BRAND

BRAND - Your Partner in the Lab. Worldwide.

General Catalog 900

Trademark Index

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sartorius®	SARTORIUS AG, Germany
STRATAGENE®	Agilent Technologies, Inc., USA
TaKaRa®	TAKARA SHUZO CO., LTD., Japan
TECHNE®	TECHNE INCORPORATED, USA
TRANSGENOMIC®	Transgenomic, Inc., USA
TRITON™	Dow Chemical Company, USA
WINDOWS®	MICROSOFT CORPORATION, USA

About the Product

Ordering options

Our products are available through major laboratory supply dealers throughout the world. If you have trouble locating a specialized supplier in your area, just call – or visit us at www.brand.de.

BRAND General Catalog

The catalog is intended for informational purposes only. Actual results may vary based upon a number of factors beyond our control, including user technique or lab environment. Suitability for a specific application is the responsibility of the end-user.
Specifications, catalog numbers and appearance are subject to change without notice.

Pictures serve the purpose of visualization. They may not necessarily correspond to the described product in every detail.

Dimensions without indication of tolerances are approximate figures.

Pack quantities are according to the recommended order quantity. The minimum order quantities are indicated in the current pricelist.

Products certified as "suitable for certification" satisfy the requirements of the German State Office of Weights and Measures ("Eichamt").

DAkkS calibration laboratory

The DAkkS-accredited calibration laboratory at BRAND is authorized to issue DAkkS calibration certificates for the following products: Liquid Handling instruments, such as piston operated pipettes and burettes, dispensers and dilutors, glass and plastic volumetric instruments and glass density bottles.

Repair and calibration service

BRAND offers repair, service and calibration (including DAkkS calibration) for all BRAND liquid handling products. BRAND calibration service is also available for third-party products.

You can obtain an order form for repair and calibration service online at www.brand.de.

We will not be held responsible for printing or typographical errors.

Contents

Ideas

Partnering for success.

Enjoyment and safety in one's daily work are essential, and make life easier. At BRAND, we help you to achieve this. Close collaboration with our customers makes it possible for us to remain aware of specific problems in labwork that arise on a daily basis. Our experts devote their best efforts to developing new ideas and solutions.
We are excited to offer you our new catalog, which reflects a philosophy that can be summed up in two words – quality and innovation.

BRAND. Your partner in the lab.

info@brand.de


ansferpette®
PIP
100
µl
electronic
µl
Dispensette® 7.4

BRAND in Wertheim

When our company started in 1949, it was an adventure. From practically nothing, Rudolf Brand together with five companions created the foundations of the Wertheimer glass industry. In that same year, he founded our present-day company. Starting from the Wertheim facility, our specialists have steadily built up the company. The effort was well worthwhile! Today, BRAND is an important partner for end users in laboratories around the world.

info@brand.de

Factory and Production

As the tasks multiplied, we have grown larger.

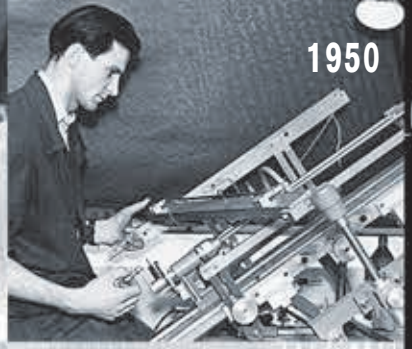
One of the world's largest cleanroom facilities, with approx. 6000 m^2 of production space, of which the cleanroom makes up 3200 m^2.

Journey through Time

Product development over the course of decades.

What began in 1949 with 6 employees engaged in producing glass apparatus, glass volumetric measuring instruments, and thermometers, with continuous facilities expansion in the interim, led in 2013 to the commissioning of one of the largest cleanroom facilities in the world. After liquid handling products, the manufacture of high-quality plastic disposables for use in the life sciences area has become one of the most important production units at BRAND.


1949


1950


the NEW
GENERAL CATALOGUE
der NEUE
Generalkatalog
RUDOLF
BRAND
WERTHEIM-
GLASHÜTTE
1957
1957


3. Auflage
3rd Edition
Plastic
Laboratory
Apparatus
Rudolf Brand
Wertheim · Glashütte
1961


1963


1964


1967

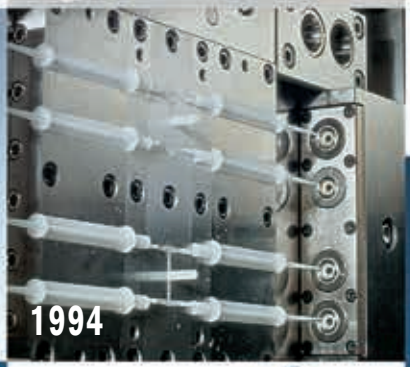

1973


1979


1984

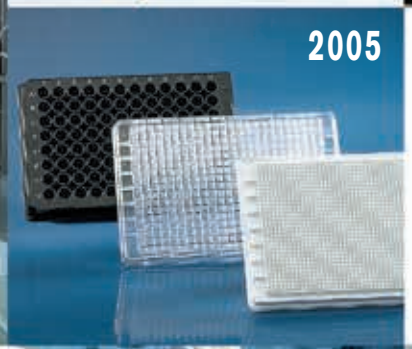

1985


1986


1994


1995


2011


2005


2008


2012


2013


2013

Goals

With you in mind, we look to the future.

More than ever, lab work requires economical solutions, and a commitment to work both sustainably and carefully. Our company offers high-quality products to help you achieve your goals, rapidly and reliably.

Advances

Vision, with implementation.

We are confident about the quality of our products. The specialists in our development division are working constantly to offer you improved and newly developed products. As our laboratory customers, you are our most important partners.

BRAND*plates*® Insert System

Innovative cell culture plates and inserts for cell and tissue culture work.

• starting on page 159

PLT Unit

The pipette leak testing unit for single and multi-channel air-displacement pipettes.

• pages 105-108

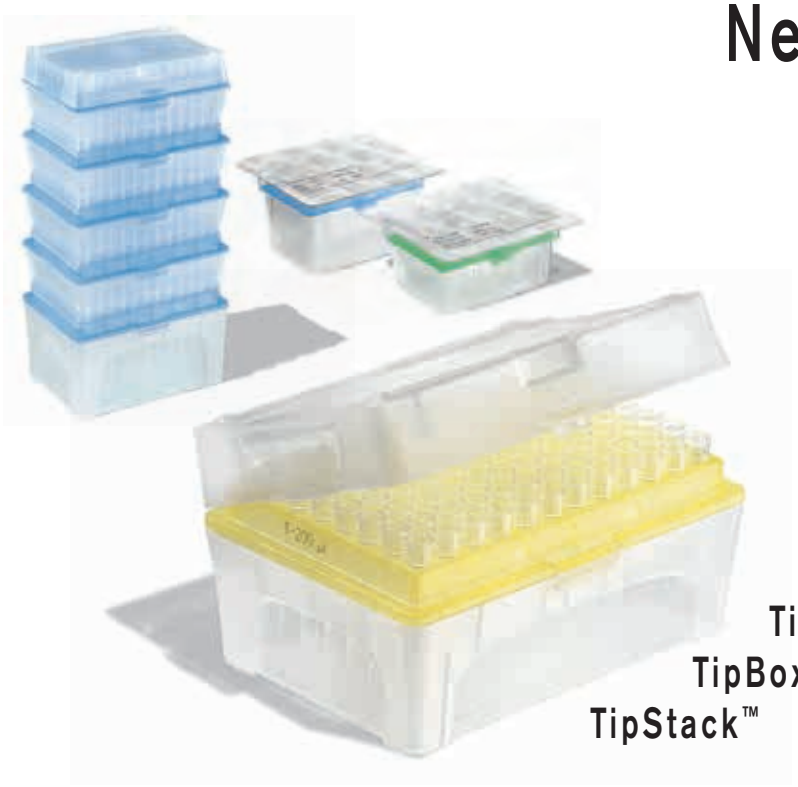
Dispensette® TA

The new bottle-top dispenser for trace analysis.

• pages 29-32

New in this Catalog!

New products for your lab.



TipRack –
TipBox –
TipStack™

The new tip system
from BRAND.

• starting on page 68

Titrette® 10 ml

bottle-top burette
pages 39-44

96-well UV plate

page 146

Strip plates

page 146

Volumetric instruments

USP model
starting on page 175

More News

macro pipette controller in new design, page 100
1.5 ml microcentrifuge tubes with lid closure, page 121
Strips of 8 PCR tubes with individual transparent flat caps, page 128
PCR plates in various formats, page 130
96-well deep-well plates 1.2 ml with elevated rim, page 137
and much more.

BRAND®

Liquid Handling

One of the most important, fundamental activities in modern laboratories is the careful handling of the ever smaller quantities of liquids used. The precision transfer of liquids in quantities from milliliters down to nanoliters is still a challenge today.

Their impressive ergonomic design, high precision, and superb quality have contributed to making BRAND liquid handling instruments known around the world for excellence.

Bottle-top dispensers

from page 19

Dispensette®
seripettor®

Bottle-top burette

from page 39

Titrette®

Single and multichannel microliter pipettes and pipette tips

from page 45

Transferpette®
Transferpettor

Repetitive pipettes and PD-Tips

from page 87

HandyStep®

Pipetting aids

from page 97

accu-jet®
macro, micro

Bottle-top aspirator

from page 103

QuikSip™

Pipette leak testing unit

from page 105

PLT unit

Calibration software

from page 109

EASYCAL™

Dispensette®

Bottle-top Dispenser

Dispensette® III

Dispensette® Organic

Dispensette® TA NEW!

The Dispensette® bottle-top dispenser has proven itself the world over with its wide range of practical applications.
It has been continuously improved over decades to meet the increasing demands of the laboratory.

BRAND®

Models

The wide range of Dispensette® bottle-top dispensers provides premium dispensing options for the complete spectrum of liquid reagents:

Dispensette® III

(red color-code)

- Digital · Easy Calibration type
- Analog-adjustable type
- Fixed-volume type

For dispensing aggressive reagents

including concentrated acids such as H_3PO_4, H_2SO_4, bases like NaOH, KOH, saline solutions, as well as many organic solvents.

■ Parts in contact with medium

borosilicate glass, ceramic, platinum-iridium, ETFE, FEP, PFA, PTFE and PP (discharge tube safety screw cap)

■ Operating limits

vapor pressure max. 600 mbar
viscosity max. 500 mm^2/s
temperature max. 40 °C
density max. 2.2 g/cm^3

Dispensette® Organic

(yellow color-code)

- Digital · Easy Calibration type
- Analog-adjustable type
- Fixed-volume type

For dispensing organic solvents

including chlorinated and fluorinated hydrocarbons (e.g., trichlorotrifluoro-ethane and dichloromethane), concentrated acids such as HCl and HNO_3, trifluoroacetic acid (TFA), tetra-hydrofuran (THF) and peroxides.

■ Parts in contact with medium

borosilicate glass, ceramic, tantalum, ETFE, FEP, PFA, PTFE and PP (discharge tube safety screw cap)

■ Operating limits

vapor pressure max. 600 mbar
viscosity max. 500 mm^2/s
temperature max. 40 °C
density max. 2.2 g/cm^3

Areas of application

(For assistance in selecting a system, please see the guide on page 23)

Bases	Saline solutions	Acids	Organic solvents
Dispensette® III			
		Dispensette® Organic	

Note! For dispensing HF, we recommend the use of the Dispensette® TA bottle-top dispenser with platinum-iridium valve spring (Cat. No. 4740 041, page 32).

A Closer Look...

The Digital · Easy Calibration type has a digital display and all the features that make dispensing safer and convenient.

Mechanical/digital display
The mechanical volume setting is easy to read and ensures accurate and reproducible volume control.

Easy Calibration Technique
Calibration and adjustments according to ISO 9001 and GLP are done within seconds. Alteration of factory setting is automatically indicated by a red recalibration flag. For more information please see page 324.

SafetyPrime™ recirculation valve
The SafetyPrime™ recirculation valve (optional) reduces risk of splashes caused by air bubbles during instrument priming and permits recirculation during priming to avoid reagent waste. Valve control knob clearly indicates valve position.

Easy to use
The minimal force needed to operate the floating piston makes serial dispensing convenient and effortless.

Safety discharge system
The integrated safety discharge system reduces the risk of inadvertent dispensing and splashes if discharge tube is improperly installed or missing.

Rotating valve block
To allow the bottle label to face the user, the valve block can be rotated 360°. The 45 mm standard thread plus the included adapters fit common lab bottles.

Telescoping filling tube
Adjusts easily to different size bottles – without measuring or cutting.

Discharge tube safety screw cap
Screw cap protects against reagent contact and is easy to attach and remove, even while wearing gloves.

Use and Handling

One-handed operation

Each piston is matched individually with precise tolerances to its cylinder. A thin liquid film acts as a non-wearing seal that reduces friction, so dispensing is easy and convenient.

Dispensing sterile fluids

The instrument can be autoclaved at 121 °C and may be fitted with an optional microfilter to prevent contamination of the bottle contents. Sterile technique must be followed.

Serial dispensing

To facilitate serial dispensing, the optional flexible discharge tube with safety handle permits fast and precise dispensing even into narrow test tubes. The functions of the safety discharge system and SafetyPrime™ recirculation valve are fully maintained with the flexible discharge tube.

Dispensing sensitive reagents

The optional drying tube screws into the ventilation aperture at the rear of the instrument. Filled with a suitable absorbing agent, it can protect sensitive reagents against humidity or CO_2.

General features of the Dispensette® bottle-top dispenser

- Dispensing directly from the supply bottle
- Easy to dismantle for cleaning
- Replaceable filling valves
- Autoclavable at 121 °C
- DE-M marking
- Easy to calibrate and adjust in order to comply with ISO 9001 and GLP guidelines. A positive indicator automatically indicates adjustment from factory settings.

Dispenser Selection Chart

Reagent	Disp. III	Disp. Organic
Acetaldehyde	+	+
Acetic acid (glacial), 100%	+	+
Acetic acid, ≤ 96%	+	+
Acetic anhydride		+
Acetone	+	+
Acetonitrile	+	+
Acetophenone		+
Acetyl chloride		+
Acetylacetone	+	+
Acrylic acid	+	+
Acrylonitrile	+	+
Adipic acid	+	
Allyl alcohol	+	+
Aluminium chloride	+	
Amino acids	+	
Ammonia, ≤ 20%	+	+
Ammonia, 20-30%		+
Ammonium chloride	+	
Ammonium fluoride	+	
Ammonium sulfate	+	
n-Amyl acetate	+	+
Amyl alcohol (Pentanol)	+	+
Amyl chloride (Chloropentane)		+
Aniline	+	+
Barium chloride	+	
Benzaldehyde	+	+
Benzene (Benzol)	+	+
Benzine (Petroleum benzin), bp 70-180 °C		+
Benzoyl chloride	+	+
Benzyl alcohol	+	+
Benzylamine	+	+
Benzylchloride	+	+
Boric acid, ≤ 10%	+	+
Bromobenzene	+	+
Bromonaphthalene	+	+
Butanediol	+	+
1-Butanol	+	+
n-Butyl acetate	+	+
Butyl methyl ether	+	+
Butylamine	+	+
Butyric acid	+	+
Calcium carbonate	+	
Calcium chloride	+	
Calcium hydroxide	+	
Calcium hypochlorite	+	
Carbon tetrachloride		+
Chloro naphthalene	+	+
Chloroacetaldehyde, ≤ 45%	+	+
Chloroacetic acid	+	+
Chloroacetone	+	+
Chlorobenzene	+	+
Chlorobutane	+	+
Chloroform		+
Chlorosulfonic acid		+
Chromic acid, ≤ 50%	+	+
Chromosulfuric acid	+	
Copper sulfate	+	
Cresol		+
Cumene (Isopropyl benzene)	+	+

Reagent	Disp. III	Disp. Organic
Cyclohexane		+
Cyclohexanone	+	+
Cyclopentane		+
Decane	+	+
1-Decanol	+	+
Dibenzyl ether	+	+
Dichloroacetic acid		+
Dichlorobenzene	+	+
Dichloroethane		+
Dichloroethylene		+
Dichloromethane		+
Diesel oil (Heating oil), bp 250-350 °C		+
Diethanolamine	+	+
Diethyl ether		+
Diethylamine	+	+
1.2 Diethylbenzene	+	+
Diethylene glycol	+	+
Dimethyl sulfoxide (DMSO)	+	+
Dimethylaniline	+	
Dimethylformamide (DMF)	+	+
1.4 Dioxane		+
Diphenyl ether	+	+
Essential oil		+
Ethanol	+	+
Ethanolamine	+	+
Ethyl acetate	+	+
Ethylbenzene		+
Ethylene chloride		+
Fluoroacetic acid		+
Formaldehyde, ≤ 40%	+	
Formamide	+	+
Formic acid, ≤ 100%		+
Glycerol	+	+
Glycol (Ethylene glycol)	+	+
Glycolic acid, ≤ 50%	+	
Heating oil (Diesel oil), bp 250-350 °C		+
Heptane		+
Hexane		+
Hexanoic acid	+	+
Hexanol	+	+
Hydriodic acid, ≤ 57% **	+	+
Hydrobromic acid		+
Hydrochloric acid, ≤ 20%	+	+
Hydrochloric acid, 20-37% **		+
Hydrogen peroxide, ≤ 35%		+
Isoamyl alcohol	+	+
Isobutanol	+	+
Isooctane		+
Isopropanol (2-Propanol)	+	+
Isopropyl ether	+	+
Lactic acid	+	
Methanol	+	+
Methoxybenzene	+	+
Methyl benzoate	+	+
Methyl butyl ether	+	+
Methyl ethyl ketone	+	+
Methyl formate	+	+
Methyl propyl ketone	+	+

Reagent	Disp. III	Disp. Organic
Methylene chloride		+
Mineral oil (Engine oil)	+	+
Monochloroacetic acid	+	+
Nitric acid, ≤ 30%	+	+
Nitric acid, 30-70% */**		+
Nitrobenzene	+	+
Oleic acid	+	+
Oxalic acid	+	
n-Pentane		+
Peracetic acid		+
Perchloric acid	+	+
Perchloroethylene		+
Petroleum, bp 180-220 °C		+
Petroleum ether, bp 40-70 °C		+
Phenol	+	+
Phenylethanol	+	+
Phenylhydrazine	+	+
Phosphoric acid, ≤ 85%	+	+
Phosphoric acid, 85% + Sulfuric acid, 98%, 1:1	+	+
Piperidine	+	+
Potassium chloride	+	
Potassium dichromate	+	
Potassium hydroxide	+	
Potassium permanganate	+	
Propionic acid	+	+
Propylene glycol (Propanediol)	+	+
Pyridine	+	+
Pyruvic acid	+	+
Salicylaldehyde	+	+
Scintilation fluid	+	+
Silver acetate	+	
Silver nitrate	+	
Sodium acetate	+	
Sodium chloride	+	
Sodium dichromate	+	
Sodium fluoride	+	
Sodium hydroxide, ≤ 30%	+	
Sodium hypochlorite	+	
Sulfuric acid, ≤ 98%	+	+
Tartaric acid	+	
Tetrachloroethylene		+
Tetrahydrofuran (THF) */**		+
Tetramethylammonium hydroxide	+	
Toluene		+
Trichloroacetic acid		+
Trichlorobenzene		+
Trichloroethane		+
Trichloroethylene		+
Trichlorotrifluoro ethane		+
Triethanolamine	+	+
Triethylene glycol	+	+
Trifluoro ethane		+
Trifluoroacetic acid (TFA)		+
Turpentine		+
Urea	+	
Xylene		+
Zinc chloride, ≤ 10%	+	
Zinc sulfate, ≤ 10%	+	

The above recommendations reflect testing completed prior to publication. Always follow instructions in the operating manual of the instrument as well as the reagent manufacturer's specifications. In addition to these chemicals, a variety of organic and inorganic saline solutions (e.g., biological buffers), biological detergents and media for cell culture can be dispensed. Should you require information on chemicals not listed, please feel free to contact BRAND. Status as of: 1014/13

* use ETFE/PTFE bottle adapter
** use PTFE seal for valve block

Note! For dispensing HF, we recommend the use of the Dispensette® TA bottle-top dispenser with platinum-iridium valve spring (Cat. No. 4740 041, page 32).

Ordering Data

Items supplied:

Each Dispensette® bottle-top dispenser has DE-M marking and is supplied with performance certificate, discharge tube, telescoping filling tube, SafetyPrime™ recirculation valve (optional), mounting tool and adapters of polypropylene:

Dispensette® nominal volume, ml	Adapter for bottle thread	Filling tube length, mm
0.5	GL 25, GL 28, GL 32	125-240
1, 2, 5, 10	GL 25, GL 28, GL 32, GL 38, S 40	125-240
25, 50, 100	GL 32, GL 38, S 40	170-330

Dispensette® III, Digital · Easy Calibration

Capacity ml	Subdivision ml	A* ≤ ± %	A* ≤ ± µl	CV* ≤ %	CV* ≤ µl	without SafetyPrime™ recirculation valve Cat. No.	with SafetyPrime™ recirculation valve Cat. No.
0.2 - 2	0.01	0.5	10	0.1	2	**4700 320**	**4700 321**
0.5 - 5	0.02	0.5	25	0.1	5	**4700 330**	**4700 331**
1 - 10	0.05	0.5	50	0.1	10	**4700 340**	**4700 341**
2.5 - 25	0.1	0.5	125	0.1	25	**4700 350**	**4700 351**
5 - 50	0.2	0.5	250	0.1	50	**4700 360**	**4700 361**

Dispensette® III, Analog-adjustable

Capacity ml	Subdivision ml	A* ≤ ± %	A* ≤ ± µl	CV* ≤ %	CV* ≤ µl	without SafetyPrime™ recirculation valve Cat. No.	with SafetyPrime™ recirculation valve Cat. No.
0.05 - 0.5	0.01	1.0	5	0.2	1	**4700 100**	**4700 101**
0.2 - 2	0.05	0.5	10	0.1	2	**4700 120**	**4700 121**
0.5 - 5	0.1	0.5	25	0.1	5	**4700 130**	**4700 131**
1 - 10	0.2	0.5	50	0.1	10	**4700 140**	**4700 141**
2.5 - 25	0.5	0.5	125	0.1	25	**4700 150**	**4700 151**
5 - 50	1.0	0.5	250	0.1	50	**4700 160**	**4700 161**
10 - 100	1.0	0.5	500	0.1	100	**4700 170**	**4700 171**

Dispensette® III, Fixed-volume

Capacity ml	A* ≤ ± %	A* ≤ ± µl	CV* ≤ %	CV* ≤ µl	without SafetyPrime™ recirculation valve Cat. No.	with SafetyPrime™ recirculation valve Cat. No.
1	0.5	5	0.1	1	**4700 210**	**4700 211**
2	0.5	10	0.1	2	**4700 220**	**4700 221**
5	0.5	25	0.1	5	**4700 230**	**4700 231**
10	0.5	50	0.1	10	**4700 240**	**4700 241**
Special fixed volumes: 0.5-100 ml (please state when ordering)					**4700 290**	**4700 291**

* Calibrated to deliver (TD, Ex). Error limits according to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. The error limits are well within the limits of DIN EN ISO 8655-5. DE-M marking.
A = Accuracy, CV = Coefficient of variation

Dispensette® Organic, Digital · Easy Calibration

Capacity ml	Subdivision ml	A* ≤ ± %	A* ≤ ± µl	CV* ≤ %	CV* ≤ µl	without SafetyPrime™ recirculation valve Cat. No.	with SafetyPrime™ recirculation valve Cat. No.
0.5 - 5	0.02	0.5	25	0.1	5	**4730 330**	**4730 331**
1 - 10	0.05	0.5	50	0.1	10	**4730 340**	**4730 341**
2.5 - 25	0.1	0.5	125	0.1	25	**4730 350**	**4730 351**
5 - 50	0.2	0.5	250	0.1	50	**4730 360**	**4730 361**

Dispensette® Organic, Analog

Capacity ml	Subdivision ml	A* ≤ ± %	A* ≤ ± µl	CV* ≤ %	CV* ≤ µl	without SafetyPrime™ recirculation valve Cat. No.	with SafetyPrime™ recirculation valve Cat. No.
0.5 - 5	0.1	0.5	25	0.1	5	**4730 130**	**4730 131**
1 - 10	0.2	0.5	50	0.1	10	**4730 140**	**4730 141**
2.5 - 25	0.5	0.5	125	0.1	25	**4730 150**	**4730 151**
5 - 50	1.0	0.5	250	0.1	50	**4730 160**	**4730 161**
10 - 100	1.0	0.5	500	0.1	100	**4730 170**	**4730 171**

Dispensette® Organic, Fix

Capacity ml	A* ≤ ± %	A* ≤ ± µl	CV* ≤ %	CV* ≤ µl	without SafetyPrime™ recirculation valve Cat. No.	with SafetyPrime™ recirculation valve Cat. No.
5	0.5	25	0.1	5	**4730 230**	**4730 231**
10	0.5	50	0.1	10	**4730 240**	**4730 241**
Special fixed volumes: 2-100 ml (please state when ordering)					**4730 290**	**4730 291**

* Calibrated to deliver (TD, Ex). Error limits according to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. The error limits are well within the limits of DIN EN ISO 8655-5. DE-M marking.
A = Accuracy, CV = Coefficient of variation

Note! When ordering instruments with DAkkS calibration certificates, the prefix 'DAkkS' must be added to the order number, e.g., DAkkS 4700 321.

BRAND also offers calibration service at the factory lab. For more information, please see page 326.

Accessories and Spare Parts

(Other spare parts and accessories can be found in the operating manual.)

Discharge tubes with integrated valve

Pack of 1.

Description	Nominal volume ml	Shape	Length mm	Cat. No.
■ for Dispensette® III	0.5, 1, 2, 5, 10	fine tip	90	**7079 15**
	5, 10	standard	90	**7079 16**
	25, 50, 100	standard	120	**7079 17**
	25, 50, 100	fine tip	120	**7079 18**
■ for Dispensette® Organic	0.5, 1, 2, 5, 10	fine tip	90	**7079 35**
	5, 10	standard	90	**7079 36**
	25, 50, 100	standard	120	**7079 37**
	25, 50, 100	fine tip	120	**7079 38**

SafetyPrime™ recirculation valves

Pack of 1.

Description	Cat. No.
■ for Dispensette® III 1-100 ml	**7060 80**
■ for Dispensette® III 0.5 ml	**7060 81**
■ for Dispensette® Organic	**7060 90**

Discharge tube with Luer-Lock attachment for micro filter

With integrated valve.
Pack of 1.

Cat. No.	7079 28*

* not suitable for HF and Peroxide

Bottle adapters

For Dispensette®, Titrette®, seripettor® and QuikSip™.

PP or ETFE. Adapters of ETFE offer higher chemical resistance. Pack of 1.

Outer thread	for bottle thread/ ground joint	Material	Cat. No.
GL 32	GL 25	PP	**7043 25**
GL 32	GL 28 / S 28	PP	**7043 28**
GL 32	GL 30	PP	**7043 30**
GL 32	GL 45	PP	**7043 45**
GL 45	GL 32	PP	**7043 96**
GL 45	GL 35	PP	**7044 31**
GL 45	GL 38	PP	**7043 97**
GL 45	S* 40	PP	**7043 43**
GL 45	S* 54	PP	**7044 30**
GL 45	S* 60	PP	**7043 48**
GL 32	GL 25	ETFE	**7043 75**
GL 32	GL 28 / S 28	ETFE	**7043 78**
GL 32	GL 30	ETFE	**7043 80**
GL 32	GL 45	ETFE	**7043 95**
GL 45	GL 32	ETFE	**7043 98**
GL 45	GL 38	ETFE	**7043 99**
GL 45	S* 40	PTFE	**7043 91**
GL 32	NS 19/26	PP	**7044 19**
GL 32	NS 24/29	PP	**7044 24**
GL 32	NS 29/32	PP	**7044 29**

* buttress thread

Bottle Stand

PP. Full plastic material – suitable for use in aggressive environment (e.g., acid fumes in the hood). Support rod 325 mm, base plate 220 x 160 mm, weight 1130 g. Pack of 1.

Cat. No.	7042 75

Threaded bottles, coated and uncoated, see page 299.

Telescoping filling tubes

FEP. Adjusts to various bottle heights.
Pack of 1.

Nominal volume ml	Outer Ø mm	Length mm	Cat. No.
0.5, 1, 2, 5, 10	6	70-140	**7042 02**
		125-240	**7042 03**
		195-350	**7042 08**
		250-480	**7042 01**
25, 50, 100	7.6	170-330	**7042 04**
		250-480	**7042 05**

Flexible discharge tubing

PTFE tube, coiled, length approx. 800 mm, with safety handle. Pack of 1.

Nominal volume ml	Discharge tube Outer Ø mm	Inner Ø mm	Cat. No.
1, 2, 5, 10	3	2	**7079 25***
25, 50, 100	4.5	3	**7079 26***

* not suitable for HF and Peroxide

Filling valve with sealing washer

Pack of 1.

Description	Nominal volume ml	Cat. No.
for Dispensette® III, Dispensette® Organic	0.5, 1, 2, 5, 10	**6697**
for Dispensette® III, Dispensette® Organic	25, 50, 100	**6698**

Filling valve with olive-shaped nozzle made of PEEK

For frequent autoclaving with the filling tube mounted, this filling valve with tube nozzle is recommended. PEEK has limited chemical resistance!
Pack of 1.

Description	Nominal volume ml	Cat. No.
for Dispensette® III, Dispensette® Organic	0.5, 1, 2, 5, 10	**6637**
for Dispensette® III, Dispensette® Organic	25, 50, 100	**6638**

Seals

PTFE. Spare seals for discharge tube, SafetyPrime™ and filling valve.
Pack of 5 each type.

Cat. No.	6696

Seal for valve block

PTFE. For highly volatile reagents.
Pack of 1.

Cat. No.	7044 86

Air vent cap for micro filter with Luer-cone

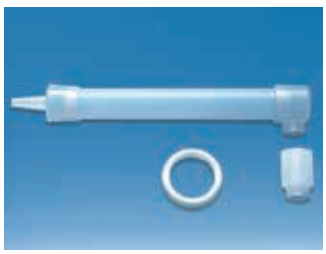
PP. Air vent cap and PTFE-sealing ring.
Pack of 1 each.

Cat. No.	7044 95

Drying tube

Drying tube and seal, without drying agent. Pack of 1.

Cat. No.	7079 30



Remote Dispensing System for Drum Dispensing

for Dispensette® III and Dispensette® Organic

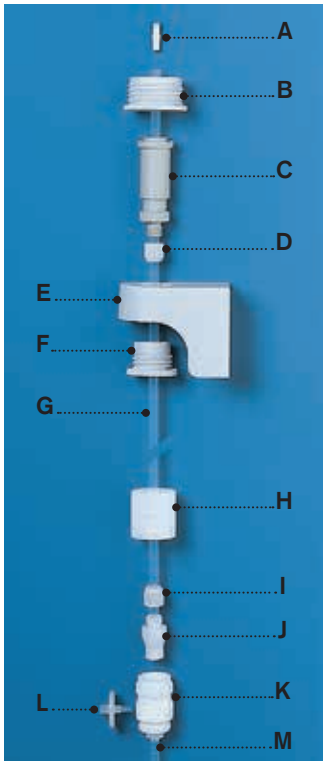
- Dispense accurate volumes directly from drums and bulk refills
- The Dispensette® can be mounted on a wall, a ring stand or on lab furniture
- A filter in the drum adapter minimizes risk of contaminating high-purity reagents when air is drawn in for pressure compensation after dispensing.
- A quick-release connector with integrated valves allows quick changing of the bulk container
- The remote dispensing system allows storage of the drum up to 10 meters (30 feet) away from the Dispensette®. The max. delivery height is approximately 1.2 m.

Standard supply:

without Dispensette®, for drums with 3/4" inner thread, consisting of:

A) Plug-in adapter, PTFE (only for Dispensettes ≤ 10 ml)
B) Thread adapter, PP (GL 45/32)
C) Strain relief, PP
D) Locking screw, ETFE
E) Wall mounting unit, PP
F) Thread adapter, PP (GL 32/28)
G) Filling tube, FEP, 3 m, outer Ø 7.6 mm
H) Mounting screw, PTFE
I) Locking screw, ETFE
J) Coupling, ETFE, with ball valve
K) Drum adapter, PTFE, for drums with inner-thread of 3/4", with ball valve (incl. closure cap)
L) Membrane filter, 3 µm, non-sterile
M) Filling tube, 0.47 m, outer Ø 6.9 mm

Note! Observe all Safety Instructions, Operating Exclusions and Limitations of the Dispensette® III and the Dispensette® Organic.



Cat. No.	7042 61

* not suitable for HF and Peroxide

Operating Exclusions

Never use the remote dispensing system:

1. with SafetyPrime™ recirculation valve. It has to be removed before use!
2. for pressurized vessels
3. for liquids attacking borosilicate glass, Al_2O_3-ceramic, PFA, ETFE, FEP or PTFE
4. for Peroxide (due to catalytic reaction)
5. for carbon disulfide (CS_2), due to risk of explosion!

Accessories

Description	Dimensions	Cat. No.
Filling tube, FEP	10 m, outer Ø 7.6 mm	7042 67
Filling tube, FEP	1 m, outer Ø 6.9 mm	7042 69
Filling tube, FEP	1.5 m, outer Ø 6.0 mm	7042 09
Filling tube, FEP	1.5 m, outer Ø 7.6 mm	7042 10
Thread adapter, steel	outer thread 2", inner thread 3/4"	7042 70
Thread adapter, PTFE, for direct mounting of Dispensette® on drum	outer thread 3/4", outer thread GL 32	7042 81
Thread adapter, PTFE, to connect remote dispensing system with drums with GL outer thread	inner thread 3/4", inner thread GL 32	7042 82
Support rod connector for wall mounting unit		7042 68
Shelf clamp for wall mounting unit		7042 72


Support rod connector


Shelf clamp

Dispensette® TA

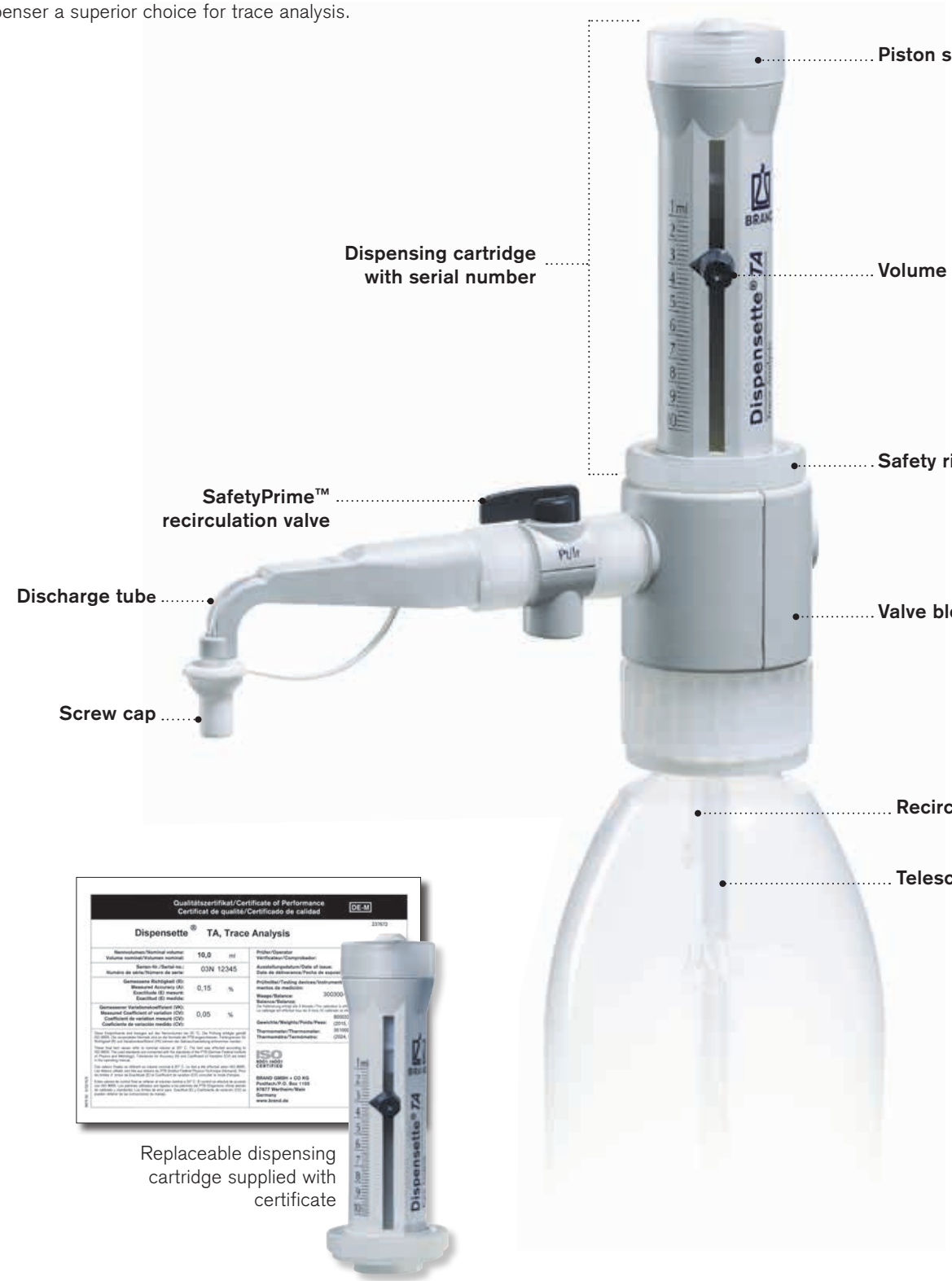
Trace Analysis

The Dispensette® TA provides outstanding performance for precise volume dispensing of high-purity media for trace analysis. Also suitable for HF with platinum-iridium valve spring.

The components of the fluid path are constructed of the highest purity materials, such as PFA, PTFE and sapphire. Depending on application, either platinum-iridium or tantalum valve springs can be chosen. The volume range is from 1 to 10 ml. Especially well suited for dispensing acids, bases and hydrogen peroxide. Trace metal content of dispensed liquid is generally in the low ppb range, or, depending on application, even in the ppt range.

A Closer Look...

Designed for use in trace analysis. The high-purity materials release virtually no metal ions after appropriate cleaning. This makes the Dispensette® TA bottletop dispenser a superior choice for trace analysis.



Replaceable dispensing cartridge supplied with certificate

Use and Handling

Replaceable dispensing cartridge

If the piston seal is worn after an extended period of use, the entire dispensing cartridge can easily be replaced without tools by the user. The cartridge is fully adjusted at the factory, and delivered with a performance certificate. No calibration is required after replacement.

Serial dispensing

For easy serial dispensing, an optional flexible discharge tube with textured safety handle (not approved for HF) permits fast and precise dispensing, even into narrow test tubes. Full functionality of the SafetyPrime™ recirculation valve and the safety discharge system is maintained after installation.

General features of the Dispensette® TA bottle-top dispenser

- Plastics in contact with media consist of high-purity materials such as PTFE, ETFE, FEP, and PFA. The purest sapphire is used for replaceable valves. Depending on the application, platinum-iridium or tantalum are available as spring materials.
- A field-tested cleaning process before use in trace analysis is described in the operating manual.
- If contamination of the bottle contents must be avoided, we recommend using the device without the SafetyPrime™ recirculation valve.
- The 45 mm standard thread plus the included adapters fit most common lab bottles.
- The valve block can be rotated 360° so that the bottle label always faces the user for safety.
- Telescoping filling tube adjusts to different bottle sizes.
- Easy disassembly for replacement of the dispensing cartridge.

Parts in contact with medium

Various fluoroplastics (ETFE, FEP, PFA, PTFE), Al_2O_3 sapphire and platinum-iridium or tantalum, depending on design.

Operating limits

Vapor pressure max. 600 mbar
viscosity max. 500 mm^2/s
temperature max. 40 °C
density max. 3.8 g/cm^3

Recommended application range

Dispensing medium	Valve spring: Pt-Ir	Valve spring: Ta
Acetic acid	+	+
Ammonia solution	+	+
Bromine	+	+
Hydrochloric acid	+	+
Hydrofluoric acid*	+	–
Hydrogen peroxide	–	+
Nitric acid	+	+
Perchloric acid	+	+
Phosphoric acid	+	+
Sodium hydroxide, 30%	+	–
Sulfuric acid	+	+
Water	+	+

+ suitable – not suitable

* Hydrofluoric acid reacts slightly with sapphire resulting in mildly elevated aluminum values. To reduce these values we recommend discarding 3-5 dispensings of 2 ml each before performing the analysis.

The above recommendations reflect testing completed prior to publication. Always follow instructions in the operating manual of the instrument as well as the reagent manufacturer's specifications. Should you require information on chemicals not listed, please feel free to contact BRAND. Status as of: 0713/2

Ordering Data

Dispensette® TA, Analog-adjustable

Items supplied:

Each Dispensette® TA bottle-top dispenser has DE-M marking and is supplied with performance certificate, telescoping filling tube, SafetyPrime™ recirculation valve and recirculation tube (optional), mounting tool, bottle adapters GL 28/S 28 (ETFE), GL 32 (ETFE) and S 40 (PTFE).

Capacity ml	Valve spring	A* ≤ ± %	µl	CV* ≤ %	µl	without SafetyPrime™ recirculation valve Cat. No.	with SafetyPrime™ recirculation valve Cat. No.
1-10	Platinum-iridium	0.5	50	0.1	10	**4740 040**	**4740 041**
1-10	Tantalum	0.5	50	0.1	10	**4740 240**	**4740 241**

* Calibrated to deliver (TD, Ex). Error limits according to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. The error limits are well within the limits of DIN EN ISO 8655-5. DE-M marking.
A = Accuracy, CV = Coefficient of variation

Accessories and Spare Parts

(Other spare parts and accessories can be found in the operating manual.)

SafetyPrime™ recirculation valves

Pack of 1.

Valve spring, Platinum-iridium

Cat. No.	7060 86

Valve spring, Tantalum

Cat. No.	7060 87

Discharge tubes with integrated valve

Tube closure cap PTFE. Pack of 1.

Nominal volume ml	Valve spring	Length mm	Cat. No.
10	Platinum-iridium	90	**7079 55**
10	Tantalum	90	**7079 56**

Flexible discharge tubing

PTFE, coiled, length 800 mm, with safety handle. Must not be used with HF! Pack of 1.

Nominal volume ml	Valve spring	Cat. No.
10	Platinum-iridium	**7079 45**
10	Tantalum	**7079 46**

Telescoping filling tubes

FEP. Adjusts to various bottle heights. Pack of 1.

Length mm	Cat. No.
70-140	**7042 02**
125-240	**7042 03**
195-350	**7042 08**
250-480	**7042 01**

Filling valve with sealing washer

Pack of 1.

Cat. No.	6622

Dispensing cartridge with safety ring

Nominal volume 10 ml, calibrated, incl. quality certificate. Pack of 1.

Cat. No.	7075 42

Bottle Stand

PP. Full plastic construction – suitable for use in aggressive environment (e.g., acid fumes in the hood). Support rod 325 mm, base plate 220 x 160 mm, weight 1130 g. Pack of 1.

Cat. No.	7042 75

seripettor®

seripettor® *pro*

seripettor® and seripettor® *pro* are innovative bottle-top dispensers from BRAND with a special design. They provide a cost-effective alternative to high-end dispensers for routine laboratory use.

seripettor®

Bottle-top Dispenser

BRAND®

Models

Two models, seripettor® and seripettor® *pro*, are available to simplify your routine dispensing operations. These dispensers will serve in a wide variety of applications – when dispensing buffer solutions, culture media, vitamin solutions, acids, bases, saline solutions or many polar solvents.
Even special cases can be managed; for example, the seripettor® bottle-top dispenser can handle agar culture media up to a max. of 60 °C.

■ **Operating range: seripettor®**

– **Aqueous solutions**
Routinely used biological buffer solutions and detergents, antifoaming agents, culture media, vitamin solutions and so on can be dispensed. Hydrogen peroxide can also be dispensed.
Agar culture media can be dispensed at up to a max. of 60 °C.

– **Acids**
Weak, dilute or non-oxidizing acids can be dispensed.

– **Alkaline solutions**
The components of the instrument are compatible with alkaline solutions, such as NaOH, KOH and ammonia.

– **Polar solvents**
e.g., polar solvents such as ethanol, methanol, acetylacetone, etc.

■ **Operating range: seripettor® *pro***

The seripettor® *pro* bottle-top dispenser extends the operating range to include the dispensing of

– acids such as concentrated HCl
– polar solvents such as acetone
– UV-sensitive reagents

Information on use with your specific media can be found in the guidelines for dispenser selection on page 36, or ask BRAND.

Use and Handling

One-handed operation

For dispensing, press down gently on the piston.
The automatic lifting action of a spring pushes the piston up. This automatically fills the dispensing cartridge.

Serial dispensing

The optional flexible discharge tube with safety handle makes it easier to dispense in long series (it connects to the valve block with an adapter).

Dispensing sterile liquids

1. Mount the valve block with filling tube onto the bottle and cover the valve block with cap. Affix the autoclavable sterile membrane filter (0.2 µm) laterally and autoclave at 121 °C.
2. On a clean-bench (sterile hood), remove the cap from the valve block, screw in a new sterile dispensing cartridge and mount the pump assembly. You're ready to dispense!

A Closer Look...

The design of the seripettor® bottle-top dispenser makes it possible for the user to replace any functional parts when needed, quickly and easily without the use of tools. Cleaning and maintenance work is reduced to a minimum.

Pump assembly with lifting spring
The automatic lifting action of a spring pushes the piston up. This fills the dispensing cartridge.

Volume settings
Scalloped track allow for quick and exact setting of desired volume. The selected volume can be easily read.

Replaceable dispensing cartridge
If the dispenser's piston seal becomes worn, it is easy and inexpensive to replace. One spare cartridge included free.

Valve block
Valve block (GL 45) and included adapters (GL 32 and S 40) match the threads of the most common reagent bottles.
(See page 26 for an overview of available bottle adapters.)

Cap for discharge tube
Stopper cap or screw cap (depending on the model).

Materials of construction	seripettor®	seripettor® *pro*
Pump assembly	PC	PPO/PEI (for UV protection)
Lifting spring	spring steel	Hastalloy (stainless)
Dispensing cartridge*	PE/PP	PE/PP
Valve block*	PP	PP
Valves*	PP/EPDM	ETFE/borosilicate glass/Al_2O_3/Pt-Ir
Discharge tube*	FEP	PTFE/ETFE/FEP/PFA/borosilicate glass/Al_2O_3/Pt-Ir
Filling tube*	PP	Telescoping filling tube, FEP/PTFE
Cap for discharge tube*	Stopper cap, PP	Screw cap, PP

* parts in contact with the media

Dispenser Selection Chart

Reagent	seri-pettor®	seripet-tor® *pro*
Acetaldehyde		+
Acetic acid, 5%	+	+
Acetic acid, 96%		+
Acetic acid (glacial), 100%		+
Acetone		+
Acetonitrile		+
Acetophenone	+	
Acetylacetone	+	+
Acrylic acid		+
Acrylonitrile		+
Adipic acid	+	+
Agar (60 °C)	+	
Allyl alcohol	+	+
Aluminium chloride	+	+
Amino acids	+	+
Ammonia, 30%	+	+
Ammonium chloride	+	+
Ammonium fluoride	+	+
Ammonium sulfate	+	+
Amyl alcohol (Pentanol)	+	+
n-Amyl acetate		+
Aniline		+
Barium chloride	+	+
Benzaldehyde		+
Benzyl alcohol		+
Benzylamine		+
Benzylchloride		+
Boric acid, 10%	+	+
Butanediol	+	+
1-Butanol		+
Butylamine		+
n-Butyl acetate		+
Calcium carbonate	+	+

Reagent	seri-pettor®	seripet-tor® *pro*
Calcium chloride	+	+
Calcium hydroxide	+	+
Calcium hypochlorite		+
Chloroacetaldehyde, 45%		+
Chloroacetic acid		+
Chromic acid, 50%		+
Copper sulfate	+	+
Cumene (Isopropyl benzene)		+
Diethylene glycol	+	+
Dimethyl sulfoxide (DMSO)		+
Dimethylaniline		+
Ethanol	+	+
Formaldehyde, 40%	+	+
Formamide	+	+
Formic acid, 100%		+
Glycerol	+	+
Glycol (Ethylene glycol)	+	+
Glycolic acid, 50%	+	+
Hexanoic acid	+	+
Hexanol		+
Hydriodic acid	+	+
Hydrobromic acid		+
Hydrochloric acid, 37%		+
Hydrogen peroxide, 35%	+	
Isoamyl alcohol		+
Isobutanol	+	+
Isopropanol (2-Propanol)	+	+
Lactic acid	+	+
Methanol	+	+
Methyl benzoate		+
Methyl ethyl ketone		+
Methyl propyl ketone		+
Mineral oil (Engine oil)		+

Reagent	seri-pettor®	seripet-tor® *pro*
Monochloroacetic acid		+
Nitric acid, 10%		+
Oxalic acid	+	+
Perchloric acid		+
Phenol		+
Phosphoric acid, 85%		+
Piperidine		+
Potassium chloride	+	+
Potassium dichromate	+	+
Potassium hydroxide	+	+
Potassium hydroxide in ethanol	+	+
Potassium permanganate	+	+
Propionic acid	+	+
Propylene glycol (Propanediol)	+	+
Pyridine		+
Pyruvic acid	+	+
Salicylaldehyde		+
Salicylic acid	+	+
Silver acetate	+	+
Silver nitrate	+	+
Sodium acetate	+	+
Sodium chloride	+	+
Sodium dichromate	+	+
Sodium fluoride	+	+
Sodium hydroxide, 30%	+	+
Sodium hypochlorite 20% (active chlorine approx. 10%)		+
Sulfuric acid, 10%	+	+
Tartaric acid		+
Urea	+	+
Zinc chloride, 10%	+	+
Zinc sulfate, 10%	+	+

The above recommendations reflect testing completed prior to publication. Always follow instructions in the operating manual of the instrument as well as the reagent manufacturer's specifications. In addition to these chemicals, a variety of organic and inorganic saline solutions (e.g., biological buffers), biological detergents and media for cell culture can be dispensed. Should you require information on chemicals not listed, please feel free to contact BRAND. Status as of: 0114/9

Note! seripettor® and seripettor® *pro* are not suitable for HF. For dispensing HF, we recommend the use of the Dispensette® TA bottle-top dispenser with platinum-iridium valve spring (Cat. No. 4740 041, page 32).

Operating limits	seripettor®	seripettor® *pro*
Vapor pressure	up to 500 mbar	up to 500 mbar
Density	up to 2.2 g/cm³	up to 2.2 g/cm³
Temperature	15 to 40 °C	15 to 40 °C
	agar cultures up to 60 °C	
Viscosity	2 ml instrument: 300 mm²/s	2 ml instrument: 300 mm²/s
	10 ml instrument: 150 mm²/s	10 ml instrument: 150 mm²/s
	25 ml instrument: 75 mm²/s	25 ml instrument: 75 mm²/s

Ordering Data

seripettor®

Items supplied:

Each seripettor® bottle-top dispenser is supplied with discharge tube, filling tube, spare dispensing cartridge and PP adapters (GL 45/32 and GL 45/S40).

Volume ml	Subdivision ml	A* ≤ ± %	µl	CV* ≤ %	µl	Cat. No.
0.2 - 2	0.04	1.2	24	0.2	4	**4720 120**
1 - 10	0.2	1.2	120	0.2	20	**4720 140**
2.5 - 25	0.5	1.2	300	0.2	50	**4720 150**

seripettor® *pro*

Items supplied:

Each seripettor® *pro* bottle-top dispenser is supplied with discharge tube, filling tube, spare dispensing cartridge, mounting tool and PP adapters (GL 45/32 and GL 45/S40).

Volume ml	Subdivision ml	A* ≤ ± %	µl	CV* ≤ %	µl	Cat. No.
0.2 - 2	0.04	1.2	24	0.2	4	**4720 420**
1 - 10	0.2	1.2	120	0.2	20	**4720 440**
2.5 - 25	0.5	1.2	300	0.2	50	**4720 450**

* Calibrated to deliver (TD, Ex). Error limits according to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. A = Accuracy, CV = Coefficient of variation

Accessories and Spare Parts

(Other spare parts and accessories can be found in the operating manual.)

Note! Dispensing cartridges are not autoclavable.

Dispensing cartridges

For seripettor® and seripettor® *pro*. Non-sterile and sterile. Piston (PE), cylinder (PP).

Description	Pack of	Cat. No.
2 ml, non-sterile	3	**7045 00**
10 ml, non-sterile	3	**7045 02**
25 ml, non-sterile	3	**7045 04**
2 ml, sterile (individually wrapped)	7	**7045 07**
10 ml, sterile (individually wrapped)	7	**7045 06**
25 ml, sterile (individually wrapped)	5	**7045 08**

Flexible discharge tube

For seripettor® and seripettor® *pro*. PTFE tube, coiled, length approx. 800 mm, with safety handle. Pack of 1.

Nominal volume	Cat. No.
2 + 10 ml	**7045 22**
25 ml	**7045 23**

Note! Not suitable for peroxides.

Pump assembly seripettor®

PC, spring steel lifting spring.
Pack of 1.

Description	Cat. No.
2 ml	**7045 41**
10 ml	**7045 42**
25 ml	**7045 44**

Discharge tube seripettor®

Incl. closure cap and EPDM discharge valve.
Pack of 1.

Description	Cat. No.
Fine tip (2 ml)	**7045 18**
Standard (10 + 25 ml)	**7045 20**

Valve set seripettor®

1 filling valve (filling valve body, O-ring) 1 discharge valve, 2 seals.

Cat. No.	6790

See page 26 for an overview of available **bottle adapters**.

Pump assembly seripettor® *pro*

PPO. PEI (UV protection). Hastaloy (stainless) lifting spring.
Pack of 1.

Description	Cat. No.
2 ml	**7045 51**
10 ml	**7045 48**
25 ml	**7045 49**

Discharge tube seripettor® *pro*

With integrated valve with seal.
Pack of 1.

Description	Cat. No.
2 ml	**7079 15**
10 ml	**7079 16**
25 ml	**7079 18**

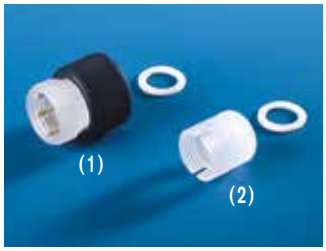
Discharge tube adapters are ordered separately.

Filling valve seripettor® *pro*

Filling valve with seal.
Pack of 1.

Description	Cat. No.
2 + 10 ml	**6697**
25 ml	**6698**

Filling valves are ordered separately.



(1) Adapter for discharge tube seripettor® *pro*

PP. With seal.
Pack of 1.

Cat. No.	6208

(2) Adapter for filling valve seripettor® *pro*

PP. With seal.
Pack of 1.

Cat. No.	6707

Filling tubes seripettor®

PP. Autoclavable design with additional O-rings.

Length mm	Pack of	Cat. No.
250	2	**7045 32**
500	2	**7045 34**
250, with O-ring	1	**7045 36**
500, with O-ring	1	**7045 38**

Telescopic filling tubes seripettor® *pro*

FEP. Adjusts to various bottle heights.
Pack of 1.

Nominal volume ml	Outer Ø mm	Length mm	Cat. No.
2 + 10	6	70-140	**7042 02**
		125-240	**7042 03**
		195-350	**7042 08**
		250-480	**7042 01**
25	7.6	170-330	**7042 04**
		250-480	**7042 05**

Titrette® – the first bottle-top burette to satisfy Class A error limits for glass burettes! It is also remarkable for its easy dropwise titration, compact design, ultra-high precision, replaceable piston/cylinder assembly and an optional PC interface. With the Titrette® bottle-top burette, you can titrate quickly and reliably with the highest precision, even in close quarters, with no power hookup needed – in the lab, in production, or in the field.

Titrette®

Bottle-top Burette

BRAND®

A Closer Look...

The control elements of the Titrette® bottle-top burette have an intuitive layout. Separate buttons for On/Off and Pause; CLEAR button allows user to reset the display and select functions. Easy-grip hand wheel action and smooth precision gears for fast or drop-wise titration make handling more reliable and extremely simple.

Use and Handling

Smooth operation

No switching is needed to change between filling and titration. The dispenser automatically detects whether you are filling or titrating by the direction of hand wheel rotation. With the optimized gear ratio, you can fill the instrument quickly and still titrate drop-wise very slowly and sensitively. The drop size for the 10 ml instrument is approx. 20 µl, and for the 25 and 50 ml instruments approx. 30 µl.

User serviceable

The dispenser is quickly and easily dismantled within a few minutes – for cleaning, to replace the piston/cylinder, or to replace the batteries.
Now you can carry out maintenance conveniently and easily in the lab, and the instrument is ready to use again in minutes.

Light-weight and compact

The compact and lightweight design ensures good stability. The titrating tube can be adjusted horizontally and vertically. This provides flexibility when positioning the instrument, e.g., when using a magnetic stirrer or different bottle sizes.

Light protection

For protection of light-sensitive media, the clear inspection windows can be replaced with the amber colored windows (included).

Useful extras
The instrument is equipped with four helpful additional electronic functions:

Adjustment with Easy Calibration

With Easy Calibration technology, the instrument can be adjusted quickly and easily – with no tools! A small 'CAL' icon in the display indicates that the factory setting has been changed.

Calibration schedule

The next calibration date can be stored under 'GLP', and called up each time the instrument is turned on. The GLP and the year and month of the scheduled date are then shown continuously.

Save power with Auto Power Off

The instrument switches off automatically after longer periods of inactivity. The current display value is stored, and returned to the display after the power is switched on again manually. Under 'APO' (Auto Power Off), the inactivity period until automatic power off can be set from 1 to 30 minutes.

Changing decimal place settings

For use as a micro-burette, the titrated volume display can be switched from 2 to 3 decimal places under 'dP' (decimal point). Above 20.00 ml, the display automatically switches to 2 decimal places.

PC interface (optional)

The instrument is available with an optional RS 232 communications interface. Advantages compared to the standard configuration:

- The titration results are automatically transmitted to the PC by double-clicking on the CLEAR key. This eliminates transcription errors while recording primary data, and complies with an important requirement of GLP.
- With each data transfer, the burette sends the titrated volume, the serial number of the instrument, the nominal volume and the adjustment value, as well as the next scheduled calibration date. Thus, all raw data is collected and displayed together with actual date/time stamp from the PC.

  The transmitted data is recognized as keyboard inputs by the PC. This universal input format ensures that the instrument is compatible with all PC applications that accept keyboard inputs.

To connect the instrument to a USB interface, simply use a standard USB/RS 232 adapter.

The instrument can be used for the following titration media (maximum concentration 1 mol/l):

Range of application	
Acetic acid	Potassium bromide bromate solution
Alcoholic potassium hydroxide solution	Potassium dichromate solution
Ammonium iron (II) sulfate solution	Potassium hydroxide solution
Ammonium thiocyanate solution	Potassium iodate solution
Barium chloride solution	Potassium permanganate solution*
Bromide bromate solution	Potassium thiocyanate solution
Cerium (IV) sulfate solution	Silver nitrate solution*
EDTA solution	Sodium arsenite solution
Hydrochloric acid	Sodium carbonate solution
Hydrochloric acid in acetone	Sodium chloride solution
Iodide Iodate solution*	Sodium hydroxide solution
Iodine solution*	Sodium nitrite solution
Iron (II) sulfate solution	Sodium thiosulfate solution
Nitric acid	Sulfuric acid
Oxalic acid solution	Tetra-n-butylammonium hydroxide solution
Perchloric acid	Triethanolamine in acetone*
Perchloric acid in glacial acetic acid	Zinc sulfate solution
Potassium bromate solution	

* Use light shield inspection window

The above recommendations reflect testing completed prior to publication. Always follow instructions in the operating manual of the instrument as well as the reagent manufacturer's specifications. Should you require information on chemicals not listed, please feel free to contact BRAND. Status as of: 0713/4

When the instrument is properly handled, dispensed liquid will only come into contact with the following chemically resistant materials: borosilicate glass, Al_2O_3, ETFE, PFA, FEP, PTFE, platinum-iridium; PP (screw cap).

Limitations of use

Chlorinated and fluorinated hydrocarbons or chemical combinations which form deposits may make the piston difficult to move or may cause jamming.
Compatibility of the instrument for a special application (e.g., trace material analysis) must be checked by the user. For additional information, please contact the manufacturer.

The instrument is not autoclavable!

Operating limits

This instrument is designed for titrating liquids, observing the following physical limits:

- +15 °C to +40 °C (59 °F to 104 °F) of instrument and reagent
- Vapor pressure up to 500 mbar
- Viscosity up to 500 mm^2/s
- Altitude: maximum 3000 m above sea level
- Relative humidity: 20% to 90%

Comparison of error limits

		Titrette® bottle-top burette				Bottle-top burettes according to DIN EN ISO 8655-3				Glass burettes Class A acc. to DIN EN ISO 385 and ASTM
Volume ml	Partial volume ml	A* ≤ ± %	µl	CV* ≤ %	µl	A* ≤ ± %	µl	CV* ≤ %	µl	EL** ± µl
10	10	**0.10**	**10**	**0.05**	**5**	0.3	30	0.1	10	20
NEW!	5	**0.20**	**10**	**0.10**	**5**	0.6	30	0.2	10	20
	1	**1.00**	**10**	**0.50**	**5**	3	30	1	10	20
25	25	**0.07**	**18**	**0.025**	**6**	0.2	50	0.1	25	30
	12.5	**0.14**	**18**	**0.05**	**6**	0.4	50	0.2	25	30
	2.5	**0.70**	**18**	**0.25**	**6**	2	50	1	25	30
50	50	**0.06**	**30**	**0.02**	**10**	0.2	100	0.1	50	50
	25	**0.12**	**30**	**0.04**	**10**	0.4	100	0.2	50	50
	5	**0.60**	**30**	**0.20**	**10**	2	100	1	50	50

* Calibrated to deliver (TD, Ex). Error limits according to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. The error limits are well within the limits of DIN EN ISO 8655-3. DE-M marking. A = Accuracy, CV = Coefficient of variation

** Error limit: EL = A + 2CV, according to DIN EN ISO 8655-6 Annex B

The titration volume is displayed in steps of 1 µl at instruments with 10 ml and 25 ml size and in steps of 2 µl for 50 ml size instruments. For titration volumes above 20 ml the display will automatically switch to steps of 10 µl.

The error limits for Class A burettes according to DIN EN ISO 385 are met.

Note! If you need an official certification which confirms the error limits that are much stricter than those of DIN EN ISO 8655-3, we recommend a calibration certificate from an accredited calibration laboratory (e.g., the DAkkS laboratory at BRAND).

Ordering Data

Titrette®

Items supplied:

Each Titrette® bottle-top burette has DE-M marking and is supplied with performance certificate, telescoping filling tube (170 - 330 mm), recirculation tube, 2 batteries (AAA/UM4/LR03), 3 PP bottle adapters (GL 45/32, GL 45/S 40, GL 32/NS 29/32), 2 amber colored light shield inspection windows.

Volume	Standard Cat. No.	with RS 232 interface* Cat. No.
10 ml NEW!	**4760 141**	**4760 241**
25 ml	**4760 151**	**4760 251**
50 ml	**4760 161**	**4760 261**

* Additionally included: 2 m interface cable (Sub-D plug connector, 9-pin), one CD (driver software and open RS232 communication protocol). The CD also includes an example application in XLS-file format, as well as a special operating manual.

Note! When ordering instruments with DAkkS calibration certificates, the prefix 'DAkkS' must be added to the order number, e.g., DAkkS 4760 161.

BRAND also offers calibration service at the factory lab. For more information, please see page 326.

Accessories and Spare Parts

(Other spare parts and accessories can be found in the operating manual.)

Titrating tube

With screw cap and integrated discharge and recirculation valve. Pack of 1.

for volume ml	Cat. No.
10	**7075 25**
25 + 50	**7075 29***

* Manufactured from Jan. 2012 onwards (serial number 01K)

Telescoping filling tubes

FEP.
Pack of 1.

Length mm	Cat. No.
170 - 330	**7042 04**
250 - 480	**7042 05**

Filling valve

With olive-shaped nozzle and sealing ring.
Pack of 1.

Cat. No.	6636

Inspection window

1 set colorless and 1 set amber colored (light shield).

Cat. No.	6783

Piston

Pack of 1.

for volume ml	Cat. No.
10	**7075 31**
25	**7075 30**
50	**7075 32**

Dispensing cylinder with valve block

Pack of 1.

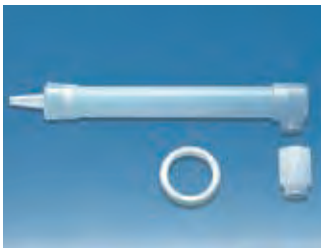
for volume ml	Cat. No.
10	**7075 33**
25	**7075 35***
50	**7075 37***

* Manufactured from Jan. 2012 onwards (serial number 01K)

Bottle Stand

PP. Full plastic construction.
Support rod 325 mm,
base plate 220 x 160 mm,
weight 1130 g.
Pack of 1.

Cat. No.	7042 75



Drying tube

Drying tube and seal, without drying agent. Pack of 1.

Cat. No.	7079 30

Threaded bottles, coated and uncoated, see page 299.

See page 26 for an overview of available **bottle adapters**.

BRAND offers the ideal pipette for every hand:

- Transferpette® *S* with the central pipetting button and one-handed volume setting
- Transferpette® with the pipetting key on the side
- Transferpette® electronic with motor drive

BRAND has been developing and manufacturing single-channel and multichannel piston-operated pipettes for more than 25 years. Special attention is always paid to optimum ergonomics and reduction of injuries caused by prolonged strain (such as Repetitive Strain Injury Syndrome, RSI).

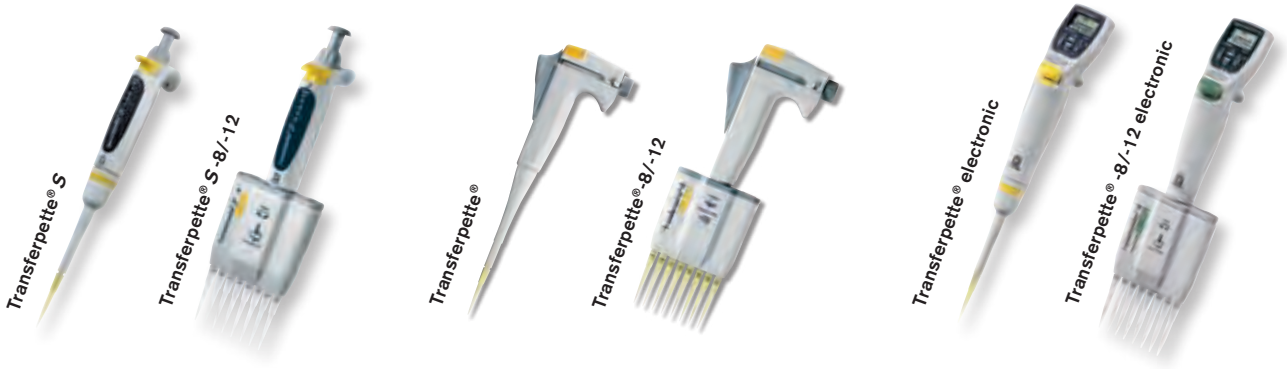
Transferpette®

Pipetting System

BRAND®

Pipetting – A Routine Laboratory Procedure

Pipetting is one of the most frequent tasks in the laboratory. The right choice of pipette is critical to performing this repetitive task accurately and strain-free.



What are the special features to look for?

■ Pipetting key

To fit your preferred working style, choose either the Transferpette® pipettes with the pipetting key on the side or the Transferpette® *S* pipettes with the central pipetting button. The Transferpette® electronic pipettes only need a light tap on the pipetting button to activate the piston.

■ Tip ejector

All Transferpette® models have separate tip ejection controls. This reduces the risk of accidental tip ejection.

■ Easy Calibration

Piston-operated pipettes are calibrated in compliance with the monitoring of measuring instruments according to EN ISO 8655. All Transferpette® models feature the Easy Calibration Technique that allows adjustment without tools (please see page 324).

■ Autoclavability

No compromises! Depending on the model, either the complete pipette shaft (Transferpette®, Transferpette® electronic) or the entire pipette (Transferpette® *S*) can be autoclaved at 121 °C (2 bar), according to DIN EN 285.

■ Tip cone

Pipette and pipette tip form a single system. Both components have been developed by BRAND and are perfectly matched. This ensures an optimum fit between the Transferpette® pipettes and the pipette tips and filter tips from BRAND.

For your convenience, the tip cone is also designed to accept tips made by other leading manufacturers.

Which Transferpette® is right for you?

	Transferpette® *S*	Transferpette®	Transferpette® electronic
Side pipetting key		✔	
Central pipetting button	✔		✔
Separate tip ejection	✔	✔	✔
Easy Calibration Technique	✔	✔	✔
Entire shaft is autoclavable	✔	✔	✔
Entire pipette is autoclavable	✔		
Corrosion-resistant piston	✔	✔	✔
Universal tip cone	✔	✔	✔
Volume display	4-position	3/4-position*	4-position
Volume range	0.1 µl - 10 ml	0.1 µl - 5 ml	0.5 µl - 5 ml
Motor driven			✔

* depending on volume range

Transferpette® *S*

Single and Multichannel Pipettes

The performance standard among pipettes with a central pipetting button: Transferpette® *S* pipettes from BRAND.

Transferpette® *S* models are the product of intensive ergonomic and operational studies and the application of modern innovative materials. The Transferpette® *S* models are the perfect manual pipettes for demanding laboratory applications for scientists who prefer the central pipetting button.
The Transferpette® *S* pipettes provide all of the features required by users working in the life sciences field: robust, one-handed operation, completely autoclavable, high precision and Easy Calibration technique for lasting reliability.

Transferpette® *S* Solutions for *S*cience

Models

Lightweight – robust – low force:

The piston-operated pipette Transferpette® *S* provides maximum versatility and optimum quality over the entire volume range.

There are 10 single-channel pipettes with adjustable volume and 8 single-channel pipettes with fixed volume available in the 0.1 µl to 10 ml range.

There are 5 different multichannel pipettes available in the 0.5 to 300 µl volume range.

Features

- Large, central pipetting button and separate ejection function
- True one-handed operation for both right-and left-handers
- The Transferpette® *S* is completely autoclavable at 121 °C (2 bar), acc. DIN EN 285.
- Volume-change protection
- 4-position volume display, always clearly visible
- Transferpette® *S* features Easy Calibration technique – readjustment without special tools (please see page 324 for further details). Clearly visible external flag indicates changes from factory settings.
- Short stroke of only 12.5 mm to reduce the risk of RSI (Repetitive Strain Injury)
- Corrosion-resistant piston and ejector
- Color-coded volume range
- Transferpette® *S* 0.1-1 µl offers maximum precision for molecular biology work, especially when pipetting enzymes.
- UV resistant
- CE-IVD-compliant

Transferpette® *S*

Transferpette® *S*-8

Optimal performance will be achieved with the use of genuine premium tips from BRAND. **Pipette and filter tips**, see pages 68-82.

A Closer Look...

A central pipetting button, one-handed operation, precise 4-position volume settings and a volume display that can be easily read by both right- and left-handed operators are only a few examples of the attention to detail in the design of the Transferpette® *S* pipette.

Pipetting button
The centrally mounted, large pipetting button allows uniform smooth movement of the piston.

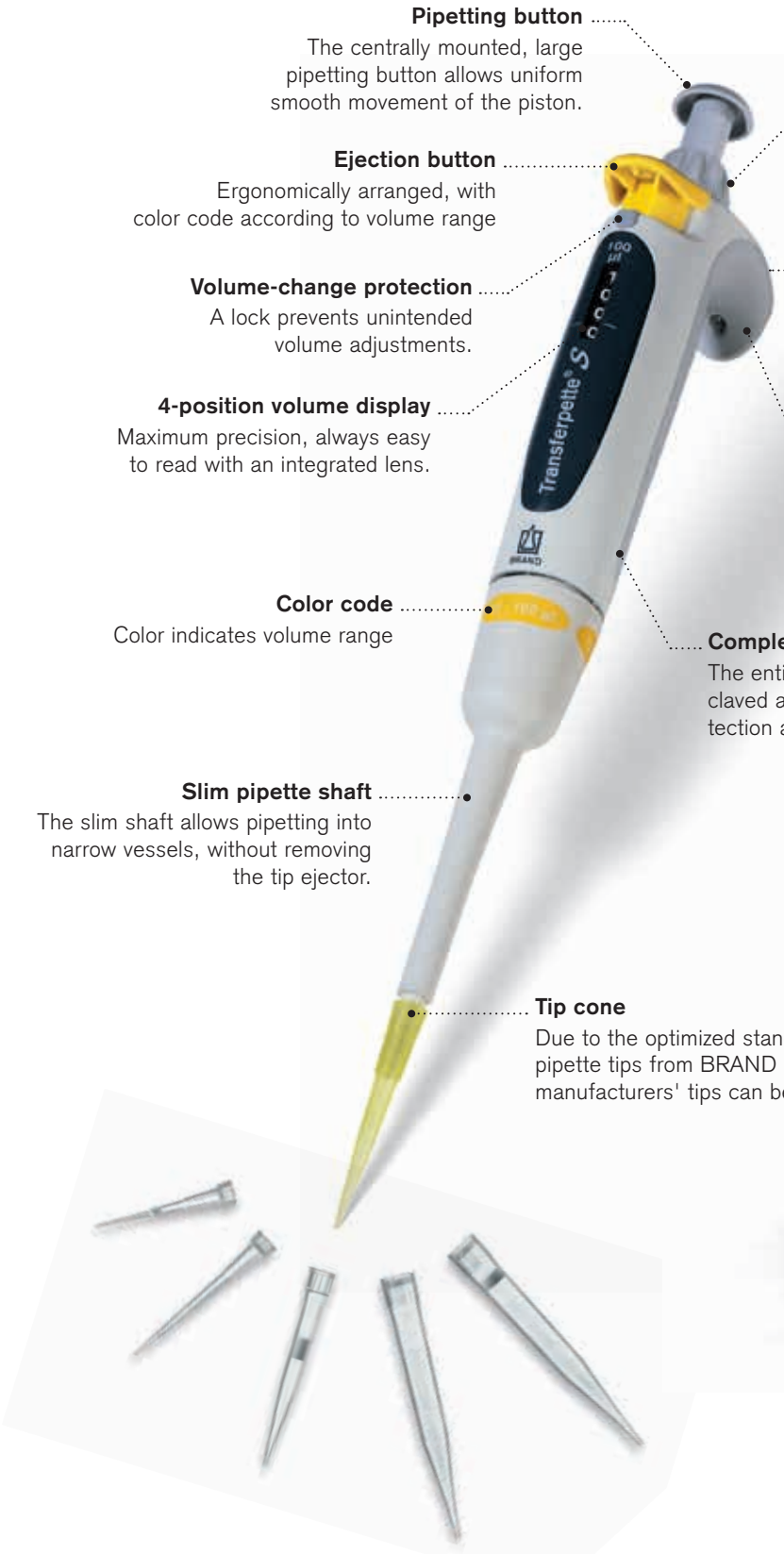
Ejection button
Ergonomically arranged, with color code according to volume range

Volume-change protection
A lock prevents unintended volume adjustments.

4-position volume display
Maximum precision, always easy to read with an integrated lens.

Color code
Color indicates volume range

Slim pipette shaft
The slim shaft allows pipetting into narrow vessels, without removing the tip ejector.



Volume adjustment
True one-handed volume adjustment for right- and left-handed operators – even with gloves.

Easy Calibration Technique
Changes from factory settings are externally visible! (For more information, please see page 324.)

Finger rest
The ergonomically designed finger rest takes the load off the hand. You don't need to grip the pipette tightly, so even prolonged pipetting operations can be completed with less fatigue.

Completely autoclavable
The entire instrument can be autoclaved at 121 °C for maximum protection against contamination.

Tip cone
Due to the optimized standard design, pipette tips from BRAND and other manufacturers' tips can be used.

The freely rotating stand provides safe storage for Transferpette® *S* and Transferpette® *S* -8/-12 pipettes.

Ordering Data

Items supplied:

Each Transferpette® *S* adjustable and fixed volume pipette has DE-M marking and is supplied with performance certificate, shelf/rack mount and silicone oil.

Transferpette® *S*, adjustable volume

Capacity, µl (color-coded)	Description	A* ≤ ± %	µl	CV* ≤ %	µl	Subdivision µl	Cat. No.
0.1 - 1	D-1	2	0.02	1.2	0.012	0.001	**7047 68**
0.1 - 2.5	D-2.5	1.4	0.035	0.7	0.018	0.002	**7047 69**
0.5 - 10	D-10	1	0.1	0.5	0.05	0.01	**7047 70**
2 - 20	D-20**	0.8	0.16	0.4	0.08	0.02	**7047 72**
5 - 50	D-50	0.8	0.4	0.3	0.15	0.05	**7047 73**
10 - 100	D-100	0.6	0.6	0.2	0.2	0.1	**7047 74**
20 - 200	D-200**	0.6	1.2	0.2	0.4	0.2	**7047 78**
100 - 1000	D-1000	0.6	6	0.2	2	1	**7047 80**
500 - 5000	D-5000	0.6	30	0.2	10	5	**7047 82**
1000 - 10000	D-10000	0.6	60	0.2	20	10	**7047 84**

Transferpette® *S*, fixed volume

Capacity, µl (color-coded)	Description	A* ≤ ± %	µl	CV* ≤ %	µl	Cat. No.
10	F-10	1	0.1	0.5	0.05	**7047 08**
20	F-20**	0.8	0.16	0.4	0.08	**7047 16**
25	F-25	0.8	0.2	0.4	0.1	**7047 20**
50	F-50	0.8	0.4	0.4	0.2	**7047 28**
100	F-100	0.6	0.6	0.2	0.2	**7047 38**
200	F-200**	0.6	1.2	0.2	0.4	**7047 44**
500	F-500	0.6	3	0.2	1	**7047 54**
1000	F-1000	0.6	6	0.2	2	**7047 62**

* Calibrated to deliver (TD, Ex). Error limits according to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. The error limits are well within the limits of DIN EN ISO 8655-2. DE-M marking.
A = Accuracy, CV = Coefficient of variation

** For use only with 2-200 µl pipette tips

Accessories

(Other accessories for Transferpette® *S* pipettes can be found on page 52 and in the operating manual.)

Starter Kit

Items supplied: 3 Transferpette® *S* adjustable volume pipettes, 3 x TipBox (filled), 3 shelf/rack mounts.

Type	The kit includes the following Transferpette® *S* models	Cat. No.
MICRO	D-1, D-10, D-100	**7047 90**
MIDI	D-20, D-200, D-1000	**7047 91**
MACRO	D-1000, D-5000, D-10000	**7047 92**
STANDARD	D-10, D-100, D-1000	**7047 93**

Note! When ordering instruments with DAkkS calibration certificates, the prefix 'DAkkS' must be added to the order number, e.g., DAkkS 7047 28.

BRAND also offers calibration service at the factory lab. For more information, please see page 326.

A Closer Look...

Easy Handling – a particular advantage of the new multichannel pipette is the easy operation, e.g., when performing serial pipetting of immunological assays, while making serial dilutions or when filling 96-well plates for cell cultures.

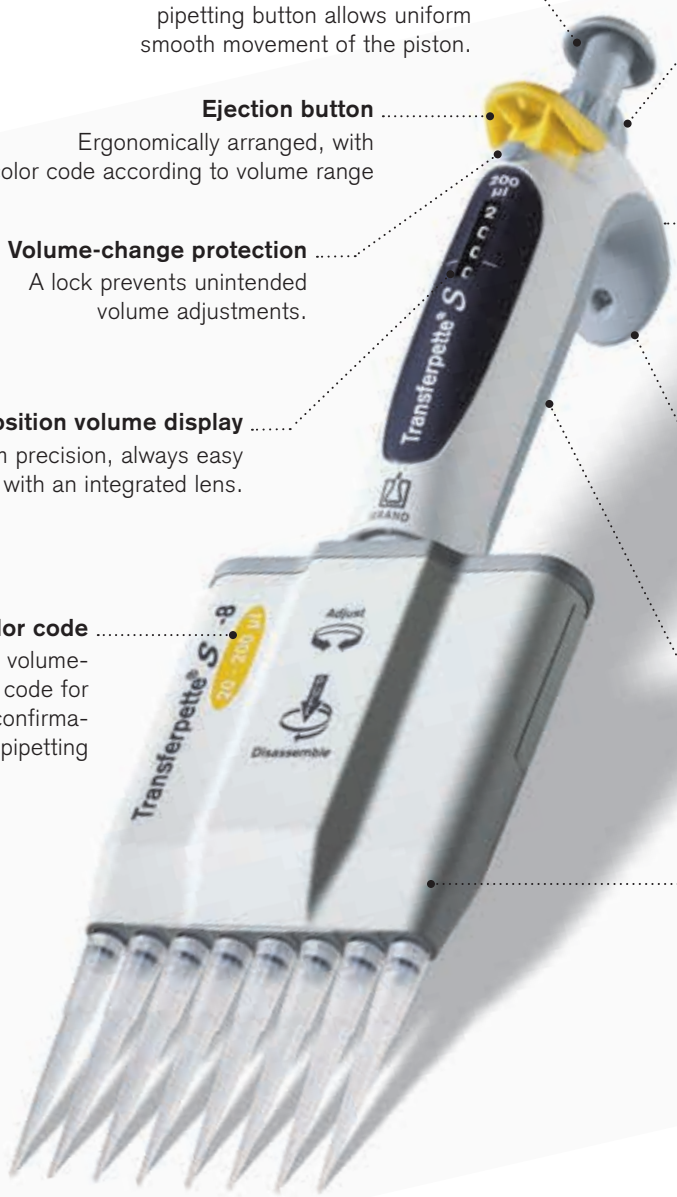
Pipetting button
The centrally mounted, large pipetting button allows uniform smooth movement of the piston.

Ejection button
Ergonomically arranged, with color code according to volume range

Volume-change protection
A lock prevents unintended volume adjustments.

4-position volume display
Maximum precision, always easy to read with an integrated lens.

Color code
Manifold has volume-range color code for easy visual confirmation while pipetting



Volume adjustment
True one-handed volume adjustment for right- and left-handed operators – even with gloves.

Easy Calibration Technique
Changes from factory settings are externally visible!
(For more information, please see page 324.)

Finger rest
The ergonomically designed finger rest takes the load off the hand. You don't need to grip the pipette tightly, so even prolonged pipetting operations can be completed with less fatigue.

Completely autoclavable
The entire instrument can be autoclaved at 121 °C for maximum protection against contamination.

Manifold
Can be freely rotated by 360° in either direction.

Stepped surface **Sealing ring of FKM**

Shafts and sealing rings are made of resilient FKM material, and are designed so that only minimal attachment force is needed for solid and parallel tip seating. The stepped design allows the ejection force to be sequentially distributed to the tips within fractions of a second and thus drastically reduces the force required.

Individual shafts with seals which can be easily unscrewed with only a supplied simple gripping tool. Tip cones and seals can now be easily cleaned or replaced. This patented procedure eliminates the expense of long service outages, providing long service life and low operating costs.

Ordering Data

Items supplied:

Each Transferpette® *S* -8/-12 pipette has DE-M marking and is supplied with performance certificate, 2 x TipBox, filled with pipette tips from BRAND, 1 shelf/rack mount, 1 reagent reservoir, 1 mounting tool, silicone oil and 1 set of sealing rings made of FKM.

Transferpette® *S*-8

Capacity, µl (color-coded)	Description	A* ≤ ± %	CV* ≤ %	Subdivision µl	Cat. No.
0.5 - 10	M8-10	1.6	1.0	0.01	**7037 00**
5 - 50	M8-50	0.8	0.4	0.05	**7037 06**
10 - 100	M8-100	0.8	0.3	0.1	**7037 08**
20 - 200	M8-200	0.8	0.3	0.2	**7037 10**
30 - 300	M8-300	0.6	0.3	0.5	**7037 12**

Transferpette® *S*-12

Capacity, µl (color-coded)	Description	A* ≤ ± %	CV* ≤ %	Subdivision µl	Cat. No.
0.5 - 10	M12-10	1.6	1.0	0.01	**7037 20**
5 - 50	M12-50	0.8	0.4	0.05	**7037 26**
10 - 100	M12-100	0.8	0.3	0.1	**7037 28**
20 - 200	M12-200	0.8	0.3	0.2	**7037 30**
30 - 300	M12-300	0.6	0.3	0.5	**7037 32**

* Calibrated to deliver (TD, Ex). Error limits according to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. The error limits are well within the limits of DIN EN ISO 8655-2. DE-M marking.
A = Accuracy, CV = Coefficient of variation

Accessories

Transferpette® *S* · Transferpette® *S*-8/-12

(Other accessories and spare parts can be found in the operating manual.)

Individual stands please see pages 57, 59 and 64.

Bench-top rack

For 6 Transferpette® *S* or Transferpette® *S* -8/-12 pipettes. Pack of 1.

Cat. No.	7048 05

Shelf/rack mount

Shelf/rack mount for all Transferpette® *S* single instruments. Pack of 1.

Cat. No.	7048 10

Filter

For all Transferpette® *S* single-channel pipettes 0.5-5 ml. Pack of 25.

Cat. No.	7046 52

For Transferpette® *S* 1-10 ml pipettes. Pack of 25.

Cat. No.	7046 53

Transferpette®

Single and Multichannel Pipettes

The Transferpette® pipette from BRAND is designed for routine lab and research applications in a shape that is adapted to the anatomy of the human hand. The special handle shape with the side pipetting key allows the Transferpette® pipette to lie loosely and lightly in your hand.

The Transferpette® models are particularly well suited for prolonged pipetting, or for anyone who is susceptible to RSI syndrome due to repetitive laboratory procedures.

Models

Economical – accurate – versatile:

With only 5 instruments you can cover the entire volume range from 0.1 µl to 5 ml. You can choose from 10 models of the adjustable volume Transferpette® pipette and from 12 models of the fixed-volume type.

There are 7 different multichannel pipettes available in the 0.5 to 300 µl volume range.

Features

- Side pipetting key relieves strain; separate ejector function limits errors.
- Pipette shafts/manifold are entirely autoclavable at 121 °C (2 bar), acc. DIN EN 285.
- Transferpette® adjustable volume models and Transferpette®-8/-12 feature Easy Calibration technique – readjustment without special tools (please see page 324 for further details).
- Corrosion-resistant piston and ejector
- Tip ejector caps with color code according volume range.
- Transferpette® 0.1-1 µl offers maximum precision for molecular biology work, especially when pipetting enzymes.
- A variety of pipette stands for optimum storage of the Transferpette® pipette
- UV resistant
- CE-IVD-compliant

The microliter pipettes Transferpette® 0.1-1 µl, Transferpette® *S* 0.1-1 µl and Transferpette® *S* 0.1-2.5 µl can be used to pipette the smallest volumes down to 0.1 µl with the highest precision.

For the instruments 0.1-1 µl, which work exclusively with BRAND nano-cap™ pipette tips, the air cushion is greatly minimized in order to attain the highest precision when pipetting.

The smallest volumes of liquid can be taken up with good visibility, and positioned in a microcentrifuge tube, for example.

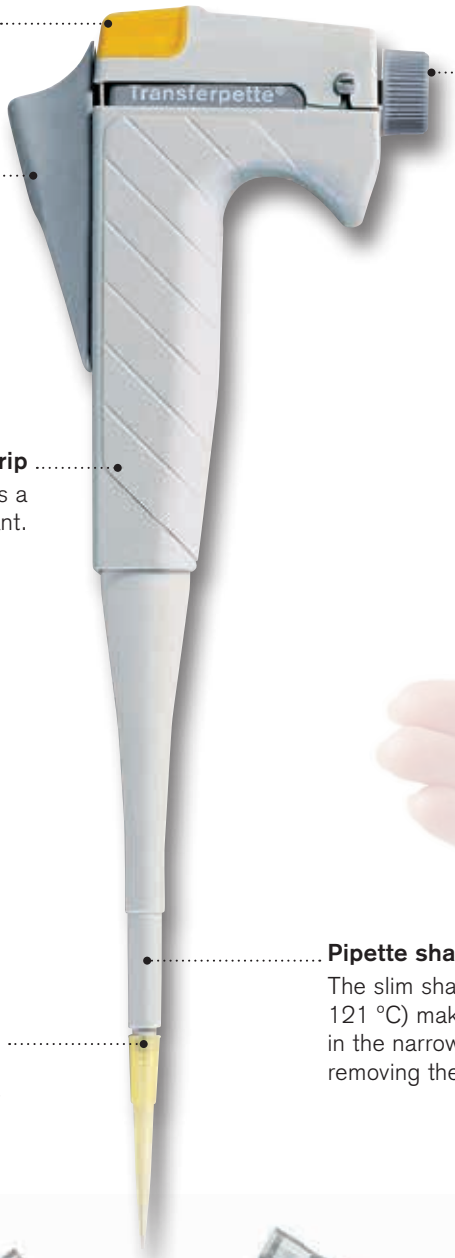
A Closer Look...

The Transferpette® pipette is designed to the shape of the human hand for maximum comfort.

Tip ejector cap
Ergonomically arranged, with color code according to volume range

Pipetting key
The side mounted pipetting key reduces hand fatigue, especially when performing serial pipetting operations.

Hand grip
The textured housing ensures a firm grip, and is UV resistant.



Volume adjustment
Changing volume is easy without snagging gloves. Detents prevent inadvertent volume changes.

Easy Calibration Technique
Calibration and adjustments according to ISO 9001 and GLP are done within seconds.

Pipette shaft
The slim shaft (autoclavable at 121 °C) makes it possible to pipette in the narrowest vessels without removing the tip ejector.

Tip cone
The taper is designed to fit pipette tips from BRAND and most other leading manufacturers tips.

Optimal performance will be achieved with the use of genuine premium tips from BRAND.
Pipette and filter tips, see pages 68-82.

Ordering Data

Transferpette®, adjustable volume

Items supplied:

Each Transferpette® adjustable volume pipette has DE-M marking and is supplied with performance certificate and silicone oil.

Capacity, µl (color-coded)	A* ≤ ± %	µl	CV* ≤ %	µl	Subdivision µl	Cat. No.
0.1 - 1	2	0.02	1.2	0.012	0.005	**7041 01**
0.5 - 10	1	0.1	0.8	0.08	0.05	**7041 02**
2 - 20	0.8	0.16	0.4	0.08	0.1	**7041 03**
2 - 20	0.8	0.16	0.4	0.08	0.1	**7041 04**
5 - 50	0.8	0.4	0.4	0.2	0.1	**7041 72**
10 - 100	0.6	0.6	0.2	0.2	0.1	**7041 74**
20 - 200	0.6	1.2	0.2	0.4	1	**7041 78**
25 - 250	0.6	1.5	0.2	0.5	1	**7041 76**
100 - 1000	0.6	6	0.2	2	1	**7041 80**
500 - 5000	0.6	30	0.2	10	10	**7041 82**

Transferpette®, fixed volume

Items supplied:

Each Transferpette® Fixed volume pipette has DE-M marking and is supplied with performance certificate, calibration key and silicone oil.

Capacity, µl (color-coded)	A* ≤ ± %	µl	CV* ≤ %	µl	Cat. No.
5	1	0.05	0.8	0.04	**7041 06**
10	1	0.1	0.8	0.08	**7041 08**
20	0.8	0.16	0.4	0.08	**7041 16**
25	0.8	0.2	0.4	0.1	**7041 20**
50	0.8	0.4	0.4	0.2	**7041 28**
100	0.6	0.6	0.2	0.2	**7041 38**
200	0.6	1.2	0.2	0.4	**7041 44**
200	0.6	1.2	0.2	0.4	**7041 46**
250	0.6	1.5	0.2	0.5	**7041 48**
500	0.6	3	0.2	1	**7041 54**
1000	0.6	6	0.2	2	**7041 62**
2000	0.6	12	0.2	4	**7041 64**

* Calibrated to deliver (TD, Ex). Error limits according to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. The error limits are within the limits of DIN EN ISO 8655-2. DE-M marking.
A = Accuracy, CV = Coefficient of variation

Note! When ordering instruments with DAkkS calibration certificates, the prefix 'DAkkS' must be added to the order number, e.g., DAkkS 7041 01.

BRAND also offers calibration service at the factory lab. For more information, please see page 326.

Accessories

(Other accessories and spare parts can be found in the operating manual.)

PipSet Transferpette® adjustable volume

The PipSet contains of three Transferpette® pipettes (0.5-10 µl, 10-100 µl, 100-1000 µl), one bench-top rack and one filled TipBox for each Transferpette® pipette.
Pack of 1.

Cat. No.	7041 90

Pipetting keys, colored

For Transferpette® and Transferpette®-8/-12 pipettes.
Incl. 2 stickers per key.
Pack of 5.

Color	Cat. No.
light green	7040 70
pink	7040 71
blue	7040 72
beige	7040 73
dark gray	7040 74
assorted colors	7040 75

Bench-top rack

Incl. 1 or 2 adapters for Transferpette® pipettes 2 ml or 0.5-5 ml.
Pack of 1.

Description	Cat. No.
for 1 x 3 Transferpette® pipettes	7032 03
for 2 x 3 Transferpette® pipettes (round)	7032 08

Wall/rack mount

Pack of 1.

Description	Cat. No.
for 1 x 3 Transferpette® pipettes*	7032 10

* Not suitable for the 0.5-5 ml or 2 ml Transferpette®

Individual stand

For Transferpette® 0.5-5 ml, 2 ml, Transferpette® *S* and Transferpette® electronic 0.5-5 ml pipettes.
Pack of 1.

Cat. No.	7053 86

Filter

For all Transferpette® single-channel pipettes 0.5-5 ml.
Pack of 25.

Cat. No.	7046 52

A Closer Look...

The effortless ease of operation and its unique ergonomic shape make working with the Transferpette®-8/-12 piston-operated pipette so comfortable. The use of high-quality materials makes it exceptionally light in weight, while special FKM V-rings and the stepped shape of the ejector significantly reduce the ejection force needed. Your hand remains relaxed and loose, even during a prolonged pipetting operation.

Tip ejector cap
Ergonomically arranged, with color code according to volume range

Pipetting key
The side mounted pipetting key helps to reduce hand fatigue, especially when performing serial pipetting operations.

Hand grip
The textured housing ensures a firm grip, and is UV resistant.

Color code
Manifold has volume-range color code for easy visual confirmation while pipetting

Stepped tip ejector
The stepped tip ejector ensures a tight tip seal with minimal tip ejection force.

Volume adjustment
Changing volumes is easy without snagging gloves. Detents prevents inadvertent volume changes.

Easy Calibration Technique
Calibration and adjustments according to ISO 9001 and GLP are done within seconds.

Manifold
Autoclavable at 121 °C and freely rotated over 360° to adapt to your most comfortable pipetting position.

Tip cone
The taper is designed to fit pipette tips from BRAND and most other leading manufacturers tips.

Individual shafts and seals can easily be replaced in the laboratory.

Ordering Data

Items supplied:

Each Transferpette®-8/-12 pipette has DE-M marking and is supplied with performance certificate, 2 x TipBox, filled with pipette tips from BRAND, 1 stand, silicone oil and 1 set of sealing rings made of FKM.

Transferpette®-8

Capacity, µl (color-coded)	A* ≤ ± %	µl	CV* ≤ %	µl	Subdivision µl	Cat. No.
0.5 - 10	1.6	0.16	1.0	0.1	0.05	**7036 00**
2 - 20	1.0	0.2	0.6	0.12	0.1	**7036 02**
2.5 - 25	1.0	0.25	0.6	0.15	0.1	**7036 04**
5 - 50	0.8	0.4	0.4	0.2	0.1	**7036 06**
10 - 100	0.8	0.8	0.3	0.3	0.1	**7036 08**
20 - 200	0.8	1.6	0.3	0.6	1	**7036 10**
30 - 300	0.6	1.8	0.3	0.9	1	**7036 12**

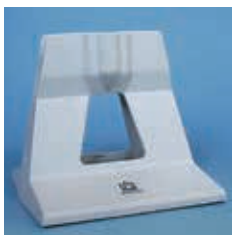
Transferpette®-12

Capacity, µl (color-coded)	A* ≤ ± %	µl	CV* ≤ %	µl	Subdivision µl	Cat. No.
0.5 - 10	1.6	0.16	1.0	0.1	0.05	**7036 20**
2 - 20	1.0	0.2	0.6	0.12	0.1	**7036 22**
2.5 - 25	1.0	0.25	0.6	0.15	0.1	**7036 24**
5 - 50	0.8	0.4	0.4	0.2	0.1	**7036 26**
10 - 100	0.8	0.8	0.3	0.3	0.1	**7036 28**
20 - 200	0.8	1.6	0.3	0.6	1	**7036 30**
30 - 300	0.6	1.8	0.3	0.9	1	**7036 32**

* Calibrated to deliver (TD, Ex). Error limits according to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. The error limits are within the limits of DIN EN ISO 8655-2. DE-M marking.
A = Accuracy, CV = Coefficient of variation

Accessories

(Other accessories and spare parts can be found in the operating manual.)



Individual stand

For all Transferpette® multi-channel pipettes.
Pack of 1.

Cat. No.	7034 40

Reagent reservoir,
PP, non-sterile or sterile,
please see page 67.

Transferpette® electronic

Single and Multichannel Pipettes

The Transferpette® electronic piston-operated pipette combines the widely recognized features of BRAND mechanical pipettes with the advantages of electronic apparatus.
Comfortable design, balanced weight distribution, intuitive software and user-friendly technical documentation were the key objectives in developing the Transferpette® electronic pipette.
TUV Rhineland/Berlin-Brandenburg has confirmed the design as ergonomically sound and easy to use after rigorous field testing. It was the first pipette ever granted such recognition as a comprehensive, ergonomic concept.

Models

Ergonomics – approved and certified.
Transferpette® electronic single channel pipette is available in 5 different models: 0.5-10 µl, 2-20 µl, 20-200 µl, 100-1000 µl and 0.5-5 ml.

The Transferpette®-8/-12 electronic multichannel pipette is available in 5 different models: 0.5-10 µl, 1-20 µl, 5-100 µl, 10-200 µl and 15-300 µl.

TÜV Rheinland Product Safety
ERGONOMIE GEPRÜFT
ERGONOMICS APPROVED

Transferpette® electronic

Transferpette®-8 electronic

Optimal performance will be achieved with the use of genuine premium tips from BRAND. **Pipette and filter tips**, see pages 68-82.

Features

■ **Ergonomic**
– functional, ergonomic housing design
– individually adjustable finger rest

■ **Easy operation**
– intuitive menu structure
– comprehensively illustrated user manual

■ **Innovative**
Significantly reduced tip attachment and ejection forces using universal tips

■ **Resistant**
Corrosion-resistant piston and ejector

■ **Five convenient programs**
(Please see page 62 for details)
– Pipetting
– Reverse pipetting
– Mixing
– GEL-Electrophoresis
– Dispensing

■ **Ready for use**
– 4000 pipetting cycles with each battery charge
– battery refresh function
– even during recharging

■ **CE-IVD-compliant**

Functions

The Programs

Pipetting (PIP Mode)

The 'standard' program.
The set volume is aspirated by the pipette, and then discharged.

Mixing of Samples (PIPmix Mode)

Program for mixing of liquids. The sample is repeatedly aspirated and discharged, and the number of mixing cycles is displayed.

Reverse Pipetting (revPIP Mode)

Program specially designed for the pipetting of liquids with a high viscosity, high vapor pressure or foamy media.

Pipetting with Electrophoresis (GEL Mode)*

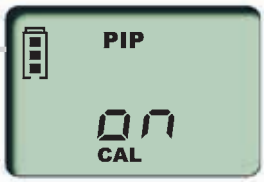
Program for the loading of electrophoresis gels**.
The required sample volume is aspirated at the desired, adjustable speed, and is then discharged very slowly.
The exact volume of liquid discharged is shown in the display as it is discharged.

Dispensing (DISP Mode)

A program for the dispensing of liquids in a series of equal aliquots. A volume that has been aspirated is dispensed in steps.

Easy Calibration Technique (CAL Mode)

Program for making quick adjustments to the instrument, without tools. By changing the factory setting, <CAL> appears automatically in the display (please see page 325 for more information).



Battery-Refresh (batt Mode)

Regeneration function for increased performance and extending the service life of the batteries. The world's first microliter pipette with this function.

* The GEL mode is not included in the 1000 µl and 5000 µl single channel pipettes because these volumes are rarely used in electrophoresis.

** Patented

A Closer Look...

The single channel pipette Transferpette® electronic was **the first microliter pipette worldwide** to be recognized with the 'Ergonomics Approved' certificate from the Technical Control Board Rhineland/Berlin-Brandenburg!

Independent user tests confirm the ergonomics and the operating ease of the product and system! A user acceptance rating of **1.54** is an outstanding result.

You can obtain information about the Transferpette® electronic pipette at www.tuv.com, ID No. 0011105500.

Ordering Data

Transferpette® electronic

Items supplied:

Each Transferpette® electronic pipette has DE-M marking and is supplied with performance certificate, battery, AC adapter, silicone oil.

Capacity, µl (color-coded)	Subdiv. µl	A* ≤ ± %	A* ≤ ± µl	CV* ≤ %	CV* ≤ µl	With AC adapter for	Cat. No.
0.5 - 10	0.01	1.0	0.1	0.4	0.04	Europe (continental)	**7052 99**
						UK/Ireland	**7053 09**
						USA/Japan	**7053 19**
						Australia	**7053 29**
						without AC adapter	**7053 39**
2 - 20	0.02	1.0	0.2	0.4	0.08	Europe (continental)	**7053 00**
						UK/Ireland	**7053 10**
						USA/Japan	**7053 20**
						Australia	**7053 30**
						without AC adapter	**7053 40**
20 - 200	0.2	0.8	1.6	0.2	0.4	Europe (continental)	**7053 03**
						UK/Ireland	**7053 13**
						USA/Japan	**7053 23**
						Australia	**7053 33**
						without AC adapter	**7053 43**
100 - 1000	1.0	0.6	6	0.2	2	Europe (continental)	**7053 06**
						UK/Ireland	**7053 16**
						USA/Japan	**7053 26**
						Australia	**7053 36**
						without AC adapter	**7053 46**
500 - 5000	5.0	0.6	30	0.2	10	Europe (continental)	**7053 07**
						UK/Ireland	**7053 17**
						USA/Japan	**7053 27**
						Australia	**7053 37**
						without AC adapter	**7053 47**

* Calibrated to deliver (TD, Ex). Error limits according to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. The error limits are well within the limits of DIN EN ISO 8655-2. DE-M marking.
A = Accuracy, CV = Coefficient of variation

Accessories

(Other accessories and spare parts can be found in the operating manual.)

3-device charging stand for Transferpette® electronic (up to 1000 µl)

Pack of 1.

for Transferpette® electronic with AC adapter for	Cat. No.
Europe (continental) (230V/50Hz)	**7053 90**
UK/Ireland (230V/50Hz)	**7053 91**
USA/Japan (110V/50-60Hz)	**7053 92**
Australia (240V/50Hz)	**7053 93**

Filter for Transferpette® single-channel pipettes 0.5-5 ml, please see page 57.

Individual stand for Transferpette® electronic

Also suitable for corresponding models of Transferpette® and Transferpette® *S* pipettes. Pack of 1.

for Transferpette® electronic	Cat. No.
up to 1000 µl	**7053 85**
500-5000 µl	**7053 86**

A Closer Look...

The optimal position of the thumb relative to the functional elements of the pipette is the starting point for a relaxed grip. Avoiding RSI is the key.

The optimum design, the layout of the controls, and the adjustable finger rest provide a Transferpette®-8/-12 electronic multichannel pipette that fits the hand like a glove. Perfect for right-handers and left-handers alike!

The Transferpette®-8/-12 electronic pipette was the world's first electronic multichannel pipette to received the Ergonomics Certificate. The User Acceptance Rating of **1.55** is unrivaled anywhere!

Charging connector jack

Large, clear display

Intuitive operation of all functions using 4 keys

Ergonomically arranged ejection button with color code according to volume range

Individually adjustable finger rest

Manifold has volume-range color code for easy visual confirmation while pipetting

Complete manifold can be autoclaved at 121 °C and rotates freely 360° in either direction.

Stepped tip ejector reduces ejection forces significantly.

V-rings made of FKM allow effortless mounting and easy ejection of the tips, and readily adapt to tips from various manufacturers.

Individual shafts and seals can easily be replaced in the laboratory (patented).

Ordering Data

Items supplied:

Each Transferpette®-8/-12 electronic pipette has DE-M marking and is supplied with performance certificate, battery, AC adapter, device stand, TipBox, refill unit, reagent reservoir, mounting tool, silicone oil and 1 set of sealing rings made of FKM.

Transferpette®-8 electronic

Capacity, µl (color-coded)	Subdivision µl	A* ≤ ± %	A* ≤ ± µl	CV* ≤ %	CV* ≤ µl	With AC adapter for	Cat. No.
0.5 - 10	0.01	1.2	0.12	0.8	0.08	Europe (continental)	**7053 99**
						UK/Ireland	**7054 09**
						USA/Japan	**7054 19**
						Australia	**7054 29**
1 - 20	0.02	1.0	0.2	0.5	0.1	Europe (continental)	**7054 00**
						UK/Ireland	**7054 10**
						USA/Japan	**7054 20**
						Australia	**7054 30**
5 - 100	0.1	0.8	0.8	0.25	0.25	Europe (continental)	**7054 03**
						UK/Ireland	**7054 13**
						USA/Japan	**7054 23**
						Australia	**7054 33**
10 - 200	0.2	0.8	1.6	0.25	0.5	Europe (continental)	**7054 04**
						UK/Ireland	**7054 14**
						USA/Japan	**7054 24**
						Australia	**7054 34**
15 - 300	0.5	0.6	1.8	0.25	0.75	Europe (continental)	**7054 06**
						UK/Ireland	**7054 16**
						USA/Japan	**7054 26**
						Australia	**7054 36**

* Calibrated to deliver (TD, Ex). Erro r limits according to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. The error limits are well within the limits of DIN EN ISO 8655-2. DE-M marking.
A = Accuracy, CV = Coefficient of variation

Note! When ordering instruments with DAkkS calibration certificates, the prefix 'DAkkS' must be added to the order number, e.g., DAkkS 7053 99.

BRAND also offers calibration service at the factory lab. For more information, please see page 326.

Transferpette®-12 electronic

Capacity, µl (color-coded)	Subdivision µl	A* ≤ ± %	A* ≤ ± µl	CV* ≤ %	CV* ≤ µl	With AC adapter for	Cat. No.
0.5 - 10	0.01	1.2	0.12	0.8	0.08	Europe (continental)	7054 49
						UK/Ireland	7054 59
						USA/Japan	7054 69
						Australia	7054 79
1 - 20	0.02	1.0	0.2	0.5	0.1	Europe (continental)	7054 50
						UK/Ireland	7054 60
						USA/Japan	7054 70
						Australia	7054 80
5 - 100	0.1	0.8	0.8	0.25	0.25	Europe (continental)	7054 53
						UK/Ireland	7054 63
						USA/Japan	7054 73
						Australia	7054 83
10 - 200	0.2	0.8	1.6	0.25	0.5	Europe (continental)	7054 54
						UK/Ireland	7054 64
						USA/Japan	7054 74
						Australia	7054 84
15 - 300	0.5	0.6	1.8	0.25	0.75	Europe (continental)	7054 56
						UK/Ireland	7054 66
						USA/Japan	7054 76
						Australia	7054 86

* Calibrated to deliver (TD, Ex). Error limits according to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. The error limits are well within the limits of DIN EN ISO 8655-2. DE-M marking.
A = Accuracy, CV = Coefficient of variation

Accessories

(Other accessories and spare parts can be found in the operating manual.)

Reagent reservoir

PP, high clarity.
Capacity 60 ml.
Autoclavable (121 °C).

Non-sterile, with lid.
Pack of 10.

Cat. No.	7034 59

Sterile, without lid.
Packed individually.
Pack of 100.

Cat. No.	7034 11

Sterile, without lid.
5 per bag, pack of 200.

Cat. No.	7034 09

Pipette Tips and Filter Tips

Standard
from page 74

Ultra Low Retention
from page 78

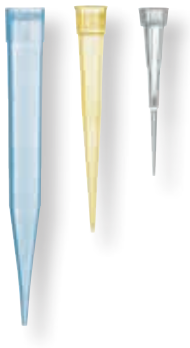
Pipette tips and filter tips are manufactured by BRAND in a cleanroom under the most modern production conditions, and are automatically rack packed and packaged to ensure that the tips are of consistently high quality.

- High-purity polypropylene, free from DiHEMDA and oleamide
- Manufactured without lubricants
- Cadmium-free pigments
- Graduation for a quick volume check
- All racked tips and filter tips up to 1000 µl are free of DNA (< 40 fg), RNase (< 8.6 fg), endotoxins (< 1 pg) and ATP (< 1 fg)
- Autoclavable at 121 °C (2 bar), acc. DIN EN 285
- Environmentally friendly packaging systems
- CE-marked according to IVD-Directive 98/79 EC

Consistently high quality

Pipette tips and filter tips are the most frequently used disposables in the laboratory. As processing methods have become increasingly sensitive, the requirements for these disposable items have changed significantly over the years. Starting with the raw materials, here PP, to the tools used and the quality tests carried out, a lot of parameters need to be considered to meet the highest standards both in research and standardized applications.

For the manufacture of pipette tips and filter tips, BRAND exclusively uses raw materials that are free from the additives di(2-hydroxyethyl)methyldodecylammonium (DiHEMDA) and 9-octadecenamide (oleamide). Both of these additives are frequently found in PP granules, and can interfere with biological tests, leading to spurious results. Only highly polished tooling equipment is used, so that no parting agents or demolding aids are needed.



New packaging options

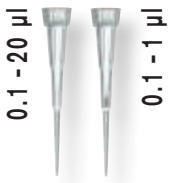
In order to guarantee the high quality of our products, from manufacturing through packaging and all the way to the laboratory, BRAND has also optimized the packaging options to comply with the new requirements.
Even the primary packaging for the new systems, such as the PET outer packaging for the new TipRacks (refill units) and the spacers for the new TipStacks, are produced under cleanroom conditions, which guarantees the high purity of the products.

All racked pipette tips and filter tips up to 1000 µl are now free from DNA, RNases, endotoxins and ATP. Sterile tips and packaging are manufactured exclusively under BIO-CERT® quality certification. (for detailed information see page 118).

Cleanroom technique

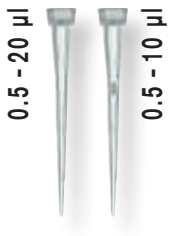
BRAND disposable items for the life sciences are produced using the most advanced cleanroom techniques in one of the world's largest cleanrooms for laboratory disposable items.
The ongoing cleanroom monitoring includes continuous measurements of air particulates, positive air pressure, air exchange rate, room temperature, and the relative humidity, among other things. This ensures that the actual parameters can immediately be checked against the nominal values. Deviations are detected immediately, and suitable countermeasures can be taken before the limit values are exceeded.
The high-precision control of environmental conditions provides a very high degree of stability in the corresponding parameters, especially the room temperature. This uniformity, together with quality testing of the final product by batch, guarantees the consistently high quality in the life science products from BRAND.
For the production of disposable items, class 8, 7, and 5 manufacturing environments are available. Compliance of our class 8 cleanroom with ISO 14644-1 is validated and certified by external, independent auditors.

Pipette tips and Filter Tips
Sizes and Description



0.1 - 20 µl
0.1 - 1 µl (Filter)

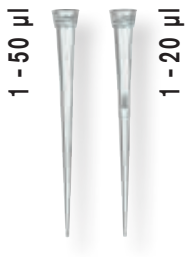
The nano-cap™ tip was specially developed for the nanoliter range and hence is ideal for molecular biological applications such as PCR. It is 37 mm long, and features a capillary rise that is even visible to the naked eye at 0.1 µl. The capillary part of the tip conveniently fills gel wells for gel electrophoresis systems from most manufacturers. Suitable for pipettes up to 20 µl. The racked tips are colorless and placed into a grey-colored tip tray.



0.5 - 20 µl
0.5 - 10 µl (Filter)

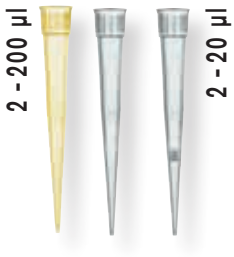
The slender design and 46 mm length allow pipetting in microtubes and microplates without touching the walls. Graduation at 2 µl and 10 µl for quick volume check. The racked tips are colorless and placed into a grey-colored tip tray.

NEW!



1 - 50 µl
1 - 20 µl (Filter)

With a length of 50 mm, the tip is ideal for working down to the bottom of narrow containers. Graduation at 2.5, 10, 25 and 50 µl for quick volume check. The racked tips are colorless and placed into a grey-colored tip tray.



2 - 200 µl
2 - 20 µl (Filter)

A tested and proven thin-walled tip. Lighter in weight, 50 mm long and can be used for virtually all pipettes with yellow color code. Graduation at 20 µl and 100 µl for a quick volume check. Bulk tips are yellow colored. The racked tips are colorless and placed into a yellow-colored tip tray.

Package Types

Bulk packed in bags, non-sterile

All tips and filter tips are produced under supervised state-of-the-art clean-room conditions and automatically shrink-wrapped in reclosable bags and packaged in cardboard boxes. The batch number is printed on every bag.

Racked (TipRack), sterile and non-sterile

For TipBox. Refill unit, protected in an environmentally compatible packaging of recyclable PET. Sterile TipRacks are supplied with a transfer aid so that the rack can be put into a previously autoclaved box without hand contact.

NEW!

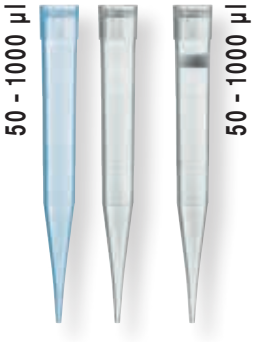
TipBox, sterile and non-sterile

PP. With hinged lid/push-on lid. Two different sizes. Stackable and repeatedly autoclavable at 121 °C (2 bar), acc. DIN EN 285. (Empty TipBox, ordering information, see page 74).

NEW!

5 - 300 µl
5 - 100/200 µl (Filter)

The thin-walled tip is suitable for reverse pipetting and plate washing. It is 53 mm long and can also be used for pipettes with yellow color code. It is particularly suited for working with multichannel pipettes. Graduation at 50 and 100 µl for quick volume check. The racked tips are colorless and placed into a green-colored tip tray.



50 - 1000 µl
50 - 1000 µl (Filter)

Proven thin-walled tip for routine laboratory and research pipetting. Its length is 70 mm. Graduation at 250, 500 and 1000 µl for a quick volume check. Bulk tips are blue colored. The racked tips are colorless and placed into a blue-colored tip tray.

0.5 - 5 ml

Particularly slender shape, at 160 mm length and approx. 9.6 mm diameter! This allows pipetting even from narrow volume measuring equipment such as volumetric flasks with NS 12/21. Suitable for microliter pipette Transferpette® and Thermo Fisher Scientific FINNPIPETTE®.

1 - 10 ml

156.5 mm length and approx. 15 mm diameter! Ideal for working with the microliter pipette Transferpette® *S* 10 ml. Compatible with Eppendorf® systems.

NEW!

TipStack™, sterile and non-sterile

Space-saving, environmentally compatible refill system for TipBox. 5 racks, each having 96 tips incl. 1 TipBox. Sterile TipStacks are supplied with a transfer aid so that the rack can be put into a previously autoclaved box without hand contact. Each packaging unit contains 2 TipStacks.

TipBox 5/10 ml, non-sterile

The 5 ml and 10 ml tips are only available as a racked tip version in this specially corresponding TipBox.

Ultra Low Retention tips see page 78.

Which pipette tip works with which Transferpette®?

See page 82 for table and information.

BIO-CERT®

Sterile pipette tips from BRAND are manufactured under certified BIO-CERT® quality:

free of DNA, RNase, endotoxins and ATP.

(for detailed information see page 118).

TipBox/TipRack System

All sizes up to 1000 µl available
in 96-unit format

No deflection during tip loading

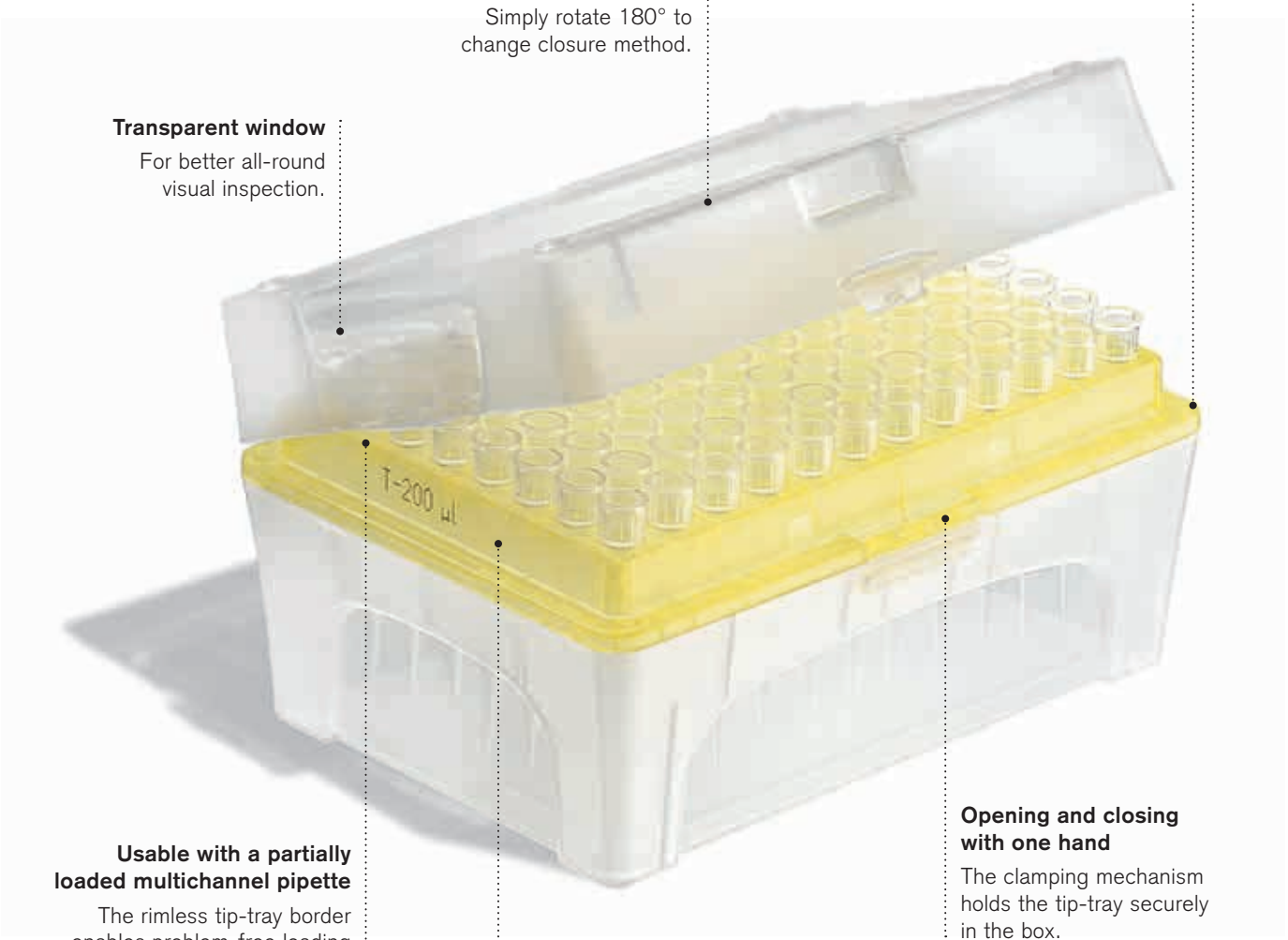
The tip-tray is fabricated from especially rigid PP.

Dual function hinged and push-on lid

Simply rotate 180° to change closure method.

Transparent window

For better all-round visual inspection.



Usable with a partially loaded multichannel pipette

The rimless tip-tray border enables problem-free loading of individual pipette tips with multichannel instruments.

Colored tip-trays with side panel labeling

The contents of the box are always clearly visible.

Opening and closing with one hand

The clamping mechanism holds the tip-tray securely in the box.

TipBox for 1000 µl pipette tips and filter tips. Stackable.

The TipBox is optimized for pipette tips and filter tips up to 300 µl. Stackable.

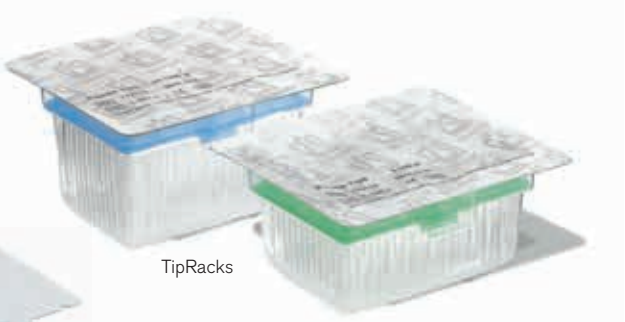
TipRack, TipStack™ and Transfer Aid

TipStack™

Transfer aid

TipRack

Compared to the filled TipBoxes, the amount of waste with the new refill units is reduced by over 20%. All racked pipette tips and filter tips up to 1000 µl are free of DNA, RNases, endotoxins and ATP (for detailed information see page 118). TipRacks in BIO-CERT® quality are sterile according to ISO 11 137 and the AAMI guidelines, a SAL of 10^{-6} is obtained. These racks are supplied with a transfer aid that enables simple, contamination-free transfer into a previously sterilized TipBox. All tip-trays are printed on one side with information on the contents.



TipRacks

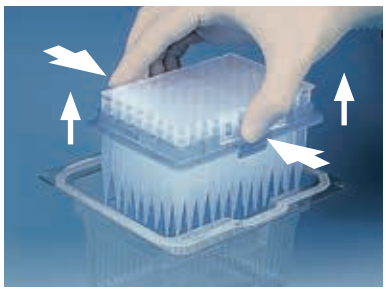
TipStack™

A tip tower containing 5 filled tip-trays and a TipBox constitute the new, space-saving refill system for 20 µl, 200 µl and 1000 µl tips.
Tightly sealing spacers prevent the tips from getting stuck together, and ensure them to be free from DNA, RNases, endotoxins and ATP.
The sterile TipStacks (BIO-CERT® quality) are supplied with a transfer aid for contamination-free use in a previously sterilized TipBox.

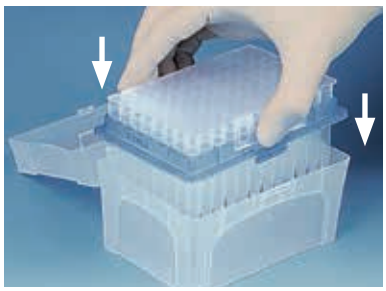
- All components are recyclable
- Reduced amount of waste
- Sterilizable and reusable TipBox
- High purity of the pipette tips and filter tips
- Space-saving design

Sterile handling

Press the long sides of the transfer aid together, and continue pressing them together while withdrawing the tip-tray.
Ensure that the holding straps for the transfer aid are correctly positioned.



Insert the filled tip-tray perpendicularly from above into the previously sterilized TipBox until it locks into place.



Remove the transfer aid from the mounting plate. Finished – all without tip contact!

Pipette Tips

0.1 - 20 µl

Pipette tips, 0.1 - 20 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	2000	2 bags, 1000 each	**7320 02**	–
bulk XXL	10000	10 bags, 1000 each	**7320 22**	–
racked	960	10 TipRacks, 96 each	**7321 02**	**7321 22**
TipBox	480	5 boxes, 96 each	**7322 02**	–
TipBox sterile	960	10 boxes, 96 each	–	**7322 22**
TipStack™	–	–	–	–

0.5 - 20 µl

Pipette tips, 0.5 - 20 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	2000	2 bags, 1000 each	**7320 04**	–
bulk XXL	10000	10 bags, 1000 each	**7320 24**	–
racked	960	10 TipRacks, 96 each	**7321 04**	**7321 24**
TipBox	480	5 boxes, 96 each	**7322 04**	–
TipBox sterile	960	10 boxes, 96 each	–	**7322 24**
TipStack™	960	2 x 5 racks, 96 each	**7322 44**	**7322 64**

1 - 50 µl

Pipette tips, 1 - 50 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	2000	2 bags, 1000 each	**7320 06**	–
bulk XXL	10000	10 bags, 1000 each	**7320 26**	–
racked	960	10 TipRacks, 96 each	**7321 06**	**7321 26**
TipBox	480	5 boxes, 96 each	**7322 06**	–
TipBox sterile	960	10 boxes, 96 each	–	**7322 26**
TipStack™	–	–	–	–

2 - 200 µl

Pipette tips, 2 - 200 µl (bulk tips are yellow colored)

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	1000	1 bag, 1000 each	**7320 08**	–
bulk XXL	10000	10 bags, 1000 each	**7320 28**	–
racked	960	10 TipRacks, 96 each	**7321 08**	**7321 28**
TipBox	480	5 boxes, 96 each	**7322 08**	–
TipBox sterile	960	10 boxes, 96 each	–	**7322 28**
TipStack™	960	2 x 5 racks, 96 each	**7322 48**	**7322 68**

TipBox, with tip-tray, empty

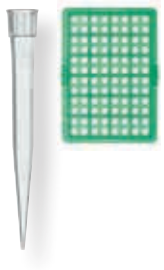
PP. Stackable. Pack of 1.

Model	Cat. No.
up to 50 µl	**7329 90**
for 200 µl	**7329 92**
for 300 µl	**7329 94**
for 1000 µl	**7329 96**

Pipette tips, 5 - 300 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	1 000	1 bag, 1000 each	**7320 10**	–
bulk XXL	10 000	10 bags, 1000 each	**7320 30**	–
racked	960	10 TipRacks, 96 each	**7321 10**	**7321 30**
TipBox	480	5 boxes, 96 each	**7322 10**	–
TipBox sterile	960	10 boxes, 96 each	–	**7322 30**
TipStack™	–	–	–	–

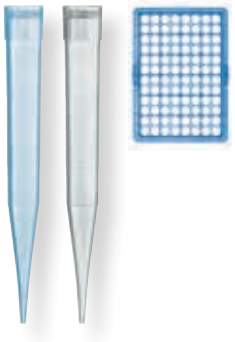
5 - 300 µl



Pipette tips, 50 - 1000 µl (bulk tips are blue colored)

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	1 000	2 bags, 500 each	**7320 12**	–
bulk XXL	5 000	10 bags, 500 each	**7320 32**	–
racked	960	10 TipRacks, 96 each	**7321 12**	**7321 32**
TipBox	480	5 boxes, 96 each	**7322 12**	–
TipBox sterile	960	10 boxes, 96 each	–	**7322 32**
TipStack™	960	2 x 5 racks, 96 each	**7322 52**	**7322 72**

50 - 1000 µl



Pipette tips, 0.5 - 5 ml

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	200	1 bag, 200 each	**7025 95**	–
bulk XXL	1000	5 bags, 200 each	**7026 00**	–
racked	–	–	–	–
TipBox 5 ml	28	1 box, 28 each	**7026 05**	–
TipStack™	–	–	–	–

0.5 - 5 ml

1 - 10 ml

Pipette tips, 1 - 10 ml

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	200	2 bags, 100 each	**7026 03**	–
bulk XXL	1000	10 bags, 100 each	**7026 04**	–
racked	–	–	–	–
TipBox 10 ml	18	1 box, 18 each	**7026 08**	–
TipStack™	–	–	–	–

bulk

racked

TipBox

TipStack™

TipBox 5 ml

Filter Tips

Non-self-sealing filter tips from BRAND have a PE filter that is free from chemical additives. Permeability is controlled by the combination of pore size and filter length, so that no aerosols can reach the pipette shaft. These filters function with consistent reliability. On the other hand, liquids can pass very slowly should they accidentally contact the filter.

Since the filter does not swell as in the case of self-sealing filter tips, the sample can be recovered from the filter by simply actuating the pipette's blow-out function, or by centrifugation if necessary. This is clearly an important advantage of non-self-sealing filters, especially when working with valuable samples. As an added advantage, the absence of filter additives protects samples from contamination.

0.1 - 1 µl

Filter tips, 0.1 - 1 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	960	1 bag, 960 each	**7325 02**	–
racked	960	10 TipRacks, 96 each	**7326 02**	**7326 22**
TipBox	480	5 boxes, 96 each	**7327 02**	–
TipBox sterile	960	10 boxes, 96 each	–	**7327 22**

0.5 - 10 µl

Filter tips, 0.5 - 10 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	960	1 bag, 960 each	**7325 04**	–
racked	960	10 TipRacks, 96 each	**7326 04**	**7326 24**
TipBox	480	5 boxes, 96 each	**7327 04**	–
TipBox sterile	960	10 boxes, 96 each	–	**7327 24**

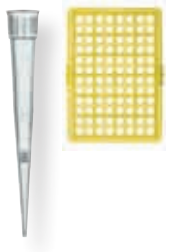
1 - 20 µl

Filter tips, 1 - 20 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	960	1 bag, 960 each	**7325 06**	–
racked	960	10 TipRacks, 96 each	**7326 06**	**7326 26**
TipBox	480	5 boxes, 96 each	**7327 06**	–
TipBox sterile	960	10 boxes, 96 each	–	**7327 26**

Filter tips, 2 - 20 µl

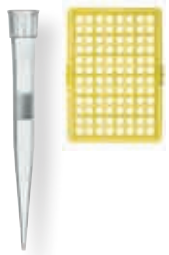
2 - 20 µl



	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	960	1 bag, 960 each	**7325 08**	**–**
racked	960	10 TipRacks, 96 each	**7326 08**	**7326 28**
TipBox	480	5 boxes, 96 each	**7327 08**	**–**
TipBox sterile	960	10 boxes, 96 each	**–**	**7327 28**

Filter tips, 5 - 100 µl

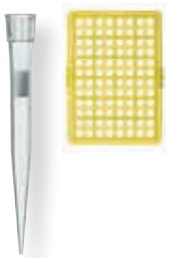
5 - 100 µl



	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	960	1 bag, 960 each	**7325 10**	**–**
racked	960	10 TipRacks, 96 each	**7326 10**	**7326 30**
TipBox	480	5 boxes, 96 each	**7327 10**	**–**
TipBox sterile	960	10 boxes, 96 each	**–**	**7327 30**

Filter tips, 5 - 200 µl

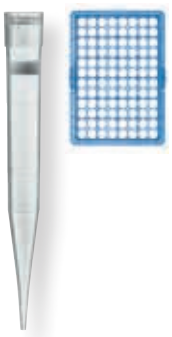
5 - 200 µl



	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	960	1 bag, 960 each	**7325 12**	**–**
racked	960	10 TipRacks, 96 each	**7326 12**	**7326 32**
TipBox	480	5 boxes, 96 each	**7327 12**	**–**
TipBox sterile	960	10 boxes, 96 each	**–**	**7327 32**

Filter tips, 50 - 1000 µl

50 - 1000 µl



	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	960	1 bag, 960 each	**7325 14**	**–**
racked	960	10 TipRacks, 96 each	**7326 14**	**7326 34**
TipBox	480	5 boxes, 96 each	**7327 14**	**–**
TipBox sterile	960	10 boxes, 96 each	**–**	**7327 34**

bulk

racked

TipBox

Ultra Low Retention Pipette Tips

The surfaces of the Ultra Low Retention tips are produced through a special physicochemical process. The homogeneous, defect-free surface thus produced has extremely low surface tension – over 50% less than PTFE (see table). This significantly reduces sample loss and provides substantially higher reproducibility when working with critical media.

- Ideal for biological samples that contain detergents such as TRITON™ X-100, SDS, Tween etc.
- No additives that can be leached out! No siliconization of the surface!
- High chemical resistance. Ideal for working with solvents.
- The tips can be autoclaved at 121 °C (2 bar) without damaging the material properties.

Surface	Surface tension
BRAND® PP Ultra Low Retention	9 mN/m
PTFE	19 mN/m
Silicone	21.5 mN/m
Untreated PP	30 mN/m
Water	72 mN/m

0.1 - 20 µl

ULR pipette tips, 0.1 - 20 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
TipBox	480	5 boxes, 96 each	**7323 02**	–
TipBox sterile	960	10 boxes, 96 each	–	**7323 22**
TipStack™	–	–	–	–

0.5 - 20 µl

ULR pipette tips, 0.5 - 20 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
TipBox	480	5 boxes, 96 each	**7323 04**	–
TipBox sterile	960	10 boxes, 96 each	–	**7323 24**
TipStack™	960	2 x 5 racks, 96 each	**7323 44**	**7323 64**

ULR pipette tips, 1 - 50 µl

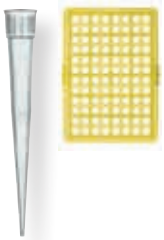
	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
TipBox	480	5 boxes, 96 each	**7323 06**	–
TipBox sterile	960	10 boxes, 96 each	–	**7323 26**
TipStack™	–	–	–	–

1 - 50 µl

ULR pipette tips, 2 - 200 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
TipBox	480	5 boxes, 96 each	**7323 08**	–
TipBox sterile	960	10 boxes, 96 each	–	**7323 28**
TipStack™	960	2 x 5 racks, 96 each	**7323 48**	**7323 68**

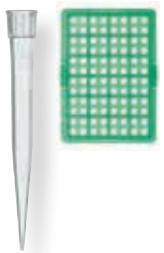
2 - 200 µl



ULR pipette tips, 5 - 300 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
TipBox	480	5 boxes, 96 each	**7323 10**	–
TipBox sterile	960	10 boxes, 96 each	–	**7323 30**
TipStack™	–	–	–	–

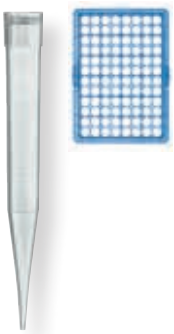
5 - 300 µl



ULR pipette tips, 50 - 1000 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
TipBox	480	5 boxes, 96 each	**7323 12**	–
TipBox sterile	960	10 boxes, 96 each	–	**7323 32**
TipStack™	960	2 x 5 racks, 96 each	**7323 52**	**7323 72**

50 - 1000 µl



TipBox

TipStack™

Ultra Low Retention Filter Tips

0.1 - 1 µl

ULR filter tips, 0.1 - 1 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
TipBox	480	5 boxes, 96 each	**7328 02**	–
TipBox sterile	960	10 boxes, 96 each	–	**7328 22**

0.5 - 10 µl

ULR filter tips, 0,5 - 10 µl

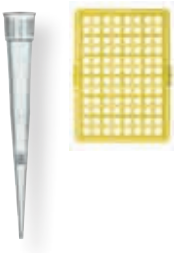
	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
TipBox	480	5 boxes, 96 each	**7328 04**	–
TipBox sterile	960	10 boxes, 96 each	–	**7328 24**

1 - 20 µl

ULR filter tips, 1 - 20 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
TipBox	480	5 boxes, 96 each	**7328 06**	–
TipBox sterile	960	10 boxes, 96 each	–	**7328 26**

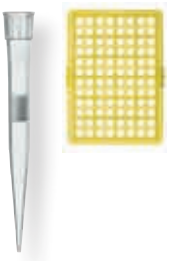
2 - 20 µl



ULR filter tips, 2 - 20 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
TipBox	480	5 boxes, 96 each	**7328 08**	–
TipBox sterile	960	10 boxes, 96 each	–	**7328 28**

5 - 100 µl



ULR filter tips, 5 - 100 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
TipBox	480	5 boxes, 96 each	**7328 10**	–
TipBox sterile	960	10 boxes, 96 each	–	**7328 30**

ULR filter tips, 5 - 200 µl

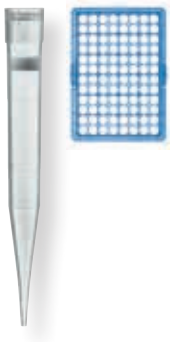
	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
TipBox	480	5 boxes, 96 each	**7328 12**	–
TipBox sterile	960	10 boxes, 96 each	–	**7328 32**

5 - 200 µl

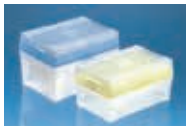
ULR filter tips, 50 - 1000 µl

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
TipBox	480	5 boxes, 96 each	**7328 14**	–
TipBox sterile	960	10 boxes, 96 each	–	**7328 34**

50 - 1000 µl



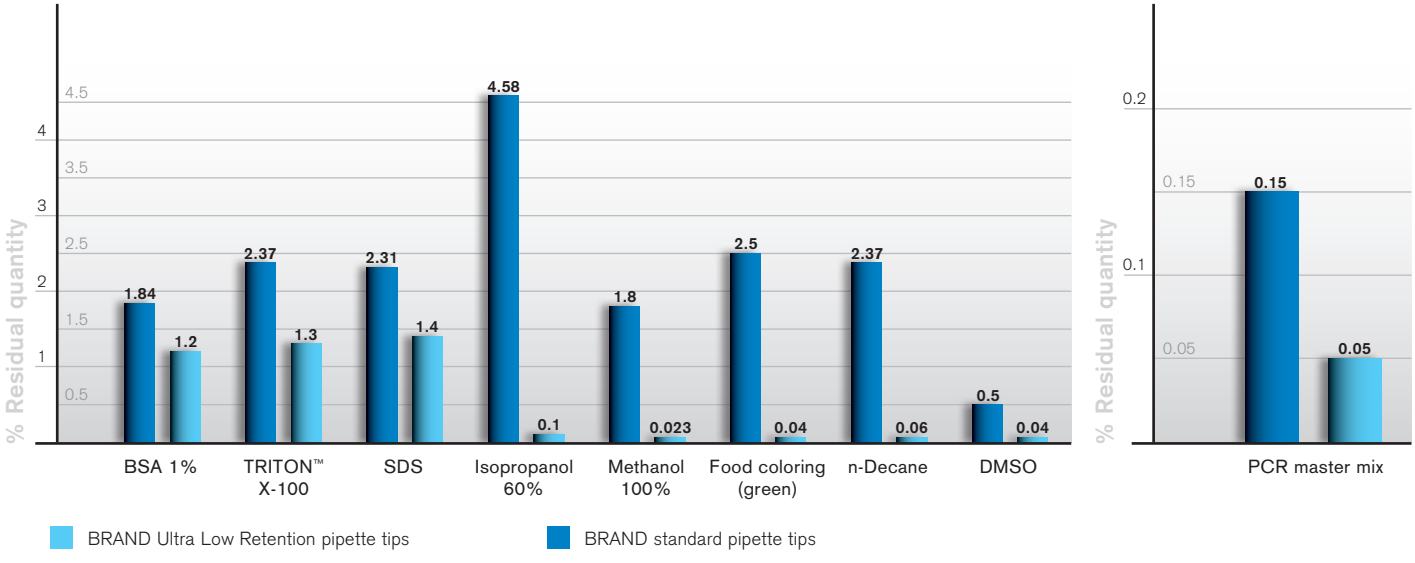
TipBox



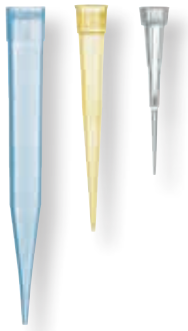
Comparison chart

Standard and Ultra Low Retention pipette tips from BRAND

Volume 200 µl, compared with various media and subsequent photometric analysis and conversion.



Pipette Tips and Filter Tips in Standard and Ultra Low Retention Quality

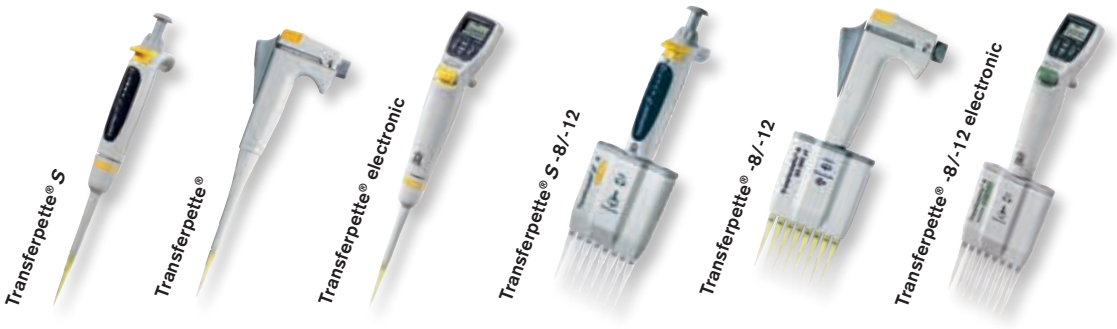


Optimum results are achieved in combination with BRAND microliter pipettes. BRAND quality tips seat perfectly for precise analyses.

Pipette and filter tips from BRAND are tested for BRAND pipettes and most of the pipette types of GILSON®, Thermo Fisher Scientific FINNPIPETTE®, Eppendorf® and BIOHIT®/sartorius®.
The 5 ml tip is exclusively tested for BRAND pipettes and Thermo Fisher Scientific FINNPIPETTE®. The 10 ml tip is tested for BRAND and Eppendorf®.

DE-M
IVD
CE

Note: Pipette shafts can be subject to modification. The fit depends on the manufacturer, pipette type, serial number, and date of manufacture, among other things. We recommend checking the fit of the tips using the free sample bag.



The right Pipette Tip

Pipette tips / Filter tips — Volume range	Transferpette® single channel — Nominal volume																		Transferpette® multichannel — Nominal volume						
	1 µl	2.5 µl	5 µl	10 µl	10 µl [2]	20 µl	20 µl [2]	25 µl	50 µl	100 µl	200 µl	200 µl [3]	250 µl	500 µl	1000 µl	2 ml	5 ml	10 ml	10 µl	20 µl	25 µl	50 µl	100 µl	200 µl	300 µl
0.1 - 20 µl	✔	✔[4]		✔[4]		✔[4]													✔	✔					
0.5 - 20 µl		✔		✔		✔													✔	✔					
1 - 50 µl		✔[4]		✔		✔													✔	✔					
2 - 200 µl [1]			✔		✔		✔	✔	✔	✔	✔										✔	✔	✔	✔	✔
5 - 300 µl			✔		✔		✔	✔	✔	✔	✔										✔	✔	✔	✔	✔
50 - 1000 µl [1]												✔	✔	✔	✔										
0.5 - 5 ml																✔	✔								
1 - 10 ml																		✔							
0.1 - 1 µl	✔			✔[4]															✔						
0.5 - 10 µl		✔		✔		✔													✔	✔					
1 - 20 µl		✔[4]		✔		✔													✔	✔					
2 - 20 µl			✔		✔		✔	✔	✔	✔	✔										✔	✔	✔	✔	
5 - 100 µl			✔		✔		✔	✔	✔	✔	✔										✔	✔	✔	✔	✔
5 - 200 µl											✔										✔	✔	✔	✔	✔
50 - 1000 µl														✔	✔										

✔ = Tip volume less than pipette's nominal volume

[1] Bulk tips are yellow or blue colored, racked tips are colorless in a yellow-colored or blue-colored tip tray
[2] Transferpette® with yellow color code
[3] Transferpette® with blue color code
[4] Calibration and possible adjustment needed

The Transferpettor pipette is ideal for liquids when air displacement pipettes just won't work. Viscous, foaming, high vapor pressure: the Transferpettor pipette can handle them all, with the precision and accuracy you expect from a BRAND pipette. This is the pipette for your most demanding pipetting operations.

Transferpettor

Piston-operated pipette

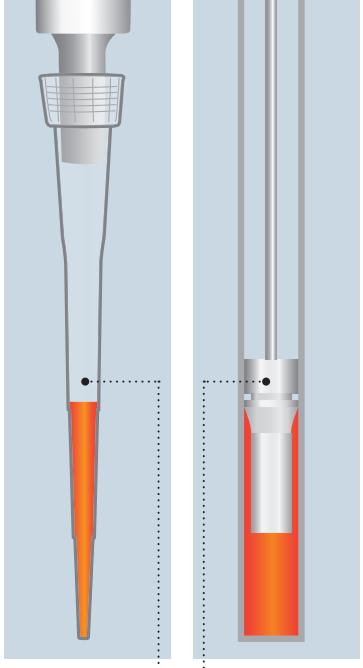
BRAND®

A Closer Look...

The Transferpettor pipette operates on the positive displacement principle.

In contrast with air displacement pipettes, the piston is in direct contact with the aspirated liquid. The movable, precision-fit piston always glides smoothly along the walls of the capillaries and tips, right on through to the last drop that can be clearly observed as it leaves the opening.

In this way, the results obtained are exactly reproducible regardless of the pipetting rate and environmental conditions.



Air-interface principle

Positive displacement principle

There is no need to discard tips after each pipetting operation, since residual wetting is negligible.

However, in cases where no carry-over can be tolerated, for example with infectious or radioactive media, a different BRAND Transferpette® model is recommended, such as an air displacement pipette with a disposable tip for convenient operation (page 45).

The Transferpettor pipette is suitable for media with:

- Density up to 13.6 g/cm³
- Viscosity up to 140,000 mm²/s (depending on the instrument size)
- Vapor pressure up to 500 mbar

Working temperature range:

- 15 °C to 40 °C

Volume range 1 µl to 10 ml:

- Transferpettor fixed volume and digital adjustable pipette up to 200 µl:
  Caps: glass
  Seals: PTFE
- Transferpettor digital adjustable pipette above 100 µl:
  Caps: PP
  Seals: PE

Application

Media which tend to foam

– surfactant solutions

Media with high vapor pressure

– alcohols, ether, hydrocarbons

Highly viscous media and media with high density

– highly concentrated protein solutions, oils, resins, fats

– glycerin, mercury, sulfuric acid

Ordering Data

Transferpettor, Digital-adjustable

Capacity µl	A* ≤ ± %	A* ≤ ± µl	CV* ≤ %	CV* ≤ µl	Subdivision µl	Color code	Cat. No.
2.5 - 10	1.0	0.1	0.8	0.08	0.01	orange	**7018 07**
5 - 25	0.8	0.2	0.5	0.125	0.1	2 x white	**7018 12**
10 - 50	0.6	0.3	0.4	0.2	0.1	green	**7018 17**
20 - 100	0.6	0.6	0.4	0.4	0.1	blue	**7018 22**
100 - 500	0.5	2.5	0.2	1.0	1.0	green	**7028 04**
200 - 1000	0.5	5.0	0.2	2.0	1.0	yellow	**7028 06**
1000 - 5000	0.5	25.0	0.2	10.0	10.0	red	**7028 10**
2000 - 10000	0.5	50.0	0.2	20.0	10.0	orange	**7028 12**

Transferpettor, Fixed-volume

Capacity µl	A* ≤ ± %	A* ≤ ± µl	CV* ≤ %	CV* ≤ µl	Color code	Cat. No.
1	4.0	0.04	4.0	0.04	white	**7018 42**
2	2.5	0.05	2.0	0.04	white	**7018 44**
5	1.0	0.05	0.8	0.04	white	**7018 53**
10	1.0	0.1	0.8	0.08	orange	**7018 58**
20	0.8	0.16	0.5	0.1	black	**7018 63**
25	0.8	0.2	0.4	0.1	2 x white	**7018 64**
50	0.6	0.3	0.4	0.2	green	**7018 68**
100	0.6	0.6	0.4	0.4	blue	**7018 73**
200	0.5	1.0	0.2	0.4	red	**7018 78**

* Calibrated to deliver (TD, Ex). Error limits according to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. The error limits are within the limits of DIN EN ISO 8655-2. DE-M marking.
A = Accuracy, CV = Coefficient of variation

Items supplied:

Each Transferpettor pipette has DE-M marking and is supplied with performance certificate.

Accessories and Spare Parts

Caps, glass

DE-M marking.
Pack of 100 (except 100/200 µl: pack of 50).

For nominal volume, µl	Color code	Cat. No.
1, 2, 3, 4, 5	white	7019 00
10	orange	7019 02
20	black	7019 04
25	2 x white	7019 06
50	green	7019 08
100, 200	blue	7019 10

Caps, PP

DE-M marking.
Pack of 10.

For capacity µl	Color code	Cat. No.
100 - 500	green	7028 52
200 - 1000	yellow	7028 54
1000 - 5000	red	7028 58
2000 - 10000	orange	7028 60

Combi-pack Caps and Seal

DE-M marking.
Caps, PP: pack of 2. Seal, PE: pack of 1.

For capacity µl	Color code	Cat. No.
100 - 500	green	7028 83
200 - 1000	yellow	7028 84
1000 - 5000	red	7028 85
2000 - 10000	orange	7028 86

Repair set

DE-M marking. 1 allen key, 1 piston rod with fitted PTFE Transferpettor-Seal (for capacities ≥ 20 µl), 1 calibrating gauge, 1 screwdriver, 3 clamping discs, 1 fixing-screw, 3 Transferpettor-Seals, PTFE, 1 mounting block (for capacities ≥ 20 µl).

For capacity µl	Mounting block	Cat. No.
1, 2, 5	–	7019 64
10	–	7019 65
20, 25	natural	7019 66
50	green	7019 67
100, 200	blue	7019 68

Seals, PTFE

DE-M marking.
Pack of 3, with mounting block.

For capacity µl	Cat. No.
20, 25	7019 20
50	7019 22
100, 200	7019 24

Seals, PE

DE-M marking.
Pack of 10.

For capacity µl	Cat. No.
100 - 500	7028 64
200 - 1000	7028 66
1000 - 5000	7028 70
2000 - 10000	7028 72

Transferpettor-Station

Accommodates 2 instruments 0.5 to 10 ml with accessories.
Pack of 1.

Cat. No.	7028 90

Transferpettor-Station

Accommodates 4 instruments up to 200 µl with accessories.
Pack of 1.

Cat. No.	7019 60

Piston rod

DE-M marking.
For capacities ≥ 20 µl, provided with seal. Pack of 3.

For capacity µl	Cat. No.
1, 2, 5	7019 28
10	7019 30
20, 25	7019 32
50	7019 34
100	7019 36
200	7019 38

Serial pipetting can be quick and easy with the HandyStep® *S* repetitive pipette. Ergonomic and durable, the instrument, in conjunction with PD-Tips from BRAND, gives you as many as 49 repetitive dispensings from a single aspiration. The simple operation of the HandyStep® *S* repetitive pipette, combined with the positive displacement PD-Tips, makes it ideal for versatile use in fields like microbiology, immunology and biochemistry.

HandyStep® *S*

Repetitive Pipette

BRAND®

A Closer Look...

The HandyStep® *S* repetitive pipette is ideal for routine or research applications in diagnostics, molecular biology, environmental analysis, and many more.
HandyStep® *S* and PD-Tips work on the direct displacement principle. This offers the highest-precision dispensing of liquid media with high viscosity, high density, or high vapor pressure. Direct displacement permits contamination-free operation, since no aerosols are formed.

The HandyStep® *S* repetitive pipette is suitable for use with BRAND PD-Tips, Encode™ tips, Repet tips, Combitips®, Combitips® plus and other compatible dispenser tips.

Volume table
Double-sided volume table on the back side for quick adjustments (see below).

Stroke indicator
Clear, large stroke selection indicator – for fast, simple checking.

Dispensing lever
Optimally positioned dispensing lever, easy on the thumb.

Stroke setting wheel
One-handed volume adjustment for right- and left-handed operators – even with gloves.

Finger rest
Ergonomic finger loop to keep the hand relaxed, important when conducting long series.

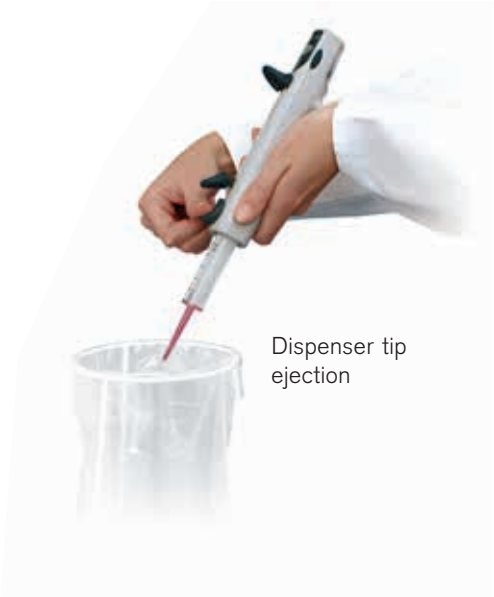
Ejection key
At the push of a button! Ergonomic eject button for contact-free, safe ejection of contaminated dispenser tips.

Locking/filling lever
Just one lever for locking the piston and filling the PD-Tip.

PD-Tip
In addition to PD-Tips from BRAND, compatible dispenser tips from other manufacturers can also be used.

Use and Handling

Repetitive dispensing



Dispenser tip ejection

- Increased chemical resistance through innovative plastic materials
- Easy tip mounting – PD-Tip is now simply inserted from below
- Dispensed volume range from 2 µl to 5 ml
- Up to 49 dispensing steps
- Weighs only 108 g
- CE-IVD-compliant

HandyStep® *S* with PD-Tips volume table

Offers 59 different partial volumes with different numbers of dispensing steps, depending on the PD-Tip size and stroke setting number used.

Setting	Tip size (ml)										Steps
	0.1	0.5	1	1.25	2.5	5	10	12.5	25	50	
1	2	10	20	25	50	100	200	250	500	1000	49
1.5	3	15	30	37.5	75	150	300	375	750	1500	32
2	4	20	40	50	100	200	400	500	1000	2000	24
2.5	5	25	50	62.5	125	250	500	625	1250	2500	19
3	6	30	60	75	150	300	600	750	1500	3000	15
3.5	7	35	70	87.5	175	350	700	875	1750	3500	13
4	8	40	80	100	200	400	800	1000	2000	4000	11
4.5	9	45	90	112.5	225	450	900	1125	2250	4500	10
5	10	50	100	125	250	500	1000	1250	2500	5000	9
	Volume (µl)										

Accuracy Table (PD-Tips from BRAND, 20 °C 'Ex', DE-M marking)

PD-Tip size ml	Volume range µl	A* ≤ ± % Stroke setting ≙ % of **nominal volume**			CV* ≤ % Stroke setting ≙ % of **nominal volume**		
		1 ≙ 2%	**3 ≙ 6%**	**5 ≙ 10%**	**1 ≙ 2%**	**3 ≙ 6%**	**5 ≙ 10%**
0.1	2 - 10	4.0	2.4	1.6	6.0	3.0	2.0
0.5	10 - 50	2.5	1.5	1.0	2.5	1.5	1.0
1	20 - 100	2.5	1.5	1.0	2.0	1.2	0.8
1.25	25 - 125	2.5	1.4	0.9	2.0	1.1	0.7
2.5	50 - 250	1.8	1.1	0.7	1.5	0.9	0.6
5	100 - 500	1.8	1.1	0.7	1.5	0.9	0.7
10	200 - 1000	1.8	1.1	0.7	2.0	1.2	0.8
12.5	250 - 1250	1.8	1.1	0.8	3.2	2.0	1.4
25	500 - 2500	1.5	0.9	0.6	3.0	1.5	1.0
50	1000 - 5000	1.5	0.8	0.5	5.0	1.8	1.2

A* = Accuracy, CV* = Coefficient of variation

The nominal volume is the maximum volume printed on the PD-Tip.
Error limits refer to the partial volume set relative to the PD-Tip size, obtained at equal temperature (20 °C) of instrument, tip, ambience and dist. H_2O, and with smooth, steady operation. The testing is according to DIN EN ISO 8655-5.

Information for **PD-Tips from BRAND** with size encoding on pages 95-96.

Ordering Data

HandyStep® *S*

Items supplied:

Each HandyStep® *S* repetitive pipette has DE-M marking, serial number, performance certificate, shelf/rack mount, 3 PD-Tips: 0.1 ml, 1 ml and 10 ml.
Pack of 1.

Cat. No.	7051 10

Note! BRAND also offers **calibration service** at the factory lab (for more information, please see page 326).

Accessory

Shelf/rack mount

for HandyStep® *S*. Can be fitted to the bench-top rack of Transferpette® *S* (page 52).
Pack of 1.

Cat. No.	7051 30

The HandyStep® electronic repetitive pipette was designed to provide effortless pipetting for repetitive serial dispensing. Reduced operating forces, intuitive menu and easy-to-read display further simplify repetitive pipetting.

HandyStep® electronic

Repetitive Pipette

BRAND®

A Closer Look...

- **7.01 µl – 70.1 µl – 1.01 ml – 11.4 ml?** Any volume you require from 1.0 µl to 50 ml
- **Patented automatic tip size recognition** of the PD-Tips from BRAND with size encoding
- **Compatible system:** will accept most third-party dispenser tips
- **Versatile operation** with 3 modes: Dispensing – Automatic Dispensing – Pipetting
- **Patented learning function** for individual adjustments of intervals in automatic dispensing
- **Separate speed adjustment** for filling and dispensing, independently adjustable
- **NiMH battery pack –** easy to replace, charges in as little as 2.5 hours!
- **Charge** the storage battery either in the instrument or separately in the charger
- **CE-IVD-compliant**

Use and Handling

Dispensing (DISP)
the standard mode

A predefined volume is dispensed repeatedly.

Automatic Dispensing
(AUTO-DISP)

The instrument uses its patented learning function to calculate the average time interval between your first three dispensing steps, and automatically continues to work at this rhythm. No need to calculate and enter time intervals manually!

Pipetting (PIP)

Single aspiration/dispense positive displacement function. Ideal for pipetting viscous or volatile fluids.

Accuracy table (PD-Tips from BRAND, 20 °C 'Ex', DE-M marking)

PD-Tip size	Volume range	Subdivision		Nominal volume (A* ≤ ± %) 100%	50%	10%	1%	Nominal volume (CV* ≤ %) 100%	50%	10%	1%
0.1 ml	1 µl - 100 µl	1 µl - 100 µl	0.1 µl	1.0	1.0	1.6	8.0	0.5	1.0	2.0	12.0
0.5 ml	5 µl - 500 µl	5 µl - 100 µl 100 µl - 500 µl	0.1 µl 1 µl	0.9	0.9	1.0	5.0	0.3	0.6	1.0	5.0
1.0 ml	10 µl - 1 ml	10 µl - 1 ml	1 µl	0.6	0.9	1.0	5.0	0.3	0.5	0.8	4.0
1.25 ml	12.5 µl - 1250 µl	12.5 µl - 100 µl 100 µl - 1000 µl 1 ml - 1.25 ml	0.5 µl 1 µl 10 µl	0.6	0.6	0.9	5.0	0.2	0.5	0.7	4.0
2.5 ml	25 µl - 2500 µl	25 µl - 1000 µl 1 ml - 2.5 ml	1 µl 10 µl	0.5	0.6	0.7	3.5	0.15	0.3	0.6	3.0
5.0 ml	50 µl - 5000 µl	50 µl - 1000 µl 1 ml - 5 ml	1 µl 10 µl	0.5	0.5	0.7	3.5	0.15	0.4	0.7	3.0
10.0 ml	100 µl - 10 ml	100 µl - 10 ml	10 µl	0.4	0.5	0.7	3.5	0.15	0.5	0.8	4.0
12.5 ml	125 µl - 12.5 ml	125 µl - 1000 µl 1 ml - 10 ml 10 ml - 12.5 ml	5 µl 10 µl 100 µl	0.5	0.5	0.8	3.5	0.15	0.6	1.4	6.5
25.0 ml	250 µl - 25 ml	250 µl - 10 ml 10 ml - 25 ml	10 µl 100 µl	0.5	0.5	0.6	3.0	0.15	0.3	1.0	6.0
50.0 ml	500 µl - 50 ml	500 µl - 10 ml 10 ml - 50 ml	10 µl 100 µl	0.5	0.5	0.5	3.0	0.15	0.4	1.2	9.0

* Error limits refer to the nominal volumes and partial volumes relative to the PD-Tip, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth operation. The error limits defined in ISO 8655 are not exceeded. A = Accuracy, CV = Coefficient of variation
The nominal volume is the maximum volume printed on the PD-Tip.

Compatible with third-party dispenser tips!

The special tip connector of the HandyStep® electronic repetitive pipette will accept most common dispenser tips such as Combitips®, Combitips® plus, Repet-Tips, Encode™-Tips, and others. Simply enter the tip size manually.

Ordering Data

HandyStep® electronic

Items supplied:

Each HandyStep® electronic has DE-M marking and is supplied with performance certificate, NiMH battery pack, charging dock and AC adapter. One each PD-Tip size 0.5 ml, 1.25 ml, 2.5 ml, 5 ml and 12.5 ml.

AC adapter	Cat. No.
Europe (continental) (230 V/50 Hz)	7050 00
UK/Ireland (230 V/50 Hz)	7050 01
USA/Japan (110 V/50-60 Hz)	7050 02
Australia (240 V/50 Hz)	7050 03
without charging dock	7050 04

Note! BRAND also offers **calibration service** at the factory lab (for more information, please see page 326).

The ideal combination:
PD-Tips from BRAND and HandyStep® electronic

The HandyStep® electronic repetitive pipette saves time and prevents errors through automatic tip size recognition of the PD-Tips from BRAND. The size of these tips is encoded in their piston (patented). After inserting the tip, the size is automatically recognized and displayed, making it easy to select the volume to be dispensed. When a new PD-Tip of the same size is inserted, all instrument settings are maintained. Information for PD-Tips with size encoding on page 96.

Accessories

AC adapter for charging dock

Pack of 1.

Description	Cat. No.
Europe (continental) (230 V/50 Hz)	7050 50
UK/Ireland (230 V/50 Hz)	7050 51
USA/Japan (110 V/50-60 Hz)	7050 52
Australia (240 V/50 Hz)	7050 53

Charging dock

Without AC adapter.
Pack of 1.

Cat. No.	7050 20

NiMH Battery Pack

Pack of 1.

Cat. No.	7050 25

PD-Tips

Precision Dispenser Tips

The PD-Tips with patented size encoding are the ideal system component for the repetitive pipettes HandyStep® electronic (with automatic tip size recognition) and HandyStep® *S* from BRAND. The PD-Tips comply with ISO 8655 requirements and come with a batch certificate. CE-marked according to IVD-Directive 98/79 EC. PD-Tips are available either non-sterile or sterile/endotoxin-free (individually wrapped), as well as in **BIO-CERT®** quality (see page 118 for detailed information).

- PD-Tips can be used with compatible third-party dispensing systems. The automatic size detection option is available in HandyStep® electronic, GILSON® REPETMAN™ and Rainin AutoRep™ E.
  In addition, PD-Tips can be used with the repetitive pipette HandyStep® *S*, Rainin AutoRep™ M, Rainin AutoRep™ S, Eppendorf® Multipette® 4780 and EDOS 521 among others.
- PD-Tips are made from high-quality materials (cylinder: PP, piston: PE-HD, 0.1 ml: LCP).
- PD-Tips work on the positive displacement principle and are therefore particularly suitable for dispensing of fluids with high viscosity, high vapor pressure, etc.

Information about the **HandyStep® *S*** and **HandyStep® electronic** on pages 87-94.

Accuracy table (PD-Tips from BRAND, 20 °C 'Ex', DE-M marking)

PD-Tip size	Volume range	Nominal volume (A* ≤ ± %)				Nominal volume (CV* ≤ %)			
		100%	50%	10%	1%	100%	50%	10%	1%
0.1 ml	1.0 µl - 100 µl	1.0	1.0	1.6	8.0	0.5	1.0	2.0	12.0
0.5 ml	5.0 µl - 500 µl	0.9	0.9	1.0	5.0	0.3	0.6	1.0	5.0
1.0 ml	10.0 µl - 1 ml	0.6	0.9	1.0	5.0	0.3	0.5	0.8	4.0
1.25 ml	12.5 µl - 1250 µl	0.6	0.6	0.9	5.0	0.2	0.5	0.7	4.0
2.5 ml	25.0 µl - 2500 µl	0.5	0.6	0.7	3.5	0.15	0.3	0.6	3.0
5.0 ml	50.0 µl - 5000 µl	0.5	0.5	0.7	3.5	0.15	0.4	0.7	3.0
10.0 ml	100 µl - 10 ml	0.4	0.5	0.7	3.5	0.15	0.5	0.8	4.0
12.5 ml	125 µl - 12.5 ml	0.5	0.5	0.8	3.5	0.15	0.6	1.4	6.5
25.0 ml	250 µl - 25 ml	0.5	0.5	0.6	3.0	0.15	0.3	1.0	6.0
50.0 ml	500 µl - 50 ml	0.5	0.5	0.5	3.0	0.15	0.4	1.2	9.0

* Error limits refer to the nominal volumes and partial volumes relative to the PD-Tip. obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C. and with smooth operation. The error limits defined in ISO 8655 are not exceeded. A = Accuracy. CV = Coefficient of variation
The nominal volume is the maximum volume printed on the PD-Tip.

PD-Tips, non-sterile

Precision Dispenser Tips

Capacity ml	Pack of	Cat. No.
0.1	100	**7024 02**
0.5	100	**7023 70**
1.0	100	**7024 06**
1.25	100	**7023 72**
2.5	100	**7023 74**
5	100	**7023 76**
10	100	**7024 07**
12.5	100	**7023 78**
25*	50	**7023 80**
50*	25	**7023 82**
PD-Tip Set (20 PD tips each in sizes of 0.5, 1, 1.25, 2.5, 5, 10 and 12.5 ml)		**7023 68**

* incl. 1 adapter

PD-Tips, sterile

Precision Dispenser Tips, individually wrapped

Capacity ml	Pack of	sterile/endotoxin-free Cat. No.	BIO-CERT® Cat. No.
0.1	100	**7024 04**	**7026 83**
0.5	100	**7023 84**	**7026 84**
1.0	100	**7024 36**	**7026 85**
1.25	100	**7023 86**	**7026 86**
2.5	100	**7023 88**	**7026 88**
5	100	**7023 90**	**7026 90**
10	100	**7024 38**	**7026 91**
12.5	100	**7023 92**	**7026 92**
25*	25	**7023 94**	**7026 94**
50*	25	**7023 96**	**7026 96**

* incl. 1 adapter

Adapter

for size 25 and 50 ml PD-Tips, PP, autoclavable. Non-sterile or sterile.

Description	Cat. No.
non-sterile	**7023 98**
BIO-CERT®	**7023 99**

For detailed information about **BIO-CERT®**, see page 118 'Life Science'.

Note! PD-Tips are not autoclavable.

25 ml

50 ml

0.1 ml | 0.5 ml | 1 ml | 1.25 ml | 2.5 ml | 5 ml | 10 ml | 12.5 ml

Pipetting Aids

Pipetting aids from BRAND excel by their comfortable grips, superior control, light weight and rugged reliability:

- accu-jet® *pro*
- macro
- micro
- micro-classic

BRAND®

A Closer Look...

Specifications

- Weight: 190 g
- Operating and charging temperature: +10 °C to + 35 °C
- Pipetting speed: 50 ml in less than 10 seconds
- For glass and plastic pipettes from 0.1 to 200 ml
- Approx. eight hours of continuous pipetting (with a 10 ml pipette) without recharging
- Battery pack: NiMH battery 2.4 V / 700 mAh

Direct exhaust of liquid vapors protects against corrosion ensuring long instrument life.

Pipette adapter firmly holds pipettes from 0.1 to 200 ml. The safety valve and 0.2 µm hydrophobic membrane filter provide double protection against fluid penetration.

Use and Handling

Comfortable

Ergonomic handgrip, weight only 190 g, perfectly balanced design – for fatigue-free pipetting even in prolonged operations.

Sensitive

With the accu-jet® *pro* pipette controller, you have continuously variable speed control using just two buttons. In addition, you can select your preferred maximum motor speed to improve sensitivity and control with low-volume pipettes.

Powerful and quiet

At maximum motor speed, a 50 ml pipette is filled in less than 10 seconds. Now that's fast! Motor and pump operate quietly and with very low vibration. The longer you use it, the more you will appreciate it.

Power to spare

No need to worry about having enough battery power left to finish your series. A flashing LED light will alert you approx. two hours in advance.

■ **Single-handed operation**
All with one hand: select the delivery mode (gravity-delivery/blow-out) and adjust the motor speed range with your thumb; use variable button pressure for fine control of filling and delivery speed.

■ **Advanced charging**
The intelligent battery charger prevents overcharging of the NiMH battery.
It effectively reduces the lazy-battery-effect (shortened operating time due to premature recharging).
A flashing LED indicates when the storage battery needs charging. Charging time is 4 hours. After that, the charger automatically switches to a pulsed, long-term charging mode. The pipette controller is always ready for action, even while being charged.

■ **Tidy storage**
Keep your instrument within reach by placing it inverted on your lab bench. Or store it in the space saving wall support.

■ **Four colors**
Select from four colors to individualize your pipette controller.

Ordering Data

accu-jet® *pro*

Items supplied:

Each pipette controller is supplied with nickel-metal hydride battery, 2 battery compartment covers, wall support, AC adapter (100 - 240 V; 50/60 Hz) and 2 spare membrane filters 0.2 µm, sterile.

Color accu-jet® *pro*	dark blue Cat. No.	magenta Cat. No.	green Cat. No.	royal blue Cat. No.
with AC adapter for				
Europe (continental)	**263 00**	**263 01**	**263 02**	**263 03**
UK/Ireland	**263 10**	**263 11**	**263 12**	**263 13**
USA	**263 30**	**263 31**	**263 32**	**263 33**
Australia	**263 20**	**263 21**	**263 22**	**263 23**
Japan	**263 40**	**263 41**	**263 42**	**263 43**
without AC adapter	**263 04**	**–**	**–**	**–**

Spare Parts

(Other spare parts and accessories can be found in the operating manual.)

Description	Cat. No.
Membrane filter 0,2 µm (PP, PTFE), sterile	**265 30**
Pipette adapter with non-return valve	**265 08**
Nickel-metal hydride battery pack	**266 30**

macro Pipette Controller

New Design – optimized handling NEW!

Convenient operation without effort

The unique valve system allows for easy compression of the newly designed bellows. 50 ml of fluid can be drawn in within just 11 seconds. The spring loaded lever enables an even more sensitive filling and delivery of liquids. The meniscus is easily adjustable.

Broad area of applications

One single macro pipette controller covers the entire range of bulb and graduated pipettes from 0.1 to 200 ml. The conical silicone adapter offers a secure fit for the different diameters. The unit is fully autoclavable at 121 °C (2 bar) according to DIN EN 285. A hydrophobic membrane filter protects the system from liquid penetration.

Ergonomic design

The optimized design, the practical arrangement of functions, and the low weight of 125 g offer reliable operation during serial pipetting tasks, even for inexperienced users.

Ordering Data

BLAUBRAND® Pipetting Package

Items supplied:

- **1 macro pipette controller,** gray
- **6 BLAUBRAND® graduated pipettes, type 2**
  3 pipettes 5 ml and 10 ml each, class AS, DE-M marking, with batch certificate
- **Useful product information**
  BLAUBRAND® volumetric instruments, handling of pipettes
- **Handy plastic container**
  Ideal for storage of pipettes up to 360 mm length

Cat. No.	260 07

macro Pipette Controller

Items supplied:

Each pipette controller is supplied with a 3 µm spare membrane filter.

Color	Cat. No.
gray	**262 00**
green	**262 01**
blue	**262 02**
magenta	**262 03**

Bulb and graduated pipettes can be found on pages 174-182.

Spare parts for macro Pipette Controller

Description	Pack of	Cat. No.
Membrane filter 3 µm (PP, PTFE), non-sterile	1	**260 52**
Membrane filter 3 µm (PP, PTFE), non-sterile	10	**260 56**
Adapter (silicone), length 44 mm	1	**261 46**
Adapter support (PP), gray, length 49 mm	1	**262 20**
Valve system (PP, PTFE, silicone)	1	**261 28**
Suction bellows (silicone) with screw ring (PP)	1	**262 25**

micro Pipette Controller

The micro pipette controller is an indispensable accessory for sampling with disposable micropipettes with ring mark and many small volume pipettes up to 1 ml (e.g., blood diluting and blood sugar pipettes) with aspiration end-Ø max. 5 mm.

The micro reduces the hazards of infection and is autoclavable at 121 °C.

The integrated ejection device allows the disposal of contaminated pipettes up to 50 µl without touching them, thus helping to prevent the transmission of dangerous viruses such as hepatitis B or HIV.

The micro is extremely light and very convenient.

micro Pipette Controller

Pack of 1.

Cat. No.	258 00

Spare suction system

Pack of 3.

Cat. No.	258 05

A high-performance team: micro Pipette Controller and **BLAUBRAND® Disposable Micropipettes**, page 251.

micro-classic Pipette Controller

Working under a microscope requires utmost concentration and therefore comfortable and reliable instruments.

The micro-classic pipette controller with its ergonomic shape and simple handling offers comfort and convenience for this strenuous job. It is a must in IVF and medical laboratories. Suitable for disposable micropipettes with ring mark and other small volume pipettes up to 1 ml (e.g., blood diluting pipettes) with aspiration end-Ø max. 5 mm. The micro-classic adapts to right- and left-handed operation. Adapter and suction tube are autoclavable at 121 °C.

The micro-classic minimizes the risk of contamination when working with infectious material.

micro-classic Pipette Controller

Each pipette controller is supplied with 2 spare suction tubes. Pack of 1.

Cat. No.	259 00

Spare adapter with suction tube

Pack of 3.

Cat. No.	259 31

Pipette fillers

Simple pipetting aids made of natural rubber for one-mark and graduated pipettes. Control of the functions by squeezing the appropriate valves between thumb and forefinger.

Pipette filler

Standard model, for pipettes up to 10 ml.
Pipette filler with 3 valves.
Valve A: Release air
Valve S: Filling
Valve E: Delivery
Pack of 1.

Cat. No.	253 00

Pipette filler

Universal model, for pipettes up to 100 ml.
Pipette filler with 3 valves.
Valve A: Release air
Valve S: Filling
Valve E: Delivery
Pack of 1.

Cat. No.	253 15

Pipette filler

Flip model, for pipettes up to 100 ml.
Pipette filler with 2 valves.
Release air through an automatic valve.
Valve ↑: Filling
Valve ↓: Delivery
Pack of 1.

Cat. No.	254 00

QuikSip™

BT-Aspirator

The QuikSip™ bottle-top aspirator from BRAND is designed for safe and fast aspiration of common laboratory liquids used in biology, food chemistry and medicine.

- Safe removal of supernatants (up to max. 25 ml per plunger stroke), e.g., biological solutions, nutrient media, polar solvents, aqueous soutions
- Ideal for use with the new BRAND*plates*® Insert System
- Works without vacuum pump.
- Fingertip vacuum control using the cell-culture™-unit.
- Works as single channel or 8-channel aspirator (manifold optional).
- For use with disposable pipette tips, micropipettes and glass pasteur pipettes.
- Adapter and suction tube of the cell-culture™-unit are autoclavable at 121 °C (2 bar), acc. DIN EN 285. Dispensing cartridge and pump unit are not autoclavable.

BRAND®

Ordering Data

QuikSip™ BT-Aspirator

Items supplied:
1 QuikSip™ BT-Aspirator,
1 cell-culture™-unit incl. suction tube and 3 adapters, spare dispensing cartridge and 2 PP adapters (GL 45/32 and GL 45/S 40).

Cat. No.	4723 150

Spare parts Quik-Sip™

Description	Cat. No.
Seals for QuikSip™ (Pack of 5)	6788
Filling tube (PP) with filling valve (PP/EPDM)	7045 75
Discharge valve (PP/EPDM) with seal (EPDM)	7045 80

cell-culture™-unit

Single channel device. Complete with suction tube and 3 adapters.

Cat. No.	259 50

Spare parts cell-culture™

Pack of 1.

Spare parts	Cat. No.
Adapter (SI, PVC) for glass Pasteur pipettes	259 60
Adapter (PVC) for capillaries, micro pipettes	259 33
Adapter (PP) for pipette tips	259 61
Suction tube (SI), 2 m	259 62

BRAND*plates*® Insert System, please see page 159.

Accessories and Spare Parts

Adapter

PP. Pack of 1.

Outer-thread	for bottle thread	Cat. No.
GL 32	GL 25	7043 25
GL 32	GL 28	7043 28
GL 45	S* 40	7043 43
GL 32	GL 45	7043 45
GL 45	GL 32	7043 96
GL 45	GL 38	7043 97

* buttress rim

8-channel manifold

PP. Autoclavable (121 °C). Pack of 1.

Cat. No.	7045 26

Dispensing cartridge

Piston (PE), cylinder (PP). Pack of 3.

Cat. No.	7045 04

Cap

PP. Cap for valve block. Autoclavable (121 °C). Pack of 1.

Cat. No.	7045 54

Membrane filter

Membrane filter, 0.2 µm. Pack of 10 in PE-bag, non-sterile, autoclavable (121 °C). Pack of 1.

Cat. No.	265 35

PLT unit

Pipette Leak Testing Unit

The most frequent cause of inaccuracy in air displacement pipettes is leakage. This arises from damage either to the seals, pistons, or tip cones. Often not detectable by the naked eye, leaks lead to significant volume errors. The BRAND pipette leak tester (PLT unit) for air displacement pipettes finds even the smallest leaks within seconds.

BRAND®

A Closer Look...

According to monitoring of measuring instruments, air-displacement pipettes must be checked at regular intervals and the results must be compared with the ISO 8655-2 error limits.
However, a calibration certificate only reflects the results at the time of testing. The time between these calibrations is crucial, since leaks can occur at any time.
Well over 80% of pipettes sent in for repair have leaks and are outside their volume tolerances, even if they don't drip.

While the PLT unit cannot replace regular gravimetric testing, daily pipette checks can provide a safeguard during the periods between calibrations. Even the smallest leaks are detected! Process reliability for the pipettes is thus significantly improved.

Leak rates and their detection

The leak rate is a measure of the quantity of material that flows through a leak per time unit. For air-displacement pipettes the PLT unit determines the rate through a differential pressure measurement, i.e., after creating a negative pressure, the pressure rise over a given time is measured.

■ **Complex determinations**

The leak rate is determined by considering complex physical relationships. Calculation of the limit values resident in the PLT must include factors such as the dead volume of the pipette/tip system, flow cross-section of the pipette tip, pressure rise per time unit, pipette volume and type, etc.

■ **The pV value**

The pV value is the product of the pressure and the volume of a certain quantity of a gas at the prevailing temperature. This is a measure of the quantity of material or the mass of the gas.

■ **The leak rate Q_L**

The leak rate Q_L is the ratio of the pV value and the period of time during which the gas flows through a path cross-section.

■ **The volume loss**

For the pipette test, hPa ml/s is a suitable unit for the leak rate. A leak rate of e.g., 1 hPa ml/s at an air pressure of 1000 hPa means a volume loss of about 1 µl/s.

Single-channel adapter for pipettes with tip

Single-channel adapter for pipettes without tip

PE filter in single- and multichannel adapters

Multichannel adapter for pipettes with and without tip

Back of the instrument with AC adapter socket and USB port

Use and Handling

Testing with and without tip

To check the overall pipette system, the test is conducted with a mounted, unused tip. When a leak has been identified, the test can be repeated without a tip to determine whether the leak arises from the tip cone/tip coupling region.

Dynamic or static test?

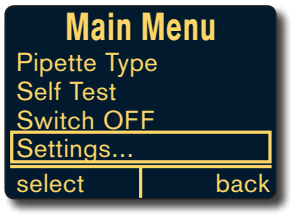
The **dynamic test** can rapidly determine whether a defective piston (contamination, scratches, etc.) has caused a leak. The pipette button must be pushed down numerous times during the measurement period. The associated piston movement allows a defective piston to be recognized.
In the **static test**, the pipette button is not pressed during the test procedure, i.e. the piston doesn't move. This will only determine a leak in a general way, without attributing it to a particular component.

Features

- Limit values for the commercially available single- and multichannel pipettes in the volume range 1 µl to 10 ml are pre-programmed.
- Testing with and without tips
- Test results in seconds
- Patent pending

Main Menu

A wide variety of submenus can be selected from the main menu, e.g., pipette type, volume range, self-test, and settings (language, shut-off time, pressure units, etc.)

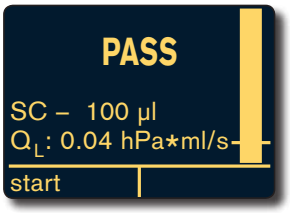


Limit values

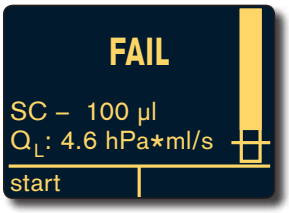
The limit values referenced during testing represent a warning limit, from which significantly lower volume values can also be determined gravimetrically. This is one quarter of the volume tolerances, according to ISO 8655-2.

The limit value for the leak volume of a given pipette allows the leak rate to be calculated. These calculations, which are based on over 35 years of experience in the development and production of pipettes, include the dead volume and the intake characteristics, among other things.

If the pipette is mechanically defect-free, clean, and the test is carried out properly with the BRAND PLT unit, then the instrument is within the ISO 8655-2 tolerances.
The marks in the vertical progress bars in the display represent the resident limit values for the leak rate Q_L.



With the correlation table in the PLT operating manual, the missing volume can be approximately determined from the leak rate. The level of the progress bar in the display indicates whether the pipette is leak-tight, and whether it lies within the tolerance limits or leaks.



Ordering Data

PLT unit
(Pipette Leak Testing Unit)

Including one 1-channel pipette adapter* each for testing of single-channel air-displacement pipettes with tip (mounted) and without tip, 2 plugs, 3 replacement PE filters for the pipette adapters, universal AC adapter, quality certificate and operating manual. Pack of 1.

Cat. No.	7039 70

* 4-channel pipette adapter optional

Accessories

1-channel pipette adapter

for testing of single-channel air-displacement pipettes with tip mounted, including 1 plug. Pack of 1.

Cat. No.	7039 75

for testing of single-channel air-displacement pipettes without tip, including 1 plug. Pack of 1.

Cat. No.	7039 76

4-channel pipette adapter

for testing of multichannel air-displacement pipettes with and without tips, including 4 plugs. Pack of 1.

Cat. No.	7039 77

Filters

PE, for pipette adapter. Pack of 10.

Cat. No.	7039 78

Universal AC adapter

Input: AC 100 V - 240 V, 50/60 Hz
Output: DC 6,5 V, 800 mA
Pack of 1.

Cat. No.	7039 79

BRAND calibration software is compatible with nearly all liquid handling instruments and glass or plastic volumetric instruments. Now you can calibrate and track measuring instruments to GLP and ISO 9001 standards without calculators or scratch paper. EASYCAL™ 4.0 software from BRAND performs all accuracy and precision calculations, matches them to standards and generates a report.

EASYCAL™ 4.0

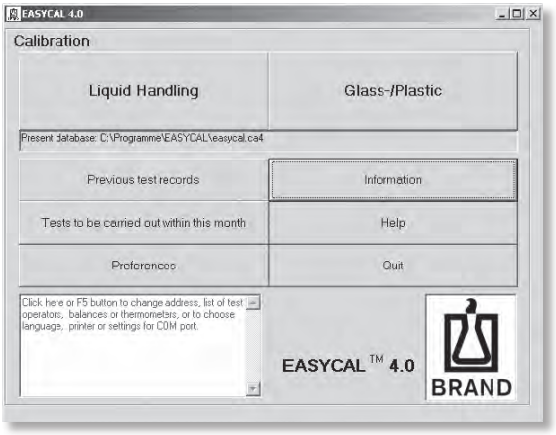
Calibration Software

A Closer Look...

- For testing of liquid handling instruments and volumetric instruments of glass and plastic, according to ISO 8655, ISO 4787 etc.
- Open software, suitable for all volumetric instruments, irrespective of the manufacturer.
- Continual control of the actual results during testing by means of a traffic-light indicator.
- Reminder function for outstanding calibrations.
- Recording of primary data in accordance with GLP.
- Reliable transmission, calculation and saving of measurement data.

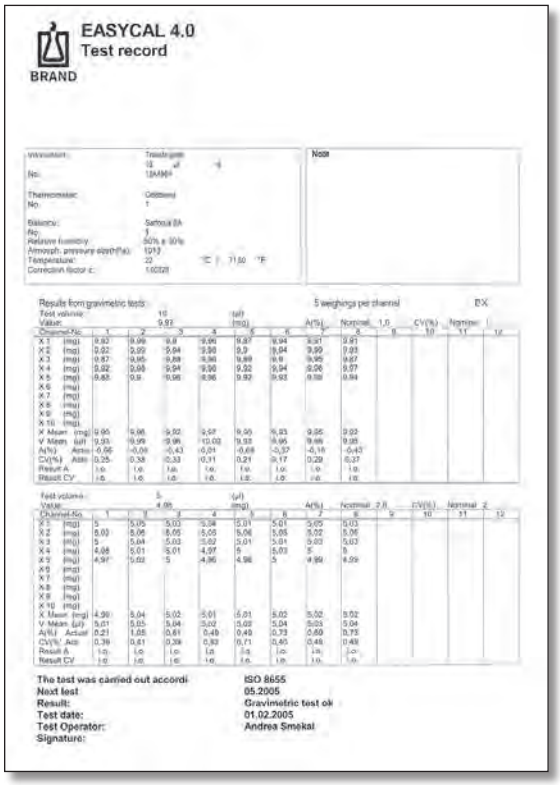
EASYCAL™ 4.0 carries out all calculations automatically and compares them with the error limits specified in current standards or your individual preset limit values. The error limits of many instruments, and the settings of over 100 balances, are already preset in the software.

In the case of multichannel pipettes, the result of each individual channel is compared with the error limits.



Start screen:
This determines whether a liquid handling or volumetric measuring device of glass/plastic is to be tested.

After entering the weighing values (primary data), all calculations are carried out automatically. Automatic import of the weighing values is only available in the professional version.

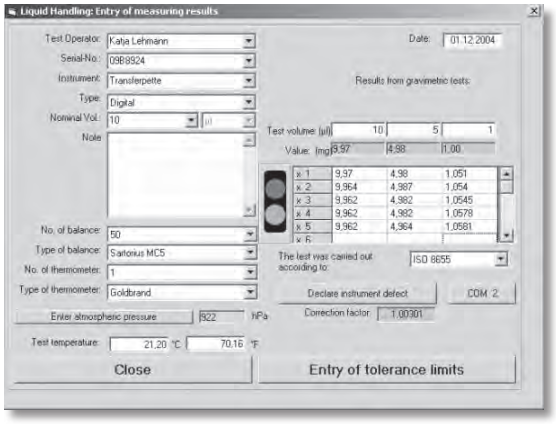


You can print out a clear and conclusive report to GLP standards. The test results are also stored in an easily sorted database. The test certificate can be saved in various formats (e.g., MICROSOFT® Word or Excel).

Quit calibration early?

After entering three weighing values (either manually or via data transmission from the balance), EASYCAL™ 4.0 executes a background comparison of the results with the error limits. A traffic-light indicator (green/red) displays whether your results exceed the error limits.

EASYCAL™ also helps you with testing times and intervals. You will be automatically reminded which tests are due.



In the event of unsuccessful testing, the test equipment can be designated as a 'defective device'. You can cancel this selection after successful cleaning or repair.

Ordering Data

EASYCAL™ 4.0

Items supplied:

CD-ROM with EASYCAL™ software in 5 languages (German/English/French/Spanish/Dutch), manual and testing instructions (SOPs) in 4 languages in PDF format for single- and multichannel pipettes, hand-held dispensers, bottletop burettes and dispensers and volumetric measuring instruments of glass/plastic.

Version	Description	Cat. No.
Professional Version	automatic import of measurement values	**7084 40**
Basic Version	manual entry of measurement values	**7084 45**
Upgrade		on request
Network license		on request

Demo version EASYCAL™ 4.0

A demo version of our software is available for download from www.brand.de. With this, you can test EASYCAL™ for 4 weeks before deciding to purchase the full version.

System requirements:

PC with 32 MB RAM, MICROSOFT® WINDOWS® 98/NT with SP6 / ME / 2000 / XP, SVGA graphic card with 256 colors, mouse, CD-ROM drive, MICROSOFT® Paint.

For connection of the professional version of EASYCAL™ with the balance, please obtain the necessary interface cable from the balance manufacturer.
EASYCAL™ supports balances such as those from sartorius®, Kern, A&D, OHAUS®, etc. METTLER TOLEDO® balances are only partially compatible (AT and AG series).

Accessories

Protection against evaporation

Avoid time-consuming evaporation traps or an expensive dual-pan balance! Pipettes < 50 µl can be surprisingly easy to calibrate using EASYCAL™ testing tubes (available as an accessory) or using the new micro-weighing container.

Attach testing tube

1. Tare the testing tube and clip. Remove the testing tube from the balance after taring. Pipette the sample from the pipette tip into the testing tube.

2. Place filled testing tube with clip on the balance; note mass. Done!

EASYCAL™ test tubes

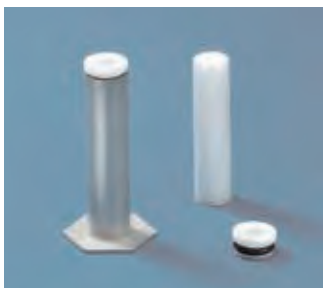
For pipettes < 50 µl.
Pack of 250.

Cat. No.	7084 62

Pipette holder (clip)

For test tubes.
Pack of 10.

Cat. No.	7086 05



Micro-weighing container

The extremely small cap opening and internal filter provides simple protection against evaporation.

Micro-weighing container

incl. 10 filters and
3 cover caps.

Cat. No.	7084 70

Filter pack

20 replacement filters
(capacity approx. 1000 µl).

Cat. No.	7084 71

Cover cap set

3 spare closures.

Cat. No.	7084 72


English
Deutsch
Español
Français
BRAND
Search: Searchword
ABOUT US
PRODUCTS
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Products
Liquid Handling
Liquid Handling
Bottle-top dispensers
Bottle-top burettes
Microliter pipettes
PLT unit (Pipette Leak Test)
Positive displacement pipettes
Stepper/Repetitive pipette
Pipette tips/PD-tips
Pipette controllers
Calibration software
Life Science Products
Volumetric instruments
Density/Temperature measurement
Clinical Laboratory
General Lab Products
Dispensing Equipment / OEM - Products
Titrette®
class A precision
The BRAND line of liquid handling instruments described here sets the world standard for accuracy, ergonomic design, and reliability.
Bottle-top dispensers
Dispensette®
Dispensette® TA
seripettor®
Bottle-top burettes
Titrette®
Microliter pipettes
Transferpette® S
Transferpette® S -8/-12
Transferpette®
Transferpette®-8/-12
Transferpette® electronic
Transferpette®-8/-12 electronic
PLT unit
Positive displacement pipettes
Transferpettor
Repetitive Pipettes
HandyStep® S
HandyStep® electronic
Pipette Tips
PD-Tips
Pipette Controllers
accu-jet® pro
macro
micro
micro-classic
Calibration Software
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Notes:

BRAND®

Life Science

Research – and even routine applications – in the biosciences are unimaginable today without high quality plastic consumables. Increasingly sensitive detection methods rely on ever higher quality from lab disposables.

In addition to pipette tips, filter tips, microcentrifuge tubes and PD-Tips, BRAND Life Science also provides a variety of other high-performance products for PCR, storage, immunology and cell culture technology.


(Foto © Fraunhofer/Rafael Krötz)

Life Science products

Quality is our highest priority – for reliable analyses and reproducible results

It is hard to imagine carrying out analyses in the life sciences field these days without using high-quality disposables. For almost 25 years, BRAND has offered high-performance plastic products for various applications. We start by asking users around the world for input on product details, and then select raw materials and design injection-molding tools to ensure the highest product performance. Finally, the entire manufacturing process is strictly controlled, with quality assurance testing in accredited internal and external laboratories.

Starting materials

Sensitive applications, such as enzyme tests, PCR or DNA purification, require plastic disposable products of the highest quality. The proper selection of raw materials is a significant step in the manufacture of high-quality products. Over many years, polypropylene and polystyrene have earned their place as preferred materials for life science consumables. These materials often come into direct contact with expensive reagents and valuable samples.
For manufacturing pipette tips, BRAND uses specially selected PP types, free from the additives di-(2-hydroxyethyl) methyldodecylammonium (DiHEMDA) and 9-octadecenamide (oleamide). Both of these additives are frequently found in PP granules, and can interfere with biological tests, leading to spurious results*.
The starting materials for life science products are carefully selected by BRAND so that substances that can dissolve out of the raw material (leachables), which could affect the results of biological tests, are reduced to the minimum necessary for processing. Mold release agents, such as stearates and erucic acid amide, are not used in the production process.

Advantages of PP

- **High resistance to chemicals**
  Deep-well plates and microplates can be used with DMSO and other aggressive chemicals.
- **Good temperature resistance**
  Containers remain stable even at high temperatures; these products are generally autoclavable at 121 °C (2 bar), acc. DIN EN 285.
- **Minimal retention**
  PCR vessels, micro tubes and tips have no residual wetting and the material is biologically inert – no adhesion of biomolecules to the surfaces.

Advantages of PS

- **Good optical characteristics**
  Colorimetric tests like ELISA and microanalyses can be carried out with PS microplates.
- **Easily modifiable surface**
  Physiochemical treatments can modify the surface so as to be suitable for applications in cell culture or immunoanalytics.

* G. R. McDonald, A. L. Hudson, S. M. J. Dunn, H. You, G. B. Baker, R. M. Whittal, J. W. Martin, A. Jha, D. E. Edmondson, A. Holt (2008). Bioactive Contaminants Leach from Disposable Laboratory Plasticware. Science, 322 (5903), 917-917.

Cleanroom production

BRAND disposable items for the life sciences are produced using the most advanced cleanroom techniques in one of the world's largest cleanrooms for laboratory disposable items. Continuous cleanroom monitoring, together with precise control of environmental conditions, ensures a high level of temperature stability over the entire production area. This uniformity, together with quality testing of the final product by batch, guarantees the consistently high quality of life science products from BRAND.
Depending on the desired usage environment for the final product, cleanrooms according to ISO 14644-1 (Classes 5, 7 and 8) are available for manufacturing.

Surface modification

To produce optimal properties, surface modification using various physical and chemical methods is required for the products used in many life sciences applications.
Depending on the modification conditions employed, starting materials can be customized, e.g., with either hydrophilic or hydrophobic surfaces. To take a specific case, PS surfaces can either be made hydrophobic so that membrane proteins can bind, or hydrophilic to enable cell growth.

As exemplified by BRAND Ultra Low Retention tips, even PP surfaces can be modified to be as hydrophobic as PTFE, and such a material will not be wetted by liquids in which the surface tension has been reduced through the use of detergents.

Surface	Surface tension
BRAND® PP Ultra Low Retention	9 mN/m
PTFE	19 mN/m
Silicone	21.5 mN/m
Untreated PP	30 mN/m
Water	72 mN/m

Internal quality controls and independent laboratory tests

All products are subjected to a number of optical and functional tests before they are tested for molecular-biological contaminants. For example, PCR products are tested for evaporation losses and PCR plates are subjected to stringent vacuum tests to ensure that the systems satisfy your highest expectations. After the disposable items have successfully completed this internal process, the products are examined by an independent accredited laboratory. Sensitive detection methods are used to ensure that the products, depending on the intended use, contain no DNA, DNase, RNase, endotoxins or ATP.

The proper quality grade for every application

The right quality grade should be used in each application. Consequently, BRAND offers a range of quality grades so that the optimal one is always available.

	sterile acc. ISO 11 137	free of DNA	free of RNase	free of endotoxins	free of ATP	free of cytotoxic substances acc. ISO 10 993
Pipette tips and filter tips standard, racked		✔	✔	✔	✔	
Pipette tips and filter tips BIO-CERT®	✔	✔	✔	✔	✔	
PD-Tips sterile/endotoxin-free	✔			✔		
PD-Tips BIO-CERT®	✔	✔	✔	✔	✔	
Microcentrifuge tubes sterile BIO-CERT®	✔	✔	✔	✔	✔	
Microcentrifuge tubes with lid closure		✔	✔	✔		
Micro tubes with screw cap, sterile	✔	✔	✔	✔		✔
PCR products		✔	✔	✔		
Deep-well plates		✔	✔	✔		
Cryogenic tubes	✔	✔	✔	✔		✔
BRAND*plates*® standard		✔	✔	✔		✔
BRAND*plates*® sterile	✔	✔	✔	✔		✔
UV-Cuvettes micro		✔	✔	✔		

BIO-CERT® BIO-CERT® products correspond to the highest quality grade. They are sterile, free from DNA, RNases, endotoxins and ATP.

Sterility

Sterility means being free of living organisms. BRAND products are sterilized with beta radiation according to ISO 11 137 and the AAMI Guidelines. The radiation dose is at least 12.1 kGy. The inertGrade™ microplates are an exception; these are sterilized with ethylene oxide due to their special surface characteristics.
An SAL (sterility assurance level) of 10^{-6} is guaranteed, meaning no more than one part in 1×10^{6} is contaminated! This level of sterility complies with the requirements of USP 29 and the Ph.Eur.

DNA and RNases

DNA (deoxyribonucleic acid) is the carrier of genetic information. RNases (ribonucleases) are enzymes that can degrade ribonucleic acid (RNA) through hydrolysis. Ribonucleic acids serve as transmitters of genetic information. RNases are ubiquitous and extremely stable. To protect the RNA molecules from undergoing enzymatic degradation, one must be absolutely certain that plastic items are free from RNases.
Products from BRAND are free from DNA (< 4×10^{-14} g/tip = 40 fg), to avoid false positive results, e.g., in PCR*, and free from RNases (< 8.6×10^{-15} g/tip = 8.6 fg), to make it possible to work with RNA.

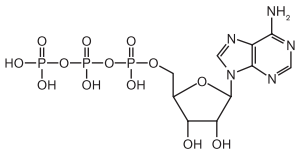
* The Polymerase Chain Reaction (PCR) is covered by international patents. Use of the PCR process may require a license.

Endotoxins

Endotoxins refer to the components present in the outer membranes of Gram-negative bacteria. These components are lipopolysaccharides that are released when cells are destroyed. Endotoxins make up the largest group of pyrogens, and these two are often falsely believed to be synonymous. Depending on the concentration, these heat-stable substances lead to fever, circulatory collapse, shock, etc., and can be fatal in very high doses. The concentration of endotoxins in products from BRAND is determined by the kinetic-turbidimetric limulus amebocyte lysate (LAL) test. The detection limit is 0.01 EU/ml. This corresponds to an endotoxin concentration of < 1×10^{-12} g/tip (1 pg/tip). Freedom from endotoxins is required in pharmaceutical manufacture and cell culture.

ATP

Adenosine triphosphate is the energy source for every living cell. ATP is an energy-rich, transportable molecule. It is an indicator for living cells, and can serve as a marker for detecting viable bacteria, yeasts, and human cells, etc. Products from BRAND are free of ATP (ATP concentration < 1×10^{-15} g/tip = 1 fg) and thus are especially suitable for luminescence measurements, e.g., those employed in the hygiene monitoring field according to the HACCP concept.



Cytotoxicity

Various substances are capable of damaging cells. Extracts from BRAND*plates*® for cell culture are checked for their effects on cell cultures using an in vitro cytotoxicity test. BRAND*plates*® are free from cytotoxic substances according to DIN EN ISO 10 993.

Microcentrifuge Tubes

Quality features

- Uniform lid thickness ensures trouble-free piercing.
- Consistent wall thickness.
- Tight fitting attached lid provides leak-free seal, yet reopens easily.
- High clarity.
- Autoclavable at 121 °C (2 bar), acc. DIN EN 285

Relative Centrifugal Force (RCF)

Quoted RCF (g) values are determined with 20 °C water being centrifuged for 20 min.

Actual stress limit may be affected by conditions such as rotor positioning, reagents, run time and temperature. Specified RCF values should only be used as a comparative guide (DIN 58970).

To calculate RCF:

$$RCF = 1.118 \cdot r \cdot \left(\frac{n}{1000}\right)^2$$

Example:

Rotation radius **r = 180 mm** (vertical distance between center of rotation axis and bottom of centrifuge tube)

Speed **n = 6000 min^{-1}**

$$\mathbf{RCF = 1.118 \cdot 180 \cdot \left(\frac{6000}{1000}\right)^2}$$

$$\mathbf{= 7245}$$

Microcentrifuge tubes

0.5 ml, with lid

PP.

RCF max.	Lid membrane Ø mm	Thickness lid membrane mm	Outer-Ø mm	Height mm
10000 (at 20 °C, t_e 20 min)	5.4	0.3	7.9	31.4

Pack of 1000
(1 bag).

Cat. No.	7805 07

1.5 ml, with lid

PP. Frosted marking area, subdivisions for approximate volume determination.
CE-marked according to IVD-Directive 98/79 EC.

RCF max.	Lid membrane Ø mm	Thickness lid membrane mm	Outer-Ø mm	Height mm
20000 (at 20 °C, t_e 20 min)	8.5	0.3	10.75	40.8

Pack of 500
(1 bag).

Cat. No.	7805 00

Pack of 3000
(6 bags of 500).

Cat. No.	7805 02

BIO-CERT®
Sterile and free of endotoxins, DNA, RNase and ATP.
Pack of 450 (30 blister packs of 15 tubes).

Cat. No.	7804 00

Colored
Pack of 500.

Color	Cat. No.
yellow	7805 21
blue	7805 22
green	7805 23
orange	7805 24
amber*	7805 25

* The amber-colored microcentrifuge tubes are particularly suitable for light-sensitive reagents.

0.5 ml, 1.5 ml and 2.0 ml, with lid closure

NEW!

PP. RNase-, DNA- and endotoxin-free. Lid closure to achieve especially effective sealing and prevent accidental opening! Frosted marking area, subdivisions for approximate volume determination.

Volume ml	RCF max.	Outer-Ø mm	Height mm	Pack of	Cat. No.
0.5	30000 (at -5 °C, t_e 20 min)	10.0	30.0	500	**7805 36**
1.5	30000 (at -5 °C, t_e 20 min)	12.8	38.8	1000	**7805 40**
2.0	30000 (at -5 °C, t_e 20 min)	12.8	40.0	500	**7805 46**

lid closure

1.5 ml, without lid

PP.

RCF max.	Outer-Ø mm	Height mm
6000 (at 20 °C, t_e 20 min)	11	39.5

Pack of 12000
(6 bags of 2000).

Cat. No.	7805 05

Microcentrifuge tube racks and adapters can be found on page 125.

2 ml, with lid

PP. Frosted marking area, subdivisions for approximate volume determination.

RCF max.	Lid membrane Ø mm	Thickness lid membrane mm	Outer-Ø mm	Height mm
20000 (at 20 °C, t_e 20 min)	8.5	0.3	10.7	41.15

Pack of 500
(1 bag).

Cat. No.	7805 50

Micro tubes with screw caps

Screw cap micro tubes are ideal for storage of serums and blood samples, and for boiling, centrifugation, etc.

Colored
Cap inserts for coding, available in a variety of colors.

Safe
Positive sealing screw cap with sealing cone or silicone seal.

Fast
Fast opening and closing with 1¼ turn of cap.

Accurate
Dimensions: outer Ø 11 mm, height 47 mm.

Clear
All tubes are made of high-transparency PP for easy visibility of samples.

Rugged
Withstands RCF to 17 000 g at 20 °C, for 20 min.

Convenient
Micro tubes with ring stands (self-standing) can be placed in suitable racks one-handed.

Versatile
Micro tubes with screw caps are available in different formats, designs and quality grades. Micro tubes of PP and screw caps of PE or PP are precisely matched to ensure a secure seal.

with sealing cone

Micro tubes with sealing cone are particularly suitable for the storage of sensitive samples, since they avoid the risk of contamination from existing silicone seals. These tubes are not autoclavable.

with silicone seal

Micro tubes are sealed extremely well with silicone seals, without contact between the sample and the sealing ring. The containers are suitable for the storage of samples in the gaseous (vapor) phase of liquid nitrogen. Micro tubes with silicone seals are autoclavable at 121 °C (2 bar), acc. DIN EN 285.

with silicone seal, tamper-evident screw cap

The tamper-evident screw cap guarantees the user an uncontaminated sample. A visible ring acts as an anti-tamper seal, which breaks when the cap is first opened. The micro tubes have a silicone seal, and are suitable for the storage of samples in the gaseous (vapor) phase of liquid nitrogen. The micro tubes with tamper-evident screw cap are autoclavable at 121 °C (2 bar), acc. DIN EN 285.

Micro tubes

Colored screw caps and colored cap inserts are available separately (page 124).

attached screw cap with sealing cone, non-sterile

PP, ungraduated, screw cap PE. Operating range: -90 °C to +100 °C.
Pack of 1000.

Capacity ml	Description	Cat. No.
0.5	self-standing	**7807 00**
1.5	self-standing	**7807 01**
1.5	round-bottom	**7807 02**
2	self-standing	**7807 03**
2	round-bottom	**7807 04**

attached screw cap with silicone seal, non-sterile

PP, graduated, screw cap PP. With frosted marking area.
Operating range: -196 °C to +121 °C. Pack of 1000.

Capacity ml	Subdiv. up to ml	Description	Cat. No.
0.5*	–	self-standing	**7807 10**
1.5	1	self-standing	**7807 11**
1.5	1	round-bottom	**7807 12**
2	1.2	self-standing	**7807 13**
2	1.2	round-bottom	**7807 14**

* ungraduated

bulk screw cap with silicone seal, sterile

PP, graduated, screw cap PP. With frosted marking area. Operating range: -196 °C to +121 °C. DNA-, DNase-, and RNase-free, endotoxin-free, non-mutagenic, non-toxic.
Pack of 500.

Capacity ml	Description	sterile with cap Cat. No.
0.5*	self-standing	**7807 50**
1.5	self-standing	**7807 51**
1.5	round-bottom	**7807 52**
2	self-standing	**7807 53**
2	round-bottom	**7807 54**

* ungraduated

without screw cap, non-sterile

PP, graduated. With frosted marking area. Operating range: -196 °C to +121 °C.
Pack of 1000.

Capacity ml	Description	non-sterile without cap Cat. No.
0.5*	self-standing	**7807 30**
1.5	self-standing	**7807 31**
1.5	round-bottom	**7807 32**
2	self-standing	**7807 33**
2	round-bottom	**7807 34**

* ungraduated

Micro tubes

with tamper-evident screw cap, with silicone seal, sterile

PP, graduated. With frosted marking area. Operating range: -196 °C to +121 °C.
DNA, DNase, and RNase-free, endotoxin-free, non-mutagenic, non-toxic.
Pack of 500.

Capacity ml	Description	Cat. No.
0.5*	self-standing	7807 55
1.5	self-standing	7807 56
1.5	round-bottom	7807 57
2	self-standing	7807 58
2	round-bottom	7807 59

* ungraduated

without screw cap, non-sterile

PP, ungraduated. Operating range: -196 °C to +121 °C.
Pack of 1000.

Capacity ml	Description	Cat. No.
0.5	self-standing	7807 60
1.5	self-standing	7807 61
1.5	round-bottom	7807 62
2	self-standing	7807 63
2	round-bottom	7807 64

Caps, colored

Screw caps with silicone seal, for micro tubes 7807 30 - 7807 34, 7807 50 - 7807 54

PP. Applications: -196 °C to +121 °C.
Pack of 1000.

Cap Color	Cat. No.
white	7807 40
blue	7807 41
red	7807 42
green	7807 43
yellow	7807 44

Cap inserts for micro tubes with attached or bulk screw caps

PP. Applications: -196 °C to +121 °C.
Pack of 500.

Cap insert Color	Cat. No.
white	7807 20
blue	7807 21
red	7807 22
green	7807 23
yellow	7807 24

Tamper-evident screw caps with silicone seal, for micro tubes 7807 60 - 7807 64

PP. Applications: -196 °C to +121 °C.
Pack of 1000.

Cap Color	Cat. No.
transparent	7807 70
blue	7807 71
green	7807 72
purple	7807 73
red	7807 74
yellow	7807 75

Accessories microcentrifuge tubes

Microcentrifuge tube rack

PP, grey. Numbered positions for 20 microcentrifuge tubes, 1.5 ml.
Autoclavable at 121 °C (2 bar), acc. DIN EN 285.
Pack of 1.

Positions	Length mm	Width mm	Height mm	Cat. No.
20	210	70	37	**7806 05**

0.5 ml adapter for Cat. No. 7806 05

PP. Microcentrifuge tube racks can be equipped with inserts to accommodate 0.5 ml microcentrifuge tubes. Easy permanent assembly. Pack of 20.

Cat. No.	7806 08

Microcentrifuge tube racks

PP. Stackable racks with alphanumerical positions. Operating temperature -20 °C to +90 °C. Autoclavable at 121 °C (2 bar), acc. DIN EN 285. Density 1.2 g/cm³. Will not float in waterbath. Racks are supplied in two-pieces (Ø 11 mm, for microcentrifuge tubes) or three-pieces (Ø 13 mm, for cryogenic tubes) for convenient and permanent assembly. L x W x H in mm: 265 x 126 x 38. Pack of 5.

For Ø up to mm	Positions	white Cat. No.	blue Cat. No.	red Cat. No.	yellow Cat. No.
11	8 x 16	**43410 50**	**43410 51**	**43410 52**	**43410 53**
13	6 x 14	**43410 00**	**43410 01**	**43410 02**	**43410 03**

Mini cooler

PC. Mini coolers are designed to protect a wide range of solutions (enzymes, DNA, RNA, cell suspensions) by helping to maintain freezer temperatures on the lab bench. Durable polycarbonate filled with non-toxic gel. Mini coolers hold twelve 0.5 ml to 2.0 ml tubes.

Bench temp. maintained	Time held	Color	Cat. No.
0 °C	60 min.	red	**1149 30**
-20 °C	60 min.	yellow	**1149 35**
-70 °C	45 min.	white	**1149 40**

PCR

Tubes, strips, plates and accessories

BRAND has significantly expanded its product range of extra-thin-wall disposable products, which were specially developed to satisfy the demands of PCR applications, particularly in 96-well PCR plates. Single tubes, strips of 8 and 12, and, for high sample throughput, PCR plates in 24-well, 48-well, 96-well, and 384-well formats are available. Thus, there is an optimal product for every application.

Features

- Suitable for use in common thermal cyclers.
- PP, extra-thin uniform wall thicknesses to provide the optimal thermal transfer and short cycle times.
- 96-well PCR plates with blue alphanumeric code and cut corner marking
- Highly transparent flat covers optimally suited for qPCR
- DNase-, DNA- and RNase-free
- Autoclavable at 121 °C (2 bar), acc. DIN EN 285

Real-Time PCR?

q!PCR outstanding!

PCR Plates:
Plates that fit in quantitative Real-Time thermal cyclers, also available in white

PCR Tubes:
Tubes with highly transparent caps for sensitive detection of fluorescence signals

PCR Seals:
Seals, highly transparent for sensitive detection of fluorescence signals

Note! Autoclaves can be a source of contamination for disposable products.

The Polymerase Chain Reaction (PCR) is covered by international patents. Use of the PCR process may require a license.

Single PCR tubes

0.2 ml and 0.5 ml PCR tubes with attached caps are compatible with leading thermal cyclers with heated lids. The caps are easy to open and close without tools, yet ensure a tight fit to reduce sample evaporation. The various colors of the PCR tubes allow fast sample classification.

0.2 ml and 0.5 ml

with attached caps

PP. Pack of 1000.

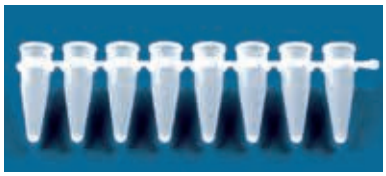
Capacity ml	Description	Color	Cat. No.
0.2	domed cap	clear	**7813 00**
0.2	flat cap	clear	**7813 05**
	flat cap	rose	**7813 01**
	flat cap	yellow	**7813 02**
	flat cap	green	**7813 03**
	flat cap	blue	**7813 04**
0.5	flat cap	clear	**7813 10**
	flat cap	rose	**7813 11**
	flat cap	yellow	**7813 12**
	flat cap	green	**7813 13**
	flat cap	blue	**7813 14**

domed cap

flat cap

PCR Strips

White PCR products offer significantly better results for qPCR, and are specifically recommended by many thermal cycler manufacturers.



Strips of 8

with detached cap strips

PP. 8 connected 0.2 ml tubes. Separate, domed or flat caps are available in strips of 8. They are easy to open and close without tools. The tubes have a holding strap at one end, and the cover strips on each cap have a small lip on the side for careful, contamination-free opening.

Pack of 125 strips, 1000 vessels or caps, total.

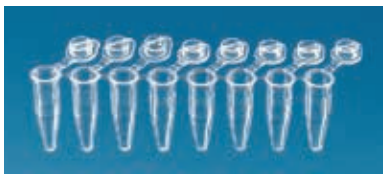
Capacity ml	Color	Strips of 8 PCR tubes Cat. No.	Strips of 8 PCR caps domed Cat. No.	Strips of 8 PCR caps flat* Cat. No.
0.2	clear	**7813 20** qPCR	**7813 40**	**7813 34** qPCR
	rose	**7813 21**	**7813 41**	–
	yellow	**7813 22**	**7813 42**	–
	green	**7813 23**	**7813 43**	–
	blue	**7813 24**	**7813 44**	–
	white	**7813 25** qPCR	–	–

NEW!

Pack of 250 strips each, 2000 tubes and 2000 caps, total.

Capacity ml	Color	Strips of 8 PCR tubes and strips of 8 PCR caps domed Cat. No.	Strips of 8 PCR tubes and strips of 8 PCR caps flat* Cat. No.
0.2	clear	**7813 27**	**7813 26** qPCR

* flat caps suitable for Real-Time PCR



NEW!

Strips of 8 PCR tubes

with attached flat individual caps

PP. 8 connected 0.2 ml or 0.15 ml tubes with attached, flat individual caps – ideal protection against contamination. The highly transparent cap makes them ideal for real-time PCR. Available in standard and low profile versions.
Pack of 120 Strips, 960 vessels total.

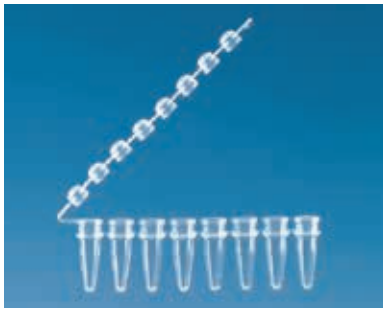
Description	Capacity ml	Color	Pack of	Cat. No.
Standard	0.2	clear	120 strips per bag	**7813 32** qPCR
Standard	0.2	white	120 strips per bag	**7813 16** qPCR NEW!
Low profile	0.15	clear	120 strips per bag	**7813 33** qPCR
Low profile	0.15	white	120 strips per bag	**7813 17** qPCR NEW!

Strips of 8 PCR tubes

with attached cap strips

PP. 8 connected 0.2 ml tubes with attached cap strips. Domed caps facilitate one-handed operation. Pack of 125 strips, 1000 vessels, total.

Cat. No.	7813 30

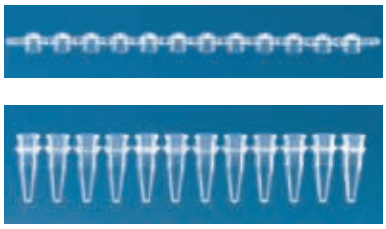


Strips of 12

with detached cap strips

PP. 12 connected 0.2 ml tubes. The separate domed caps are available in strips of 12. They ensure a secure seal. Pack of 125 strips, 1500 vessels or caps, total.

Capacity ml	Color	Strips of 12 PCR tubes Cat. No.	Strips of 12 PCR caps Cat. No.
0.2	clear	7812 80	7812 90
	rose	7812 81	7812 91
	yellow	7812 82	7812 92
	green	7812 83	7812 93
	blue	7812 84	7812 94



q!PCR 24-well and 48-well PCR Plates

These plates reduce material costs and allow work on a compact PCR plate even with small sample throughputs.

24-well, non-skirted

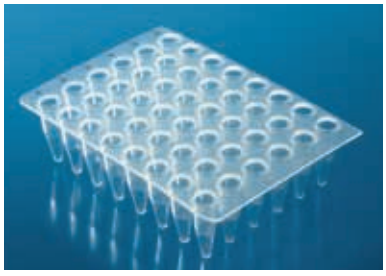
PP. 0.2 ml wells. Suitable for most commercially available thermal cyclers.
A detailed compatibility table can be found on page 134.

Description	Color	Pack of	Cat. No.
Standard profile	clear	40 (5 plates per bag)	7814 11
Standard profile	white	40 (5 plates per bag)	7814 12

48-well, non-skirted

PP. 0.2 ml wells. Suitable for most commercially available thermal cyclers.
A detailed compatibility table can be found on page 134.

Description	Color	Pack of	Cat. No.
Standard profile	clear	20 (5 plates per bag)	7814 15
Standard profile	white	20 (5 plates per bag)	7814 16

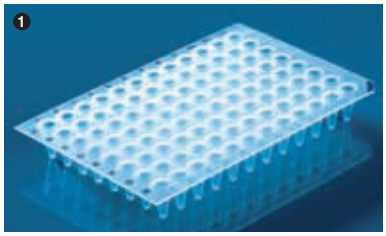


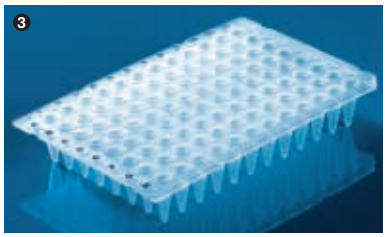
q!PCR 96-well PCR Plates

The ultra thin-walled PCR plate design facilitates constant, rapid and precise heat transfer. The smooth vessel interior minimizes the binding of enzymes and nucleic acid to the walls. The rim of the wells are designed to protect against cross-contamination, allowing a reliable seal with the sealing mats tailored to the plates.

The use of Real-Time PCR (qPCR) is becoming increasingly widespread. In particular, the direct quantification of the DNA formed can be achieved by the use of fluorescence measurement. White PCR products by BRAND offer significantly better results in this application than transparent tubes. The different products in this line are uniformly colored with TiO_2 (titanium dioxide), so that in combination with the smooth surfaces, the optimum reflection of the fluorescence signal is provided.

The new 96-well PCR plates from BRAND offer features such as blue alphanumeric coding and cut corner design to facilitate orientation.





NEW!


Low profile


Standard profile


Standard profile, elevated rim

96-well, non-skirted

PP. 0.2 ml or 0.15 ml wells. 96-well non-skirted PCR plates are suitable for most commercially available thermal cyclers. A detailed compatibility table can be found on page 134.

Description	Color	Cut corner	Pack of	Cat. No.
❶ Low profile	clear	H12	50 (5 plates per bag)	**7813 66**
Low profile	white	H12	50 (5 plates per bag)	**7813 67**
❷ Standard profile	clear	A12	50 (5 plates per bag)	**7813 68**
Standard profile	white	A12	50 (5 plates per bag)	**7813 69**
❸ Standard profile, elevated rim	clear	H12	50 (5 plates per bag)	**7813 50**
Standard profile, elevated rim	white	H12	50 (5 plates per bag)	**7813 54**

Please note the **thermal cycler compatibility table** on page 134.

96-well PCR plates in standard profile can be sealed with PCR caps (strips of 8), Cat. No. 7813 40 - 7813 44 and 7813 34 page 128.

Low profile

Low profile, raised skirt

Standard profile

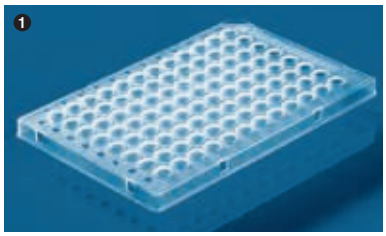
Standard profile, elevated rim

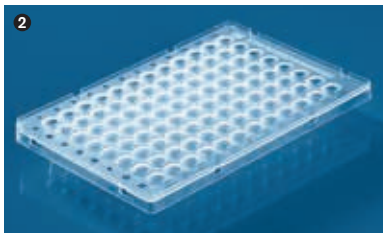
NEW!

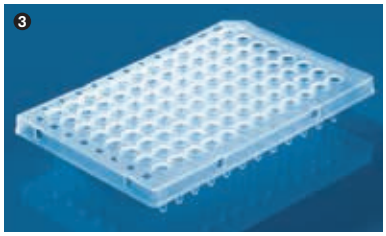
96-well, semi-skirted

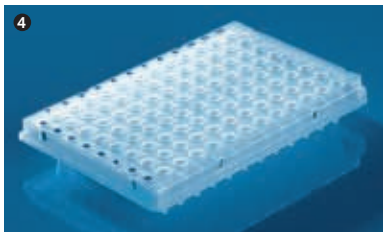
PP. 0.2 ml or 0.15 ml wells. 96-well semi-skirted PCR plates can easily be labeled or tagged with a barcode. A detailed compatibility table can be found on page 134.

	Description	Color	Cut corner	Pack of	Cat. No.
❶	Low profile	clear	A12	50 (5 plates per bag)	**7813 71**
	Low profile	white	A12	50 (5 plates per bag)	**7813 72**
❷	Low profile, raised skirt	clear	A1	50 (5 plates per bag)	**7813 73**
	Low profile, raised skirt	white	A1	50 (5 plates per bag)	**7813 74**
❸	Standard profile	clear	A12	50 (5 plates per bag)	**7813 75**
	Standard profile	white	A12	50 (5 plates per bag)	**7813 76**
❹	Standard profile, elevated rim	clear	H12	50 (5 plates per bag)	**7814 00**
	Standard profile, elevated rim	white	H12	50 (5 plates per bag)	**7813 57**









96-well, semi-skirted

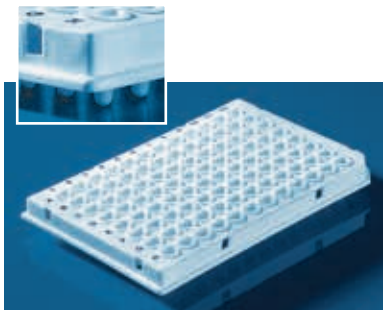
NEW!

Suitable for Roche® LightCycler® 480 and other thermal cyclers

PP. 0.15 ml wells. Semi-skirted. With black alphanumeric code.
Available with or without self-adhesive sealing film (polyester, high-transparent, for qPCR).

Description	Color	Cut corner	Pack of	Cat. No.
Low profile*	white	H12	50 (10 plates per bag)	**7813 64**
Low profile*	white	H12	50 (10 plates per bag) + 50 films for qPCR	**7813 65**

* black alphanumeric code, no additional markings on the cut corner.



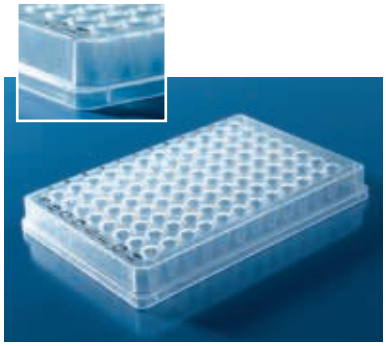
96-well, skirted

NEW!

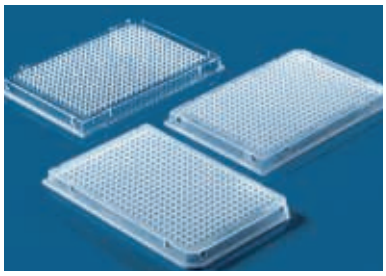
PP. 0.15 ml wells. 96-well skirted PCR plates are especially rigid, and are optimally suited for use with automatic pipetting systems and for being transported. A detailed compatibility table can be found on page 134.

Description	Color	Cut corner	Pack of	Cat. No.
Low profile*	clear	H1	50 (10 plates per bag)	**7813 77**
Low profile*	white	H1	50 (10 plates per bag)	**7813 78**

* black alphanumeric code, no additional markings on the cut corner.



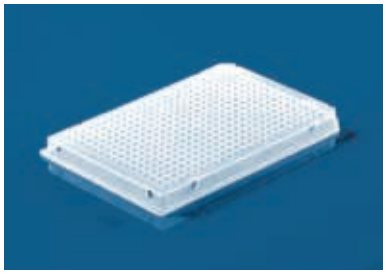
384-well PCR Plates



384-well, skirted

PP. The 40 µl wells can hold sample volumes of 2 µl to 30 µl. This helps to reduce reagent costs and shortens cycle times. The plates can be filled using multichannel pipettes or robotic systems. A detailed compatibility table can be found on page 134.

Description	Color	Cut corner	Pack of	Cat. No.
Skirted, PP	clear	A24, P24	50 (10 plates per bag)	**7813 45**
Skirted, PP	clear	A24	50 (10 plates per bag)	**7813 47**
Skirted, rigid plate	clear	A24	50 (10 plates per bag)	**7813 48**



384-well, skirted

Suitable for Roche® LightCycler® 480 and other thermal cyclers

PP. 0.03 ml tubes. The wells can hold sample volumes of 2 µl to 30 µl. This helps to reduce reagent costs and shortens cycle times. The plates can be filled using multichannel pipettes or robotic systems.

Description	Color	Cut corner	Pack of	Cat. No.
Skirted	white	A12, H12	50 (10 plates per bag)	**7813 58**

Please note the **thermal cycler compatibility table** on page 134.

Accessories PCR tubes

PCR-Box/-Rack

sorted by color (red, yellow, green, purple, blue)

PP. Suitable for sample preparation, for keeping and storing 0.2 ml single tubes, 8-strips, and 12-strips, and 96-well PCR plates. These racks can also be stacked without lids. Withstand temperatures from -80 to +121 °C.
Pack of 5.

Cat. No.	7813 62

PCR Mini cooler

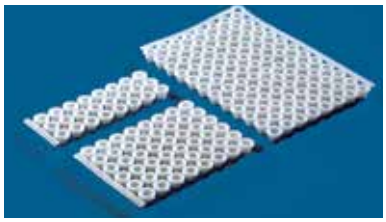
with transparent lid

PP. For protecting samples from warming. The mini PCR cooler keeps samples at 4 °C for approximately 3 hours. The insulating gel changes from violet to pink at 7 °C. Suitable for 0.2 ml single tubes, 8-strips, and 12-strips, as well as 96-well PCR plates.
Pack of 2.

Cat. No.	7812 60

PCR sealing mats

PCR sealing mats have been designed to fit BRAND PCR plates exactly and reduce evaporation losses by up to 75% compared to conventional systems. They are characterized by their high flexibility, tight sealing, autoclavability and are easily pierced by pipette tips.



24-, 48- and 96-well

Product	Material	Pack of	Cat. No.
24-well mat (for Cat. No. 7814 11)	TPE	10	**7814 02**
48-well mat (for Cat. No. 7814 15)	TPE	10	**7814 03**
96-well mat (for 96-well PCR plates)	TPE	5	**7814 05**

PCR sealing films, self-adhesive

In case the PCR plates need not only to be covered, but also securely sealed, self-adhesive sealing films are available. These film sheets can be easily applied on the plates and removed without the use of expensive equipment.

for ELISA, PCR

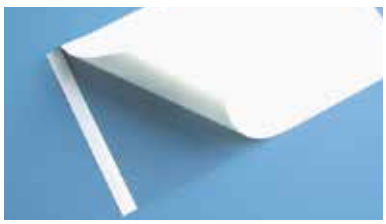
Polyester. Allows visual inspection. Temperature range -40 °C to +120 °C. Single film. Packs of 100 sheets.

Cat. No.	7813 90

for ELISA, Real-Time PCR (qPCR)

Polyester. High-transparency. Allows visual inspection. Temperature range -20 °C to +120 °C. Single film. Packs of 100 sheets.

Cat. No.	7813 91



for storage, ELISA, PCR

PP. DMSO resistant. Allows visual inspection. Temperature range -80 °C to +120 °C. Single film. Pack of 100 sheets.

Cat. No.	7013 67

Thermal Cycler Compatibility

One glance at the table will tell you which BRAND PCR plates are compatible with your thermal cycler. We are continuously updating the table with information from manufacturers and feedback from our customers. Ask for a free sample of our PCR plates to check compatibility with your thermal cycler (www.brand.de), with no obligation.

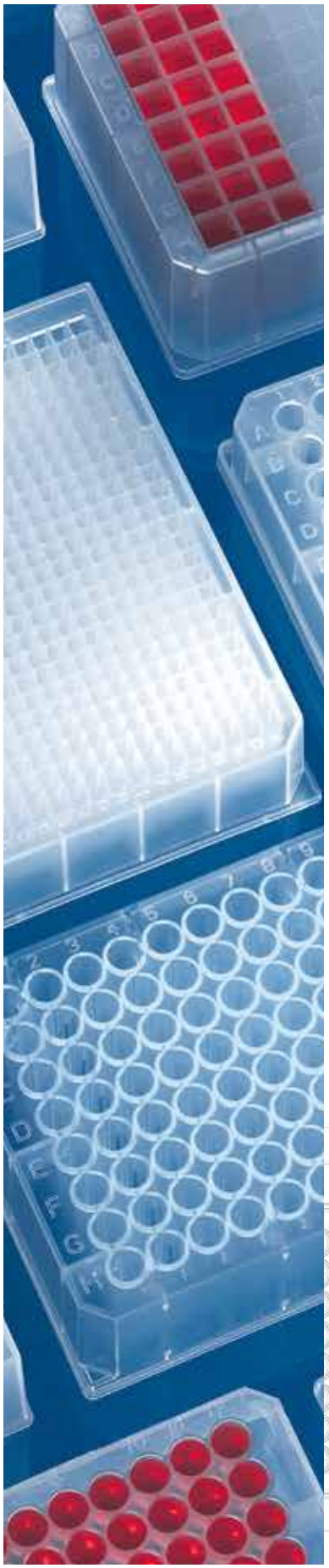
	non-skirted					semi-skirted				r.s.-s.*	skirted				
	7814 11 / 7814 12	7814 15 / 7814 16	7813 66 / 7813 67	7813 68 / 7813 69	7813 50 / 7813 54	7814 00 / 7813 57	7813 64	7813 71 / 7813 72	7813 75 / 7813 76	7813 73 / 7813 74	7813 77 / 7813 78	7813 45	7813 47	7813 48 rigid	7813 58
White color	x	x	x	x	x	x	x	x	x	x	x	x			x
Number of wells	24	48	96	96	96	96	96	96	96	96	96	384	384	384	384
Standard well	x	x		x	x	x			x						
Low Profile well			x				x	x		x	x				
Cut corner			H12	A12	H12	H12	H12	A12	A12	A1	H1	A24 + P24	A24	A24	A24 + P24
Agilent Technologies															
AriaMx			●								●				
Analytik Jena															
Flex Cycler² 96 Series				●	●	●			●						
Flex Cycler² Twin 48		●			●										
Speed Cycler² SPR				●	●	●			●						
qTower 2.0 und 2.2				●	●	●			●						
APPLIED BIOSYSTEMS®															
2700	●	●		●	●	●			●			●	●	●	●
3100	●	●		●	●				●				●	●	
3130	●	●		●	●				●				●	●	
3500				●					●				●	●	
3700	●	●		●	●				●			●	●	●	
3730/ 3730x	●	●		●	●				●				●	●	
9600	●	●		●	●	●			●						
9700	●	●		●	●	●			●			●	●	●	●
9800 Fast										●					
5700	●	●		●	●				●						
7000	●	●		●	●			●	●						
7300	●	●		●	●			●	●						
7500	●	●		●	●			●	●						
7700	●	●		●	●			●	●						
7900 HT				●				●		●			●		
7500 Fast										●					
Step One Plus										●					
Veriti 0.2 ml									●						
Veriti 0.1 ml										●					
ViiA™ 7			●							●					
AMERSHAM® Bioscience															
MegaBace® 500											●				
MegaBace® 1000											●				
MegaBace® 4000											●	●	●	●	●
BECKMAN®															
CEQ				●							●				
MegaBace® 4000											●	●	●	●	●
BIOMETRA® Analytik Jena AG															
Uno	●	●	●	●	●	●			●		●				
Uno II	●	●	●	●	●	●			●			●	●	●	●
T1 Thermal Cycler	●	●	●	●	●	●			●		●	●	●	●	●
Tgradient	●	●	●	●	●	●			●		●				
Trobot	●	●	●	●	●	●			●		●	●	●	●	●
BIORAD®/MJ RESEARCH®															
CFX 96 Touch™			●								●				
CFX 96 Connect™			●								●				
CFX Automated System II											●	●	●	●	
T100				●					●						
Genecycler				●											
C1000	●	●	●	●	●	●			●		●		●	●	
S100			●	●					●		●				
PTC-200 DNA-Engine	●	●	●	●	●	●			●		●	●	●	●	●
PTC-220 DNA-Eng. Dyad	●	●	●	●	●				●		●		●	●	●
PTC-221 Dyad-Disciple	●	●	●	●	●	●			●		●				●
PTC-225 DNA-Tetrad	●	●	●	●	●				●		●	●	●	●	●
PTC-240 DNA-Tetrad 2									●						
Base Station											●				
iCycler	●	●		●	●				●		●				
MyCycler	●	●		●	●				●						
MyiQ	●	●		●	●						●				●
iQ4				●					●		●				
iQ5	●	●		●	●				●		●				
CFX96			●								●				
Chromo 4			●	●					●		●				

continued

	non-skirted										semi-skirted							r.s.-s.*		skirted					
	7814 11	7814 12	7814 15	7814 16	7813 66	7813 67	7813 68	7813 69	7813 50	7813 54	7814 00	7813 57	7813 64	7813 71	7813 72	7813 75	7813 76	7813 73	7813 74	7813 77	7813 78	7813 45	7813 47	7813 48 rigid	7813 58
White color		x		x		x		x		x		x	x		x		x		x		x	x			x
Number of wells	24		48		96		96		96		96		96	96		96		96		96		384	384	384	384
Standard well	x		x				x		x		x					x									
Low Profile well					x								x	x				x		x					
Cut corner					H12		A12		H12		H12		H12	A12		A12		A1		H1		A24 + P24	A24	A24	A24 + P24
BIORAD®/MJ RESEARCH®																									
Opticon					●		●													●					
Opticon 2					●		●													●					
Opticon 4					●															●					
Corbett Research																									
Palm Cycler 96																●									
Palm Cycler 384							●																●	●	●
Eppendorf®																									
Mastercycler® Gradient	●		●				●		●		●					●									
Mastercycler® ep	●		●		●		●		●											●					
Mastercycler®					●		●									●				●					
Mastercycler® M384																						●	●	●	●
Mastercycler® ep Realplex					●		●									●		●		●					
Ericomp																									
Single Block	●		●		●		●		●							●									
Twin Block	●		●		●		●		●							●									
Power Block					●		●							●		●									
Delta Cycler	●		●		●		●		●					●		●									
Esco																									
Swift							●																		●
Flexi																									
Gene							●													●					●
Genius							●													●					
G-Storm																									
GS1/ GS4/ GSX					●		●							●		●									
Labnet																									
MultiGene™ OptiMax							●									●									
Thermo Hybaid																									
Multi Block System	●		●		●		●		●		●			●		●				●		●	●	●	●
Omnigene	●		●		●		●		●		●			●		●				●		●	●	●	●
Omn-E	●		●		●		●		●		●			●		●				●					●
PCR-Express	●		●		●		●		●		●			●		●				●		●	●	●	
PCR-Sprint	–		–		●		●		–		–			●		●				●					
pxe	●		●		●		●		●					●		●				●					●
px2	●		●		●		●		●					●		●				●		●	●	●	●
Touchdown	●		●		●		●		●		●			●		●				●		●	●	●	●
MWG®																									
Primus 96	●		●		●		●		●		●			●		●				●					
Primus 384																●						●	●	●	●
The Q LifeCycler					●		●																		
PEQLAB®																									
PeqStar 96	●		●				●		●		●					●				●					
Roche®																									
LightCycler® 480													●												●
STRATAGENE®																									
Robocycler	●		●				●		●		–					●				●		●	●	●	
Robocycler Gradient					●		●							●		●				●					
Mx 3000	●		●						●																
Mx 3000 P					●		●							●		●									
Mx 3005 P					●		●							●		●									
Mx 4000	●		●		●		●		●																
TaKaRa®																									
TP2400																				●		●	●	●	
TP3000	●		●		●		●		●					●		●				●		●	●	●	
TECHNE®																									
TC-412	●		●		●		●		●		●			●		●				●		●	●	●	
Flexigene	●		●		●		●		●		●			●		●				●		●	●	●	●
Genius	●		●						●		●											●	●	●	
Genius Quad					●		●							●		●				●		●	●	●	
TC-512	●		●		●		●		●		●			●		●				●		●	●	●	●
Touchgene Gradient							●				●			●								●	●	●	●
Touchgene X					●											●				●					●
TC-3000X	●		●						●		–											–	–	–	
Quantica																									
Cyclogene					●		●							●		●				●					
TRANSGENOMIC®																									
Wave System																				●					●

● = compatible – = not compatible = no information *** r. s.-s. = raised skirt semi-skirted**

Status as of: 1015

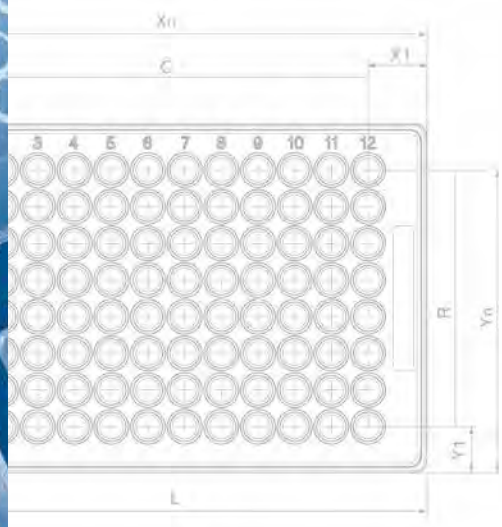


Sample Storage

BRAND has developed a number of disposable products of polypropylene and polystyrene especially for the storage of life science samples. These products are popular for applications including cell biology, molecular biology, drug discovery tests, and screening.

Features

- Polypropylene for high chemical resistance, e.g., DMSO, phenol, chloroform
- Autoclavable at 121 °C (2 bar), acc. DIN EN 285 (PP-plates)
- Optimal sample mixing and recovery using U-bottom wells
- Alphanumeric code and cut-away corner simplify sample identification and orientation
- Can be used with multichannel pipettes and automatic liquid handling systems from all leading manufacturers



Deep-well Plates

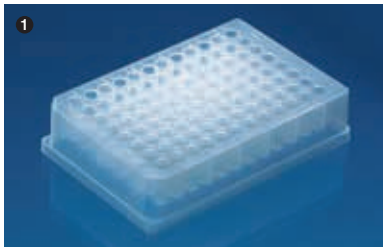
The most important application for deep-well plates is sample storage (e.g., in substance libraries). Deep-well plates are also an important component in numerous other applications, e.g., cultivation of microorganisms, extraction of nucleic acids and proteins, screening studies, etc.


1,2 elevated skirt

Essential features of the 96-well deep-well plates made from PP

- Free from DNA, RNases, and DNases
- High chemical resistance, e.g., against DMSO
- Temperature range -80 °C to 121 °C
- According to ANSI/SLAS 1 and 4
- Stackable

The 1.2 ml low profile model reduces the space requirements by approx. 30%.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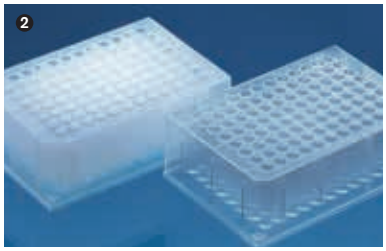
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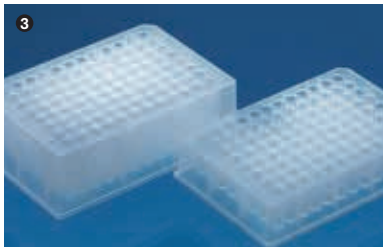
NEW!


3


4

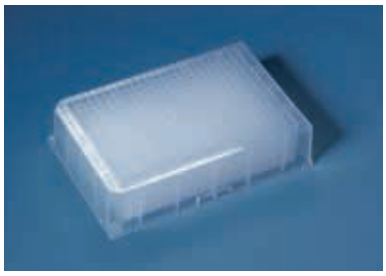
96-well

U-bottom wells, non-sterile

PP and PS. Capacities 0.5 ml, 1.1 ml, 1.2 ml low profile and 2.2 ml.

	Capacity ml	Material	well shape	Height mm	Pack of		Cat. No.
❶	0,5	PP	round	28.5	48		**7013 46**
❷	1,1	PP	round	40.6	24		**7013 50**
	1,1*	PS	round	41.0	32		**7013 52**
❸	1,2 elevated skirt	PP	round	41.4	32	NEW!	**7013 42**
	1,2 low profile**	PP	round	26.5	50		**7013 40**
❹	2,2	PP	square	44.0	24		**7013 54**

* Not autoclavable, usable down to -20 °C
** Not checked for absence of DNA, RNases, and DNases

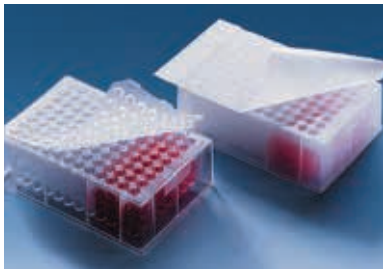


384-well

V-bottom wells, non-sterile

PP. Capacity 0.3 ml. Designed for a wide range of applications, such as High-Throughput Screening (HTS), tests requiring a mother plate, cell and tissue cultures, serial dilutions, reagent transfer and sample storage down to -80 °C. Deep-well plates are manufactured in the ANSI/SLAS format and are stackable for easy storage. Pack of 48.

Cat. No.	7013 55



Cover mats for Deep-well plates

Cover mats reduce the maximum volume of wells.
Adhesive sealing films can also be used.

Description	Material	Pack of	Cat. No.
for 0.3 ml 384-well plates	Silicone	50	**7013 57**
for 0.5 ml 96-well plates	PP	50	**7013 58**
for 1.1 ml 96-well plates	mod. PE	24	**7013 60**
for 1.2 ml 96-well plates, low profile	TPE	50	**7013 68**
for 2.2 ml 96-well plates	EVA	24	**7013 62**

Microtitration plates and deep-well plates are also available **with bar codes**. More information at www.brand.de.

96-well microplate

U-bottom wells, non-sterile

PP. For volumes up to 300 µl. Compatible with virtually all leading microplate centrifuges. Raised rings around the orifice of each well minimize possible cross-contamination.
The plates can be sealed using self-adhesive films, such as DMSO-resistant sealing film (for more information, see page 140).
Pack of 100 (10 per bag).

Cat. No.	7013 30

96 tube racks

with 0.65 ml or 1.2 ml tubes, non-sterile, for use with robots

Tubes and rack are autoclavable at 121 °C (2 bar), acc. DIN EN 285 (cover mat/strip, TPE, not autoclavable). Tubes, racks, and lids can withstand temperatures as low as -80 °C. The seal of the tubes is pressure-tested. Thanks to the stable connection between the mounting plate and the racks, the stackable racks in ANSI/SLAS format are especially well-suited for use with robots and other automated dispensing systems. Coded tubes (A1 - H12) and rack sides suitable for barcode labels simplify sample organization.

Description	Material	Pack of	Cat. No.
Rack with lid for 0.65 ml tubes, empty*	PP	50	**7815 62**
Rack with lid with 96 coded 0.65 ml tubes*	PP	50	**7815 65**
Refill unit of 96 coded 0.65 ml tubes*	PP	50	**7815 72**
Single 0.65 ml tube w/o coding	PP	5000	**7815 75**
Rack with lid for 1.2 ml tubes, empty*	PP	50	**7815 63**
Rack with lid with 96 coded 1.2 ml tubes*	PP	50	**7815 66**
Refill unit of 96 coded 1.2 ml tubes*	PP	50	**7815 73**
Single 1.2 ml tube w/o coding	PP	5000	**7815 76**
Strip of 8 lids, piercable	TPE	1000	**7815 82**
Cover mat for 96 tubes, piercable	TPE	100	**7815 83**

* Not available in the USA.

Tubes 1.2 ml, rack packed

Tubes and rack, non-sterile

PP tubes and rack are autoclavable at 121 °C (2 bar), acc. DIN EN 285 (caps, PE, are not autoclavable). Ideal for biological tests, such as PCR, cell uptake studies, RIA and EIA. Designed for storing and freezing down to -80 °C, and for transporting reagents and samples. Compatible with standard microplates and suitable for working with multichannel pipettors. (Size of tubes: outer Ø 8.8 mm, height 45 mm.)

Description	Material	Pack of	Cat. No.
Rack with 96 individual tubes	PP	10	**7815 00**
Rack with 12 strips of 8 tubes	PP	10	**7815 10**
Individual tubes	PP	960	**7815 20**
Strip of 8 tubes	PP	120	**7815 25**
Individual caps	PE	960	**7815 30**
Strip of 8 caps	PE	120	**7815 35**
Rack with grid, empty	PP	10	**7815 40**

Sealing films, self-adhesive

In case the microplates need not only to be covered, but also securely sealed, self-adhesive sealing films are available. These film sheets can be easily applied on the plates and also removed without the use of expensive equipment. They are available in different versions and are especially well-suited for storage or cell- and tissue-culture.

ELISA, PCR

Allows visual inspection. Temperature range -40 °C to +120 °C (7813 90), -40 °C to +110 °C (7813 91), -80 °C to+120 °C (7013 67). Single films. Packs of 100 sheets.

for ELISA, PCR
Polyester. Transparent.

Cat. No.	7813 90

for ELISA, Real-Time PCR
Polyester. High-transparency.

Cat. No.	7813 91

for storage, ELISA, PCR
PP. DMSO resistant.

Cat. No.	7013 67

Roller

For simple, even pressure of self-adhesive films.

Hard rubber.
Pack of 1.

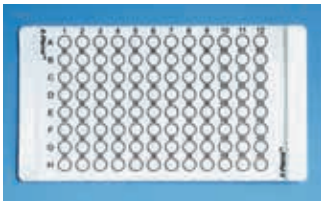
Cat. No.	7013 80

Automation

Easy to pierce with pipette tips.
Temperature range -40 °C to +90 °C. Single films.

PE top, underside PP with adhesive. Inert, chemically resistant.
Packs of 50 sheets.

Cat. No.	7013 70



Vinyl, acrylic adhesive.
Multiply pierceable with pipette tips.
Packs of 100 sheets.

Cat. No.	7013 74

Fluorescence and luminescence measurement

Temperature range -40 °C +80 °C.
Single films. Packs of 50 sheets.

for fluorescence measurement
Vinyl, black.
Light-absorbent.

Cat. No.	7013 71

for luminescence measurement
Vinyl, white.
Reflective.

Cat. No.	7013 72

Cell and tissue culture

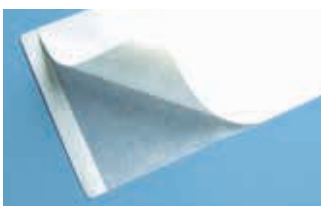
Rayon. Gas-permeable. Temperature range -20 °C to +80 °C.
Single films.

Non-sterile
pack of 100 sheets

Cat. No.	7013 64

Sterile
pack of 50 sheets

Cat. No.	7013 65



Cold storage

Aluminum. Easy to pierce with pipette tips. Temperature range -80 °C to +120 °C. Packs of 100 sheets. Single film or 1 roll.

Single sheets

Cat. No.	7813 81

Roll

Cat. No.	7813 80

Cryogenic Tubes

Designed for storage of biological material, such as microorganisms, human and animal cells, etc. in the gaseous phase of liquid nitrogen.
PP, graduated, outer-Ø 12.5 mm. Large frosted marking area and colored cap inserts for easy sample identification. Temperature stability to -196 °C, γ-sterilized (SAL 10^{-6}) and autoclavable at 121 °C (2 bar), acc. DIN EN 285.
Marked with the CE symbol according to the IVD Directive 98/79 EC. Tubes without ring stands can be centrifuged at up to an RCF of 14 000 g.

Cryogenic tubes are sterile, RNase-, DNase-, DNA- and endotoxin-free.

with external thread

Screw-on cap with silicone seal

Pack of 1000 (10 bags of 100).

Capacity ml	Subdivision up to ml	Description	Height mm	Cat. No.
1.2	1.0	self-standing	41	**1148 30**
2.0	1.8	round-bottom	47	**1148 31**
2.0	1.8	self-standing	49	**1148 32**
3.0	3.0	self-standing	70	**1148 33**
4.0	3.6	self-standing	76	**1148 34**
5.0	4.5	self-standing	90	**1148 35**

with internal thread

Screw-on cap with sealing cone

Pack of 1000 (10 bags of 100).

Capacity ml	Subdivision up to ml	Description	Height mm	Cat. No.
1.2	1.0	self-standing	41	**1148 40**
2.0	1.8	self-standing	49	**1148 41**
2.0	1.8	round-bottom	48	**1148 42**
4.0	3.6	round-bottom	70	**1148 43**
4.0	3.6	self-standing	71	**1148 44**
5.0	4.6	round-bottom	90	**1148 45**

Cap inserts

PP. Fit for all sizes.
Pack of 500.

Color	Cat. No.
white	**1148 50**
blue	**1148 51**
red	**1148 52**
green	**1148 53**
yellow	**1148 54**

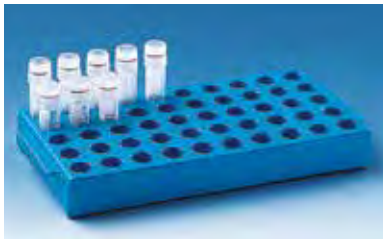
Accessories Cryogenic Tubes

Storage boxes

PC. For cryogenic tubes. Operating range (in the gaseous phase of liquid nitrogen) -196 °C to +121 °C. Autoclavable at 121 °C (2 bar), acc. DIN EN 285. Pack of 4.

for cryogenic tubes ml	Positions	Length mm	Width mm	Height mm	Cat. No.
1.2 and 2	81	132	132	52	**1148 62**
3, 4 and 5*/***	81	132	132	95	**1148 64**
1.2 and 2**	100	132	132	52	**1148 66**

* Pack of 5 ** internal thread *** external thread



Cryogenic tube rack

PP, blue. For 50 self-standing cryogenic tubes. Pack of 4.

Cat. No.	1148 60

Microcentrifuge tube racks

PP. Operating temperature -20 °C to +90 °C. Autoclavable at 121 °C (2 bar), acc. DIN EN 285. Density 1.2 g/cm^3, will not float in waterbath. L x W x H in mm: 265 x 126 x 38. Pack of 5.

Positions	white Cat. No.	blue Cat. No.	red Cat. No.	yellow Cat. No.
6 x 14	**43410 00**	**43410 01**	**43410 02**	**43410 03**

Mini cooler

PC. Mini coolers are designed to protect a wide range of solutions (enzymes, DNA, RNA, cell suspensions) by helping to maintain freezer temperatures on the lab bench. Durable polycarbonate filled with non-toxic gel. Mini coolers hold twelve 0.5 ml to 2.0 ml tubes. Pack of 1.

Bench temperature maintained	Time held	Color	Cat. No.
0 °C	60 min.	red	**1149 30**
-20 °C	60 min.	yellow	**1149 35**
-70 °C	45 min.	white	**1149 40**

BRAND*plates*® Microplates

Modern research methods require high-quality disposables.
BRAND*plates*® microplates can be used in all important fields of life science. For this comprehensive line, three immunological and four cell culture surfaces have been developed under the most modern production conditions.
The product line covers a multitude of standard applications (e.g., homogenous assays, screenings) as well as applications in the fields of immunology and cell culture technique.

- **Non-treated surfaces**
  - pureGrade™
  - pureGrade™ S
- **Immunology**
  - immunoGrade™
  - hydroGrade™
  - lipoGrade™
- **Cell culture**
  - cellGrade™
  - cellGrade™ plus
  - cellGrade™ premium
  - inertGrade™

The BRAND*plates*® product range has grown to more than 115 different microplates. To assist you in the selection and to give a quick overview, we offer the BRAND*plates*® Selection Guide, available on the internet at www.brand.de.

BRAND*plates*®

pureGrade™
pureGrade™ S

Microplates, non-treated surface

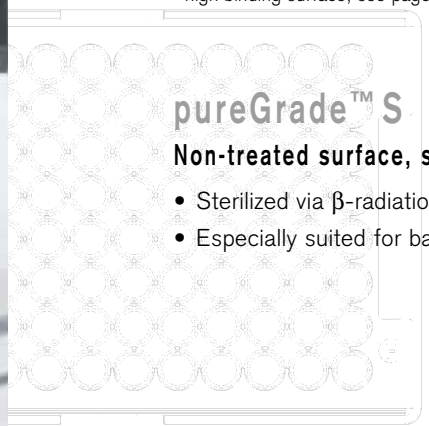
Non-treated microplates made of PS are used in the most diversified application fields, such as homogenous standard assays and extensive screening assays. The hydrophobic characteristics of non-treated PS are often helpful in performing these applications.

pureGrade™ (medium binding)*

Non-treated surface, non-sterile

- The standard plate for most applications.
- Particularly applicable for homogenous assays, screening, and for storage.

* high binding surface, see page 150



pureGrade™ S

Non-treated surface, sterile

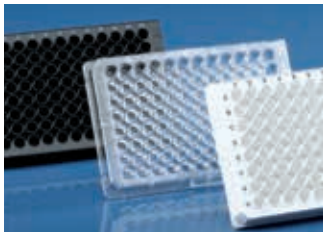
- Sterilized via β-radiation.
- Especially suited for bacteriological assays.

Application Specifications

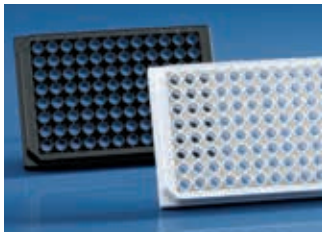
	Application	Types (see below) 96-well	384-well	1536-well
pureGrade™ medium binding, non-sterile	for homogenous assays, screening, and for storage, for DNA, RNA and protein quantification	1 2 3 4	1 2	1
pureGrade™ S sterile	for bacteriological assays, screenings etc.	1 2	1 2	1

Types

96-well microplates



1 **Standard**

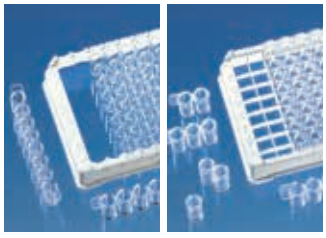


2 **with transparent bottom**

NEW!

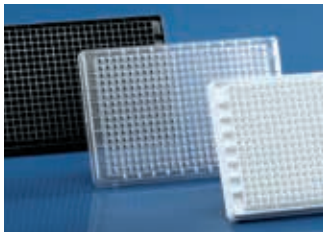
3 **with UV-transparent film bottom**

NEW!



4 **Strip plates (without and with grid)**

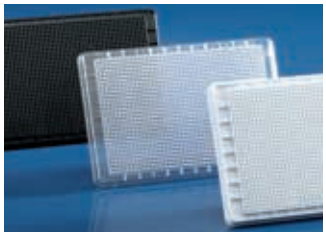
384-well microplates



1 **Standard**

2 **with transparent bottom**

1536-well microplates



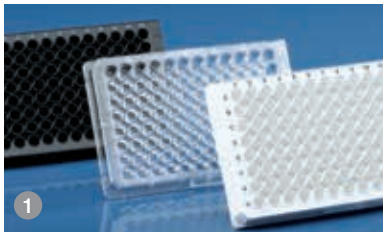
1 **Standard**

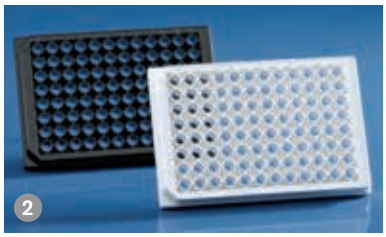
Insert System microplates **pureGrade™ S 6-well and 24-well** can be found on page 159.

96-well Microplates

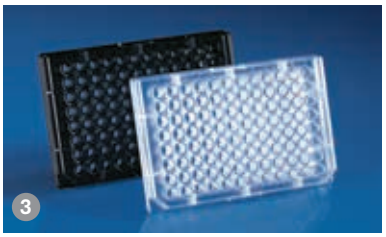
pureGrade™ (medium binding)

PS. Non-treated, non-sterile.
For homogenous assays, screenings, storage, etc.

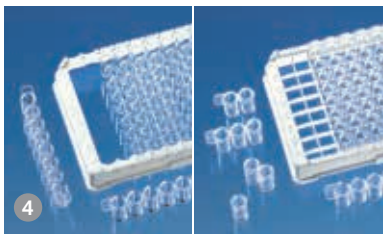




NEW!



NEW!



Color	Bottom	Well volume	Pack of	Cat. No.	
1 96-well standard microplates					
transparent	U-bottom	330 µl	100 (20 stacks of 5 plates)	**7816 00**	
transparent	V-bottom	360 µl	100 (20 stacks of 5 plates)	**7816 01**	
transparent	F-bottom	350 µl	100 (20 stacks of 5 plates)	**7816 02**	
transparent	C-bottom	350 µl	100 (20 stacks of 5 plates)	**7816 03**	
white	U-bottom	330 µl	100 (20 stacks of 5 plates)	**7816 04**	
white	F-bottom	350 µl	100 (20 stacks of 5 plates)	**7816 05**	
black	U-bottom	330 µl	100 (20 stacks of 5 plates)	**7816 07**	
black	F-bottom	350 µl	100 (20 stacks of 5 plates)	**7816 08**	
2 96-well microplates with transparent bottom					
white	F-bottom	330 µl	100 (4 bags of 25 plates)	**7816 10**	
black	F-bottom	330 µl	100 (4 bags of 25 plates)	**7816 11**	
3 96-well microplates with UV-transparent film bottom PS with UV-transparent film bottom, slightly hydrophilized, 25 µm bottom thickness, transmission at 240 nm 80%					
transparent, UV-transparent UV!	F-bottom	350 µl	50 (5 bags of 10 plates)	**7816 14** [1]	NEW!
black, UV-transparent UV!	F-bottom	350 µl	50 (5 bags of 10 plates)	**7816 15** [1]	NEW!
4 96-well strip plates					
transparent, without grid, strips of 8 wells, not divisible	F-bottom	360 µl	100 (4 bags of 25 plates)	**7823 00**	NEW!
transparent, with grid, strips of 8 wells, divisible	F-bottom	350 µl	100 (4 bags of 25 plates)	**7823 01**	NEW!

[1] not available in USA

pureGrade™ S

PS. Non-treated, sterile.
For bacteriological assays, screenings, storage, etc.

Color	Bottom	Well volume	Pack of	Cat. No.
1 96-well standard microplates				
transparent	U-bottom	330 µl	50 (individually wrapped, with lid)	**7816 60**
transparent	V-bottom	360 µl	50 (individually wrapped, with lid)	**7816 61**
transparent	F-bottom	350 µl	50 (individually wrapped, with lid)	**7816 62**
transparent	C-bottom	350 µl	50 (individually wrapped, with lid)	**7816 63**
white	F-bottom	350 µl	50 (individually wrapped, with lid)	**7816 65**
black	F-bottom	350 µl	50 (individually wrapped, with lid)	**7816 68**
2 96-well microplates with transparent bottom				
white	F-bottom	330 µl	50 (individually wrapped, with lid)	**7816 70**
black	F-bottom	330 µl	50 (individually wrapped, with lid)	**7816 71**

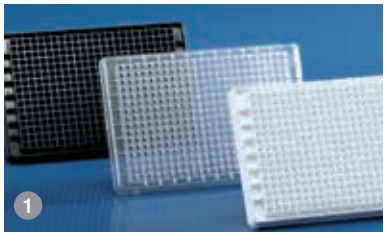
Lids for BRAND*plates*® microplates can be found on page 164.

384-well Microplates

pureGrade™ (medium binding)

PS. Non-treated, non-sterile.
For homogenous assays, screenings, storage, etc.

Color	Bottom	Well volume	Pack of	Cat. No.
1 384-well standard microplates				
transparent	F-bottom	100 µl	50 (5 bags of 10 plates)	**7816 20**
white	F-bottom	100 µl	50 (5 bags of 10 plates)	**7816 21**
black	F-bottom	100 µl	50 (5 bags of 10 plates)	**7816 22**
2 384-well microplates with transparent bottom				
white	F-bottom	120 µl	50 (2 bags of 25 plates)	**7816 26**
black	F-bottom	120 µl	50 (2 bags of 25 plates)	**7816 27**

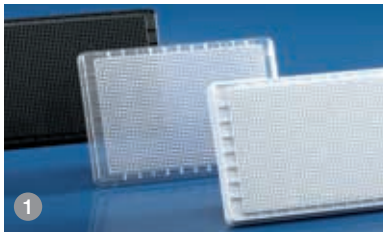


pureGrade™ S

PS. Non-treated, sterile.
For bacteriological assays, screenings, storage, etc.

Color	Bottom	Well volume	Pack of	Cat. No.
1 384-well standard microplates				
transparent	F-bottom	100 µl	50 (individually wrapped, with lid)	**7816 80**
white	F-bottom	100 µl	50 (individually wrapped, with lid)	**7816 81**
black	F-bottom	100 µl	50 (individually wrapped, with lid)	**7816 82**
2 384-well microplates with transparent bottom				
white	F-bottom	120 µl	50 (individually wrapped, with lid)	**7816 86**
black	F-bottom	120 µl	50 (individually wrapped, with lid)	**7816 87**

1536-well Microplates



pureGrade™

PS. Non-treated, non-sterile.
For homogenous assays, screenings, storage, etc.

Color	Bottom	Well volume	Pack of	Cat. No.
1 **1536-well standard microplates**				
transparent	F-bottom	10 µl	50 (5 bags of 10 plates)	**7816 40**
white	F-bottom	10 µl	50 (5 bags of 10 plates)	**7816 41**
black	F-bottom	10 µl	50 (5 bags of 10 plates)	**7816 42**

pureGrade™ S

PS. Non-treated, sterile.
For bacteriological assays, screenings, storage, etc.

Color	Bottom	Well volume	Pack of	Cat. No.
1 **1536-well standard microplates**				
transparent	F-bottom	10 µl	50 (individually wrapped, with lid)	**7817 00**
white	F-bottom	10 µl	50 (individually wrapped, with lid)	**7817 01**
black	F-bottom	10 µl	50 (individually wrapped, with lid)	**7817 02**

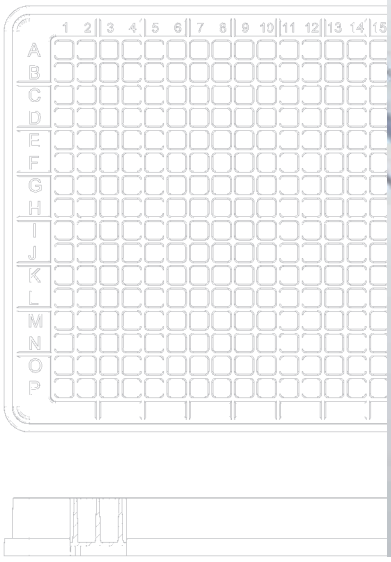
Information on **untreated Petri dishes made of PS and inoculation loops** can be found on page 244.

BRAND*plates*®

immunoGrade™
hydroGrade™
lipoGrade™

Microplates for Immunoassays

Diagnosis of disease, pregnancy or verification of doping substances – many analyses in the modern laboratory are performed with immunological assays in microplates.
They are characterized by their high specificity and provide the opportunity to detect the lowest concentrations of defined substances in complex liquids, such as blood serum.



BRAND*plates*®
Surfaces for Immunoassays

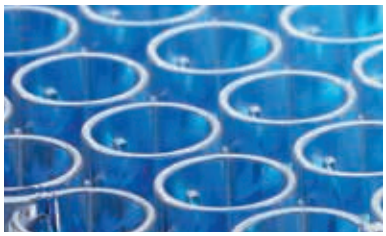
immunoGrade™, hydroGrade™ and lipoGrade™ – three surfaces with different affinities to different types of molecules. The BRAND*plates*® microplates are suitable for a broad section of applications like ELISA, RIA, FIA, etc.

immunoGrade™ (high-binding)*

Optimized for the immobilization of IgG

- Optimized for the immobilization of IgG, offering highest binding capacity for molecules with mixed hydrophilic and hydrophobic regions.
- The surface of choice for the majority of standard ELISAs.
- Suitable for solid phase immunoassays.
- Comparable to 'high-binding' plates from other manufacturers.

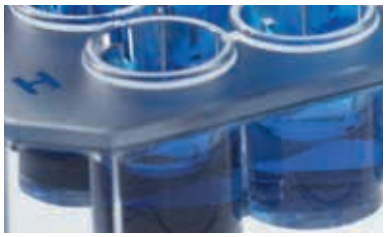
* medium binding surface, see page 144



hydroGrade™

For the immobilization of hydrophilic molecules

- Strongly hydrophilic, with high affinity to hydrophilic molecules, such as glycoproteins and peptides, antibodies with predominantly hydrophilic regions, and nucleic acids.
- An alternative to the immunoGrade™ surface when performing solid phase assays.
- Alternative for homogeneous assays with hydrophobic molecules, that remain in solution.



lipoGrade™

For the immobilization of hydrophobic molecules

- Strongly hydrophobic (lipophilic), for immobilization of biomolecules with predominantly hydrophobic regions.
- An alternative to the immunoGrade™ surface for the immobilization of molecules, such as lipoproteins or peptides.
- Specially suited for liquid phase assays when the reaction component should stay in solution. The majority of hydrophilic biomolecules are not immobilized on this surface.

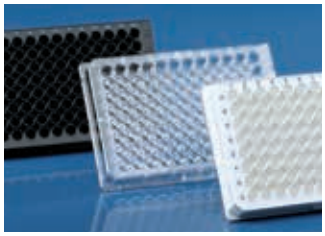
Application Specifications

	Application	Types (see below) 96-well	384-well
immunoGrade™ high-binding, non-sterile	Standard ELISA, solid phase immunoassays, optimized for the immobilization of IgG, comparable to other 'high-binding' plates	1 2 3	1
hydroGrade™ non-sterile	Solid phase with hydrophilic molecules, liquid phase with hydrophobic molecules	1	1
lipoGrade™ non-sterile	Solid phase with hydrophobic molecules, liquid phase with hydrophilic molecules	1 2	1 2

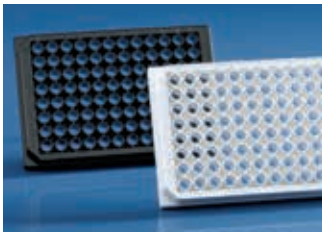
Types

NEW!

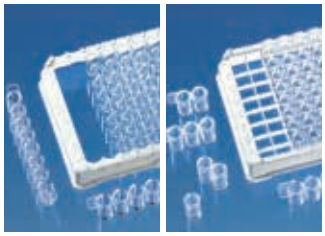
96-well microplates



1 Standard

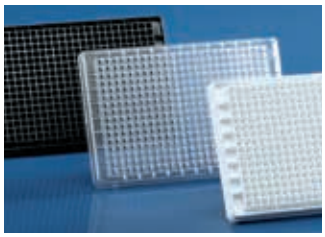


2 with transparent bottom



3 Strip plates (without and with grid)

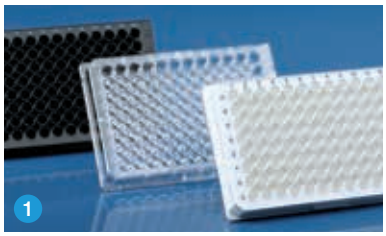
384-well microplates

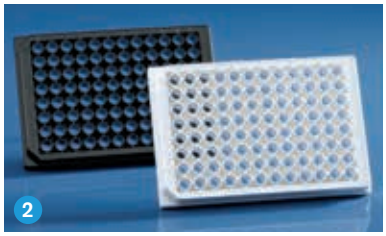


1 Standard

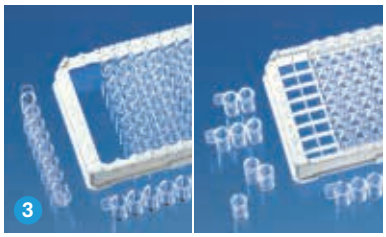
2 with transparent bottom

96-well Microplates





NEW!



immunoGrade™ (high-binding)

PS, non-sterile.
Optimized for the immobilization of IgG, standard ELISA assay.

Color	Bottom	Well volume	Pack of	Cat. No.	
1 96-well standard microplates					
transparent	U-bottom	330 µl	100 (20 stacks of 5 plates)	**7817 20**	
transparent	V-bottom	360 µl	100 (20 stacks of 5 plates)	**7817 21**	
transparent	F-bottom	350 µl	100 (20 stacks of 5 plates)	**7817 22**	
transparent	C-bottom	350 µl	100 (20 stacks of 5 plates)	**7817 23**	
white	U-bottom	330 µl	100 (20 stacks of 5 plates)	**7817 24**	
white	C-bottom	350 µl	100 (20 stacks of 5 plates)	**7817 26**	
black	U-bottom	330 µl	100 (20 stacks of 5 plates)	**7817 27**	
black	C-bottom	350 µl	100 (20 stacks of 5 plates)	**7817 29**	
2 96-well microplates with transparent bottom					
black	F-bottom	330 µl	100 (20 stacks of 5 plates)	**7817 31**	
black	F-bottom	330 µl	5 (1 bag of 5 plates)	**7817 32**	
3 96-well strip plates					
transparent, without grid, strips of 8 wells, not divisible	F-bottom	360 µl	100 (4 bags of 25 plates)	**7823 05**	NEW!
transparent, with grid, strips of 8 wells, divisible	F-bottom	350 µl	100 (4 bags of 25 plates)	**7823 06**	NEW!

hydroGrade™

PS, non-sterile. Hydrophilic. For solid phase with hydrophilic molecules and liquid phase with hydrophobic molecules, respectively.

Color	Bottom	Well volume	Pack of	Cat. No.
1 96-well standard microplates				
transparent	U-bottom	330 µl	100 (20 stacks of 5 plates)	**7817 80**
transparent	F-bottom	350 µl	100 (20 stacks of 5 plates)	**7817 82**
transparent	C-bottom	350 µl	100 (20 stacks of 5 plates)	**7817 83**
white	U-bottom	330 µl	100 (20 stacks of 5 plates)	**7817 84**
white	C-bottom	350 µl	100 (20 stacks of 5 plates)	**7817 86**
black	U-bottom	330 µl	100 (20 stacks of 5 plates)	**7817 87**
black	C-bottom	350 µl	100 (20 stacks of 5 plates)	**7817 89**

lipoGrade™

PS, non-sterile. Lipophilic/hydrophobic. For solid phase with hydrophobic molecules and liquid phase with hydrophilic molecules, respectively.

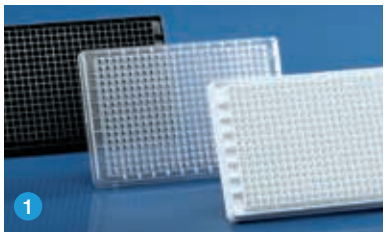
Color	Bottom	Well volume	Pack of	Cat. No.
1 96-well standard microplates				
transparent	U-bottom	330 µl	100 (20 stacks of 5 plates)	**7818 40**
transparent	V-bottom	360 µl	100 (20 stacks of 5 plates)	**7818 41**
transparent	F-bottom	350 µl	100 (20 stacks of 5 plates)	**7818 42**
transparent	C-bottom	350 µl	100 (20 stacks of 5 plates)	**7818 43**
white	U-bottom	330 µl	100 (20 stacks of 5 plates)	**7818 44**
white	C-bottom	350 µl	100 (20 stacks of 5 plates)	**7818 46**
black	U-bottom	330 µl	100 (20 stacks of 5 plates)	**7818 47**
black	C-bottom	350 µl	100 (20 stacks of 5 plates)	**7818 49**
2 96-well microplates with transparent bottom				
white	F-bottom	330 µl	100 (20 stacks of 5 plates)	**7818 50**
white	F-bottom	330 µl	5 (1 bag of 5 plates)	**7818 52**
black	F-bottom	330 µl	100 (20 stacks of 5 plates)	**7818 51**
black	F-bottom	330 µl	5 (1 bag of 5 plates)	**7818 53**

384-well Microplates

immunoGrade™ (high-binding)

PS, non-sterile.
Optimized for the immobilization of IgG, standard ELISA assay.

Color	Bottom	Well volume	Pack of	Cat. No.
1 384-well standard microplates				
transparent	F-bottom	100 µl	50 (10 stacks of 5 plates)	**7817 40**
white	F-bottom	100 µl	50 (10 stacks of 5 plates)	**7817 41**
black	F-bottom	100 µl	50 (10 stacks of 5 plates)	**7817 42**



hydroGrade™

PS, non-sterile. Hydrophilic. For solid phase with hydrophilic molecules and liquid phase with hydrophobic molecules, respectively.

Color	Bottom	Well volume	Pack of	Cat. No.
1 384-well standard microplates				
transparent	F-bottom	100 µl	50 (10 stacks of 5 plates)	**7818 00**
white	F-bottom	100 µl	50 (10 stacks of 5 plates)	**7818 01**
black	F-bottom	100 µl	50 (10 stacks of 5 plates)	**7818 02**

lipoGrade™

PS, non-sterile. Lipophilic/hydrophobic. For solid phase with hydrophobic molecules and liquid phase with hydrophilic molecules, respectively.

Color	Bottom	Well volume	Pack of	Cat. No.
1 384-well standard microplates				
transparent	F-bottom	100 µl	50 (10 stacks of 5 plates)	**7818 60**
white	F-bottom	100 µl	50 (10 stacks of 5 plates)	**7818 61**
black	F-bottom	100 µl	50 (10 stacks of 5 plates)	**7818 62**
2 384-well microplates with transparent bottom				
white	F-bottom	120 µl	50 (10 stacks of 5 plates)	**7818 66**
white	F-bottom	120 µl	5 (1 bag of 5 plates)	**7818 68**
black	F-bottom	120 µl	50 (10 stacks of 5 plates)	**7818 67**
black	F-bottom	120 µl	5 (1 bag of 5 plates)	**7818 69**

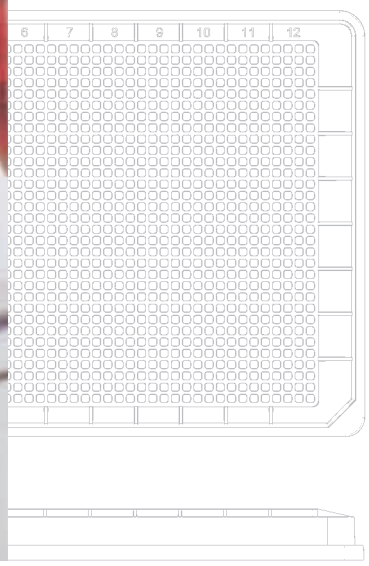
Lids for BRAND*plates*® microplates can be found on page 164.

BRAND*plates*®

cellGrade™
cellGrade™ plus
cellGrade™ premium
inertGrade™

Microplates for Cell Culture

Cell culture is increasing in popularity in the research and development area. Outside of basic research, cells are cultivated today for a number of reasons, including the production of proteins and, in particular, as assay systems.
As cell cultures can sometimes be quite demanding regarding their environment, the disposables used for cultivation have to be of highest quality. BRAND has drawn upon its extensive experience in the production of high-quality plastic disposables to expand the product range of BRAND*plates*® microplates into the field of cell culture.



info@brand.de

BRAND*plates*®
Surfaces for Cell Culture

Adherent cells prefer polar surfaces that possess hydrophilic functional groups. In contrast suspension cells prefer extremly hydrophobic or hydrophilic surfaces, that don't allow any immobilization. Four different plate surfaces – cellGrade™, cellGrade™ plus, cellGrade™ premium, inertGrade™ – allow the optimum combination between microplate and specific cell line.

cellGrade™

For the cultivation of adherent cells

- Standard surface for the cultivation of adherent cell lines.
- PS-surface with different chemical groups, such as carboxyl and hydroxyl groups, that are freely accessible.
- Surface is hydrophilic compared with non-treated PS.
- Serum components are easily bound onto the freely accessible chemical groups, allowing an indirect adhesion of cells.

cellGrade™ plus

For reduced-serum media cultivation of cells

- For cultivation of fastidious cell lines.
- In addition to carboxyl and hydroxyl chemical groups, free amino groups are present on the surface.
- The surface has a protein-like composition, so cells can directly attach and spread out.
- Cells adhere faster, better rate of yield.
- Sensitive cell lines can be cultivated.
- Suited for serum-reduced cultivation of cells.

cellGrade™ premium

Poly-D-Lysine-equivalent surface

- Poly-D-Lysine-equivalent surface, with analogous results regarding growth performance and cell morphology.
- Optimal adhesion of cells to the surface reduces cell damage when washing frequently.
- Cultivation of cell lines with the highest demands on their environment.
- Surface suited for serum-free and serum-reduced cultivation of cells.
- Good shelf life at room temperature.
- The alternative option to biologically coated surfaces.

inertGrade™

For cultivation of suspension cells

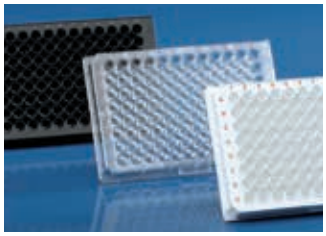
- Especially suited for cell cultures, when adhesion is not desired.
- Optimized surface characteristics reduce cell adhesion and protein adsorption to a minimum.
- Inhibits early differentiation of stem cells.
- Sterilized with ethylene oxide.

Application Specifications

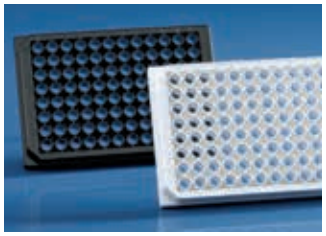
	Application	Types (see below) 96-well	384-well	1536-well
cellGrade™ sterile	For standard applications in cell culture, e.g., for the cultivation of adherent cell lines	1 2	1 2	1
cellGrade™ plus sterile	Serum-reduced cultivation for fastidious cell cultures	1 2	1 2	
cellGrade™ premium sterile	For fastidious cell lines, serum reduced and -free cultivation	1 2	1 2	
inertGrade™ sterile	Cultivation of cells (including normally adherent types) in suspension	1 2		

Types

96-well microplates

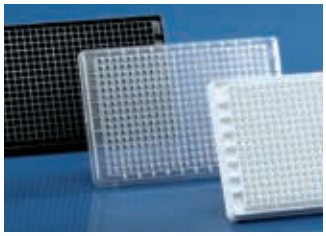


1 Standard



2 with transparent bottom

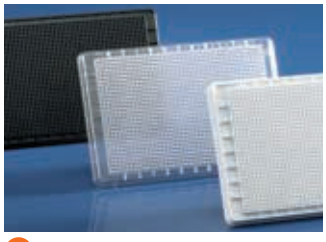
384-well microplates



1 Standard

2 with transparent bottom

1536-well microplates



1 Standard

Accessories for cell culture applications (Transferpette® multichannel pipettes, accu-jet® *pro*, QuikSip™) can be found on page 59, 99, 104.

Insert System microplates **cellGrade™ plus 6-well and 24-well** can be found on page 159.

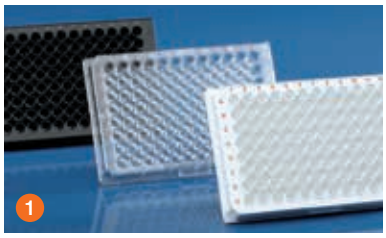
96-well Microplates

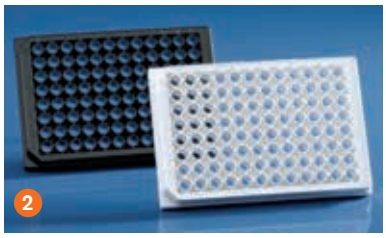
cellGrade™

PS, sterile. For standard cell culture applications.

Color	Bottom	Well volume	Pack of 5* Cat. No.	Pack of 50** Cat. No.
1 96-well standard microplates				
transparent	U-bottom	330 µl	–	**7819 60**
transparent	V-bottom	360 µl	–	**7819 61**
transparent	F-bottom	350 µl	–	**7819 62**
transparent	C-bottom	350 µl	–	**7819 63**
white	F-bottom	350 µl	–	**7819 65**
black	F-bottom	350 µl	–	**7819 68**
2 96-well microplates with transparent bottom				
white	F-bottom	330 µl	**7819 74**	**7819 70**
black	F-bottom	330 µl	**7819 75**	**7819 71**

* 1 bag of 5 plates ** individually wrapped, with lid





cellGrade™ plus

PS, sterile.
For cultivation of fastidious cell lines and for serum-reduced cultivation.

Color	Bottom	Well volume	Pack of 5* Cat. No.	Pack of 50** Cat. No.
1 96-well standard microplates				
transparent	F-bottom	350 µl	–	**7820 22**
white	F-bottom	350 µl	–	**7820 25**
black	F-bottom	350 µl	–	**7820 28**
2 96-well microplates with transparent bottom				
white	F-bottom	330 µl	**7820 34**	**7820 30**
black	F-bottom	330 µl	**7820 35**	**7820 31**

* 1 bag of 5 plates ** individually wrapped, with lid

cellGrade™ premium

PS, sterile. For the most demanding cell lines, and for serum-reduced and serum-free cultivation.

Color	Bottom	Well volume	Pack of 5* Cat. No.	Pack of 50** Cat. No.
1 96-well standard microplates				
transparent	F-bottom	350 µl	–	**7820 82**
white	F-bottom	350 µl	–	**7820 85**
black	F-bottom	350 µl	–	**7820 88**
2 96-well microplates with transparent bottomn				
white	F-bottom	330 µl	**7820 94**	**7820 90**
black	F-bottom	330 µl	**7820 95**	**7820 91**

* 1 bag of 5 plates ** individually wrapped, with lid

inertGrade™

PS, sterile. For cultivation of suspension and stem cells.

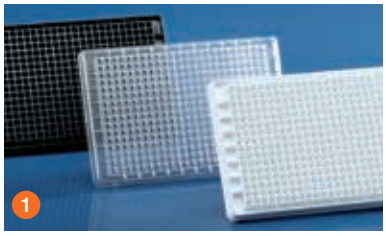
Color	Bottom	Well volume	Pack of 5* Cat. No.	Pack of 40* Cat. No.
1 96-well standard microplates				
transparent	U-bottom	330 µl	–	**7819 00**
transparent	F-bottom	350 µl	–	**7819 02**
white	U-bottom	330 µl	–	**7819 04**
white	F-bottom	350 µl	–	**7819 05**
white	C-bottom	350 µl	–	**7819 06**
black	U-bottom	330 µl	–	**7819 07**
black	F-bottom	350 µl	–	**7819 08**
black	C-bottom	350 µl	–	**7819 09**
2 96-well microplates with transparent bottom				
white	F-bottom	330 µl	**7819 12**	**7819 10**
black	F-bottom	330 µl	**7819 13**	**7819 11**

* individually wrapped, with lid

384-well Microplates

cellGrade™

PS, sterile. For standard cell culture applications.



Color	Bottom	Well volume	Pack of 5* Cat. No.	Pack of 50** Cat. No.
1 384-well standard microplates				
transparent	F-bottom	100 µl	–	**7819 80**
white	F-bottom	100 µl	–	**7819 81**
black	F-bottom	100 µl	–	**7819 82**
2 384-well microplates with transparent bottom				
white	F-bottom	120 µl	**7819 88**	**7819 86**
black	F-bottom	120 µl	**7819 89**	**7819 87**

* 1 bag of 5 plates ** individually wrapped, with lid

cellGrade™ plus

PS, sterile.
For cultivation of fastidious cell lines and for serum-reduced cultivation.

Color	Bottom	Well volume	Pack of 5* Cat. No.	Pack of 50** Cat. No.
1 384-well standard microplates				
transparent	F-bottom	100 µl	–	**7820 40**
2 384-well microplates with transparent bottom				
white	F-bottom	120 µl	**7820 48**	**7820 46**
black	F-bottom	120 µl	**7820 49**	**7820 47**

* 1 bag of 5 plates ** individually wrapped, with lid

cellGrade™ premium

PS, sterile. For the most demanding cell lines, and for serum-reduced and serum-free cultivation.

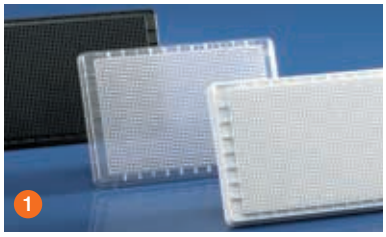
Color	Bottom	Well volume	Pack of 5* Cat. No.	Pack of 50** Cat. No.
1 384-well standard microplates				
transparent	F-bottom	100 µl	–	**7821 00**
2 384-well microplates with transparent bottom				
white	F-bottom	120 µl	**7821 08**	**7821 06**
black	F-bottom	120 µl	**7821 09**	**7821 07**

* 1 bag of 5 plates ** individually wrapped, with lid

Lids for BRAND*plates*® microplates can be found on page 164.

1536-well Microplates

cellGrade™



PS, sterile. For standard cell culture applications.

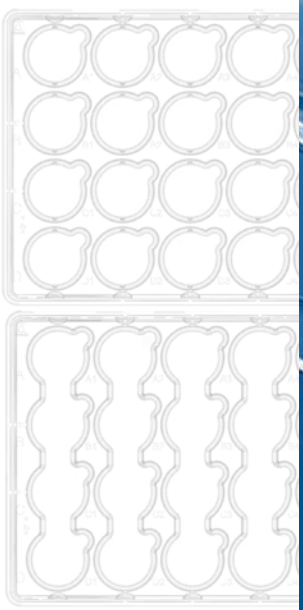
Color	Bottom	Well volume	Pack of	Cat. No.
1 1536-well standard microplates				
transparent	F-bottom	10 µl	50 (individually wrapped, with lid)	**7820 00**
white	F-bottom	10 µl	50 (individually wrapped, with lid)	**7820 01**
black	F-bottom	10 µl	50 (individually wrapped, with lid)	**7820 02**

NEW!

BRAND*plates*® Insert System

The new BRAND*plates*® Insert System offers an innovative expansion of the existing cell culture product line at BRAND. Perfect for manual applications and for use with pipetting robots!

The new cell culture plates and the associated inserts are available in both a 24-well standard and a 6-well special plate. These can be used in a wide variety of applications. The standard model is used in such applications as co-culture, secretion studies, and chemotaxis tests, and the special model finds application in the automated in vitro preparation of human tissues (3-D tissue culture). Skin, epidermis, and corneal models, etc., have taken on greater importance due to legislation that restricts animal experimentation to a minimum. These tissues are now employed on a daily basis for tolerance studies, toxicity tests, and irritation tests in the pharmaceutical and cosmetics industries.

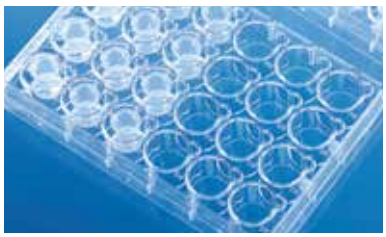


NEW!

BRAND*plates*® Insert System

For manual and automated cell and tissue culture work.

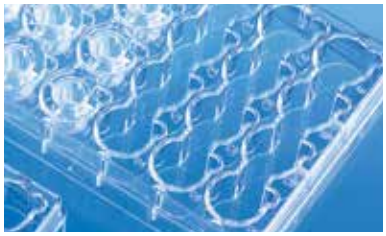
The BRAND Insert System, co-developed with the Fraunhofer Society, includes two different cell culture plates and two types of cell culture inserts, which can also be used in combination.



24-well Standard Plate

cellGrade™ plus and pureGrade™ S surface

- The plate includes 24 individually fillable wells that can be fitted with strips of 4 inserts and/or individual inserts.
- Manufactured according to the requirements in ANSI/SLAS Standards 1 and 4
- cellGrade™ plus surface: sterile, hydrophilic with different chemical groups, such as carboxyl and hydroxyl groups, that are freely accessible.
- pureGrade™ S surface: untreated, sterile



6-well Special Plate

cellGrade™ plus and pureGrade™ S surface

- The 4 wells are all connected as one large, elongated well. This well can be fitted with a strip of 4 inserts so that all 4 of the inserts in the strip can be supplied with medium at the same time.
- Manufactured according to the requirements in ANSI/SLAS Standards 1 and 4
- cellGrade™ plus surface: sterile, hydrophilic with different chemical groups, such as carboxyl and hydroxyl groups, that are freely accessible.
- pureGrade™ S surface: untreated, sterile

Cell Culture Insert Strips

smooth-walled

cellGrade™ plus surface

- Smooth-walled, for standard applications such as secretion studies, co-culture, migration studies, chemotaxis tests, etc.
- cellGrade™ plus surface: sterile, hydrophilic with different chemical groups, such as carboxyl and hydroxyl groups, that are freely accessible.

Cell Culture Insert Strips

Inlet Opening System*

cellGrade™ plus surface

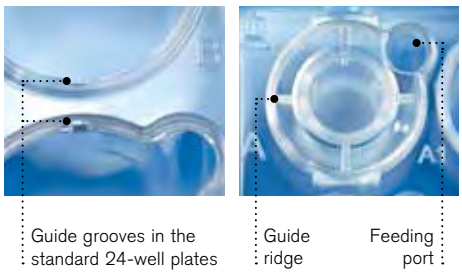
- With special inlet channels, for automated in vitro preparation of human tissues. The Inlet Opening System* enables rapid, consistent changing of media, from submersion culture to air-lift culture. The special inlet channels enable adjustment of the medium level without damage to the skin model.
- cellGrade™ plus surface: sterile, hydrophilic with different chemical groups, such as carboxyl and hydroxyl groups, that are freely accessible.

* Patent pending

A Closer Look...

The well and insert are perfectly coordinated:

The guide grooves in the support collars for the wells in the standard 24-well plate hold the guide ridges of the insert in position. This prevents the individual inserts from rotating – the feed ports on the wells remain open. At the same time, the guide ridges center the insert in the well.



- Innovative, specially designed wells with side feeding ports
- Track-etched PC and PET membranes
- Sterile according to ISO 11 137 and AAMI Guidelines, SAL 10^{-6}
- Non-cytotoxic according to ISO 10 993-5, endotoxins-free (< 0.01 EU/ml), free from DNA, DNase, and RNase.

Hanging Inserts

The distance from the well bottom to the insert membrane is 4 mm.

The cultures remain undisturbed!

Media can be changed simply and with minimal disruption using the plate's feed ports, without moving or shifting inserts already in place – **perfect for working with pipetting robots!**

Membrane pore size / application examples

Pore size	Areas of application
0.4 µm	Co-culture, transport studies, secretion studies, cell polarity studies, etc.
1.0 µm	Co-culture, transport studies, secretion studies, etc.
3.0 µm	Migration studies, chemotaxis studies, metastasis experiments, etc.
8.0 µm	Migration studies, chemotaxis studies, metastasis experiments, etc. See also the construction of full-thickness skin models by the Fraunhofer IGB (www.tissue-factory.com)

Membrane pore size and density

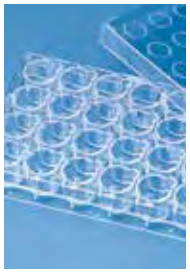
Properties	PC	PET
Optical properties	translucent	transparent
Cell visibility under Light Microscopy	–	+
Membrane thickness		
Pore size 0.4 µm	10 µm	12 µm
Pore size 1.0 µm	11 µm	12 µm
Pore size 3.0 µm	9 µm	15 µm
Pore size 8.0 µm	7 µm	23 µm
Pore density (pores per cm^2)		
Pore size 0.4 µm	1×10^8	2×10^6
Pore size 1.0 µm	2×10^7	2×10^6
Pore size 3.0 µm	2×10^6	6×10^5
Pore size 8.0 µm	1×10^5	6×10^4

Comparison of individual insert vs. individual well in the 24-well plate

	Individual insert	Individual well
Growth surface	59 mm^2	184 mm^2
Maximum volume	772 µl	3.1 ml

Ordering Data

Insert strips and plates available individually packed or as a system (6-well plates filled with 6 insert strips).




BRAND*plates*® Microplates

24-well standard plates or 6-well plates

PS. pureGrade™ S or cellGrade™ plus surface, sterile. With lid with condensation rings.

Description	Surface	Pack of	Cat. No.
24-well standard plate	pureGrade™ S	10 (individually wrapped, with lid)	**7828 80**
6-well plate	pureGrade™ S	10 (individually wrapped, with lid)	**7828 81**
24-well standard plate	cellGrade™ plus	10 (individually wrapped, with lid)	**7828 90**
6-well plate	cellGrade™ plus	10 (individually wrapped, with lid)	**7828 91**


BRAND*plates*® Insert Strips

Insert Strips, smooth-walled or with inlet channels (Inlet Opening System*)

PS. cellGrade™ plus surface, sterile. Strips of 4 inserts (divisible).

Description	Pore size µm	Pack of	PC membrane Cat. No.	PET membrane Cat. No.
smooth-walled	0.4	12 (individually wrapped)	**7828 00**	**7828 10**
	1	12 (individually wrapped)	**7828 20**	**7828 30**
	3	12 (individually wrapped)	**7828 40**	**7828 50**
	8	12 (individually wrapped)	**7828 60**	**7828 70**
with Inlet Opening System	0.4	12 (individually wrapped)	**7828 01**	**7828 11**
	1	12 (individually wrapped)	**7828 21**	**7828 31**
	3	12 (individually wrapped)	**7828 41**	**7828 51**
	8	12 (individually wrapped)	**7828 61**	**7828 71**

* patent pending


BRAND*plates*® Insert System

6-well plates filled with 6 insert strips

PS. cellGrade™ plus surface, sterile. Insert strips, smooth-walled or with inlet channels (Inlet Opening System*). With lid with condensation rings.

Description	Pore size µm	Pack of plates with lid	PC membrane Cat. No.	PET membrane Cat. No.
smooth-walled	0.4	5 (30 insert strips)	**7828 02**	**7828 12**
	1	5 (30 insert strips)	**7828 22**	**7828 32**
	3	5 (30 insert strips)	**7828 42**	**7828 52**
	8	5 (30 insert strips)	**7828 62**	**7828 72**
with Inlet Opening System	0.4	5 (30 insert strips)	**7828 03**	**7828 13**
	1	5 (30 insert strips)	**7828 23**	**7828 33**
	3	5 (30 insert strips)	**7828 43**	**7828 53**
	8	5 (30insert strips)	**7828 63**	**7828 73**

* patent pending

At a Glance

Use our BRAND*plates*® microplates Selection Guide at **www.brand.de**

96-well Microplates

Type		Non-treated		Immunological surfaces			Cell culture surfaces			
Standard										
Color	**Bottom / Well volume**	**pureGrade™**	**pureGrade™ S**	**immunoGrade™**	**hydroGrade™**	**lipoGrade™**	**cellGrade™**	**cellGrade™ plus**	**cellGrade™ premium**	**inertGrade™**
transparent	U / 330 µl	7816 00	7816 60	7817 20	7817 80	7818 40	7819 60	–	–	7819 00
transparent	V / 360 µl	7816 01	7816 61	7817 21	–	7818 41	7819 61	–	–	–
transparent	F / 350 µl	7816 02	7816 62	7817 22	7817 82	7818 42	7819 62	7820 22	7820 82	7819 02
transparent	C / 350 µl	7816 03	7816 63	7817 23	7817 83	7818 43	7819 63	–	–	–
white	U / 330 µl	7816 04	–	7817 24	7817 84	7818 44	–	–	–	7819 04
white	F / 350 µl	7816 05	7816 65	–	–	–	7819 65	7820 25	7820 85	7819 05
white	C / 350 µl	–	–	7817 26	7817 86	7818 46	–	–	–	7819 06
black	U / 330 µl	7816 07	–	7817 27	7817 87	7818 47	–	–	–	7819 07
black	F / 350 µl	7816 08	7816 68	–	–	–	7819 68	7820 28	7820 88	7819 08
black	C / 350 µl	–	–	7817 29	7817 89	7818 49	–	–	–	7819 09
with transparent bottom										
Color	**Bottom / Well volume**	**pureGrade™**	**pureGrade™ S**	**immunoGrade™**	**hydroGrade™**	**lipoGrade™**	**cellGrade™**	**cellGrade™ plus**	**cellGrade™ premium**	**inertGrade™**
white	F / 330 µl	7816 10	7816 70	–	–	7818 50	7819 70	7820 30	7820 90	7819 10
white*	F / 330 µl	–	–	–	–	7818 52	7819 74	7820 34	7820 94	7819 12
black	F / 330 µl	7816 11	7816 71	7817 31	–	7818 51	7819 71	7820 31	7820 91	7819 11
black*	F / 330 µl	–	–	7817 32	–	7818 53	7819 75	7820 35	7820 95	7819 13
with UV film bottom										
Color	**Bottom / Well volume**	**pureGrade™**	**pureGrade™ S**	**immunoGrade™**	**hydroGrade™**	**lipoGrade™**	**cellGrade™**	**cellGrade™ plus**	**cellGrade™ premium**	**inertGrade™**
transparent	F / 350 µl	7816 14 [1]	–	–	–	–	–	–	–	–
black	F / 350 µl	7816 15	–	–	–	–	–	–	–	–
Strip plates										
Color	**Bottom / Well volume**	**pureGrade™**	**pureGrade™ S**	**immunoGrade™**	**hydroGrade™**	**lipoGrade™**	**cellGrade™**	**cellGrade™ plus**	**cellGrade™ premium**	**inertGrade™**
transparent, without grid	F / 360 µl	7823 00	–	7823 05	–	–	–	–	–	–
transparent, with grid	F / 350 µl	7823 01	–	7823 06	–	–	–	–	–	–

[1] not available in USA

* Pack of 5

384-well HTS Microplates

Type		Non-treated		Immunological surfaces			Cell culture surfaces			
Standard										
Color	**Bottom / Well volume**	**pureGrade™**	**pureGrade™ S**	**immunoGrade™**	**hydroGrade™**	**lipoGrade™**	**cellGrade™**	**cellGrade™ plus**	**cellGrade™ premium**	**inertGrade™**
transparent	F / 100 µl	7816 20	7816 80	7817 40	7818 00	7818 60	7819 80	7820 40	7821 00	–
white	F / 100 µl	7816 21	7816 81	7817 41	7818 01	7818 61	7819 81	–	–	–
black	F / 100 µl	7816 22	7816 82	7817 42	7818 02	7818 62	7819 82	–	–	–
with transparent bottom										
Color	**Bottom / Well volume**	**pureGrade™**	**pureGrade™ S**	**immunoGrade™**	**hydroGrade™**	**lipoGrade™**	**cellGrade™**	**cellGrade™ plus**	**cellGrade™ premium**	**inertGrade™**
white	F / 120 µl	7816 26	7816 86	–	–	7818 66	7819 86	7820 46	7821 06	–
white*	F / 120 µl	–	–	–	–	7818 68	7819 88	7820 48	7821 08	–
black	F / 120 µl	7816 27	7816 87	–	–	7818 67	7819 87	7820 47	7821 07	–
black*	F / 120 µl	–	–	–	–	7818 69	7819 89	7820 49	7821 09	–

* Pack of 5

1536-well UHTS Microplates

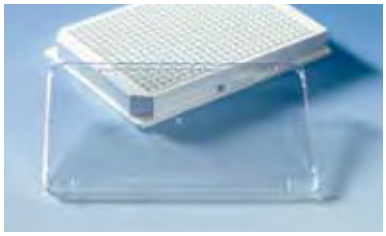
Type		Non-treated		Immunological surfaces			Cell culture surfaces			
Standard										
Color	**Bottom / Well volume**	**pureGrade™**	**pureGrade™ S**	**immunoGrade™**	**hydroGrade™**	**lipoGrade™**	**cellGrade™**	**cellGrade™ plus**	**cellGrade™ premium**	**inertGrade™**
transparent	F / 10 µl	7816 40	7817 00	–	–	–	7820 00	–	–	–
white	F / 10 µl	7816 41	7817 01	–	–	–	7820 01	–	–	–
black	F / 10 µl	7816 42	7817 02	–	–	–	7820 02	–	–	–

Accessories

Lids for 96-well standard plates

For BRAND*plates*® microplates Cat. No.:
7816 00-08, 7816 60-68, 7817 20-29, 7817 80-89, 7818 40-49, 7819 00-09, 7819 60-68, 7820 22-28, 7820 82-88

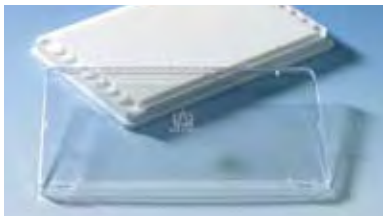
Condensation rings	Height	Sterile	Pack of	Cat. No.
yes	8 mm	–	100 (5 lids per bag)	**7821 50**
no	8 mm	–	100 (5 lids per bag)	**7821 51**



Lids for 96-well plates with transparent bottom
Lids for all 384-well plates

For BRAND*plates*® microplates Cat. No.:
7816 10-28, 7816 70-88, 7817 31-42, 7818 00-02, 7818 50-67, 7819 10-27, 7819 70-87, 7820 30-47, 7820 90-7821 07

Condensation rings	Height	Sterile	Pack of	Cat. No.
no	4.5	–	50 (10 lids per bag)	**7821 52**



Lids for all 1536-well plates

For BRAND*plates*® microplates Cat. No.:
7816 40-42, 7817 00-02, 7820 00-02

Condensation rings	Height	Sterile	Pack of	Cat. No.
no	5.5	–	50 (10 lids per bag)	**7821 53**

Sealing films for microplates
can be found on page 140.

Cuvettes

For more than 25 years, BRAND has been one of the leading manufacturers of disposable plastic cuvettes. Macro and semi-micro cuvettes of PS and PMMA are now standard in every laboratory. This product line was extended with the plastic UV-Cuvettes. The UV-transparent cuvettes are available in various types and replace sensitive and expensive glass or quartz cuvettes in many areas.

Quality features:

- Clear, clean optical path with indication of optical path orientation
- Manufactured under controlled room conditions and packaged fully automatically, without human contact
- Packed grouped by mold cavity number to ensure lowest variation of extinction coefficient
- UV-Cuvettes available as micro, semi-micro and macro cuvettes

UV-Cuvette micro

Center height: 8.5 mm or 15 mm

Specially designed for photometric determination of proteins, ssDNA, dsDNA, RNA and oligonucleotides in the UV range. Usable starting from 230 nm. Ideally suited for measurements at 260 nm, 280 nm and in the visible range. Standard 10 mm light path. Sample volumes as small as 70 µl are sufficient.
Individually wrapped UV-Cuvettes micro are free of DNase, DNA and RNase!

Center height mm	Pack of	Cat. No.
8.5	100	**7592 00**
8.5	500	**7592 10**
8.5	100 single wrapped, free of DNase, DNA and RNase	**7592 15**
15	100	**7592 20**
15	500	**7592 30**
15	100 single wrapped, free of DNase, DNA and RNase	**7592 35**

Information on selecting the UV-Cuvette **compatible with the beam height** of your photometer can be found at **www.brand.de**

Caps for UV-Cuvette micro

PE. Round covers allow a tight closure and make it possible to store samples down to -20 °C. Pack of 100.

Color	Cat. No.
blue	**7592 40**
yellow	**7592 41**
green	**7592 42**
orange	**7592 43**

UV-transparent microplates can be found on page 146.

UV-Cuvette macro and semi-micro

Ideally suited for determinations in water analysis, chemistry, and in life science applications. Usable with most polar solvents, acids and alkaline solutions. Drastically reduced risk of contamination and lower costs compared to quartz glass cuvettes. 10 mm light path. Pack of 100 per carton.

Description	Cat. No.
UV-Cuvette semi-micro	**7591 50**
UV-Cuvette macro	**7591 70**

Standard Cuvettes macro and semi-micro

PS and PMMA. Grouped by mold cavity number. 10 mm light path.
Pack of 1000 (10 boxes of 100 cuvettes per box.)

Description	Material	Cat. No.
macro cuvette	PS	**7590 05**
semi-micro cuvette	PS	**7590 15**
macro cuvette	PMMA	**7591 05**
semi-micro cuvette	PMMA	**7591 15**

Magnetic stir bars for macro cuvettes
can be found on page 292-295.

Cuvette rack

PP, grey. Numbered positions. Autoclavable (121 °C).
Suitable for standard 10 mm path-length cuvettes. Pack of 1.

Description	Length mm	Width mm	Height mm	Cat. No.
for 16 cuvettes	210	70	38	**7595 00**

Disposable stirring spatula

PS. Pack quantity 10000 = 20 bags of 500 per pack.

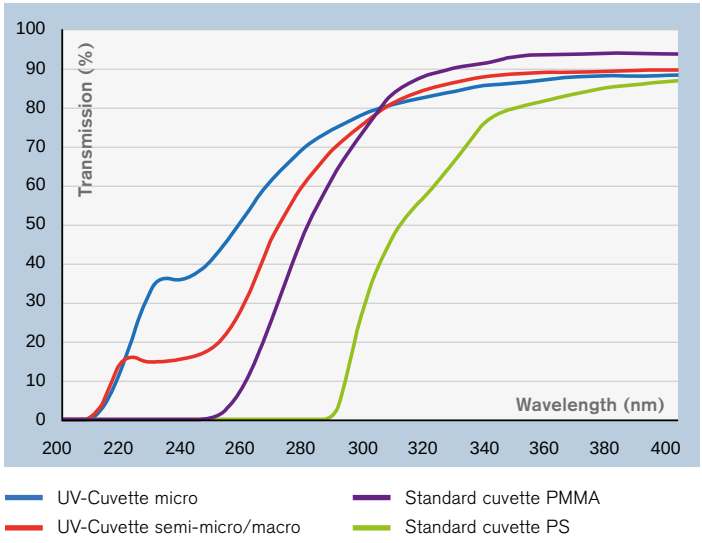
Description	Stem diameter mm	Length mm	Cat. No.
PS	3	120 mm	**7598 00**

Technical Data

Overview Table

Cuvette type	Filling volume min.	Filling volume max.	Dimensions window (w x h)	Range of application	Standard deviation in extinction units
UV-Cuvette micro, z = 8.5	70 µl	850 µl	2 x 3.5 mm (min.)	**from 230 to 900 nm**	**240 nm ≤ ± 0.007 300 nm ≤ ± 0.005**
UV-Cuvette micro, z = 15	70 µl	550 µl	2 x 3.5 mm (min.)		
UV-Cuvette macro	2.5 ml	4.5 ml	10 x 35 mm		
UV-Cuvette semi-micro	1.5 ml	3.0 ml	4.5 x 23 mm		
macro cuvette (PMMA)	2.5 ml	4.5 ml	10 x 35 mm	**from 300 to 900 nm**	**320 nm ≤ ± 0.004**
semi-micro cuvette (PMMA)	1.5 ml	3.0 ml	4.5 x 23 mm		
macro cuvette (PS)	2.5 ml	4.5 ml	10 x 35 mm	**from 340 to 900 nm**	**360 nm ≤ ± 0.005**
semi-micro cuvette (PS)	1.5 ml	3.0 ml	4.5 x 23 mm		

Transmission curves of different cuvettes



To achieve reproducible results: Before the actual measurement, always determine the blank value for the cuvette, and determine the linear range of measurement by means of a calibration curve.

Chemical resistance* of plastic cuvettes

Substance	PS	PMMA	UV-Cuvette
Acetic acid, 100%	–	–	+
Acetone	–	–	+
Ammonia	+	+	+
Benzaldehyde	–	–	+
Butanone	–	–	+
Chloroform	–	–	–
Dioxane	–	–	+
DMF	–	–	+
Ethyl acetate	–	–	+
Hexane	–	+	–
Hydrochloric acid, 36%	+	–	+
Hydrofluoric acid, 10%	+	+	+
Isopropanol	+	+	+
Nitric acid, 65%	–	–	+
Sodium hydroxide	+	+	+

* Short time resistance, 30 min. Longer-term storage of these chemicals should be confirmed by the user. Request a free sample.

Grouping by Mold Cavity

A plastic injection mold with 8 separate cavities can produce 8 cuvettes at a time. Minor dimensional variations between the cavities are unavoidable despite the most advanced technology. This may result in a greater variation of extinction values between cuvettes from different cavities. Therefore, BRAND automatically packages cuvettes originating from the same cavity in each carton of 100, 500 or 1000 cuvettes to minimize variation in extinction coefficients.

For best results, use cuvettes from the same cavity number for each series of analyses.

Various photometric methods are currently available for determining the concentration and purity of nucleic acids and proteins.

Protein determination using UV cuvettes:

$$C_{Protein\ (mg/ml)} = 1.55 \times A_{280\ nm} - 0.76 \times A_{260\ nm}$$

Nucleic determination using UV cuvettes:

$$C_{DNA\ (\mu g/ml)} = 50 \times A_{260\ nm} \times \text{dilution factor}$$

$$C_{RNA\ (\mu g/ml)} = 40 \times A_{260\ nm} \times \text{dilution factor}$$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Life Science Products
BIO-CERT®
Pipette tips/PD-Tips
BRANDplates® microplates
BRANDplates® Insert System
Micro tubes with screw cap / Cryogenic tubes
Micro-tubes with lid closure
Mini-tubes
PCR disposable products
Sample storage
Cuvettes and accessories
QUIKSIP™ BT-Aspirator
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Research – and even routine applications – in the biosciences are unimaginable today without high quality plastic consumables. Increasingly sensitive detection methods rely on ever higher quality from lab disposables. In addition to pipette tips, filter tips, microcentrifuge tubes and PD-Tips, BRAND Life Science also provides a variety of other highperformance products for PCR, storage, immunology and cell culture technology.
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BRAND

Volumetric Instruments

Precision analysis requires measuring instruments with consistently high precision. Every BLAUBRAND® volumetric instrument is individually calibrated. Statistical process control ensures with a certainty of at least 99.6 % (AQL ≤ 0.4) compliance with predefined specifications. BLAUBRAND® – quality from the very start.

Volumetric Instruments

Precision

The intended application determines which measuring instrument should be used. Precision analysis requires measuring instruments with consistently high precision. Even the most sophisticated automated systems will only deliver reliable results if the volumetric instruments used in preparing the samples meet the required precision.
BLAUBRAND® volumetric instruments represent the highest degree of technical perfection. They are made of glasses which are highly resistant to nearly all chemical substances – a prerequisite for durable precision.

Calibration

Every glass volumetric measuring instrument is individually calibrated. Computer-controlled systems ensure maximum precision in a fully automated production line.
'Statistical Process Control' (SPC) guarantees production of volumetric instruments with the smallest deviation from nominal capacity (accuracy) and narrow scatter of individual values (coefficient of variation).

Types of calibration

'TC, In': The contained quantity of liquid corresponds exactly to the capacity indicated on the instrument (e.g., graduated cylinders and volumetric flasks).

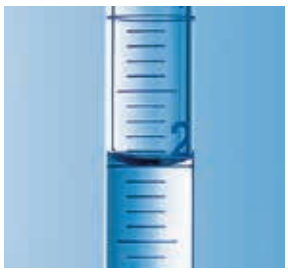
'TD, Ex': The delivered quantity of liquid corresponds exactly to the capacity indicated on the instrument (e.g., pipettes and burettes).

Silk-screening

Silk-screen printing follows calibration. BRAND uses flexible screen stencils for all graduated pipettes, burettes, graduated cylinders, and mixing cylinders. Thus, the volume markings on the stencil exactly match the calibration marks, at all capacities. Even intermediate volumes on BRAND volumetric instruments are extremely precise. For silk-screen printing BRAND uses special inks designed for volumetric instruments.

Class A/AS

Volumetric instruments of class A/AS are within the error limits defined by DIN and ISO and carry the DE-M marking.



Graduation:
ring marks at major graduations

BLAU BRAND

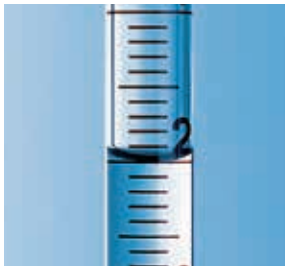
Marks and inscriptions in high contrast blue enamel. It represents the optimum combination of resistance and readability.

BLAU BRAND ETERNA

Marks and inscriptions in ETERNA amber stain. It diffuses into the glass surface and can only be removed by abrasion. It is used for volumetric instruments which are subjected to particularly aggressive cleaning methods.

Class B

Volumetric instruments of class B are within twice the error limits for class A/AS as defined by DIN and ISO.



Graduation:
short graduation marks

SILBER BRAND

Marks and inscriptions in high contrast white enamel.

SILBER BRAND ETERNA

ETERNA marks and inscriptions in amber stain are particularly resistant to aggressive cleaning methods.

Firing

High quality inks combined with carefully controlled annealing processes provide durable graduations. The most modern manufacturing technology is used for controlled heating and cooling. The maximum temperature is between 400 and 550 °C, depending on the type of glass.

Quality assurance, AQL ≤ 0,4

The QM system is DIN EN ISO 9001 certified, and includes ongoing testing during the manufacturing process with final random sample testing in compliance with DIN ISO 3951 at final inspection. The accepted quality level (AQL) is less than or equal to 0.4 (see page 318 for further information.)

Heating of volumetric instruments

All reusable BLAUBRAND® and SILBERBRAND volumetric instruments can be heated up to 250 °C in a dry box or sterilizer without having to worry about a change in volume. Use only gradual heating and cooling because abrupt temperature changes cause thermal stress and may result in glass breakage.

BLAUBRAND® Volumetric instruments with certificate

DE-M

All BLAUBRAND® volumetric instruments kept and used for measurements in legally regulated applications are marked DE-M. The manufacturer BRAND uses this mark to certify the conformity of the instruments with the German Measurement and Calibration Regulation (replaces the previous Calibration Regulation)*.

One batch certificate per packing unit!

All reusable BLAUBRAND® volumetric instruments are individually calibrated and are supplied with one batch certificate per packing unit. This facilitates the initial performance verification – also with the monitoring of measuring equipment – as the data can directly be transferred from the certificate. Batch and individual certificates can also be downloaded at www.brand.de.

* as of January 1, 2015
BRAND will change the mark on volumetric instruments to "DE-M" starting January 1, 2015.

Certificates

Batch certificate

The batch number, and mean value plus standard deviation for the batch, along with the date of issue are documented on the certificate. The measuring instrument bears the batch number that is burnt in using easy-to-read digital numbers:

15.02
(Batch number: year of manufacture/batch)

Individual certificate

The batch number, the individual serial number, the measured volume, measurement uncertainty, and the date of issue are documented on the certificate. The measuring instrument bears the batch and serial numbers that are burnt in using easy-to-read digital numbers:

15.02 0756
(Individual serial number: year of manufacture/batch/consecutive instrument number)

USP certificate

Selected BLAUBRAND® volumetric instruments can be delivered with volume error limits in compliance with United States Pharmacopeia (USP) with batch certificate and on request, with individual certificate.
The measuring instrument shows the requested error limit and the USP sign.

DAkkS calibration certificate

This certificate is issued by the DAkkS calibration laboratory at BRAND. Due to the extensive international cooperation of the DAkkS (formerly DKD) German accreditation body (EA Agreement, ILAC-MRA), the DAkkS calibration certificate is internationally recognized. Both the instrument and the certificate show an individual serial number and the laboratory's registration number as well as the year and month of issue.

Ordering note

If you require all of your BLAUBRAND® volumetric instruments to come from one batch for statistical testing equipment monitoring, please so indicate by placing a 2 in front of the BRAND catalog number. With dealer-specific catalog numbers please add the phrase "from one batch". Requests for individual, USP and DAkkS certificates should be handled in the same manner.

How it's done! Ordering example:

Volumetric instrument/ Certificate	BRAND Cat. No.
100 ml Volumetric flask **with batch certificate**	372 49
100 ml Volumetric flask, **total order from one batch** (to the extent possible)	**2** 372 49
100 ml Volumetric flask **with individual certificate**	**9** 372 49
100 ml Volumetric flask **with USP individual certificate**	**USP** 369 49
100 ml Volumetric flask **with DAkkS calibration certificate**	**DAkkS** 372 49

Single Volume Pipettes

Inscriptions on a BLAUBRAND® bulb pipette

DIN EN ISO 648

In the DIN EN ISO 648, the waiting time for single volume pipettes of class AS was reduced from 15 to 5 seconds.

Specifications, available sizes
Bulb pipettes with one or two marks, calibrated to deliver (TD, Ex).

Capacity ml	Color-Code (ISO 1769)	Pattern	Length mm (± 10 mm)	BLAUBRAND® waiting time 5 s Error limit ± ml	SILBERBRAND no waiting time Error limit ± ml
0.5	2 x black	straight	300	**0.005**	**0.007**
1	blue	straight	300	**0.008**	**0.010**
2	orange	bulb	330	**0.010**	**0.015**
2.5	–	bulb	330	**0.010**	**–**
3	black	bulb	330	**0.010**	**0.015**
4	2 x red	bulb	400	**0.015**	**–**
5	white	bulb	400	**0.015**	**0.025**
6	2 x orange	bulb	400	**0.015**	**–**
7	2 x green	bulb	400	**0.015**	**–**
8	blue	bulb	440	**0.02**	**–**
9	black	bulb	440	**0.02**	**–**
10	red	bulb	440	**0.02**	**0.03**
15	green	bulb	510	**0.03**	**0.04**
20	yellow	bulb	510	**0.03**	**0.04**
25	blue	bulb	520	**0.03**	**0.04**
30	black	bulb	520	**0.03**	**–**
40	white	bulb	540	**0.05**	**–**
50	red	bulb	540	**0.05**	**0.07**
100	yellow	bulb	585 (± 15 mm)	**0.08**	**0.12**

Single volume pipettes are also known as bulb pipettes.

BRAND bulb pipettes provide the highest accuracy. Strict statistical quality controls assure maintenance of these high standards.

All BLAUBRAND® bulb pipettes are supplied with a batch number and an accompanying batch certificate in the original packaging. On request, they are also available with an individual certificate, USP individual certificate or DAkkS calibration certificate (ordering information, page 173).

Bulb pipettes, 1 mark

BLAUBRAND®, class AS, DE-M marking

AR-GLAS®. DIN EN ISO 648.
Calibrated to deliver (TD, Ex).
Incl. one batch certificate.
0.5 to 2 ml: pack of 12;
2.5 to 100 ml: pack of 6.

Capacity ml	Error limit ± ml	Cat. No.
0.5	0.005	**297 01**
1	0.008	**297 02**
2	0.010	**297 03**
2.5	0.010	**297 04**
3	0.010	**297 05**
4	0.015	**297 06**
5	0.015	**297 07**
6	0.015	**297 08**
7	0.015	**297 09**
8	0.02	**297 10**
9	0.02	**297 11**
10	0.02	**297 12**
15	0.03	**297 13**
20	0.03	**297 14**
25	0.03	**297 15**
30	0.03	**297 16**
40	0.05	**297 17**
50	0.05	**297 18**
100	0.08	**297 19**

NEW!

Bulb pipettes, 1 mark, USP

BLAUBRAND®, class AS, DE-M marking

AR-GLAS®. DIN EN ISO 648.
Calibrated to deliver (TD, Ex).
Incl. one USP batch certificate.
0.5 to 2 ml: pack of 12;
2.5 to 100 ml: pack of 6.

Note! On request, also available with USP individual certificate.

Capacity ml	Error limit ± ml	Cat. No.
0.5*	0.005 USP	**306 01**
1	0.006 USP	**306 02**
2	0.006 USP	**306 03**
3	0.01 USP	**306 05**
4	0.01 USP	**306 06**
5	0.01 USP	**306 07**
6	0.01 USP	**306 08**
7	0.01 USP	**306 09**
8	0.02 USP	**306 10**
9	0.02 USP	**306 11**
10	0.02 USP	**306 12**
15	0.03 USP	**306 13**
20	0.03 USP	**306 14**
25	0.03 USP	**306 15**
30	0.03 USP	**306 16**
40	0.05 USP	**306 17**
50	0.05 USP	**306 18**
100	0.08 USP	**306 19**

* Error limit USP ± 0.006 ml

Bulb pipettes, 1 mark

BLAUBRAND® ETERNA, class AS, DE-M marking

AR-GLAS®. DIN EN ISO 648.
Calibrated to deliver (TD, Ex).
Incl. one batch certificate.
1 and 2 ml: pack of 12;
5 to 25 ml: pack of 6.

Capacity ml	Error limit ± ml	Cat. No.
1	0.008	**305 02**
2	0.010	**305 03**
5	0.015	**305 07**
10	0.02	**305 12**
20	0.03	**305 14**
25	0.03	**305 15**
50	0.05	**305 18**

Bulb pipettes, 2 marks

BLAUBRAND®, class AS, DE-M marking

AR-GLAS®. DIN EN ISO 648.
Calibrated to deliver (TD, Ex).
Incl. one batch certificate.
0.5 to 2 ml: pack of 12;
3 to 50 ml: pack of 6.

Capacity ml	Error limit ± ml	Cat. No.
0.5	0.005	**297 21**
1	0.008	**297 22**
2	0.010	**297 23**
3	0.010	**297 25**
5	0.015	**297 27**
10	0.02	**297 32**
15	0.03	**297 33**
20	0.03	**297 34**
25	0.03	**297 35**
50	0.05	**297 38**

Bulb pipettes, 1 mark

SILBERBRAND ETERNA, class B

AR-GLAS®. DIN EN ISO 648.
Calibrated to deliver (TD, Ex).
0.5 to 2 ml: pack of 12;
3 to 100 ml: pack of 6.

Capacity ml	Error limit ± ml	Cat. No.
0.5	0.007	**295 01**
1	0.010	**295 02**
2	0.015	**295 03**
3	0.015	**295 05**
5	0.025	**295 07**
10	0.03	**295 12**
15	0.04	**295 13**
20	0.04	**295 14**
25	0.04	**295 15**
50	0.07	**295 18**
100	0.12	**295 19**

Bulb pipettes, made of plastic, 1 mark

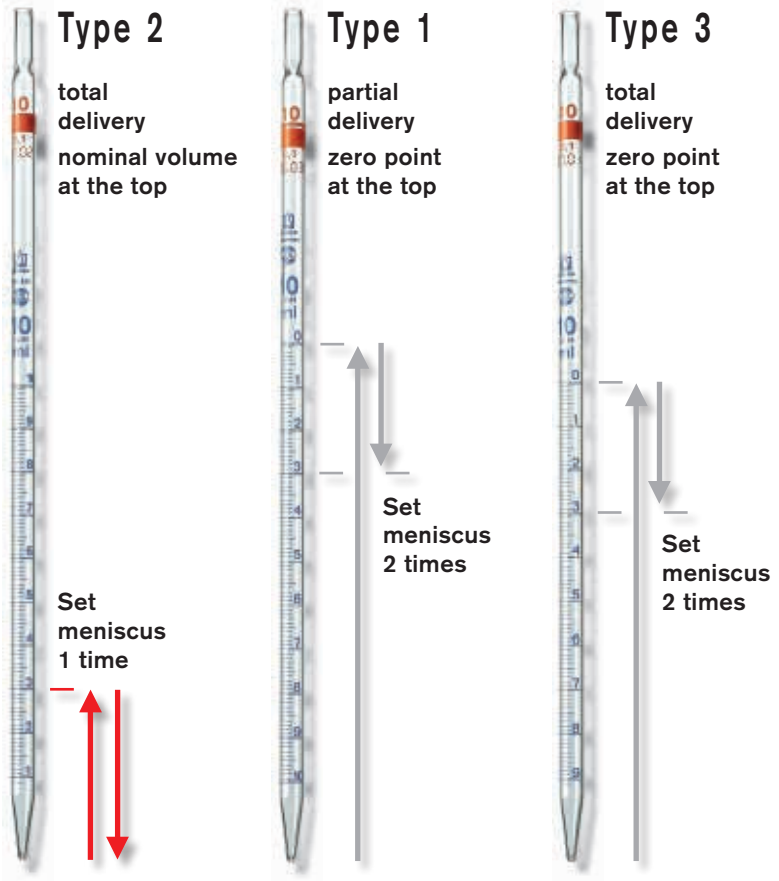
PP, high clarity. Calibrated to deliver (TD, Ex). Resistant to breakage. Exposure to temperatures up to 60 °C will not cause permanent exceeding of error limits!
Cleaning temperature below 60 °C is recommended to preserve marks and inscriptions.
1 and 2 ml: pack of 12; 5 to 50 ml: pack of 6.

Capacity ml	Pattern	Error limit ± ml	Length mm ± 10 mm	Cat. No.
1	straight	0.02	300	**300 02**
2	straight	0.02	300	**300 03**
5	bulb	0.03	300	**300 07**
10	bulb	0.04	440	**300 12**
25	bulb	0.06	450	**300 15**
50	bulb	0.1	460	**300 18**

Graduated Pipettes

In the DIN EN ISO 835 standard, the waiting time for graduated pipettes was reduced from 15 to 5 seconds and the type 2, total delivery, nominal volume at top, was included.
We recommend the graduated pipette type 2 as with these pipettes the meniscus needs to be set only once to achieve exact pipetting.
In contrast, with types 1 and 3, there is a risk of over-dispensing while setting the meniscus for partial volumes the second time. In such a case, the sample would have to be prepared again.

BLAUBRAND® Graduated Pipettes, Class AS



Precision pipette tip

Optimized flow geometry in the tip ensures reliable liquid dispensing from bulb and graduated pipettes. The mechanical resilience of the tip and its fire-polished edges ensure a long service life.

Technical data, available sizes

Graduated pipettes are calibrated to contain (TC, In) respectively to deliver (TD, Ex).

				BLAUBRAND® waiting time 5 s		SILBERBRAND no waiting time	
Capacity ml	Subdiv. ml	Color-Code (ISO 1769)	Length mm (± 10 mm)	Calibr.	Error limit ± ml	Calibr.	Error limit ± ml
0.1	0.001	2 x green	360	In	0.001	–	–
0.2	0.002	2 x white	360	In	0.002	–	–
0.5	0.01	2 x yellow	360	Ex	0.006	Ex	0.008
1	0.01	yellow	360	Ex	0.007	Ex	0.010
1	0.1	red	360	Ex	0.007	Ex	0.010
2	0.01	2 x white	360	Ex	0.010	Ex	0.015
2	0.02	black	360	Ex	0.010	Ex	0.015
2	0.1	green	360	Ex	0.010	Ex	0.015
5	0.05	red	360	Ex	0.030	Ex	0.05
5	0.1	blue	360	Ex	0.030	Ex	0.05
10	0.1	orange	360	Ex	0.05	Ex	0.08
20	0.1	2 x yellow	360	Ex	0.1	Ex	0.15
25	0.1	white	450	Ex	0.1	Ex	0.15
50	0.5	–	450	Ex	0.2	–	–

DIN EN ISO 835

In the DIN EN ISO 835, the waiting time for graduated pipettes of class AS was reduced from 15 to 5 seconds.

All BLAUBRAND® graduated pipettes are supplied with a batch number and an accompanying batch certificate in the original packaging.
On request, they are also available with an individual certificate, USP individual certificate or DAkkS calibration certificate (ordering information, page 173).

Graduated pipettes, Type 2, total delivery

BLAUBRAND®, class AS, nominal volume at the top, DE-M marking

AR-GLAS®. DIN EN ISO 835. Calibrated to deliver (TD, Ex). Incl. one batch certificate. Pack of 12 (20, 25, 50 ml: pack of 6).

Capacity ml	Subdivision ml	Error limit ± ml	Cotton plug upper end	Cat. No.
0.5	0.01	0.006	no	**278 16**
1	0.01	0.007	no	**278 17**
1	0.01	0.007	yes	**278 27**
1	0.1	0.007	no	**278 18**
2**	0.01	0.010	no	**278 29**
2	0.02	0.010	no	**278 19**
2	0.02	0.010	yes	**278 28**
2	0.1	0.010	no	**278 20**
5	0.05	0.030	yes	**278 21**
5	0.1	0.030	yes	**278 22**
10	0.1	0.05	yes	**278 23**
20	0.1	0.1	yes	**278 24**
25	0.1	0.1	yes	**278 25**
50*	0.5	0.2	yes	**278 26**

* in addition to the ISO range ** in addition to the ISO range, no DE-M marking

Graduated pipettes, Type 2, total delivery, USP NEW!

BLAUBRAND®, class AS, nominal volume at the top, DE-M marking

AR-GLAS®. DIN EN ISO 835. Calibrated to deliver (TD, Ex). Incl. USP batch certificate. Pack of 12.

Capacity ml	Subdivision ml	Error limit ± ml	Cotton plug upper end	Cat. No.
1*	0.01	0.007 USP	yes	**275 06**
2	0.02	0.01 USP	yes	**275 09**
5	0.05	0.02 USP	yes	**275 11**
10	0.1	0.03 USP	yes	**275 13**

* Error limit USP ± 0.01 ml

Note! On request, also available with USP individual certificate.

Graduated pipettes, Type 2, total delivery

BLAUBRAND® ETERNA, class AS, nominal volume at the top, DE-M marking

AR-GLAS®. DIN EN ISO 835. Calibrated to deliver (TD, Ex). Incl. one batch certificate. Pack of 12 (20, 25, 50 ml: pack of 6).

Capacity ml	Subdivision ml	Error limit ± ml	Cotton plug upper end	Cat. No.
0.5	0.01	0.006	no	**278 36**
1	0.01	0.007	no	**278 37**
1	0.01	0.007	yes	**278 47**
2	0.02	0.010	no	**278 39**
2	0.02	0.010	yes	**278 48**
5	0.05	0.030	yes	**278 41**
5	0.1	0.030	yes	**278 42**
10	0.1	0.05	yes	**278 43**
20	0.1	0.1	yes	**278 44**
25	0.1	0.1	yes	**278 45**

Graduated pipettes, Type 2, total delivery

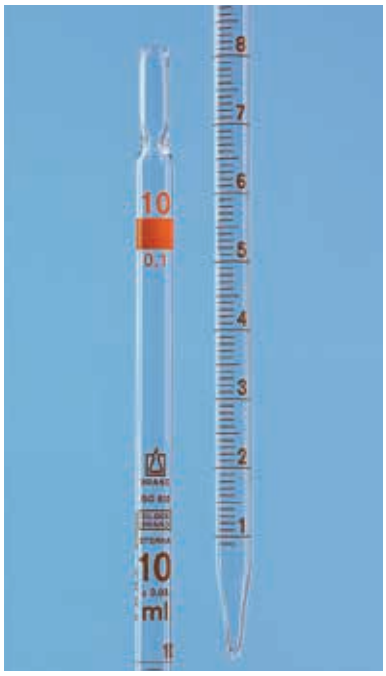
NEW!

SILBERBRAND ETERNA, class B, nominal volume at the top

AR-GLAS®. DIN EN ISO 835. Calibrated to deliver (TD, Ex).
Pack of 12 (20, 25 ml: pack of 6).

Capacity ml	Subdivision ml	Error limit ± ml	Cotton plug upper end	Cat. No.
0.5	0.01	0.008	no	**270 01**
1	0.01	0.010	no	**270 02**
1	0.01	0.010	yes	**270 03**
1	0.1	0.010	no	**270 04**
2*	0.01	0.015	no	**270 05**
2	0.02	0.015	no	**270 06**
2	0.02	0.015	yes	**270 07**
2	0.1	0.015	no	**270 08**
5	0.05	0.05	yes	**270 09**
5	0.1	0.05	yes	**270 10**
10	0.1	0.08	yes	**270 11**
20	0.1	0.15	yes	**270 12**
25	0.1	0.15	yes	**270 13**

* in addition to the ISO range



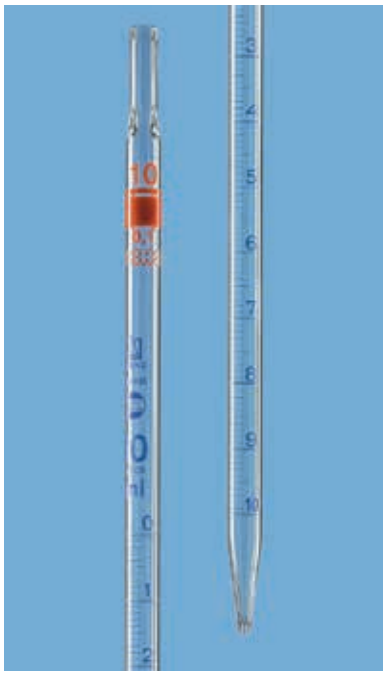
Graduated pipettes, Type 1, partial delivery

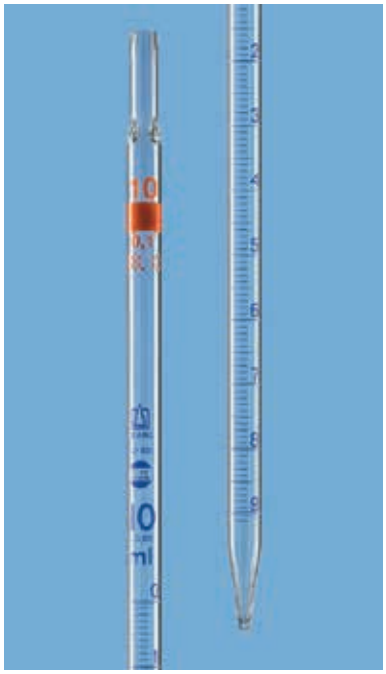
BLAUBRAND®, class AS, zero point at the top, DE-M marking

AR-GLAS®. DIN EN ISO 835. Calibrated to deliver (TD, Ex).
Incl. one batch certificate. Pack of 12 (25 ml: Pack of 6).

Capacity ml	Subdivision ml	Error limit ± ml	Cotton plug upper end	Cat. No.
0.5	0.01	0.006	no	**277 21**
1	0.01	0.007	no	**277 22**
2*	0.01	0.010	no	**277 24**
2	0.02	0.010	no	**277 25**
5	0.05	0.030	yes	**277 27**
10	0.1	0.05	yes	**277 29**
25	0.1	0.1	yes	**277 31**

* in addition to the ISO range, no DE-M marking





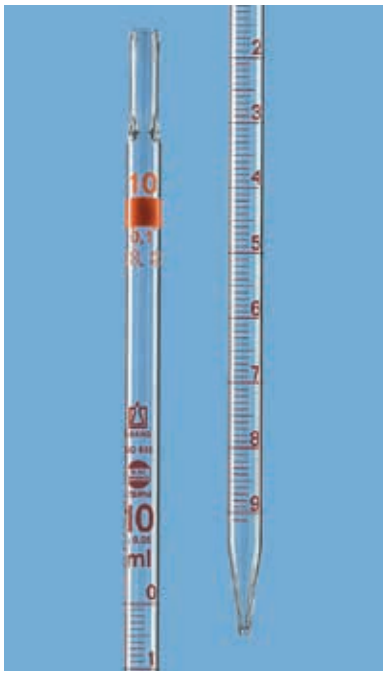
Graduated pipettes, Type 3, total delivery

BLAUBRAND®, class AS, zero point at the top, DE-M marking

AR-GLAS®. DIN EN ISO 835. Calibrated to deliver (TD, Ex). Incl. one batch certificate. 0.5 to 10 ml: Pack of 12; 20 to 50 ml: Pack of 6.

Capacity ml	Subdivision ml	Error limit ± ml	Cotton plug upper end	Cat. No.
0.5	0.01	0.006	no	**277 05**
1	0.01	0.007	no	**277 06**
1	0.01	0.007	yes	**273 06**
1	0.1	0.007	no	**277 07**
2**	0.01	0.010	no	**277 08**
2	0.02	0.010	no	**277 09**
2	0.02	0.010	yes	**273 09**
2	0.1	0.010	no	**277 10**
5	0.05	0.030	yes	**277 11**
5	0.1	0.030	yes	**277 12**
10	0.1	0.05	yes	**277 13**
20	0.1	0.1	yes	**277 14**
25	0.1	0.1	yes	**277 15**
50*	0.5	0.2	yes	**277 16**

* in addition to the ISO range ** in addition to the ISO range, no DE-M marking



Graduated pipettes, Type 3, total delivery

BLAUBRAND® ETERNA, class AS, zero point at the top, DE-M marking

AR-GLAS®. DIN EN ISO 835. Calibrated to deliver (TD, Ex). Incl. one batch certificate. 0.5 to 10 ml: Pack of 12; 20 and 25 ml: Pack of 6.

Capacity ml	Subdivision ml	Error limit ± ml	Cotton plug upper end	Cat. No.
0.5	0.01	0.006	no	**284 05**
1	0.01	0.007	no	**284 06**
1	0.01	0.007	yes	**273 16**
2	0.02	0.010	no	**284 09**
2	0.02	0.010	yes	**273 19**
5	0.05	0.030	yes	**284 11**
5	0.1	0.030	yes	**284 12**
10	0.1	0.05	yes	**284 13**
20	0.1	0.1	yes	**284 14**
25	0.1	0.1	yes	**284 15**

Cotton cord

100% cotton wool, degreased, approx. 13 g/10 m. Pack of 1 kg.

Cat. No.	282 05

The use of cotton plugs

Cotton plugs may prolong delivery time and may therefore influence the accuracy of measurement. In tests using BRAND pipettes that have had cotton plugs inserted by a cotton plugging machine, the results were within the indicated error limits.

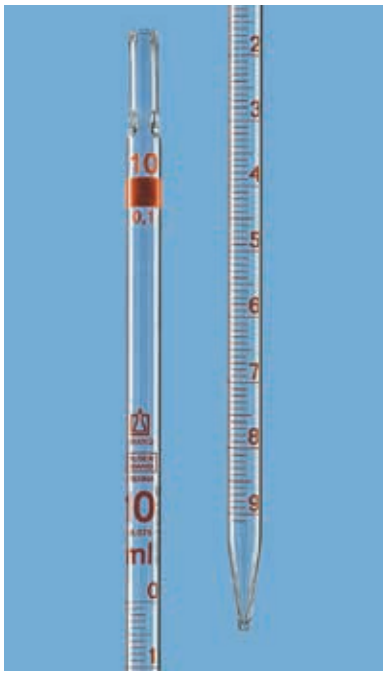
Graduated pipettes, Type 3, total delivery

SILBERBRAND ETERNA, class B, zero point at the top

AR-GLAS®. DIN EN ISO 835. Calibrated to deliver (TD, Ex).
0.5 to 10 ml: Pack of 12; 20 and 25 ml: Pack of 6.

Capacity ml	Subdivision ml	Error limit ± ml	Cotton plug upper end	Cat. No.
0.5	0.01	0.008	no	**270 69**
1	0.01	0.010	no	**270 70**
1	0.01	0.010	yes	**272 06**
1	0.1	0.010	no	**270 71**
2*	0.01	0.015	no	**270 72**
2	0.02	0.015	yes	**272 09**
2	0.02	0.015	no	**270 73**
2	0.1	0.015	no	**270 74**
5	0.05	0.05	yes	**270 75**
5	0.1	0.05	yes	**270 76**
10	0.1	0.08	yes	**270 77**
20	0.1	0.15	yes	**270 78**
25	0.1	0.15	yes	**270 79**

* in addition to the ISO range



Graduated pipettes, calibrated to contain

BLAUBRAND®, class A, DE-M marking

AR-GLAS®. Error limits and subdivisions according to DIN 12689. Length 360 mm.
Calibrated to contain (TC, In). Incl. one batch certificate. Pack of 12.

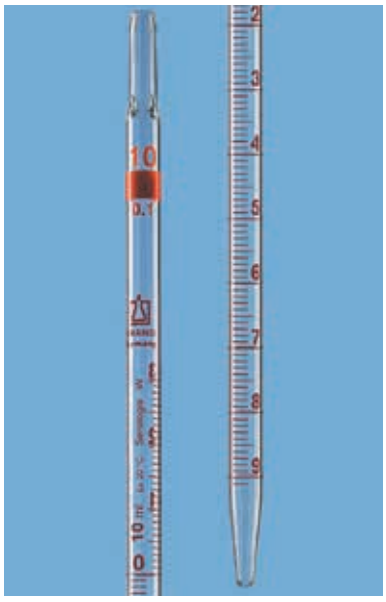
Capacity ml	Subdivision ml	Error limit ± ml	Cotton plug upper end	Cat. No.
0.1	0.001	0.001	no	**277 02**
0.2	0.002	0.002	no	**277 04**

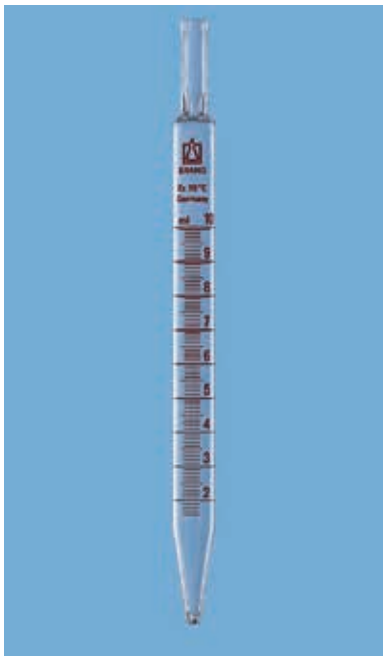
Graduated pipettes, serological

Large tip diameter, total delivery

AR-GLAS®. Calibrated to deliver (TD, Ex). Graduations and inscriptions in ETERNA amber stain. Short graduation marks. Length 360 mm (25 ml: 450 mm). Cotton plug upper end.
1 to 10 ml: Pack of 12; 25 ml: Pack of 6.

Capacity ml	Tip Ø approx. mm	Subdivision ml	Error limit ± ml	Negative range ml	Cat. No.
1	2	0.01	0.02	-0.2	**271 07**
2	2	0.02	0.04	-0.4	**271 09**
5	3	0.1	0.1	-2	**271 12**
10	3	0.1	0.2	-3	**271 13**
25	3	0.1	0.4	-5	**271 15**





Graduated pipettes, tissue culture

Short type, total delivery

AR-GLAS®. Calibrated to deliver (TD, Ex). Graduations and inscriptions in ETERNA amber stain. Ring marks at major graduations. Length 230 mm.
1 to 10 ml: Pack of 12; 25 ml: Pack of 6.

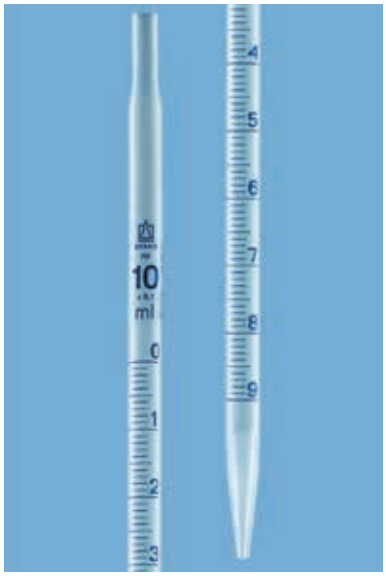
Capacity ml	Subdivision ml	Error limit ± ml	Cotton plug upper end	Cat. No.
1	0.1	0.02	yes	**271 60**
2	0.1	0.04	yes	**271 64**
5	0.1	0.1	yes	**271 66**
10	0.1	0.2	yes	**271 67**
25	0.2	0.4	yes	**271 79**

Graduated pipettes, piston type

SILBERBRAND, total delivery

AR-GLAS®. Calibrated to deliver (TD, Ex). Integrated piston pipetting aid with retaining spring. Pack of 1.

Capacity ml	Subdivision ml	Error limit ± ml	Cat. No.
1	0.01	0.01	**311 06**
2	0.02	0.02	**311 09**
5	0.05	0.05	**311 11**
10	0.1	0.1	**311 13**
25	0.1	0.2	**311 15**



Graduated pipettes, made of plastic

PP, high clarity. Calibrated to deliver (TD, Ex). Resistant to breakage. Suction tube outer Ø max. 8 mm. Exposure to temperatures up to 60 °C will not cause permanent exceeding of error limits! Cleaning temperature below 60 °C is recommended to preserve marks and inscriptions. Pack of 12.

Capacity ml	Subdivision ml	Error limit ± ml	Length mm ± 10 mm	Cat. No.
1	0.1	0.02	300	**276 07**
2	0.1	0.02	300	**276 10**
5	0.1	0.05	330	**276 12**
10*	0.1	0.1	330	**276 13**
10	0.1	0.1	320	**276 14**

* Suction tube outer Ø 10 mm

Volumetric Flasks

BRAND volumetric flasks provide the highest accuracy. Strict statistical quality controls ensure maintenance of these high standards. Volumetric flasks are indispensable for preparing dilutions and standard solutions.
Standard volumetric flasks are supplied with a square-grip PP stopper with a dripping tip. These stoppers reduce the danger of breakage if a flask tips over, and help to prevent it from rolling off the workbench.

All BLAUBRAND® volumetric flasks are supplied with a batch number and an accompanying batch certificate in the original packaging.
On request, they are also available with an individual certificate, USP individual certificate or DAkkS calibration certificate (ordering information, page 173).

Note! The abbreviation Boro 3.3 represents the internationally designated borosilicate glass type 3.3.

BLAUBRAND® Volumetric Flasks – Durable Quality

Specifications, available sizes

Volumetric flasks are always calibrated to contain (TC, In).

Volumetric flasks, trapezoidal

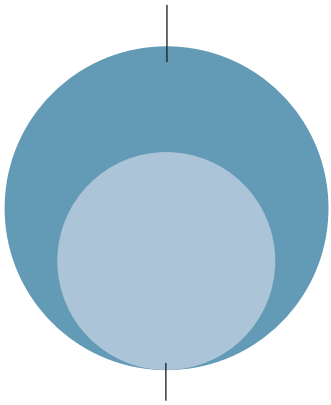
Capacity ml	Neck inner Ø mm	Neck size	BLAUBRAND® Error limit ± ml
1	7 ± 1	7/16	**0.025**
2	7 ± 1	7/16	**0.025**
5	7 ± 1	7/16	**0.025**
10 W	9 ± 1	10/19	**0.04**
20	9 ± 1	10/19	**0.04**
25	9 ± 1	10/19	**0.04**
50	11 ± 1	12/21	**0.06**

W = Wide neck

Trapezoidal volumetric flasks

Small capacity standard volumetric flasks can tip over more easily due to their higher center of gravity.
Trapezoidal measuring flasks have a much larger base area which greatly improves stability!

Twice (!) the base area compared to standard volumetric flasks of the same capacity



Volumetric flask, standard type

Volumetric flasks, standard type

Capacity ml	Neck inner Ø mm	Neck size	BLAUBRAND® Error limit ± ml	SILBERBRAND Error limit ± ml
5 W	9 ± 1	10/19	**0.04**	**–**
10 W	9 ± 1	10/19	**0.04**	**0.06**
20	9 ± 1	10/19	**0.04**	**0.06**
20 W	11 ± 1	12/21	**0.06**	**–**
25	9 ± 1	10/19	**0.04**	**0.06**
25 W	11 ± 1	12/21	**0.06**	**–**
50	11 ± 1	12/21	**0.06**	**0.09**
50 W	13 ± 1	14/23	**0.10**	**–**
100	13 ± 1	12/21	**0.10**	**0.15**
100	13 ± 1	14/23	**0.10**	**–**
200	15.5 ± 1.5	14/23	**0.15**	**0.25**
250	15.5 ± 1.5	14/23	**0.15**	**0.25**
500	19 ± 2	19/26	**0.25**	**0.40**
1000	23 ± 2	24/29	**0.40**	**0.60**
1000 W	27.5 ± 2.5	29/32	**0.60**	**–**
2000	27.5 ± 2.5	29/32	**0.60**	**0.90**
5000	38 ± 3	34/35	**1.2**	**1.8**
10000	48 ± 4	45/40	**2.0**	**–**

W = Wide neck

Volumetric flasks, trapezoidal

BLAUBRAND®, class A, DE-M marking

Boro 3.3. DIN EN ISO 1042. Calibrated to contain (TC, In). Incl. one batch certificate. Pack of 2.

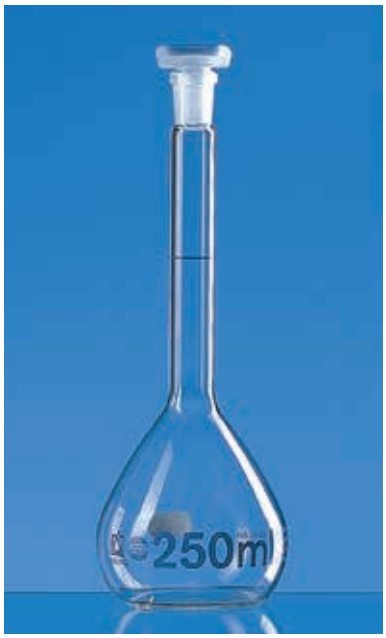
Capacity ml	Error limit ± ml	Neck size	with PP stopper Cat. No.	with glass stopper Cat. No.
1	0.025	7/16	**364 01**	**364 12**
2	0.025	7/16	**364 02**	**364 13**
5	0.025	7/16	**364 03**	**364 14**
10 W	0.04	10/19	**364 04**	**364 15**
20	0.04	10/19	**364 06**	**364 17**
25	0.04	10/19	**364 07**	**364 18**
50	0.06	12/21	**364 08**	**364 19**

W = Wide neck

Volumetric flasks

BLAUBRAND®, class A, DE-M marking

Boro 3.3. DIN EN ISO 1042. Calibrated to contain (TC, In). Incl. one batch certificate. 5 to 500 ml: Pack of 2; 1000 to 10000 ml: Pack of 1.



Capacity ml	Error limit ± ml	Neck size	with PP stopper Cat. No.	with glass stopper Cat. No.
5 W	0.04	10/19	**372 38**	**372 56**
10 W	0.04	10/19	**372 43**	**372 67**
20	0.04	10/19	**372 46**	**372 57**
20 W	0.06	12/21	**372 45**	**372 68**
25	0.04	10/19	**372 47**	**372 58**
25 W	0.06	12/21	**372 93**	**372 94**
50	0.06	12/21	**372 48**	**372 59**
50 W	0.10	14/23	**372 90**	**372 88**
100	0.10	12/21	**372 49**	**372 60**
100	0.10	14/23	**372 91**	**372 89**
200	0.15	14/23	**372 50**	**372 61**
250	0.15	14/23	**372 51**	**372 62**
500	0.25	19/26	**372 52**	**372 63**
1000	0.4	24/29	**372 53**	**372 64**
1000 W	0.6	29/32	**372 34**	–
2000	0.6	29/32	**372 54**	**372 65**
5000	1.2	34/35	**372 55**	**372 66**
10000*	2.0	45/40	**372 36**	–

W = Wide neck * in addition to the ISO range

Volumetric flasks, USP

BLAUBRAND®, class A, DE-M marking

Boro 3.3. DIN EN ISO 1042. Calibrated to contain (TC, In). Incl. one USP batch certificate. Pack of 2; 1000 ml: pack of 1.

Capacity ml	Error limit ± ml	Neck inner Ø mm	Neck size	with PP stopper Cat. No.	with glass stopper Cat. No.
5*	0.02 USP	7 ± 1	10/19	**369 38**	**369 68**
10*	0.02 USP	7 ± 1	10/19	**369 43**	**369 73**
20*	0.02 USP	7 ± 1	10/19	**369 45**	**369 75**
25	0.03 USP	9 ± 1	10/19	**369 47**	**369 77**
50	0.05 USP	11 ± 1	12/21	**369 48**	**369 78**
100	0.08 USP	13 ± 1	14/23	**369 49**	**369 79**
200	0.10 USP	15.5 ± 1.5	14/23	**369 50**	**369 80**
250	0.12 USP	15.5 ± 1.5	14/23	**369 51**	**369 81**
500	0.20 USP	19 ± 2	19/26	**369 52**	**369 82**
1000	0.30 USP	23 ± 2	24/29	**369 53**	**369 83**
2000	0.50 USP	27.5 ± 2.5	29/32	**369 54**	**369 84**

* Neck/ground socket connection enlarged

Note! On request, also available with USP individual certificate.

Volumetric flasks

BLAUBRAND® ETERNA, class A, DE-M marking

Boro 3.3. DIN EN ISO 1042. Calibrated to contain (TC, In). Incl. one batch certificate. 5 to 500 ml: Pack of 2; 1000 and 2000 ml: Pack of 1.

Capacity ml	Error limit ± ml	Neck size	with PP stopper Cat. No.
5 W	0.04	10/19	**368 38**
10 W	0.04	10/19	**368 43**
20	0.04	10/19	**368 45**
20 W	0.06	12/21	**368 46**
25	0.04	10/19	**368 41**
25 W	0.06	12/21	**368 42**
50	0.06	12/21	**368 47**
50 W	0.10	14/23	**368 48**
100	0.10	14/23	**368 49**
200	0.15	14/23	**368 50**
250	0.15	14/23	**368 51**
500	0.25	19/26	**368 52**
1000	0.4	24/29	**368 53**
2000	0.6	29/32	**368 54**

W = Wide neck

Volumetric flasks, PUR Plastic coated

BLAUBRAND® PURprotect, class A, DE-M marking

Boro 3.3. DIN EN ISO 1042. Calibrated to contain (TC, In). Incl. one batch certificate. 50 to 500 ml: Pack of 2; 1000 ml: Pack of 1.

Capacity ml	Error limit ± ml	Neck size	with PP stopper Cat. No.
50 W	0.10	14/23	**365 48**
100	0.10	14/23	**365 49**
200	0.15	14/23	**365 50**
250	0.15	14/23	**365 51**
500	0.25	19/26	**365 52**
1000	0.4	24/29	**365 53**

W = Wide neck

Synthetic coating for better protection

The PUR coating envelops the volumetric flasks like a protection skin.
In the event of breakage, the safety coating helps contain the glass fragments.
Compared to uncoated glass flasks the electrostatic charge is not increased.
The light blue coating facilitates optical distinction. The maximum operating temperature at dry heat is 135 °C (exposure time < 30 min).
Frequent autoclaving at 121 °C reduces splintering protection.
Cleaning up to max. 95 °C.

Volumetric flasks with 3 marks, DAkkS calibrated

BLAUBRAND®, class A, DE-M marking

Boro 3.3, DIN EN ISO 1042. Calibrated to contain (TC, In). Incl. DAkkS certificate.
The volumetric flask with 3 marks is used to check the functioning of a dispenser. The mark in the middle shows the nominal volume, the upper and lower marks show the error limits as specified in the table below. If the error limit is exceeded even with repeated measurements, the dispenser is defective. The DAkkS calibrated volumetric flask does not replace the gravimetric test of the monitoring of measuring instruments according to ISO 8655. Pack of 1.

Capacity ml	upper/lower mark ± ml	Neck inner Ø mm	Neck size	with PP stopper Cat. No.
10	0.070	7 ± 1	10/19*	**382 04**
25	0.175	9 ± 1	10/19	**382 06**
50	0.35	11 ± 1	12/21	**382 08**
100	0.70	13 ± 1	14/23	**382 10**

* enlarged ground joint

Further sizes on request.

Volumetric flasks, amber glass

BLAUBRAND®, class A, DE-M marking

Boro 3.3. DIN EN ISO 1042. Calibrated to contain (TC, In).
Interchangeable PP or amber glass stopper. Incl. one batch certificate.
5 to 500 ml: Pack of 2; 1000 ml: Pack of 1.

Capacity ml	Error limit ± ml	Neck size	with PP stopper Cat. No.	with glass stopper Cat. No.
5 W	0.04	10/19	**374 01**	**374 38**
10 W	0.04	10/19	**374 02**	**374 43**
20	0.04	10/19	**374 03**	**374 46**
25	0.04	10/19	**374 04**	**374 47**
50	0.06	12/21	**374 05**	**374 48**
50 W	0.10	14/23	**374 06**	**374 45**
100	0.10	14/23	**374 07**	**374 49**
200	0.15	14/23	**374 08**	**374 50**
250	0.15	14/23	**374 09**	**374 51**
500	0.25	19/26	**374 10**	**374 52**
1000	0.4	24/29	**374 11**	**374 53**

W = Wide neck

Volumetric flasks, amber glass, USP

NEW!

BLAUBRAND®, class A, DE-M marking

Boro 3.3. DIN EN ISO 1042. Calibrated to contain (TC, In). Incl. USP batch certificate.
Pack of 2; 1000 ml: pack of 1.

Capacity ml	Error limit ± ml	Neck inner Ø mm	Neck size	with PP stopper Cat. No.	with glass stopper Cat. No.
5*	0.02 USP	7 ± 1	NS 10/19	**374 81**	**374 61**
10*	0.02 USP	7 ± 1	NS 10/19	**374 82**	**374 62**
20*	0.02 USP	7 ± 1	NS 10/19	**374 83**	**374 63**
25	0.03 USP	9 ± 1	NS 10/19	**374 84**	**374 64**
50	0.05 USP	11 ± 1	NS 12/21	**374 85**	**374 65**
100	0.08 USP	13 ± 1	NS 14/23	**374 87**	**374 67**
200	0.10 USP	15.5 ± 1.5	NS 14/23	**374 88**	**374 68**
250	0.12 USP	15.5 ± 1.5	NS 14/23	**374 89**	**374 69**
500	0.20 USP	19 ± 2	NS 19/26	**374 90**	**374 70**
1000	0.30 USP	23 ± 2	NS 24/29	**374 91**	**374 71**

* enlarged ground joint

Note! On request, also available with USP individual certificate.

Volumetric flasks, beaded rim

BLAUBRAND®, class A, DE-M marking

Boro 3.3. DIN EN ISO 1042. Calibrated to contain (TC, In). Incl. one batch certificate.
10 to 500 ml: Pack of 2; 1000 ml: Pack of 1.

Capacity ml	Error limit ± ml	Cat. No.
10 W	0.04	**370 45**
20	0.04	**370 46**
25	0.04	**370 47**
50	0.06	**370 48**
100	0.10	**370 49**
200	0.15	**370 50**
250	0.15	**370 51**
500	0.25	**370 52**
1000	0.4	**370 53**

W = Wide neck

Volumetric flasks

SILBERBRAND, class B

Boro 3.3. DIN EN ISO 1042. Calibrated to contain (TC, In).
10 to 500 ml: pack of 2; 1000 to 5000 ml: pack of 1.

Capacity ml	Error limit ± ml	Neck size	with PP stopper Cat. No.
10 W	0.06	10/19	**367 43**
20	0.06	10/19	**367 46**
25	0.06	10/19	**367 47**
50	0.09	12/21	**367 48**
100	0.15	12/21	**367 49**
200	0.25	14/23	**367 50**
250	0.25	14/23	**367 51**
500	0.4	19/26	**367 52**
1000	0.6	24/29	**367 53**
2000	0.9	29/32	**367 54**
5000	1.8	34/35	**367 55**

W = Wide neck

Volumetric flasks for sugar analysis

SILBERBRAND

Boro 3.3. Error limits according to class B. Calibrated to contain (TC, In).
For Kohlrausch sugar analysis. Pack of 2.

Capacity ml	Error limit ± ml	Cat. No.
100	0.20	**4020 38**
200	0.30	**4020 46**

Volumetric flask for oil content determination

SILBERBRAND

Boro 3.3. DIN 51368. Interchangeable hollow glass stopper size 19/26. Calibrated to contain (TC, In). For determination of oil content in aqueous oil emulsions (e.g., drilling oil).
Pack of 1.

Capacity	Subdivision ml	Error limit ± ml	Cat. No.
Sample volume 100 ml	–	0.2	
Volume range 0 - 5 ml	0.1	0.1	**3655 38**
Volume range > 5 - 30 ml	0.5	0.5	

Volumetric flasks with screw cap, PFA

Error limits according to class A, DIN EN ISO 1042. Calibrated to contain (TC, In). Incl. one batch certificate. Autoclavable, easy to clean. PFA screw cap with molded sealing ring. Exposure to temperatures up to 121 °C (autoclaving) will not cause permanently exceeded error limits! Cleaning up to max. 60 °C is recommended to preserve marks and inscriptions. Pack of 1.

Capacity ml	Error limit ± ml	Height* mm	Thread	Cat. No.
10 W	0.04	90	GL 18	**362 08**
25	0.04	108	GL 18	**362 20**
50	0.06	143	GL 18	**362 28**
100	0.10	166	GL 18	**362 38**
250	0.15	222	GL 25	**362 48**
500	0.25	262	GL 25	**362 54**

W = Wide neck * without screw cap

Thread	Cat. No.
GL 18	**1292 50**
GL 25	**1292 52**

Replacement screw caps for volumetric flasks PFA

PFA. Pack of 1.

Volumetric flasks, PMP, transparent

With PP stopper. Error limits (EL) according to class A respectively B, DIN EN ISO 1042. Class A incl. one batch certificate. Calibrated to contain (TC, In). Exposure to temperatures up to 121 °C (autoclaving) will not cause permanently exceeded error limits! Cleaning up to max. 60 °C is recommended to preserve marks and inscriptions. Pack of 1.

Capacity ml	EL 'A' ± ml	EL 'B' ± ml	Height* mm	Neck size	Cat. No. EL 'A'	Cat. No. EL 'B'
10 W	0.04	0.08	90	10/19	**361 70**	**361 08**
25	0.04	0.08	108	10/19	**361 72**	**361 20**
50	0.06	0.12	146	12/21	**361 74**	**361 28**
100	0.10	0.20	173	14/23	**361 76**	**361 38**
250	0.15	0.30	225	19/26	**361 78**	**361 48**
500	0.25	0.5	258	19/26	**361 80**	**361 54**
1000	0.4	0.8	298	24/29	**361 82**	**361 62**

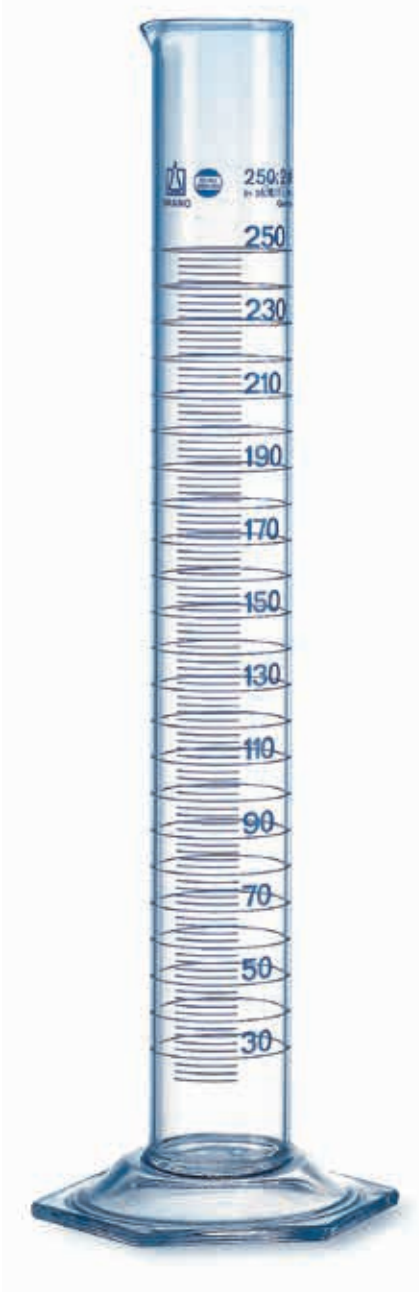
W = Wide neck * without stopper

Volumetric flasks, PP, high clarity

With PP stopper. Error limits according to class B, DIN EN ISO 1042. Calibrated to contain (TC, In). Exposure to temperatures up to 60 °C will not cause permanently exceeded error limits! Cleaning up to max. 60 °C is recommended to preserve marks and inscriptions. Pack of 1.

Capacity ml	Error limit ± ml	Height* mm	Neck size	Cat. No.
10 W	0.08	90	10/19	**360 08**
25	0.08	108	10/19	**360 20**
50	0.12	146	12/21	**360 28**
100	0.20	173	14/23	**360 38**
250	0.30	225	19/26	**360 48**
500	0.5	258	19/26	**360 54**
1000	0.8	298	24/29	**360 62**

W = Wide neck * without stopper



Graduated Cylinders

BRAND graduated and mixing cylinders provide the highest accuracy. Strict statistical quality controls ensure maintenance of these high standards.

All BLAUBRAND® graduated cylinders are supplied with a batch number and an accompanying batch certificate in the original packaging. On request, they are also available with an individual certificate, USP individual certificate or DAkkS calibration certificate (ordering information, page 173).

Note! The abbreviation Boro 3.3 represents the internationally designated borosilicate glass type 3.3.

Graduation and Reading

BLAUBRAND®. Ring marks at major graduations. Reading at lowest point of meniscus.

SILBERBRAND. Short graduation marks. Reading at lowest point of meniscus.

Specifications, available sizes

Graduated and mixing cylinders are always calibrated to contain (TC, In).

Capacity ml	Subdivision ml	BLAUBRAND® tall form Error limit ± ml	SILBERBRAND tall form Error limit ± ml	SILBERBRAND low form Error limit ± ml
5	0.1	**0.05**	**0.08**	**–**
10	0.2	**0.10**	**0.15**	**0.3**
25	0.5	**0.25**	**0.4**	**0.5**
50	1	**0.5**	**0.8**	**1**
100	1	**0.5**	**0.8**	**1**
250	2	**1.0**	**1.5**	**2**
500	5	**2.5**	**4**	**5**
1000	10	**5**	**8**	**10**
2000	20	**10**	**15**	**20**

Our class A plastic measuring cylinders made of PMP (DE-M marking) are low-price high-quality alternative to glass cylinders (see page 194-195).

Graduated cylinders, tall form

BLAUBRAND® or BLAUBRAND® ETERNA, class A, DE-M marking, ring marks at major graduations

Boro 3.3. DIN EN ISO 4788. Calibrated to contain (TC, In). Incl. one batch certificate. With spout and hexagonal base. 5 to 500 ml: pack of 2; 1000 and 2000 ml: pack of 1.

Capacity ml	Subdivision ml	Error limit ± ml	Height mm	BLAUBRAND® Cat. No.	BLAUBRAND® ETERNA Cat. No.
5	0.1	0.05	115	**321 05**	**327 05**
10	0.2	0.10	140	**321 08**	**327 08**
25	0.5	0.25	170	**321 20**	**327 20**
50	1	0.5	200	**321 28**	**327 28**
100	1	0.5	260	**321 38**	**327 38**
250	2	1.0	335	**321 48**	**327 48**
500	5	2.5	365	**321 54**	**327 54**
1000	10	5	465	**321 62**	**327 62**
2000	20	10	505	**321 64**	**327 64**

Graduated cylinders, tall form, USP NEW!

BLAUBRAND®, class A, DE-M marking, ring marks at major graduations

Boro 3.3. DIN EN ISO 4788. Calibrated to contain (TC, In). Incl. USP batch certificate. With spout and hexagonal base. 5 to 500 ml: pack of 2; 1000 ml: pack of 1.

Capacity ml	Subdivision ml	Error limit ± ml	Height mm	BLAUBRAND® Cat. No.
5	0.1	0.05 USP	115	**328 05**
10	0.2	0.10 USP	140	**328 08**
25	0.5	0.17 USP	170	**328 20**
50	1	0.25 USP	200	**328 28**
100	1	0.5 USP	260	**328 38**
250	2	1.0 USP	335	**328 48**
500	5	2.0 USP	365	**328 54**
1000	10	3.0 USP	465	**328 62**
2000	20	6.0 USP	505	**328 64**

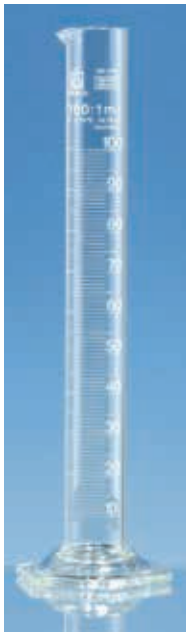
Note! On request, also available with USP individual certificate.

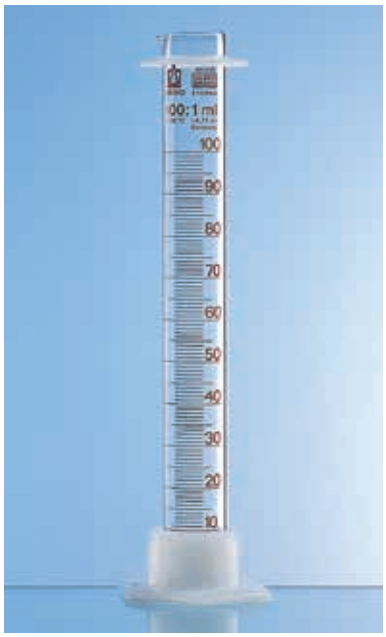
Graduated cylinders, tall form

SILBERBRAND or SILBERBRAND ETERNA, class B, short graduation marks

Boro 3.3. DIN EN ISO 4788. Calibrated to contain (TC, In).
With spout and hexagonal base. 5 to 500 ml: pack of 2; 1000 and 2000 ml: pack of 1.

Capacity ml	Subdivision ml	Error limit ± ml	Height mm	SILBERBRAND Cat. No.	SILBERBRAND ETERNA Cat. No.
5	0.1	0.08	115	–	**319 05**
10	0.2	0.15	140	**317 08**	**319 08**
25	0.5	0.4	170	**317 20**	**319 20**
50	1	0.8	200	**317 28**	**319 28**
100	1	0.8	260	**317 38**	**319 38**
250	2	1.5	335	**317 48**	**319 48**
500	5	4	365	**317 54**	**319 54**
1000	10	8	465	**317 62**	**319 62**
2000	20	15	505	**317 64**	**319 64**





Graduated cylinders, tall form

SILBERBRAND ETERNA, class B, short graduation marks

Boro 3.3. DIN EN ISO 4788. Calibrated to contain (TC, In).
With spout. With detachable hexagonal base and protective collar of PP (not autoclavable).
10 to 500 ml: pack of 2; 1000 ml: pack of 1.

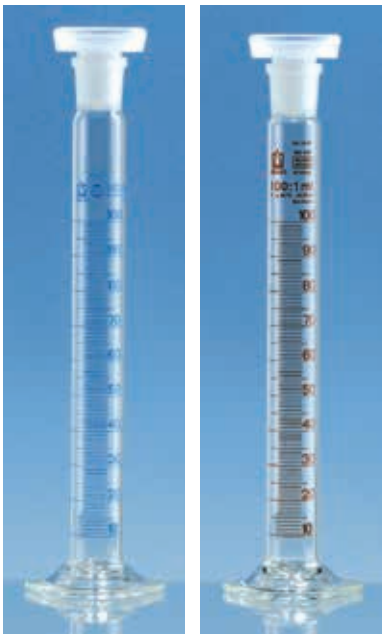
Capacity ml	Subdivision ml	Error limit ± ml	Height mm	Cat. No.
10	0.2	0.15	135	**319 09**
25	0.5	0.4	170	**319 21**
50	1	0.8	190	**319 29**
100	1	0.8	260	**319 39**
250	2	1.5	335	**319 49**
500	5	4	370	**319 55**
1000	10	8	450	**319 63**

Graduated cylinders, low form

SILBERBRAND ETERNA, class B, short graduation marks

Boro 3.3. DIN EN ISO 4788. Calibrated to contain (TC, In).
With spout and hexagonal base.
Pack of 2; 1000 ml and 2000 ml: pack of 1.

Capacity ml	Subdivision ml	Error limit ± ml	Height mm	Cat. No.
10	1	0.3	90	**420 08**
25	1	0.5	115	**420 20**
50	2	1	145	**420 28**
100	2	1	165	**420 38**
250	5	2	195	**420 48**
500	10	5	250	**420 54**
1000	20	10	285	**420 62**
2000	50	20	340	**420 64**



Mixing cylinders

BLAUBRAND®, class A, DE-M marking, or SILBERBRAND ETERNA, class B

Boro 3.3. DIN EN ISO 4788. Calibrated to contain (TC, In). BLAUBRAND® mixing cylinders incl. one batch certificate. With PP stopper and hexagonal base.
10 to 500 ml: Pack of 2; 1000 ml: Pack of 1.

Capacity ml	Subdivision ml	Neck size	Height mm	BLAUBRAND® Cat. No.	SILBERBRAND ETERNA Cat. No.
10	0.2	10/19	160	**324 08**	**339 08**
25	0.5	14/23	190	**324 20**	**339 20**
50	1	19/26	220	**324 28**	**339 28**
100	1	24/29	285	**324 38**	**339 38**
250	2	29/32	350	**324 48**	**339 48**
500*	5	34/35	395	**324 54**	**339 54**
1000*	10	45/40	500	**324 62**	**339 62**

* with octagonal stopper, PE

Dispensers, tilt measure

Bottletop dispensing head

Dispensing head Boro 3.3. Calibrated to deliver (TD, Ex). Inscriptions in green enamel. The automatic dispenser is particularly well-suited for dispensing suspensions.
Complete with reservoir bottle, borosilicate glass 4.1, capacity 1000 ml, neck size 29/32.
Pack of 1.

Capacity ml	Error limit ± ml	Height incl. bottle mm	Dispensing head Cat. No.	Head with bottle Cat. No.
5	1.0	270	**430 55**	**430 05**
10	1.0	270	**430 58**	**430 08**
20	2.0	280	**430 66**	**430 16**
25	2.5	280	**430 70**	**430 20**
50	5	280	**430 78**	**430 28**
100	10	290	**430 88**	**430 38**

Accessories for dispensers, tilt measure

Joint clip

Stainless-steel. Neck size 29/32.
Pack of 1.

Cat. No.	556 18

Ground joint sleeve

PTFE. Neck size 29/32.
Pack of 10.

Cat. No.	514 22

Reservoir bottle

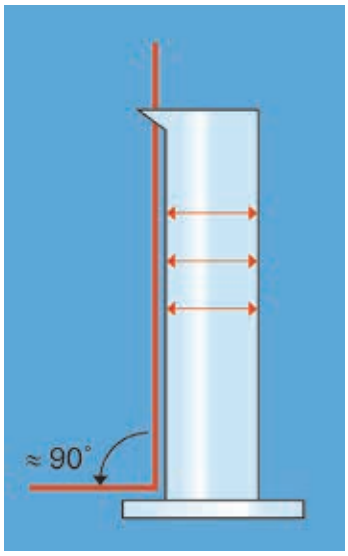
Borosilicate glass 4.1.
Capacity 1000 ml. Neck size 29/32.
Pack of 1.

Description	Cat. No.
Borosilicate glass 4.1	**1269 63**

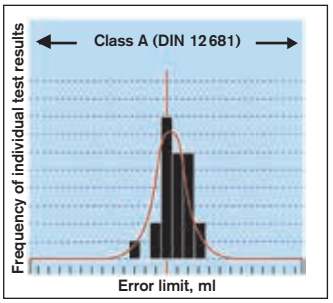
Plastic Graduated Cylinders

Graduated cylinders from BRAND are made of high-quality plastics which provide excellent chemical resistance. The nearly perfect cylindrical design allows equal graduation marks.

- Strengthened rim increases overall dimensional stability
- Functional spout minimizes spills
- Hexagonal base with knobs for increased stability
- Easy-to-read graduations
- Extremely durable



Graduated cylinders, class A



Class A graduated cylinders are characterized by their very low measure value scatter, as shown in the example above.
Class A error limits are maintained after 20 washing and 10 sterilization cycles at 121 °C. (DIN 12681 requires only 10 washing and 3 sterilization cycles.)

Graduated cylinders, class A, PMP

DE-M marking, tall form, with blue printed scale

PMP, transparent. DIN 12681 and ISO 6706. Calibrated to contain (TC, In). Incl. one batch certificate. A particularly high-quality printing ink is used in the plastic graduated cylinders. Exposure to temperatures up to 121 °C (autoclaving) will not cause permanently exceeded error limits! Cleaning temperature below 60 °C is recommended to preserve marks and inscriptions. 10 to 500 ml: pack of 2; 1000 and 2000 ml: pack of 1.

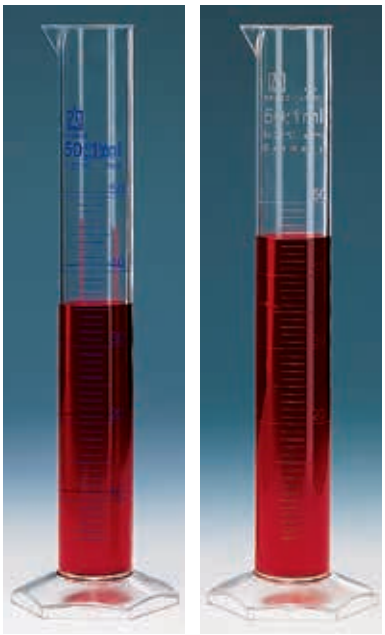
Capacity ml	Subdivision ml	Error limit A ± ml	Height mm	Cat. No.
10	0.2	0.10	145	**351 08**
25	0.5	0.25	170	**351 20**
50	1	0.5	200	**351 28**
100	1	0.5	250	**351 38**
250	2	1.0	315	**351 48**
500	5	2.5	360	**351 54**
1000	10	5	440	**351 62**
2000	20	10	535	**351 64**

Graduated cylinders, PP

tall form, class B, with blue printed scale or embossed scale

PP, high clarity. DIN 12 681 and ISO 6706. Calibrated to contain (TC, In). Exposure to temperatures up to 80 °C will not cause permanently exceeded error limits! Cleaning temperature below 60 °C is recommended to preserve marks and inscriptions.

Capacity ml	Subdivision ml	Error limit ± ml	Height mm	Pack of	blue scale Cat. No.	embossed scale Cat. No.
10	0.2	0.20	145	10	**348 08**	**350 08**
25	0.5	0.5	170	10	**348 20**	**350 20**
50	1	1.0	200	10	**348 28**	**350 28**
100	1	1.0	250	10	**348 38**	**350 38**
250	2	2.0	315	5	**348 48**	**350 48**
500	5	5	360	5	**348 54**	**350 54**
1000	10	10	440	5	**348 62**	**350 62**
2000	20	20	535	1	**348 64**	**350 64**

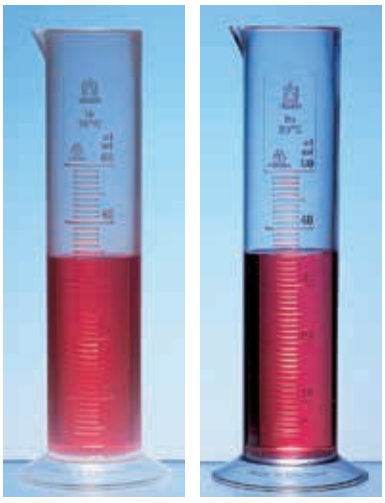


Graduated cylinders, PMP

tall form, class B, with blue printed scale or embossed scale

PMP, transparent. DIN 12 681 and ISO 6706. Calibrated to contain (TC, In). Exposure to temperatures up to 121 °C (autoclaving) will not cause permanently exceeded error limits! Cleaning temperature below 60 °C is recommended to preserve marks and inscriptions. For autoclaving, we recommend the design with embossed scale.

Capacity ml	Subdivision ml	Error limit ± ml	Height mm	Pack of	blue scale Cat. No.	embossed scale Cat. No.
10	0.2	0.20	145	10	**347 08**	**349 08**
25	0.5	0.5	170	10	**347 20**	**349 20**
50	1	1.0	200	10	**347 28**	**349 28**
100	1	1.0	250	10	**347 38**	**349 38**
250	2	2.0	315	5	**347 48**	**349 48**
500	5	5	360	5	**347 54**	**349 54**
1000	10	10	440	5	**347 62**	**349 62**
2000	20	20	535	1	**347 64**	**349 64**



Graduated cylinders, PP and SAN

low form, with embossed scale

PP, high clarity. SAN, transparent. Calibrated to contain (TC, In). Exposure to temperatures up to 80 °C will not cause permanently exceeded error limits!

Capacity ml	Subdivision ml	Error limit ± ml	Pack of	PP Cat. No.	SAN Cat. No.
25	0.5	0.5	10	**416 20**	**415 20**
50	1.0	1.0	10	**416 28**	**415 28**
100	2.0	2.0	10	**416 38**	**415 38**
250	5.0	5	5	**416 48**	**415 48**
500	10.0	10	5	**416 54**	**415 54**
1000	20.0	20	5	**416 62**	**415 62**

Burettes and Automatic Burettes

Graduation and reading

BLAUBRAND®
Schellbach Stripe
Ring marks at major graduations. Reading at point of contact of the two tips.

SILBERBRAND
Schellbach Stripe
Short marks at major graduations. Reading at point of contact of the two tips.

SILBERBRAND
Short marks at major graduations. Reading at lowest point of meniscus.

Specifications

Burettes and automatic burettes are always calibrated to deliver (TD, Ex).

Waiting times:
BLAUBRAND® – waiting time 30 sec. SILBERBRAND – no waiting time

Note: A waiting time is usually not neccessary if a titration is performed (see DIN EN ISO 385).

All BLAUBRAND® burettes and automatic burettes are supplied with a batch number and an accompanying batch certificate in the original packaging. On request, they are also available with an individual certificate, USP individual certificate or DAkkS calibration certificate (ordering information, page 173).

Note! The abbreviation Boro 3.3 represents the internationally designated borosilicate glass type 3.3.

The needle-valve stopcock

PTFE valve spindle
Operates smoothly yet is tight, even without lubrication, so there is no grease residue on the burette. The valve spindle is replaceable.

Tight seal without force
A gentle turn is all it takes to close the burette valve.

Precision burette tip

Precise drop by drop control. Drop size remains constant – from the first to the last drop. The liquid stream breaks off precisely and does not creep along the outside edge.

Burettes, lateral stopcock

BLAUBRAND®, class AS, DE-M marking

Boro 3.3. DIN EN ISO 385. Calibrated to deliver (TD, Ex). Schellbach stripe. Incl. one batch certificate. Length approx. 800 mm. Pack of 2.

Capacity ml	Subdivision ml	Error limit ± ml	Stopcock with	Cat. No.
10	0.02	0.02	PTFE spindle	**138 44**
25	0.05	0.03	PTFE spindle	**138 47**
50	0.1	0.05	PTFE spindle	**138 48**
10	0.02	0.02	Glass key	**138 84**
25	0.05	0.03	Glass key	**138 87**
50	0.1	0.05	Glass key	**138 88**

Note! On request, BLAUBRAND® class AS burettes are also available with USP individual certificate.

Burettes, straight stopcock

BLAUBRAND®, class AS, DE-M marking

Boro 3.3. DIN EN ISO 385. Calibrated to deliver (TD, Ex). Schellbach stripe. Incl. one batch certificate. Length approx. 800 mm. Pack of 2.

Capacity ml	Subdivision ml	Error limit ± ml	Stopcock with	Cat. No.
10	0.02	0.02	PTFE spindle	**124 84**
25	0.05	0.03	PTFE spindle	**124 87**
50	0.1	0.05	PTFE spindle	**124 88**
10	0.02	0.02	Glass key	**124 64**
25	0.05	0.03	Glass key	**124 67**
50	0.1	0.05	Glass key	**124 68**

Micro burettes, Bang pattern, straight stopcock

BLAUBRAND®, class AS, DE-M marking

Boro 3.3. DIN EN ISO 385. Calibrated to deliver (TD, Ex). Schellbach stripe. Incl. one batch certificate. Available with needle valve stopcock with PTFE spindle (PTFE key in intermediate stopcock) or STJ glass stopcock (glass key in intermediate stopcock). Pack of 2.

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Stopcock with	Cat. No.
2	0.01	0.01	600	PTFE spindle	**242 65**
5	0.01	0.01	820	PTFE spindle	**242 67**
10	0.02	0.02	820	PTFE spindle	**242 69**
2	0.01	0.01	600	Glass key	**242 55**
5	0.01	0.01	820	Glass key	**242 57**
10	0.02	0.02	820	Glass key	**242 59**

Note! On request, BLAUBRAND® class AS burettes are also available with USP individual certificate.

Micro burettes, Bang pattern, lateral stopcock

BLAUBRAND®, class AS, DE-M marking

Boro 3.3. DIN EN ISO 385. Calibrated to deliver (TD, Ex). Schellbach stripe. Incl. one batch certificate. Available with needle valve stopcock with PTFE spindle (PTFE key in intermediate stopcock) or STJ glass stopcock (glass key in intermediate stopcock). With base. Pack of 2.

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Stopcock with	Cat. No.
2	0.01	0.01	660	PTFE spindle	**245 95**
5	0.01	0.01	900	PTFE spindle	**245 97**
10	0.02	0.02	900	PTFE spindle	**245 99**
2	0.01	0.01	660	Glass key	**245 45**
5	0.01	0.01	900	Glass key	**245 47**
10	0.02	0.02	900	Glass key	**245 49**

Burettes, lateral stopcock

SILBERBRAND, class B

Boro 3.3. DIN EN ISO 385. Calibrated to deliver (TD, Ex). Schellbach stripe. Length approx. 800 mm. Pack of 2.

Capacity ml	Subdivision ml	Error limit ± ml	Stopcock with	Cat. No.
10	0.02	0.03	PTFE spindle	**135 63**
25	0.05	0.05	PTFE spindle	**135 66**
50	0.1	0.08	PTFE spindle	**135 68**
25	0.05	0.05	Glass key	**135 06**
50	0.1	0.08	Glass key	**135 08**

Burettes, straight stopcock

SILBERBRAND, class B

Boro 3.3. DIN EN ISO 385. Calibrated to deliver (TD, Ex). Schellbach stripe. Length approx. 800 mm. Pack of 2.

Capacity ml	Subdivision ml	Error limit ± ml	Stopcock with	Cat. No.
10	0.02	0.03	PTFE spindle	**120 93**
25	0.05	0.05	PTFE spindle	**120 96**
50	0.1	0.08	PTFE spindle	**120 98**

Burettes, straight stopcock

SILBERBRAND

Boro 3.3.
10 ml and 25 ml: Error limit according to class B, DIN EN ISO 385.
50 ml: DIN EN ISO 385, class B.
Calibrated to deliver (TD, Ex). Schellbach stripe. Pack of 2.

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Stopcock with	Cat. No.
10*	0.05	0.05	470	Glass key	**120 13**
25*	0.1	0.08	520	Glass key	**120 16**
50	0.1	0.08	790	Glass key	**120 18**

* reduced distance between subdivision marks

Burettes, amber glass, straight stopcock

SILBERBRAND

Borosilicate glass 5.4.
25 ml: Error limit according to class B, DIN EN ISO 385.
50 ml: DIN EN ISO 385, class B.
Calibrated to deliver (TD, Ex). Pack of 2.

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Stopcock with	Cat. No.
25*	0.1	0.08	550	PTFE key	**135 36**
50	0.1	0.10	800	PTFE key	**135 38**
25*	0.1	0.08	550	Glass key	**135 32**
50	0.1	0.10	800	Glass key	**135 34**

* reduced distance between subdivision marks

The Modular Burette Concept!

The Compact Burette from BRAND.

- **with PTFE stopcock**
- **fast to dismantle and easy to clean**
- **simple repair – all individual components replaceable!**

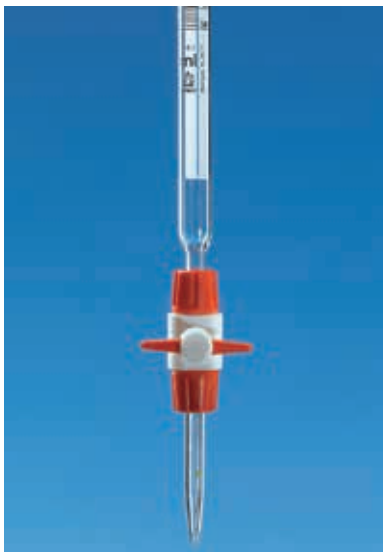
Compact Burettes

BLAUBRAND®, class AS, DE-M marking

Boro 3.3, removable PTFE stopcock. DIN EN ISO 385. Calibrated to deliver (TD, Ex).
Items supplied: Burette tube with Schellbach stripe; Stopcock with precision tip.
Incl. one batch certificate. Pack of 1.

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Cat. No.
10	0.02	0.02	795	**139 13**
25	0.05	0.03	800	**139 16**
50	0.1	0.05	800	**139 18**

Note! On request, BLAUBRAND® class AS burettes are also available with USP individual certificate.



Compact Burettes

SILBERBRAND

AR-GLAS®, removable PTFE stopcock. Error limits according to class B, DIN EN ISO 385.
Calibrated to deliver (TD, Ex). Items supplied: Burette tube with Schellbach stripe;
Stopcock with precision tip. Pack of 1.

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Cat. No.
10*	0.05	0.05	445	**139 03**
25*	0.1	0.08	510	**139 06**
50*	0.1	0.10	710	**139 08**

* reduced distance between subdivision marks

Compact Burettes, amber glass

SILBERBRAND

Borosilicate glass 5.4, removable PTFE stopcock.
25 ml: Error limit according to class B, DIN EN ISO 385.
50 ml: DIN EN ISO 385, class B.
Calibrated to deliver (TD, Ex).
Items supplied: Burette tube with white graduation; Stopcock with precision tip. Pack of 1.

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Cat. No.
25*	0.1	0.08	520	**139 26**
50	0.1	0.10	790	**139 28**

* reduced distance between subdivision marks

Spare burette tubes

for the Compact burette

BLAUBRAND®, incl. batch certificate, Pack of 1.

Desription	Capacity ml	Length mm	Cat. No.
BLAUBRAND®, Boro 3.3	10	700	**139 43**
BLAUBRAND®, Boro 3.3	25	705	**139 46**
BLAUBRAND®, Boro 3.3	50	705	**139 48**
SILBERBRAND, AR-GLAS®	10*	350	**139 33**
SILBERBRAND, AR-GLAS®	25*	410	**139 36**
SILBERBRAND, AR-GLAS®	50*	610	**139 38**
SILBERBRAND, amber glass	25*	425	**139 56**
SILBERBRAND, amber glass	50	695	**139 58**

* reduced distance between subdivision marks

Spare burette stopcock

for all Compact burettes and Compact automatic burettes

PTFE. With screw couplings and seals, without burette tip.
Pack of 1.

Cat. No.	118 05

Spare burette tips

for Compact burettes and Compact automatic burettes

Pack of 1.

For burettes	Desription	Cat. No.
clear glass 10 ml	clear glass, Boro 3.3	**115 10**
clear glass 25 ml	clear glass, Boro 3.3	**115 11**
clear glass 50 ml	clear glass, Boro 3.3	**115 12**
amber glass 25 and 50 ml	amber glass, Boro 5.4	**115 15**

Compact burettes, 'Economy'

SILBERBRAND

AR-GLAS®, removable PTFE stopcock with PP tip. Error limits according to class B, DIN EN ISO 385. Calibrated to deliver (TD, Ex). Items supplied: burette tube, stopcock with PP tip.
Pack of 2.

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Cat. No.
25*	0.1	0.08	510	**100 12**
50*	0.1	0.10	710	**100 14**

* reduced distance between subdivision marks

Burette tubes

SILBERBRAND

AR-GLAS®. Error limits according to class B, DIN EN ISO 385.
Calibrated to deliver (TD, Ex). Discharge tube with outer Ø 8 mm.
For use with PTFE stopcock (Cat. No. 118 00).
Pack of 2.

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Cat. No.
25*	0.1	0.08	400	**100 02**
50*	0.1	0.10	620	**100 04**

* reduced distance between subdivision marks

PTFE stopcock

for burette tubes

With PP tip. Complete with mounting tool.
Pack of 1.

Cat. No.	118 00

Spare burette tip

for PTFE stopcock

PP, with screw cap. Pack of 1.

Cat. No.	116 00

Automatic burettes, Dr. Schilling pattern

SILBERBRAND

Burette: AR-GLAS®. Error limits according to class B, DIN EN ISO 385. Calibrated to deliver (TD, Ex). Schellbach stripe. Automatic zeroing. Pack of 1.

Capacity ml	Subdivision ml	Error limit ± ml	With bottle ml	Total height mm	Cat. No.
10*	0.05	0.05	500	530	**237 53**
15*	0.1	0.08	500	510	**237 55**
25*	0.1	0.08	1000	620	**237 56**
50*	0.1	0.10	1000	830	**237 58**
25*, amber glass	0.1	0.08	1000, amber	650	**237 66**
50, amber glass	0.1	0.10	1000, amber	900	**237 68**

* reduced distance between subdivision marks

- **Materials:**
  Filling tube: PVC
  Discharge tube: silicone
  Reservoir bottle: PE-LD
  Base: PE-HD
  Fitting, grey: Polyamide
  Micrometer screw: brass/PP
- Squeezing bottle allows rapid filling
- Automatic zeroing
- Micrometer screw allows fine titration
- Rough titration by releasing the micrometer screw and using the press button

Note! Burettes not in use for longer periods should be drained and tubing pressure released by opening the stopcock.

Spare parts for automatic burettes, Dr. Schilling pattern

Spare burettes

Pack of 1.

Capacity ml	Length mm	Cat. No.
10*	340	**237 13**
15*	320	**237 15**
25*	390	**237 16**
50*	600	**237 18**
25*, amber glass	420	**237 23**
50, amber glass	670	**237 24**

* reduced distance between subdivision marks

Bases

Pack of 1.

For bottle ml	Ø bottle mm	Cat. No.
500	75	**237 25**
1000	94	**237 28**

Reservoir bottles

PE-LD. Narrow-mouth bottle with tube bushing. Pack of 1.

Capacity ml	Ø mm	Height mm	Thread GL	Cat. No.
500	75	180	25	**1290 55**
1000	94	212	28	**1290 60**
1000, amber	94	212	28	**1302 60**

Fittings

Micrometer screw with push-button, incl. support clamp. Pack of 1.

For capacity ml	for reservoir bottle ml	Cat. No.
10	500	**237 45**
15	500	**237 46**
25 - 50	1000	**237 48**

Glass discharge tip

AR-GLAS®. With silicone tubing. Pack of 10.

Clear glass

Cat. No.	115 00

Amber glass

Cat. No.	115 05

Automatic burettes, Pellet pattern, with intermediate stopcock

BLAUBRAND®, class AS, DE-M marking

Boro 3.3. DIN EN ISO 385. Calibrated to deliver (TD, Ex). Schellbach stripe. Incl. one batch certificate. Available with needle valve stopcock with PTFE spindle (PTFE key in intermediate stopcock) or STJ glass stopcock (glass key in intermediate stopcock). Automatic zeroing. Intermediate stopcock 4 NS/19 for recirculating residual liquid. Total height approx. 1 m incl. 2000 ml bottle (soda-lime glass). Pack of 1.

Needle-valve stopcock (PTFE key in intermediate stopcock)

Capacity ml	Subdivision ml	Error limit ± ml	Description	Cat. No.
10	0.02	0.02	with bottle	**227 64**
25	0.05	0.03	with bottle	**227 67**
50	0.1	0.05	with bottle	**227 68**
10	0.02	0.02	without bottle	**227 61**
25	0.05	0.03	without bottle	**227 62**
50	0.1	0.05	without bottle	**227 63**

Glass stopcock (glass key in intermediate stopcock)

Capacity ml	Subdivision ml	Error limit ± ml	Description	Cat. No.
10	0.02	0.02	with bottle	**227 34**
25	0.05	0.03	with bottle	**227 37**
50	0.1	0.05	with bottle	**227 38**
10	0.02	0.02	without bottle	**227 31**
25	0.05	0.03	without bottle	**227 32**
50	0.1	0.05	without bottle	**227 33**

Note! On request, BLAUBRAND® class AS burettes are also available with USP individual certificate.

Automatic burettes, Pellet pattern, without intermediate stopcock

BLAUBRAND®, class AS, DE-M marking

Boro 3.3. DIN EN ISO 385. Calibrated to deliver (TD, Ex). Schellbach stripe. Incl. one batch certificate. With needle-valve stopcock with PTFE spindle. Automatic zeroing. Total height approx. 1 m incl. 2000 ml bottle (soda-lime glass). Pack of 1.

Capacity ml	Subdivision ml	Error limit ± ml	Description	Cat. No.
10	0.02	0.02	with bottle	**225 24**
25	0.05	0.03	with bottle	**225 28**
50	0.1	0.05	with bottle	**225 30**
10	0.02	0.02	without bottle	**225 21**
25	0.05	0.03	without bottle	**225 22**
50	0.1	0.05	without bottle	**225 23**

Automatic burettes, Pellet pattern, without intermediate stopcock

SILBERBRAND, class B

Boro 3.3. DIN EN ISO 385. Calibrated to deliver (TD, Ex). Schellbach stripe.
With needle-valve stopcock with PTFE spindle. Automatic zeroing.
Total height approx. 1 m incl. 2000 ml bottle (soda-lime glass). Pack of 1.

Capacity ml	Subdivision ml	Error limit ± ml	Description	Cat. No.
10	0.02	0.03	with bottle	**219 14**
25	0.05	0.05	with bottle	**219 17**
50	0.1	0.08	with bottle	**219 18**
10	0.02	0.03	without bottle	**219 11**
25	0.05	0.05	without bottle	**219 12**
50	0.1	0.08	without bottle	**219 13**

Automatic burettes, Pellet pattern, with intermediate stopcock

SILBERBRAND, amber glass

Borosilicate glass 5.4.
25 ml: Error limits according to class B, DIN EN ISO 385.
50 ml: DIN EN ISO 385, class B.
Calibrated to deliver (TD, Ex). Available with titration stopcock with PTFE key (PTFE key in intermediate stopcock) or STJ glass stopcock (glass key in intermediate stopcock).
Automatic zeroing. Intermediate stopcock 4 NS/19 for recirculating residual liquid.
Total height 25 ml approx. 0.7 m, total height 50 ml approx. 1 m incl. 2000 ml bottle (soda-lime glass). Pack of 1.

Titration and intermediate stopcock with PTFE key

Capacity ml	Subdivision ml	Error limit ± ml	Description	Cat. No.
25*	0.1	0.08	with bottle	**223 32**
50	0.1	0.10	with bottle	**223 34**
25*	0.1	0.08	without bottle	**223 36**
50	0.1	0.10	without bottle	**223 38**

* reduced distance between subdivision marks

Titration and intermediate stopcock with glass key

Capacity ml	Subdivision ml	Error limit ± ml	Description	Cat. No.
25*	0.1	0.08	with bottle	**223 22**
50	0.1	0.10	with bottle	**223 24**
25*	0.1	0.08	without bottle	**223 26**
50	0.1	0.10	without bottle	**223 28**

* reduced distance between subdivision marks

Automatic burettes, Pellet pattern, without intermediate stopcock

SILBERBRAND, amber glass

Borosilicate glass 5.4.
25 ml: Error limits according to class B, DIN EN ISO 385.
50 ml: DIN EN ISO 385, class B.
Calibrated to deliver (TD, Ex). Available with titration stopcock with PTFE key or glass key.
Total height 25 ml approx. 0.7 m, total height 50 ml approx. 1 m incl. 2000 ml bottle (soda-lime glass). Pack of 1.

Titration stopcock with PTFE key

Capacity ml	Subdivision ml	Error limit ± ml	Description	Cat. No.
25*	0.1	0.08	with bottle	**223 12**
50	0.1	0.10	with bottle	**223 14**
25*	0.1	0.08	without bottle	**223 16**
50	0.1	0.10	without bottle	**223 18**

* reduced distance between subdivision marks

Titration stopcock with glass key

Capacity ml	Subdivision ml	Error limit ± ml	Description	Cat. No.
25*	0.1	0.08	with bottle	**223 02**
50	0.1	0.10	with bottle	**223 04**
25*	0.1	0.08	without bottle	**223 06**
50	0.1	0.10	without bottle	**223 08**

* reduced distance between subdivision marks

Spare key for intermediate stopcock 4 NS/19

for automatic burette, pellet pattern

PTFE or borosilicate glass 5.4, with retention device.
Pack of 1.

Description	Clear glass Cat. No.	Amber glass Cat. No.
PTFE key	**812 65**	**812 65**
Glass key	**812 55**	**812 56**

Please order supports, burette clamps and rubber bellows separately (pages 212-213).

The Modular Automatic Burette Concept

Compact Automatic Burettes from BRAND.

- **fast to dismantle and easy to clean**
- **easy to repair – all individual components replaceable!**

Compact automatic burettes

BLAUBRAND®, class AS, DE-M marking

Boro 3.3, detachable PTFE stopcock. DIN EN ISO 385. Calibrated to deliver (TD, Ex). Incl. one batch certificate.

Items supplied:
Burette tube with Schellbach stripe and automatic zeroing, stopcock with precision tip, filling tube (PVC, transparent), pumphead and 2000 ml bottle (soda-lime glass). Pack of 1.

Please order supports, burette clamps and rubber bellows separately (pages 212-213).

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Cat. No.
10	0.02	0.02	775	**239 19**
25	0.05	0.03	785	**239 20**
50	0.1	0.05	790	**239 21**

Note! On request, BLAUBRAND® class AS burettes are also available with USP individual certificate.

Compact automatic burettes

SILBERBRAND

AR-GLAS®, detachable PTFE stopcock. Error limits according to class B, DIN EN ISO 385. Calibrated to deliver (TD, Ex).

Items supplied:
Burette tube with Schellbach stripe and automatic zeroing, stopcock with precision tip, filling tube (PVC, transparent), pumphead and 2000 ml bottle (soda-lime glass). Pack of 1.

Please order supports, burette clamps and rubber bellows separately (pages 212-213).

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Cat. No.
10*	0.05	0.05	455	**239 09**
25*	0.1	0.08	520	**239 10**
50*	0.1	0.10	730	**239 11**

* reduced distance between subdivision marks

Please order supports, burette clamps and rubber bellows separately (pages 212-213).

Compact automatic burettes, amber glass

SILBERBRAND

Borosilicate glass 5.4, detachable PTFE stopcock. Calibrated to deliver (TD, Ex).
25 ml: Error limit according to class B, DIN EN ISO 385.
50 ml: DIN EN ISO 385, class B.

Items supplied:
Burette tube with white graduation and automatic zeroing, stopcock with precision tip, filling tube (PVC, transparent), pumphead and 2000 ml bottle (soda-lime glass). Pack of 1.

Please order supports, burette clamps and rubber bellows separately (pages 212-213).

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Cat. No.
25*	0.1	0.08	495	**239 29**
50	0.1	0.10	780	**239 30**

* reduced distance between subdivision marks

Compact automatic burettes

BLAUBRAND®, class AS, DE-M marking

Boro 3.3, detachable PTFE stopcock. DIN EN ISO 385. Calibrated to deliver (TD, Ex). Incl. one batch certificate.

Items supplied: Burette tube with Schellbach stripe and automatic zeroing, stopcock with precision tip, filling tube (PVC, transparent) and 1000 ml PE-bottle with base. Pack of 1.

Please order supports, burette clamps and rubber bellows separately (pages 212-213).

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Cat. No.
10	0.02	0.02	775	**238 19**
25	0.05	0.03	785	**238 20**
50	0.1	0.05	790	**238 21**

Note! On request, BLAUBRAND® class AS burettes are also available with USP individual certificate.

Please order supports and burette clamps separately (pages 212-213).

Compact automatic burettes

SILBERBRAND

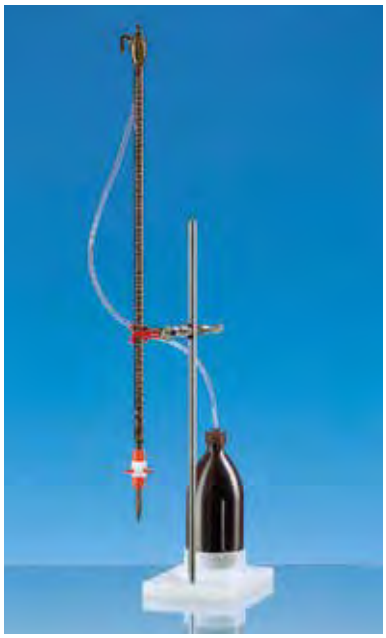
AR-GLAS®, detachable PTFE stopcock. Error limits according to class B, DIN EN ISO 385. Calibrated to deliver (TD, Ex).

Items supplied:
Burette tube with Schellbach stripe and automatic zeroing, stopcock with precision tip, filling tube (PVC, transparent) and 1000 ml PE-bottle with base. Pack of 1.

Please order supports and burette clamps separately (pages 212-213).

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Cat. No.
10*	0.05	0.05	455	**238 09**
25*	0.1	0.08	520	**238 10**
50*	0.1	0.10	730	**238 11**

* reduced distance between subdivision marks



Compact automatic burettes, amber glass

SILBERBRAND

Borosilicate glass 5.4, detachable PTFE stopcock. Calibrated to deliver (TD, Ex).
25 ml: Error limit according to class B, DIN EN ISO 385.
50 ml: DIN EN ISO 385, class B.

Items supplied:

Burette tube with white graduation and automatic zeroing, stopcock with precision tip, filling tube (PVC, transparent) and brown 1000 ml PE-bottle with base. Pack of 1.

Please order supports and burette clamps separately (pages 212-213).

Capacity ml	Subdivision ml	Error limit ± ml	Length mm	Cat. No.
25*	0.1	0.08	495	**238 29**
50	0.1	0.10	780	**238 30**

* reduced distance between subdivision marks

Spare burette tubes

for Compact automatic burettes with automatic zeroing

BLAUBRAND®, incl. batch certificate. Pack of 1.

Description	Capacity ml	Length mm	Cat. No.
BLAUBRAND®, Boro 3.3	10	680	**238 43**
BLAUBRAND®, Boro 3.3	25	690	**238 46**
BLAUBRAND®, Boro 3.3	50	695	**238 48**
SILBERBRAND, AR-GLAS®	10*	360	**238 33**
SILBERBRAND, AR-GLAS®	25*	425	**238 36**
SILBERBRAND, AR-GLAS®	50*	635	**238 38**
SILBERBRAND, amber glass	25*	400	**238 66**
SILBERBRAND, amber glass	50	685	**238 68**

* reduced distance between subdivision marks

(Burette clamps, see page 212-213)

Spare burette stopcock

for all Compact burettes and Compact automatic burettes

PTFE. With screw couplings and seals, without burette tip.
Pack of 1.

Cat. No.	118 05

Spare burette tips

for all Compact burettes and Compact automatic burettes

Pack of 1.

For burettes	Desription	Cat. No.
clear glass 10 ml	clear glass, Boro 3.3	**115 10**
clear glass 25 ml	clear glass, Boro 3.3	**115 11**
clear glass 50 ml	clear glass, Boro 3.3	**115 12**
amber glass 25 and 50 ml	amber glass, Boro 5.4	**115 15**

Spare filling tube

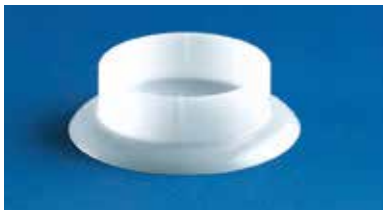
PVC, transparent.
Inner-Ø 5 mm, Outer-Ø 7 mm, length 1 m.
Pack of 1.

Cat. No.	115 25

Bases

Pack of 1.

For bottle ml	Ø bottle mm	Cat. No.
500	75	**237 25**
1000	94	**237 28**



Reservoir bottles

PE-LD. Narrow-mouth bottle with tube bushing. Pack of 1.

Capacity ml	Ø mm	Height mm	Thread GL	Cat. No.
500	75	180	25	**1290 55**
1000	94	212	28	**1290 60**
1000, amber	94	212	28	**1302 60**

Spare reservoir bottles for automatic burettes

Available in clear or amber glass

Boro 3.3 or soda-lime glass. Capacity 2000 ml. Pack of 1.

Material	Ø mm	Height mm	Neck size	Description	Cat. No.
Boro 3.3	160	200	29/32	Clear glass	**233 10**
Boro 3.3	160	200	29/32	Amber glass	**233 20**
Soda-lime glass	160	200	29/32	Clear glass	**1269 65**
Soda-lime glass	160	200	29/32	Amber glass	**1270 65**

Pumphead

for glass reservoir bottle, compact automatic burette

Boro 3.3. NS 29/32. Fitting length 185 mm. Nozzle outer diameter 7 mm. Pack of 1.

Description	Cat. No.
Clear glass	**238 75**
Amber glass	**238 76**

Rubber bellows

for automatic burettes

Orange colored, single-bulb rubber bellows. With valve and tubing. Pack of 1.

Cat. No.	234 00

Burette clamps

Zinc alloy, nickel-plated. PVC-coated clamps. Pack of 1.

Description	Cat. No.
for 1 burette	**165 15**
for 2 burettes	**165 20**

Joint Clip

Stainless-steel Neck size 29/32. Pack of 1.

Cat. No.	556 18

Burette clamp

Alluminium die cast. Two burettes up to 50 ml can be mounted in seconds. With plastic-coated roller grips. Comfortable height adjustment. Graduations remain visible.

Very sturdy design, easy to operate. Integral support connector. Ideal for use with burette support (Cat. No. 238 82). Pack of 1.

Cat. No.	5780 00

Burette clamps

PP, white. To be mounted on support rods of 8 to 14 mm Ø. Easily affixes the burette by clamping with a non-corroding spring. Pack of 1.

Description	Cat. No.
for 1 burette	165 05
for 2 burettes	165 10

Burette support

Baseplate: PP with rubber feet minimize sliding and protect bench-top.
Support rod: Stainless steel.
Includes baseplate 210 x 155 mm (L x W).
Support rod 550 x 12 mm (L x diameter)
Pack of 1.

Cat. No.	238 82

Burette covers

PP. Ribbed inside to prevent suction attachment during titration. Pack of 10.

Inner Ø mm	Height mm	Cat. No.
20	30	164 00

Spare burette stopcocks

Needle-valve stopcocks

BISTABIL, Boro 3.3/PTFE

Valve housing with precision Boro 3.3 burette tip.
Interchangeable PTFE valve spindle, PP cap and retention device.
Valve opening 0-2.5 mm. Pack of 1.

For burette capacity ml	Lateral needle-valve stopcock Cat. No.	Straight needle-valve stopcock Cat. No.
2 - 10	**821 20**	**822 20**
25	**821 21**	**822 21**
50	**821 22**	**822 22**
Spare spindle with retention for ml		
2 - 50	**821 70**	**821 70**

Glass stopcocks

BISTABIL, Boro 3.3

Stopcock housing with precision Boro 3.3 burette tip.
Interchangeable borosilicate glass stopcock key with retention device.
Stopcock size 3NS/12. Pack of 1.

For burette capacity ml	Boro 3.3 Lateral stopcock Cat. No.	Boro 3.3 Straight stopcock Cat. No.
2 - 10	**818 05**	**818 15**
25	**818 07**	**818 17**
50	**818 09**	**818 19**
Spare key with retention for ml		
2 - 10	**811 40**	**810 53**
25	**811 41**	**810 53**
50	**811 42**	**810 53**

Glass stopcocks, amber glass

BISTABIL, Borosilicate glass 5.4

Stopcock housing with burette tip.
Interchangeable PTFE or borosilicate glass key with retention device.
Stopcock size 3NS/12. Pack of 1.

For burette capacity ml	Lateral stopcock PTFE key Cat. No.	Lateral stopcock Glass key Cat. No.	Straight stopcock PTFE key Cat. No.	Straight stopcock Glass key Cat. No.
25	**819 27**	**819 07**	**819 37**	**819 17**
50	**819 27**	**819 09**	**819 39**	**819 19**
Spare key with retention for ml				
25	**811 67**	**811 46**	**812 48**	**812 47**
50	**811 67**	**811 47**	**812 48**	**812 47**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Clinical Laboratory
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Dispensing Equipment / OEM - Products
500ml
Precision analysis requires measuring instruments with consistently high precision. Every BLAUBRAND® volumetric instrument is individually calibrated. Statistical process control ensures with a certainty of at least 99.6 % (AQL ≤ 0.4) compliance with predefined specifications. BLAUBRAND® – quality from the very start.
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Notes:

BRAND®

Temperature and Density Measurement

For the measurement of temperature and density, BRAND offers high quality thermometers, individually calibrated BLAUBRAND® density bottles, and fast, reliable hydrometers.

Density Bottles

BLAUBRAND® density bottles are individually adjusted. The nominal capacity is indelibly engraved on each bottle. Each bottle is calibrated with its own stopper or thermometer; hence, stoppers and thermometers are not interchangeable.
Each bottle and its stopper or thermometer is marked with a unique matching identification number.

Certification note:

All BLAUBRAND® density bottles are supplied with one accompanying individual certificate in the original packaging.
On request, they are also available with a DAkkS calibration certificate.

Density bottles, calibrated

BLAUBRAND®

Borosilicate glass 3.3. DIN ISO 3507, Gay-Lussac type. Calibrated to contain (TC, In). Reference temperature 20 °C. Individual certificate included. Stopper NS 10/19 with capillary. Top of stopper ground and polished. The volume in cm^3 is specified to a precision of 3 decimal places. Pack of 1.

Nominal capacity cm^3	Cat. No.
5	**433 05**
10	**433 08**
25	**433 20**
50	**433 28**
100	**433 38**

BLAU BRAND

Inscriptions in high contrast blue enamel

Density bottles, calibrated

BLAUBRAND®.
With thermometer and side capillary

Borosilicate glass 3.3. DIN ISO 3507. Calibrated to contain (TC, In). Reference temperature 20 °C. Individual certificate included. Side capillary with conical ground cap size NS 7/16. Thermometer with enclosed scale, with standard ground joint NS 10/19, range 10 to 35 °C, divided in 0.2 °C, mercury filled. The volume in cm^3 is specified to a precision of 3 decimal places. Pack of 1.

No longer available in EU Member States (EU directive EG 847/2012).

Nominal capacity cm^3	Cat. No.
10	**434 08**
25	**434 20**
50	**434 28**
100	**434 38**

Density bottles, uncalibrated

Borosilicate glass 3.3. DIN ISO 3507, Gay-Lussac type. Stopper NS 10/19 with capillary. Top of stopper ground and polished. Nominal capacity printed on the bottom. Pack of 2.

Nominal capacity cm³	Cat. No.
5	**432 05**
10	**432 08**
25	**432 20**
50	**432 28**
100	**432 38**

Oxygen flasks, Winkler pattern

Soda-lime glass. For the determination of oxygen dissolved in water. The measured volume is indicated to a precision of 2 decimal places. White labelling area. Solid, obliquely cut standard-ground glass stopper can be secured with a fastening clip. Each flask is calibrated with its own stopper; hence, stoppers and flasks are not interchangeable.

Each flask and its stopper is marked with a unique matching identification number. Pack of 2.

Nominal capacity ml	Neck Size	Cat. No.
100 - 150	14/23	**3860 38**
250 - 300	19/26	**3860 48**

Accessories:

(please order separately)

Fastening clips for oxygen flasks Winkler pattern

Pack of 1.

For Flask	Cat. No.
3860 38	**3861 38**
3860 48	**3861 48**

ASTM Centrifuge Tubes

BLAUBRAND® ASTM centrifuge tubes

Borosilicate glass 3.3. Capacity 100 ml.
Withstands RCF up to 700.
Design, accuracy, etc. to meet ASTM ("American Society for Testing and Materials") specifications.
Pack of 2.

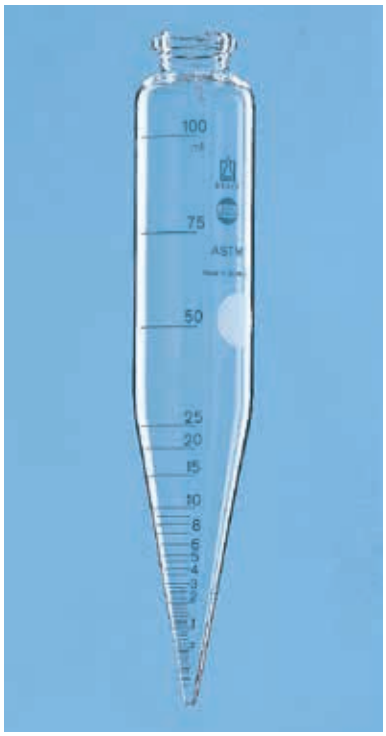
Relative Centrifugal Force (RCF)

$$RCF = 1.118 \cdot r \cdot \left(\frac{n}{1000}\right)^2$$

(see DIN 58970)

r = Rotation radius in mm
n = Speed

Note! On request, ASTM centrifuge tubes are also available with individual quality certificate by BRAND.

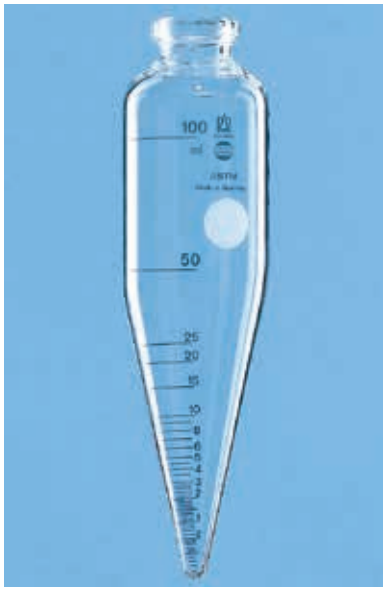


ASTM centrifuge tubes, cylindrical, conical bottom

ASTM D 91.
Length max. 203 mm,
neck inner-Ø approx. 17 mm.

Graduation ml	Subdiv. ml
from 0 to 0.5	0.05
from 0.5 to 2	0.10
from 2 to 3	0.20
from 3 to 5	0.50
from 5 to 10	1
from 10 to 25	5
from 25 to 100	25

Cat. No. **3620 38**



ASTM centrifuge tubes, cylindrical, conical bottom

Former standard ASTM D 96.
Length max. 167 mm,
neck inner-Ø approx. 17 mm.

Graduation ml	Subdiv. ml
from 0 to 0.5	0.05
from 0.5 to 2	0.10
from 2 to 3	0.20
from 3 to 5	0.50
from 5 to 10	1
from 10 to 25	5
from 25 to 100	25

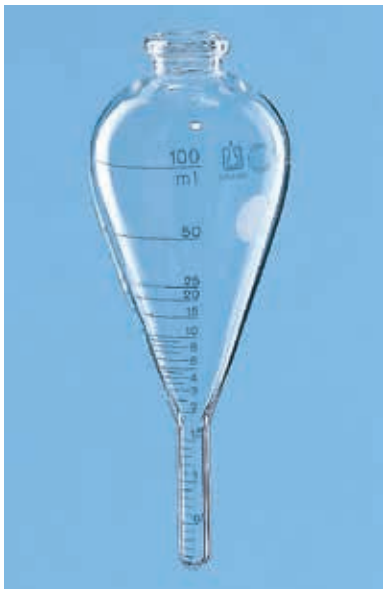
Cat. No. **3623 38**

ASTM centrifuge tubes, pear-shaped, cylindrical bottom

Former standard ASTM D 96.
Length max. 160 mm,
neck inner-Ø approx. 17 mm.

Graduation ml	Subdiv. ml
from 0 to 1.5	0.10
from 1.5 to 3	0.50
from 3 to 5	0.50
from 5 to 10	1
from 10 to 25	5
from 25 to 100	25

Cat. No. **3621 38**



Sedimentation Cones

Imhoff sedimentation cones

SILBERBRAND. Graduated to 100 ml, ring mark at 1000 ml.

Borosilicate glass 3.3. DIN 12672.

Graduation range ml	Subdiv. ml	Error limit ± ml
0 - 2	0.1	0.1
> 2 - 10	0.5	0.5
> 10 - 40	1	1
> 40 - 100	2	2
Ring mark 1000	–	10

With stopcock.
Pack of 1.

Cat. No. **3876 62**

Without stopcock.
Pack of 4.

Cat. No. **3873 62**

Imhoff sedimentation cone

SILBERBRAND.
Graduated to 1000 ml.

Borosilicate glass 3.3. DIN 12672.
Without stopcock. Pack of 4.

Graduation range ml	Subdiv. ml	Error limit ± ml
0 - 2	0.1	0.1
> 2 - 10	0.5	0.5
> 10 - 40	1	1
> 40 - 100	2	2
> 100 - 1000	50	10

Cat. No.	3874 62

Imhoff sedimentation cone, SAN

Graduated to 1000 ml.

SAN, transparent. DIN 12672.
Screw cap allows drainage. Withstands temperatures up to 85 °C. Pack of 1.

Graduation range ml	Subdiv. ml	Error limit ± ml
0 - 2	0.1	0.1
> 2 - 10	0.5	0.5
> 10 - 40	1	1
> 40 - 100	2	2
> 100 - 1000	50	10

Cat. No.	3880 00

Rack for sedimentation cones with and without stopcock

PMMA/PP, holds 2 Imhoff sedimentation cones (glass or plastic; with and without stopcock). Compact design and easy to carry, even with cones filled. Pack of 1.

Length mm	Width mm	Height mm	Cat. No.
300	130	400	**3880 60**

Rack for plastic sedimentation cones

PMMA/PP, holds 2 plastic sedimentation cones. Compact design and easy to carry, even with cones filled. Pack of 1.

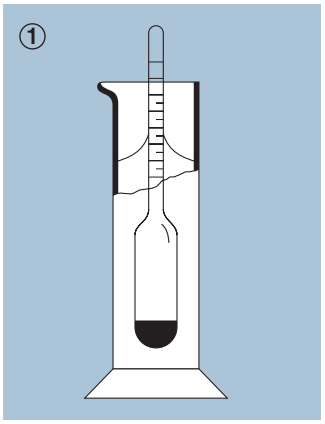
Length mm	Width mm	Height mm	Cat. No.
300	130	315	**3880 50**

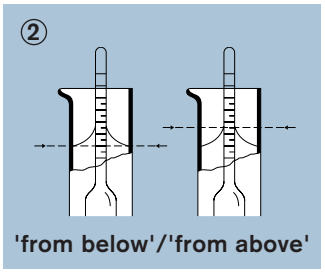
Hydrometers

Measuring Procedures

Hydrometers determine the density of liquids or the concentration of dissolved matter.

Density is frequently indicated in g/cm³ (g/ml) or in °Baumé. Concentration is indicated in percentage by volume (Vol.%) or in percentage by mass (Weight%). Permissible deviations are within ± 2 graduation marks.





'from below'/'from above'

Measuring procedure

Pour the sample into a transparent cylinder (see fig. 1) and adjust its temperature to the indicated reference temperature of the hydrometer. Immediately before measuring, mix well with a glass rod to reduce differing sample densities and temperatures.

A clean hydrometer should only be touched above the scale. Liquid should not adhere more than 5 mm above the reading point.

The meniscus should remain even and not change its shape or height when the stem moves up and down. Hydrometer should first be cleaned carefully in Mucasol® (see page 312).

Once the hydrometer has reached its equilibrium, (floating freely without touching the walls of the cylinder) the density is read "from below" for transparent samples, non-transparent samples are read "from above". (see fig. 2).

Check the temperature of the sample immediately after the reading. Maximum hydrometer measuring temperature should not exceed 70 °C.

Temperature correction

1. Measuring instrument

Certain applications may require a correction to account for the thermal expansion of the hydrometer glass, if the measuring temperature deviates from the reference temperature of the hydrometer. This factor corrects the result for the corresponding measuring temperature.

$K_t = (1-\gamma\,(t - t_0))\,\rho$

K_t	For the density after correction
γ	Volume expansion coefficient of the hydrometer glass $(25 \pm 2)\ 10^{-6}\ K^{-1}$
t	Measuring temperature °C
t_0	Reference temperature °C
ρ	Density reading g/ml

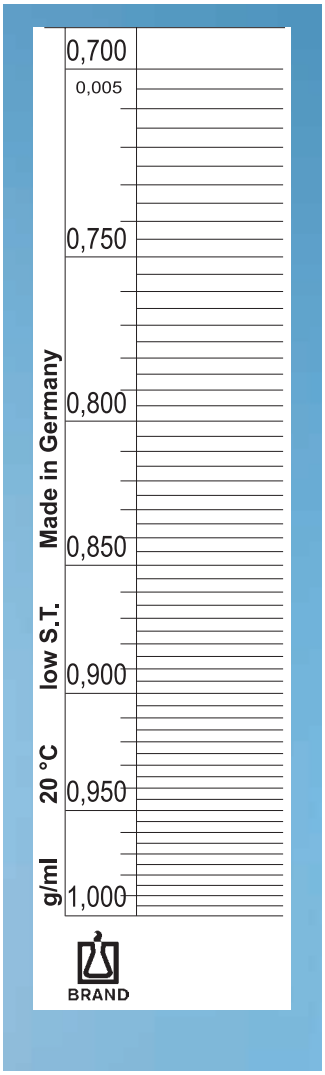
2. Sample

Conversion tables for measured densities to different temperature can be found in many chemical references. These tables can provide expansion coefficients and densities for different sample temperatures and concentrations.

Note! All scales are shown in original size.

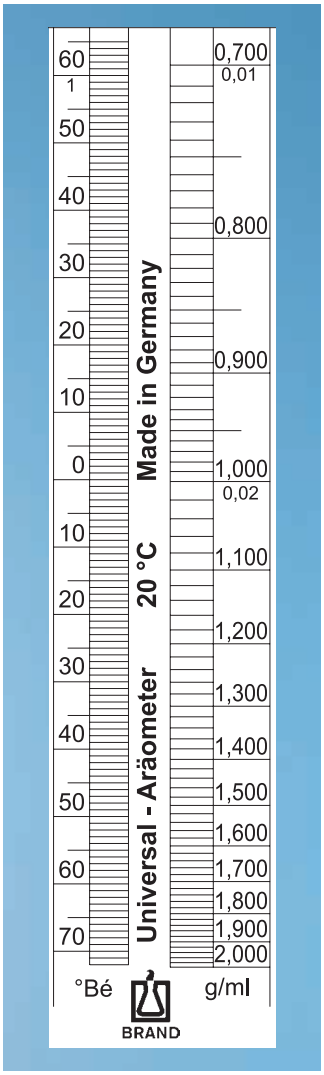
For hydrometers no certificates are provided.

Range finder hydrometers



Subdivisions 0.005 g/cm³, reference temperature 20 °C. Without thermometer, approx. 260 - 300 mm long. Pack of 1.

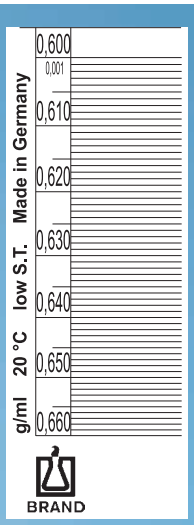
Range g/cm³	Cat. No.
0.700 - 1.000	**9700 10**
1.000 - 1.500	**9700 12**
1.500 - 2.000	**9700 14**



Subdivisions 0.01 g/cm³, reference temperature 20 °C. Without thermometer, approx. 360 mm long. Pack of 1.

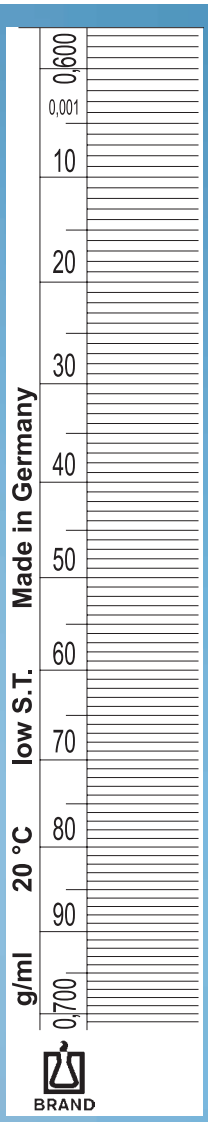
Range g/cm³	Cat. No.
0.700 - 2.000	**9705 10**

General purpose hydrometers



Subdivisions 0.001 g/cm³, reference temperature 20 °C. Without thermometer, approx. 160 mm long. Pack of 1.

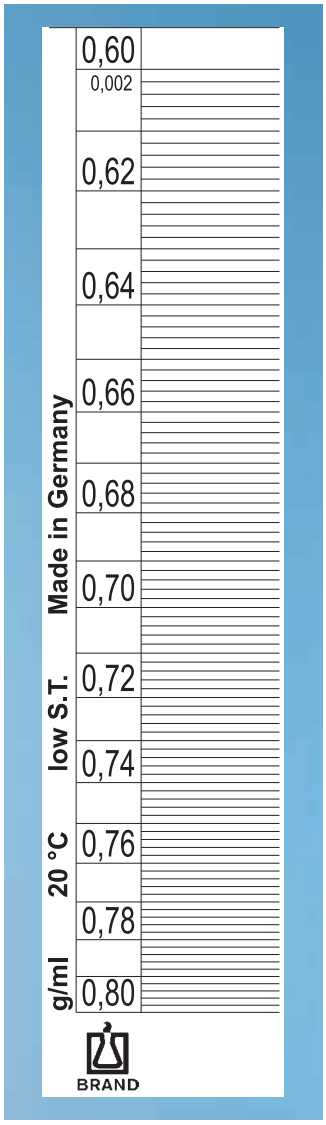
Range g/cm³	Cat. No.
0.600 - 0.660	**9660 30**
0.650 - 0.710	**9660 31**
0.700 - 0.760	**9660 32**
0.760 - 0.820	**9660 33**
0.820 - 0.880	**9660 34**
0.880 - 0.940	**9660 35**
0.940 - 1.000	**9660 36**
1.000 - 1.060	**9660 37**
1.060 - 1.120	**9660 38**
1.120 - 1.180	**9660 39**
1.180 - 1.240	**9660 40**
1.240 - 1.300	**9660 41**
1.300 - 1.360	**9660 42**
1.360 - 1.420	**9660 43**
1.420 - 1.480	**9660 44**
1.480 - 1.540	**9660 45**
1.540 - 1.600	**9660 46**
1.600 - 1.660	**9660 47**
1.660 - 1.720	**9660 48**
1.720 - 1.780	**9660 49**
1.780 - 1.840	**9660 50**
1.840 - 1.900	**9660 51**
1.900 - 1.960	**9660 52**
1.960 - 2.020	**9660 53**



Subdivisions 0.001 g/cm³, reference temperature 20 °C. Without thermometer, approx. 300 mm long. Pack of 1.

Range g/cm³	Cat. No.
0.600 - 0.700	**9685 10**
0.700 - 0.800	**9685 11**
0.800 - 0.900	**9685 12**
0.900 - 1.000	**9685 13**
1.000 - 1.100	**9685 14**
1.100 - 1.200	**9685 15**
1.200 - 1.300	**9685 16**
1.300 - 1.400	**9685 17**
1.400 - 1.500	**9685 18**
1.500 - 1.600	**9685 19**
1.600 - 1.700	**9685 20**
1.700 - 1.800	**9685 21**
1.800 - 1.900	**9685 22**
1.900 - 2.000	**9685 23**

General purpose hydrometers

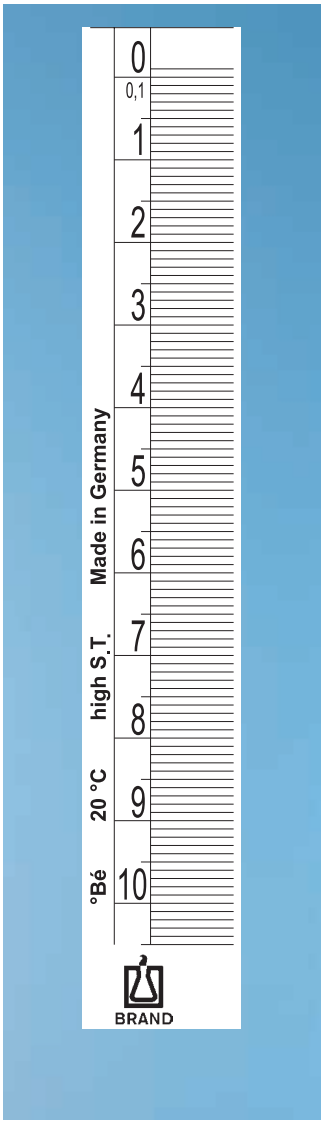


Without thermometer:
Subdivision 0.002 g/cm³, reference temperature 20 °C.
Approx. 280 mm long.
Pack of 1.

With thermometer:
Thermometer range:
0-30/40 °C (subdivision 1 °C).
Petroleum filled, blue colored.
Approx. 330 mm long.
Pack of 1.

Range g/cm³	without thermometer Cat. No.	with thermometer Cat. No.
0.600 - 0.800	**9695 10**	**9696 10**
0.800 - 1.000	**9695 11**	**9696 11**
1.000 - 1.200	**9695 12**	**9696 12**
1.200 - 1.400	**9695 13**	**9696 13**
1.400 - 1.600	**9695 14**	**9696 14**
1.600 - 1.800	**9695 15**	**9696 15**
1.800 - 2.000	**9695 16**	**9696 16**

Hydrometers Baumé pattern



For aqueous solutions and liquids with similar surface tensions.

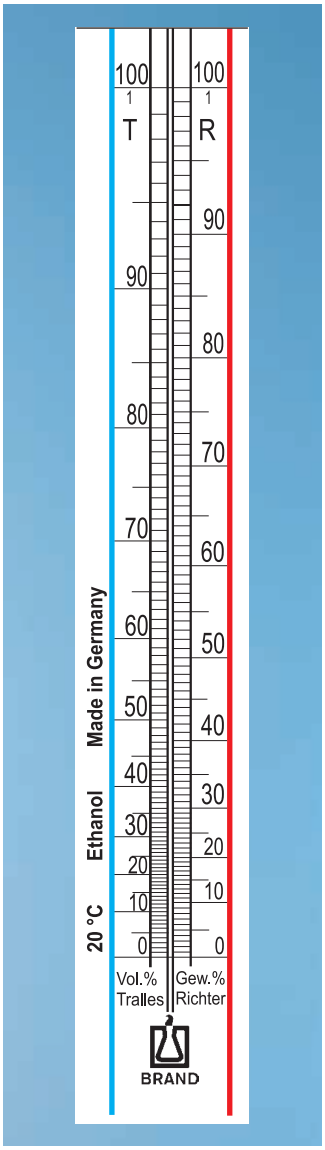
The advantage of this pattern is that the distances between graduation marks remain constant throughout the entire range.

Without thermometer.
Reference temperature 20 °C.
Pack of 1.

Range °Bé	Subdivisions °Bé	Length approx. mm	Cat. No.
0 - 35	1	250	**9715 28**
0 - 50	1	250	**9715 34**
0 - 70	1	250	**9715 35**
0 - 10	0.1	285	**9715 36**
10 - 20	0.1	285	**9715 37**
20 - 30	0.1	285	**9715 38**
30 - 40	0.1	285	**9715 39**
40 - 50	0.1	285	**9715 40**
50 - 60	0.1	285	**9715 41**
60 - 70	0.1	285	**9715 42**

The range 0-70 °C Bé corresponds to the range 1-1.94 g/cm³.

General purpose alcoholometers



Richter + Tralles pattern

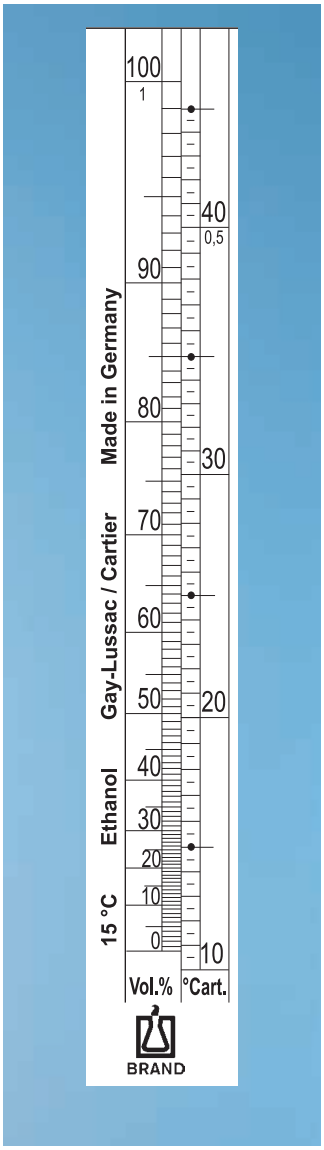
Subdivisions:
1 weight % / 1 vol.%, reference temperature 20 °C, range 0-100% (weight/vol.). Pack of 1.

Without thermometer:
approx. 260 mm long

Cat. No.	9805 10

With thermometer:
approx. 330 mm long, thermometer range: 0-30/ 40 °C (subdivisions 1 °C), petroleum filled, blue colored.

Cat. No.	9805 60



Gay-Lussac + Cartier pattern

Subdivisions:
1 vol.% / 0.5 °Cartier, reference temperature 15 °C, range 0-100 vol.% / 10-45 °Cartier. Pack of 1.

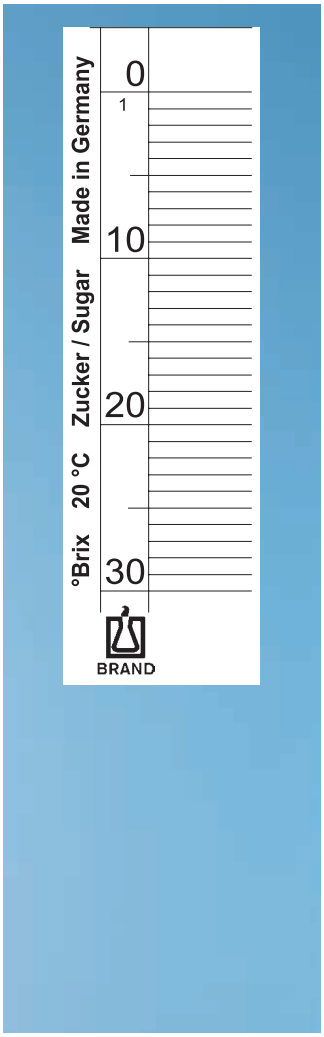
Without thermometer:
approx. 260 mm long

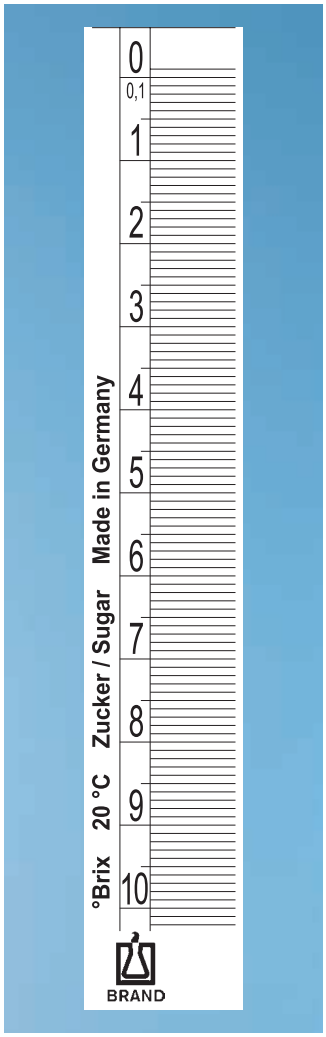
Cat. No.	9803 10

With thermometer:
approx. 330 mm long, thermometer range: 0-30/ 40 °C (subdivisions 1 °C), petroleum filled, blue colored.

Cat. No.	9803 60

Sugar hydrometers





Saccharimeters, Brix pattern (Sugar hydrometers)

(1 °Brix = 1% sugar solution)

Subdivisions: 1 °Brix.
Reference temperature 20 °C.

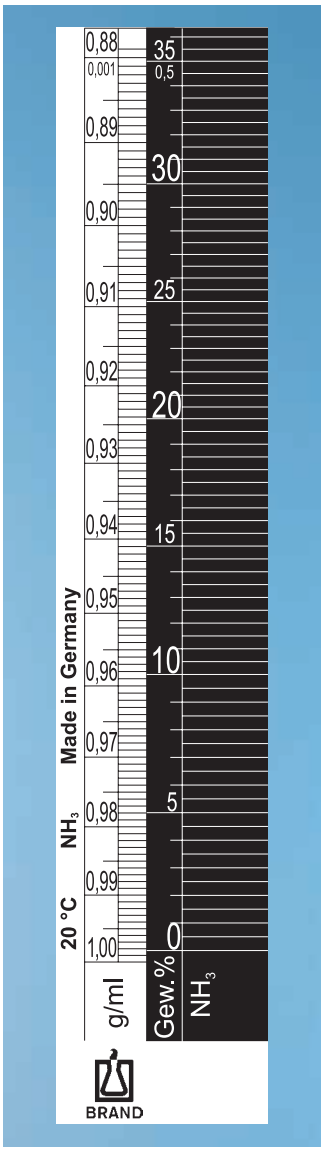
Without thermometer:
approx. 210 mm long.
Pack of 1.

Range °Brix	Cat. No.
0 - 30	9844 17
30 - 60	9844 18
60 - 90	9844 16

Subdivisions: 0.1 °Brix.
Reference temperature 20 °C.

With thermometer:
approx. 330 mm long.
Thermometer range: 0-40/ 50 °C (subdivisions 1 °C).
petroleum filled, blue colored.
Pack of 1.

Range °Brix	Cat. No.
0 - 10	9847 10
10 - 20	9847 11
20 - 30	9847 12
30 - 40	9847 13
40 - 50	9847 14
50 - 60	9847 15

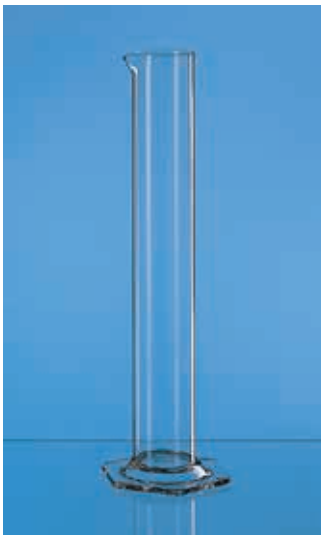


Special-purpose hydrometers

Reference temperature 20 °C. Without thermometer, approx. 290-320 mm long.
All instruments listed below are supplied with double scales (weight % and density), eliminating the need for cross reference documentation.
Pack of 1.

for	Range Weight %	Subdivision Weight %	Cat. No.
Ammonium hydroxide, NH_4OH	0 - 35	0.5	**9875 10**
Sodium chloride, NaCl	0 - 27	0.5	**9926 10**
Hydrochloric acid, HCl	0 - 40	0.5	**9929 10**

Hydrometer cylinders



Borosilicate glass 3.3.
Ungraduated, with hexagonal base and spout.
Pack of 1.

Capac. ml	i. H. mm	i. Ø mm	Cat. No.
250	310	35	**9874 02**
500	340	50	**9874 04**

Hydrometer cylinders

PP. With spout and overflow vessel. Hydrometers can be read while the cylinder is completely filled. The elasticity of the jar reduces the risk of hydrometer breakage.
Pack of 1.

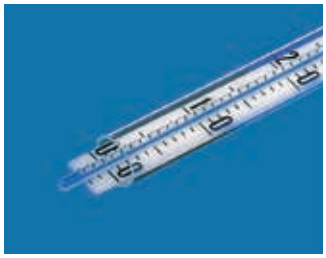
Capac. ml	i. H. mm	i. Ø mm	Cat. No.
500	350	50	**500 00**

Thermometer

BRAND thermometers – premium instruments for measuring temperature.

These high quality thermometers are manufactured in a single casting for a long service life. The dark amber stain is integrated with the glass surface, and is particularly resistant to chemical and physical corrosion.

Note! At temperatures above 150 °C, the thermometer must be carefully preheated approximately to the temperature to be measured before immersion in the fluid.



GOLDBRAND

Precision thermometers, suitable for official certification or officially certified (the official certificate is valid for 15 years).

The accuracy is within the PTB* approved error limits.

SILBERBRAND

General-purpose thermometers for routine applications.

The accuracy remains within twice the PTB* approved error limits.

* PTB (Physikalisch-Technische Bundesanstalt): German Federal Institute of Physics and Metrology

Solid-stem thermometer, yellow coated

The vivid yellow coating on the back of these thermometers clearly contrasts the mercury column and graduations.

Enclosed-scale thermometer

BRAND also carries thermometers with opal glass scales.

Error limits for thermometers

The following error limits are according to "Eichordnung EO 14-1", the German Federal Weights and Measures Regulations.

For thermometers calibrated for total immersion containing **non-wetting** thermometric liquid (e.g., mercury and mercury-thallium alloy) and for thermometers containing **wetting** thermometric liquid (e.g., toluene, pentane and petroleum).

Official error limits for thermometers containing non-wetting thermometric liquids, for the subdivisions:

Temperature range from °C/to °C	0.05 °C	0.1 °C	0.2 °C	0,5 °C	1 °C	2 °C	5 °C
-58 / -10	–	± 0.3	± 0.4	± 0.5	± 1	± 2	± 5
-10 / 110	± 0.1	± 0.2	± 0.3	± 0.5	± 1	± 2	± 5
110 / 210	–	–	± 0.4	± 0.5	± 1	± 2	± 5
210 / 410	–	–	–	± 1	± 2	± 2	± 5
410 / 610	–	–	–	–	± 3	± 4	± 5

Official error limits for thermometers containing wetting thermometric liquids, for the subdivisions:

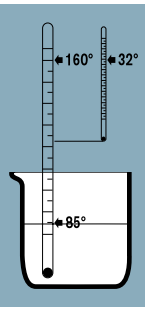
Temperature range from °C/to °C	0.5 °C	1 °C	2 °C	5 °C
-200 / -110	–	± 3	± 4	± 5
-110 / -10	± 1	± 2	± 4	± 5
-10 / 110	± 1	± 2	± 3	± 5
110 / 210	–	± 3	± 4	± 5

Calibration / Temperature correction (approximation)

Unless marked otherwise, thermometers are calibrated "for total immersion".
This means that the meniscus of the mercury column is level with the surface of the liquid being measured.
If part of the mercury column is visible above the liquid surface, a correction may be necessary.

Equation for correction:

$$t_k = t + \frac{(t-t')\,n}{6250}$$



Example:

Temp. reading:	**t = 160 °C**
Immersion point:	**t^x = 85 °C**
Emerging mercury column:	
Mean temperature:	**t' = 32 °C**
Length in °C (on scale):	**n = 160-85 = 75**
Corrected temp.:	**t_k = 161.5 °C**

1 Solid-stem thermometers

DIN 12770, for general purpose, SILBERBRAND

Calibrated for total immersion. Stem Ø 6-7 mm, yellow coated, upper end round. Graduation and inscriptions in dark amber stain. Measuring capillary of oval cross section improves readability. Pack of 1.

Range from / to °C	Subdivision °C	Overall length mm	Filling	Cat. No.
-35 / 50	1	260	Mercury	8000 01
-10 / 50	1	250	Mercury	8000 02
-10 / 110	1	280	Mercury	8000 03
-10 / 150	1	280	Mercury	8000 04
-10 / 200	1	300	Mercury	8000 05
-10 / 250	2	320	Mercury	8000 96
-10 / 300	2	320	Mercury	8000 97
-10 / 360	2	320	Mercury	8000 98
-10 / 410	2	350	Mercury	8000 99
-35 / 50	1	260	Petroleum, red colored	8001 01
-10 / 100	1	260	Petroleum, red colored	8001 03
-10 / 150	1	260	Petroleum, red colored	8001 04

No longer available in EU Member States (EU directive EG 847/2012).

2 Stirring thermometers, solid-stem

DIN 12770, for general purpose, SILBERBRAND

Calibrated for total immersion. With reinforced bottom end for stirring in beakers, etc. Stem Ø 6-7 mm, yellow coated, upper end round. Graduation and inscriptions in dark amber stain. Measuring capillary of oval cross section for better readability. Mercury filled. Pack of 1.

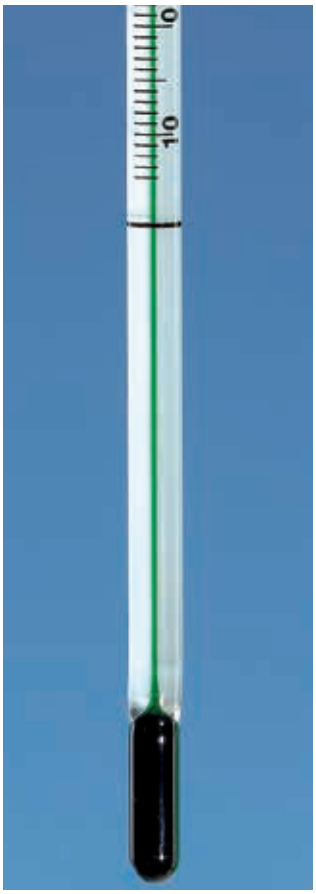
Range from / to °C	Subdivision °C	Overall length mm	Cat. No.
-10 / 50	1	300	8005 02
-10 / 110	1	300	8005 03
-10 / 150	1	300	8005 04
-10 / 220	1	300	8005 06
0 / 360	2	300	8005 48
0 / 50	1	150	8006 02
-10 / 110	1	150	8006 03
0 / 150	1	150	8006 04
0 / 220	2	150	8006 46
0 / 360	2	150	8006 48

3 Enclosed-scale thermometers

DIN 12770, for general purpose, SILBERBRAND

Calibrated for total immersion. Tube Ø 7-8 mm, upper end with ring. Opal glass scale with black graduation and inscriptions. Prismatic measuring capillary, in brilliant blue. Mercury filled. Pack of 1.

Range from / to °C	Subdivision °C	Overall length mm	Cat. No.
-35 / 50	1	260	8004 01
-10 / 50	1	200	8004 02
-10 / 100	1	260	8004 03
-10 / 150	1	260	8004 04
-10 / 200	1	300	8004 05
-10 / 250	1	300	8004 06
-10 / 300	1	340	8004 07
-10 / 360	1	340	8004 08
-10 / 420	1	340	8004 09



Solid-stem thermometers, without mercury

for general purpose, SILBERBRAND

Calibrated for partial immersion. Immersion depth 76 mm. Stem Ø 6-7 mm, white coated, upper end with ring. Graduation and inscriptions in dark amber stain. Indicator fluid is a green, wetting, thermometric liquid that is also biodegradable. Measuring capillary with large cross section for improved readability. Pack of 1.

Range from / to °C	Subdivision °C	Overall length mm	Cat. No.
-10 / 110	1	300	**8002 00**
-10 / 110	0.5	300	**8002 02**
-10 / 150	1	300	**8002 04**
-10 / 250*	2	300	**8002 06**
-10 / 360*	2	300	**8002 08**

* The color may fade due to thermal effects over time

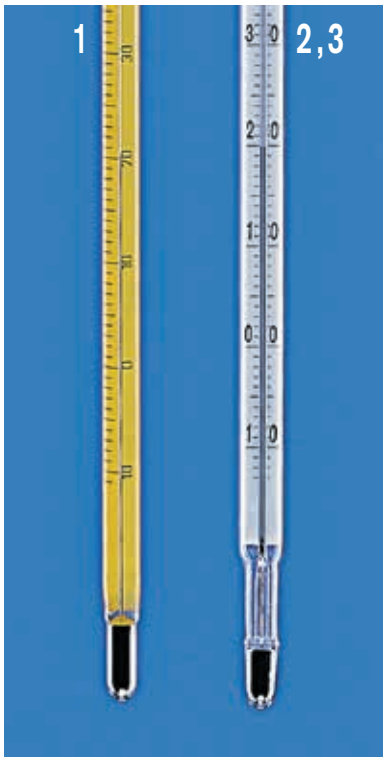
No longer available in EU Member States (EU directive EG 847/2012).

Pocket thermometers, solid-stem

DIN 12770, for general purpose, SILBERBRAND

In nickel-plated metal case with bayonet catch and clip. Case Ø 12 mm, overall length 140 mm. Calibrated for total immersion. Stem Ø 6-7 mm, yellow coated. Graduation and inscriptions in dark amber stain. Measuring capillary with oval cross section for improved readability. Mercury filled. Pack of 1.

Range from / to °C	Subdivision °C	Cat. No.
-30 / 50	1	**8385 01**
0 / 100	1	**8385 03**



1 Precision solid-stem thermometers

DIN 12770, GOLDBRAND

Calibrated for total immersion. Stem Ø 6-7 mm, yellow coated, top end round. Black graduation and inscriptions. Measuring capillary with oval cross section for improved readability. Mercury filled. Pack of 1.

Range from / to °C	Subdivision °C	Overall length mm	Suitable for official certification* Cat. No.
-10 / 50	1	250	**8040 02**
0 / 50	0.5	250	**8040 12**
0 / 50	0.2	320	**8040 22**
0 / 50	0.1	420	**8040 32**
-10 / 110	1	300	**8040 03**
0 / 100	0.5	300	**8040 13**
0 / 100	0.2	400	**8040 23**
0 / 100	0.1	550	**8040 33**
-10 / 150	1	300	**8040 04**
0 / 150	0.5	320	**8040 14**
0 / 150	0.2	450	**8040 24**
-10 / 250	1	350	**8040 06**
0 / 250	0.5	350	**8040 16**
-10 / 360	1	380	**8040 08**
0 / 360	0.5	450	**8040 18**
-10 / 410	1	400	**8040 09**

* upon request, officially calibrated with calibration certificate and/or DAkkS calibration certificate

No longer available in EU Member States (EU directive EG 847/2012).

2 Precision thermometers, enclosed-scale pattern

DIN 12775, GOLDBRAND

Calibrated for total immersion. Tube Ø 7.5-8.5 mm, upper end with Richter-pattern top and knob. Opal glass scale with black graduation and inscriptions. Prismatic measuring capillary, in brilliant blue. Mercury filled. Pack of 1.

Range from / to °C	Subdivision °C	Overall length mm	Suitable for official certification* Cat. No.
0 / 50	0.5	220	**8045 12**
0 / 50	0.1	420	**8045 32**
0 / 100 **	1	305	**8045 03**
0 / 100	0.5	270	**8045 13**
0 / 100 ***	0.1	550	**8045 33**
0 / 150 **	1	305	**8045 04**
0 / 150	0.5	350	**8045 14**
0 / 250 **	1	350	**8045 06**
0 / 250	0.5	420	**8045 16**
0 / 360 **	1	380	**8045 08**

* upon request, officially calibrated with calibration certificate and/or DAkkS calibration certificate
** to DIN 12778, *** to DIN 12770

3 Maximum-precision thermometers, enclosed-scale p.

DIN 12770, GOLDBRAND

For measurements in the autoclave. Reading is carried out at 23 °C. No temperature correction is required. Withstands vacuum and pressure to 5 bar. Calibrated for total immersion. Tube Ø 7-8 mm, upper end with Richter-pattern top and knob. Opal glass scale with black graduation and inscriptions. Prismatic measuring capillary. Mercury filled. Pack of 1.

Range from / to °C	Subdivision °C	Overall length mm	Suitable for official certification* Cat. No.
-10 / 150	1	260	**8206 00**

* upon request, officially calibrated with calibration certificate and/or DAkkS calibration certificate

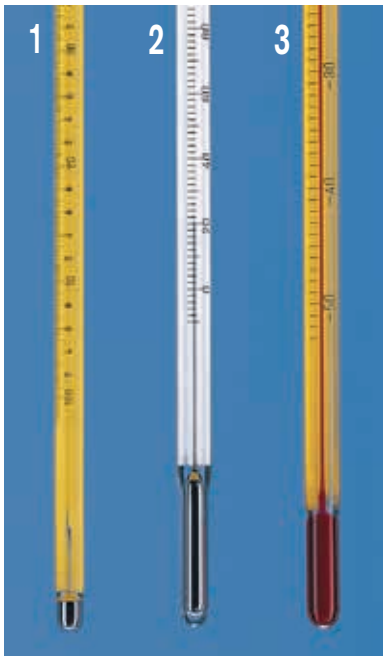
1 Precision Anschutz thermometer

Precision solid-stem thermometers, DIN 12770, GOLDBRAND

Calibrated for total immersion. Stem Ø 5-6 mm, yellow coated, upper end with knob. Black graduation and inscriptions. Measuring capillary with oval cross section for improved readability. Mercury filled. Pack of 1.

Range from / to °C	Subdivision °C	Overall length mm	Suitable for official certification/ calibratable Cat. No.
0 / 50	0.1	340	**8080 32***
50 / 100	0.1	340	**8080 33***
100 / 150	0.1	340	**8080 34****
150 / 200	0.1	340	**8080 35****
200 / 250	0.1	340	**8080 36****
250 / 300	0.1	340	**8080 37****
300 / 360	0.1	340	**8080 38****

* upon request, officially calibrated with calibration certificate and/or DAkkS calibration certificate
** upon request, available officially tested with calibration certificate and/or DKD calibration certificate



2 Precision high-temperature thermometer

solid-stem thermometer, DIN 12778, GOLDBRAND

Calibrated for total immersion. Stem Ø 5-7 mm, frosted reverse side, upper end drawn out and sealed. Black graduation and inscriptions. Measuring capillary with large cross section for improved readability. Mercury filled. Pack of 1.

Range from / to °C	Subdivision °C	Overall length mm	Suitable for official certification* Cat. No.
0 / 610	2	450	**8120 10**

* upon request, officially calibrated with calibration certificate and/or DAkkS calibration certificate

No longer available in EU Member States (EU directive EG 847/2012).

3 Precision low-temperature thermometer

solid-stem thermometer, GOLDBRAND

Calibrated for total immersion. Stem Ø 6-8 mm, upper end round. Black graduation and inscriptions. Measuring capillary with large cross section for improved readability. Pack of 1.

Range from / to °C	Subdivision °C	Overall length mm	Filling	Suitable for official certification* Cat. No.
-38 / 50 ***	1	260	Hg	**8050 01**
-38 / 50 ***	0.5	280	Hg	**8050 11**
-50 / 30	1	280	Toluene, dyed red	**8052 02**
-50 / 30	0.5	280	Toluene, dyed red	**8052 12**
-100 / 30 **	1	305	Toluene, dyed red	**8052 03**
-100 / 30	0.5	320	Toluene, dyed red	**8052 13**

* upon request, officially calibrated with calibration certificate and/or DAkkS calibration certificate
** to DIN 12778, *** to DIN 12770

No longer available in EU Member States (EU directive EG 847/2012).

1 Dropping point thermometer, Ubbelohde pattern

Precision enclosed-scale thermometer with very small, rapid response mercury bulb, to DIN 12 785, GOLDBRAND

Calibrated for total immersion. Top tube Ø 9.0-9.6 mm, bottom 3.3-3.7 mm. Upper end round. Opal glass scale with black graduation and inscriptions. Prismatic measuring capillary. Mercury filled. Mounted with metal fitting. Pack of 1.

Range from / to °C	Subdivision °C	Overall length mm	Suitable for official certification* Cat. No.
0 / 110	1	240	**8711 01**

* upon request, officially calibrated with calibration certificate and/or DAkkS calibration certificate

2 Cloud point and setting point thermometers

Precision enclosed-scale thermometer to DIN 12 785, GOLDBRAND

Calibrated for 180 mm immersion. Top tube Ø 9-11 mm, bottom 4.5-5.5 mm. Upper end round. Opal glass scale with black graduation and inscriptions. Prismatic measuring capillary. Toluene filled, dyed red. Pack of 1.

Range from / to °C	Subdivision °C	Overall length mm	Suitable for official certification* Cat. No.
-70 / 50	1	360	**8705 03**

* upon request, officially calibrated with calibration certificate and/or DAkkS calibration certificate

3 Congealing point thermometer

Precision solid-stem thermometer, prismatic, to DIN 12 785, GOLDBRAND

Calibrated for total immersion. Stem Ø 6-7 mm, yellow coated, upper end with ring. Black graduation and inscriptions. Measuring capillary of oval cross section for improved readability. Mercury filled. Pack of 1.

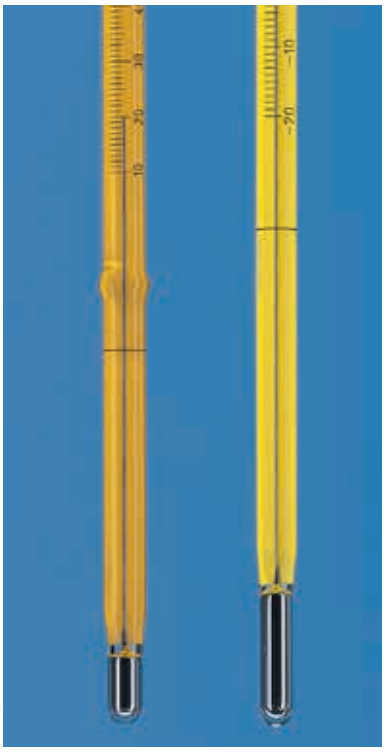
Range from / to °C	Subdivision °C	Overall length mm	Suitable for official certification* Cat. No.
0 / 100	0.5	300	**8668 01**

* upon request, officially calibrated with calibration certificate and/or DAkkS calibration certificate

ASTM thermometers

ASTM No.	Range from / to °C	Subdivision °C	Overall length mm	Immersion depth mm	Suitable for official certification*/calibratable Cat. No.
1 C	-20 / 150	1	322	76	8800 01
2 C	-5 / 300	1	390	76	8800 02
3 C	-5 / 400	1	415	76	8800 03
5 C	-38 / 50	1	230	108	8800 04
6 C	-80 / 20	1	230	76	8800 05
7 C	-2 / 300	1	385	total immers.	8800 06
8 C	-2 / 400	1	385	total immers.	8800 07
9 C W	-5 / 110	0.5	290	57	8800 08
10 C W	90 / 370	2	290	57	8800 09
11 C	-6 / 400	2	310	25	8800 10
12 C	-20 / 102	0.2	420	total immers.	8800 11
14 C	38 / 82	0.1	375	79	8800 13
15 C	-2 / 80	0.2	395	total immers.	8800 14
16 C	30 / 200	0.5	395	total immers.	8800 15
17 C W	19 / 27	0.1	275	total immers.	8800 16
18 C W	34 / 42	0.1	275	total immers.	8800 17
20 C W	57 / 65	0.1	275	total immers.	8800 19
22 C W	95 / 103	0.1	275	total immers.	8800 21
23 C	18 / 28	0.2	212	90	8800 22
24 C	39 / 54	0.2	237	90	8800 23
33 C	-38 / 42	0.2	420	50	8800 27
34 C	25 / 105	0.2	420	50	8800 28
35 C	90 / 170	0.2	420	50	8800 29
36 C	-2 / 68	0.2	405	45	8800 30
37 C	-2 / 52	0.2	395	100	8800 31
39 C	48 / 102	0.2	395	100	8800 33
40 C	72 / 126	0.2	395	100	8800 34
41 C	98 / 152	0.2	395	100	8800 35
42 C	95 / 255	0.5	395	100	8800 36
44 C T	18.6 / 21.4	0.05	305	total immers.	8800 86
45 C T	23.6 / 26.4	0.05	305	total immers.	8800 87
46 C T	48.6 / 51.4	0.05	305	total immers.	8800 88
49 C	20 / 70	0.2	305	65	8800 37
54 C	20 / 100.6	0.2	310	total immers.	8800 90
56 C	19 / 35	0.02	585	total immers.	8800 40
57 C W	-20 / 50	0.5	287	57	8800 41
61 C	32 / 127	0.2	380	79	8800 42
62 C	-38 / 2	0.1	379	total immers.	8800 43
63 C	-8 / 32	0.1	379	total immers.	8800 44
64 C T	25 / 55	0.1	379	total immers.	8800 45
66 C T	75 / 105	0.1	379	total immers.	8800 47
67 C T	95 / 155	0.2	379	total immers.	8800 48
82 C W	-15 / 105	1	162	30	8800 52
83 C W	15 / 70	1	171	40	8800 53
86 C W	95 / 175	1	167	35	8800 56
88 C W	10 / 200	1	287	57	8800 58
89 C	-20 / 10	0.1	370	76	8800 59
90 C	0 / 30	0.1	370	76	8800 60
91 C	20 / 50	0.1	370	76	8800 61
92 C	40 / 70	0.1	370	76	8800 62
93 C	60 / 90	0.1	370	76	8800 63
94 C	80 / 110	0.1	370	76	8800 64
95 C	100 / 130	0.1	370	76	8800 65**
102 C	123 / 177	0.2	395	100	8800 69
103 C	148 / 202	0.2	395	100	8800 70
104 C	173 / 227	0.2	395	100	8800 71**
105 C	198 / 252	0.2	395	100	8800 72**
106 C	223 / 277	0.2	395	100	8800 73**
107 C	248 / 302	0.2	395	100	8800 74**
110 C T	133.6 / 136.4	0.05	305	total immers.	8800 79**
114 C	-80 / 20	0.5	300	total immers.	8800 78
120 C T	38.6 / 41.4	0.05	305	total immers.	8800 84
121 C T	98.6 / 101.4	0.05	305	total immers.	8800 85

* upon request, officially calibrated with calibration certificate and/or DAkkS calibration certificate,
** upon request, available officially tested with calibration certificate and/or DAkkS calibration certificate.
W Beaded type, T Thermometer with auxiliary scale at 0 °C



ASTM thermometers

precision solid-stem thermometers, GOLDBRAND

Design, accuracy, etc. to meet ASTM ("American Society for Testing and Materials") specifications. Clear contrast through yellow coating. Black graduation and inscriptions. Mercury filled, under nitrogen (except 6 C and 114 C which are toluene filled). All thermometers without metal fittings. Pack of 1.

No longer available in EU Member States (EU directive EG 847/2012).

a: Immersion depth
b: Fitting length

No longer available in EU Member States (EU directive EG 847/2012).

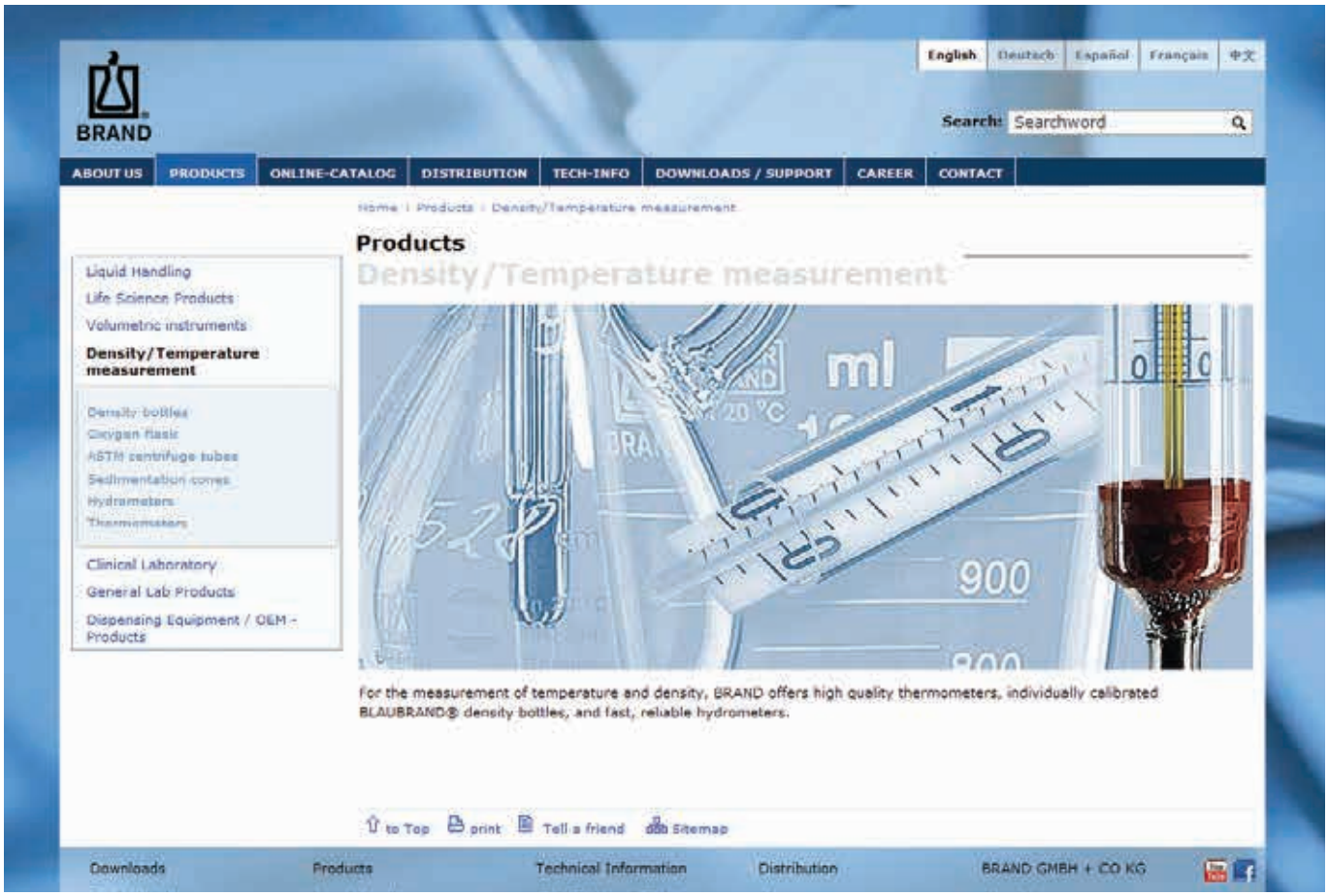
Precision thermometers with standard ground-glass joint

enclosed-scale thermometer, DIN 12770, NS 14/23, GOLDBRAND

Calibrated for partial immersion, with indication of the mean mercury column temperature. Top tube Ø 10.5-11.5 mm, bottom 7-8 mm. Upper end with round finished seal. Opal glass scale with black graduation and inscriptions. Prismatic measuring capillary, in brilliant blue. Mercury filled. Pack of 1.

Range from / to °C	Subdivision °C	Fitting length approx. mm	Immersion depth approx. mm	Suitable for official certification* Cat. No.
-10 / 150	0.5	50	27	**8130 49**
-10 / 150	0.5	60	37	**8130 50**
-10 / 150**	0.5	75	52	**8130 51**
-10 / 250	1	50	27	**8130 59**
-10 / 250	1	60	37	**8130 60**
-10 / 250**	1	75	52	**8130 61**

* upon request, officially calibrated with calibration certificate and/or DAkkS calibration certificate
** to DIN 12784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Clinical laboratories see a wide range of specimens and use a great variety of methods.
Products from BRAND for the medical laboratory are subjected to rigid quality control procedures. This ensures precise results.

Sample cup

for Technicon-Analyzer

PS, transparent. CE-marked according to IVD-Directive 98/79 EC.
Packed in bags of 1000.

Capacity ml	Upper Ø mm	Lower Ø mm	Height mm	Cat. No.
1.5	15	12.2	22.7	**1150 15**
2	14.8	12.8	24.9	**1150 16**
4	17	13.3	38	**1150 17**

Push-on caps

for Analyzer Sample cup

PE. Suitable for Technicon 1.5 ml and 2 ml sample tubes.
CE-marked according to IVD-Directive 98/79 EC.
Pack of 1000.

Cat. No.	1150 20

Sample cup

with snap cap

PS, transparent. PE snap cap.
Pack quantity: 1000 = 10 bags of 100.

Capacity ml	Ø mm	Height mm	Cat. No.
12	22	38	**7220 60**

Sample cup

for COULTER COUNTER®

PS, transparent. PE lid. CE-marked according to IVD-Directive 98/79 EC.
Pack quantity: 1000 = 4 bags of 250.

Capacity ml	Ø mm	Height mm	Cat. No.
20	32	56	**7220 55**

Jar with snap-on lid

Jar PS, snap-on lid PE-LD. Conical shape. Pack of 1000.

Capacity ml	max. Ø mm	Height mm	Cat. No.
25	47	32	**623 15**

Jars with push-on lid

PP. Pack of 10.

Capacity ml	max. Ø mm	Height mm	Cat. No.
approx. 50	56	25	**618 15**
approx. 115	75	30	**618 20**

Jar with screw cap

PP. Conical shape. Pack of 500.

Capacity ml	max. Ø mm	Height mm	Cat. No.
30	57	32	**623 10**

Urine beaker

with press-on lid

PP, with red PE lid. For hygienic and odorless urine sample handling. Lid is simply sealed by being pressed on. Easy to use: simply cut off integrated spout tip and insert test strip. CE-marked according to IVD-Directive 98/79 EC.

Description	Capacity ml	Subdivision ml	Ø mm	Height mm	Pack of	Cat. No.
Beaker + lid	125	25			1000*	**7589 00**
Beaker	125	25	65	70	1000*	**7589 01**
Red lid	–	–	70	–	1000*	**7589 02**

* Beakers: Pack of 1000, lids: Pack of 2 x 500.

Urine beaker

with screw cap

PP, with PE screw cap. For hygienic and odorless urine sample handling. CE-marked according to IVD-Directive 98/79 EC.

Description	Capacity ml	Subdivision ml	Ø mm	Height mm	Pack of	Cat. No.
non-sterile (green cap)	100	20	65	75	1000*	**7589 05**
γ-ray sterile (yellow cap)	100	20	65	75	240**	**7589 10**

* Beakers: Pack of 1 x 1000, lids: Pack of 2 x 500 ** 48 bags of 5

Faeces container

with screw cap

PS. With label. Easy to use with PS screw cap which serves as a sample scoop grip. CE-marked according to IVD-Directive 98/79 EC. Pack of 400.

Description	Capacity ml	Ø mm	Height mm	Cat. No.
non-sterile (blue cap)	30	26	92	**623 05**

Sterilization indicator tape

Self-adhesive crêpe paper containing thermoactive pigments. The white colored strips turn brown after autoclaving (121 °C: after approx. 20 min., 134 °C: after approx. 5 min.). Pack quantity: 1 roll.

Length m	Width mm	Cat. No.
50	19	**617 50**

Disposal bags

for collection of disposable items after use

PP/PA. Caution: Risk of injury! Never put sharp objects such as needles into plastic bags. Bags must be open during sterilization.

PP, autoclavable (121 °C).
PA, autoclavable (134 °C) and hot-air sterilization at 180 °C.

Description	Length mm	Width mm	Pack of	Cat. No.
PP	300	200	100	**7597 05**
PA	300	200	50	**7597 10**

Stand for disposal bags

Epoxy-coated steel wire, with rubber feet. Not autoclavable. Pack of 1.

Description	Inner Ø mm	Height mm	Cat. No.
with 100 disposal bags of PP	120	250	**7597 00**
with 50 disposal bags of PA	120	250	**7597 01**
Stand, white	120	250	**7597 03**

Workstation storage/dispenser boxes

PMMA, white and clear. Available in two sizes. Ideal for storing and dispensing small laboratory items like pipette tips, microcentrifuge tubes, pasteur pipettes, etc. Removeable top cover with hinged front cover. Pack of 1.

Description	Length mm	Width mm	Height mm	Cat. No.
large	165	152	355	**1319 00**
small	165	152	178	**1319 02**

Petri dish

Soda-lime glass. Excellent glass quality and workmanship. Dish and lid are flat inside and outside and are free from bubbles and streaks. Cut edges are fire-polished.
Pack of 10.

Lid Ø mm	Dish height (base) mm	Cat. No.
40	12	**4557 01**
60	15	**4557 17**
80	15	**4557 32**
100	15	**4557 42**
100	20	**4557 43**
150	25	**4557 51**

Petri dish

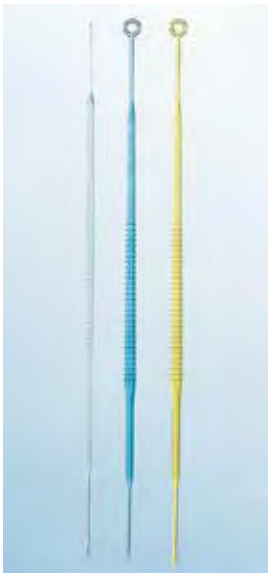
PS. Transparent, with lid, disposable. Available with or without vent lid.
Dishes and lids are assembled robotically to reduce the risk of contamination.
Pack of 480 = 24 bags of 20.

Description	Lid Ø mm	Height mm	Cat. No.
without vent	94	16	**4520 00**
with vent lid	94	16	**4520 05**

Petri dish

PS. With or without vent. Dishes and lids are assembled robotically to reduce the risk of contamination. Pack of 1620 = 108 bags of 15.

Description	Lid Ø mm	Height mm	Cat. No.
without vent	55	14	**4520 15**
with vent lid	55	14	**4520 10**



Inoculation loops

with needle, disposable

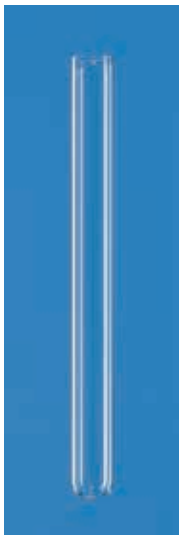
PS. For inoculation of nutrient media. Available either with loop at one end and needle at the other or loops at both ends. High flexibility permits gentle streaking without damaging the nutrient surface. γ-ray sterilized. Pack quantity: 1000 = 50 bags of 20.

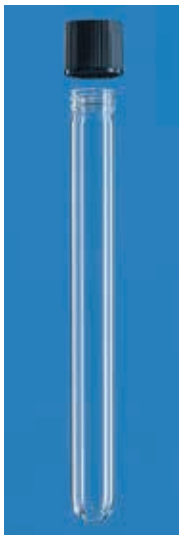
Description	Color	Cat. No.
Capacity of loop: 1 µl	natural	**4522 01**
Capacity of loop: 10 µl	blue	**4522 10**
Capacity of loop: 1 + 10 µl	yellow	**4522 15**

Culture tubes

Rimless or with screw cap (GL thread)

AR-GLAS®. Screw cap, PP, with white TPE elastomer seal.
Autoclavable at 121 °C (2 bar), acc. DIN EN 285.





Description	Capacity ml	Outer-Ø mm	Height mm	Wall thickness, mm	RCF max.	Pack of	Cat. No.
with thread GL 14*	6.5	12	100	1	3000	100	**1139 31**
with thread GL 18*	10	16	100	1	3000	100	**1139 35**
with thread GL 18*	20	16	160	1	1800	100	**1139 41**
with thread GL 18*	30	18	180	1	1100	100	**1139 43**
rimless	3	10	75	0.6	3000	250	**1141 05**
rimless	5.5	12	75	0.6	3000	250	**1141 06**
rimless	7.5	12	100	0.6	3000	144	**1141 10**
rimless	13	16	100	0.7	2600	78	**1141 15**
rimless	18	16	125	0.7	1800	105	**1141 20**
rimless	22	16	160	0.7	1500	100	**1141 25**
rimless	30	18	180	0.7	900	121	**1141 30**

* and screw cap

Centrifuge tubes

Rimless, round bottom

PC. Embossed graduation, subdivisions approx. 1 mm. Transparent, slight yellow tint.
Withstands RCF up to 20 000. Pack of 10.

Capacity ml	Subdivision ml	Outer-Ø mm	Height mm	Cat. No.
50	1	35	99	**7810 29**
100	–	41	115	**7810 39**
100	2	45	98	**7810 40**

Polycarbonate strength may be dramatically reduced when it is autoclaved or treated with alkaline cleaning agents.

Centrifuge tubes

with screw cap

PP, translucent. Withstands RCF up to 3000. Graduated, available non-sterile and γ-ray sterilized in 15 ml or 50 ml. Screw cap PE with sealing cone.
CE-marked according to IVD-Directive 98/79 EC.

Capacity ml	Description	γ-ray sterile/ non-sterile	Outer-Ø mm	Height mm	Pack of	Cat. No.
15*	without base	non-sterile	17	120	750 (5 x 150)	**1148 17**
15*	without base	sterile	17	120	750 (5 x 150)	**1148 18**
50	without base	non-sterile	30	114	300 (6 x 50)	**1148 20**
50	without base	sterile	30	114	300 (6 x 50)	**1148 21**
50	with base	non-sterile	30	116	250 (5 x 50)	**1148 22**
50	with base	sterile	30	116	250 (5 x 50)	**1148 23**

* Filling volume (working volume: 13 ml)

Centrifuge tubes

Cylindrical, with rim

PP. Without stopper. Withstands RCF up to 4500. Autoclavable (121 °C).

Capacity ml	Outer-Ø mm	Height mm	Pack of	Cat. No. (without stopper)
10	16	100	3750 (250 per bag)	**1153 42**
30	20	100	500 (50 per bag)	**1153 48**
26	24	90	500 (50 per bag)	**1153 46**
48	30	100	400 (25 per bag)	**1153 50**
75	35	100	300 (20 per bag)	**1153 52**
110	40	120	300 (20 per bag)	**1153 54**
160	45	120	100 (10 per bag)	**1153 56**

PE-Stopper*

for PP centrifuge tubes

PE. Packed in bags of 100.

Suitable for tube No.	Pack of	Cat. No.
1153 42	1000	**1153 60**
1153 48	500	**1153 66**
1153 46	500	**1153 68**
1153 50	500	**1153 70**
1153 52	500	**1153 72**
1153 54	100	**1153 74**
1153 56	100	**1153 76**

* Stopper reduces max. volume

Sample tubes

PS, transparent.

Type of tube	RCF max.	Outer-Ø mm	Height mm	Pack of	Cat. No.
Universal	2000	16	100	2000	**1147 15**
Universal	4000	12	75	4000	**1147 60**
Coagulometer	2000	12	55	5000	**1147 50**

Grip stopper

for sample tubes

PE-LD, neutral. Packed in bags of 1000.

Stoppers for tubes	Pack of	Cat. No.
1147 15	10000	**1147 20**
1147 50, 1147 60	20000	**1147 30**

Sedimentation tube

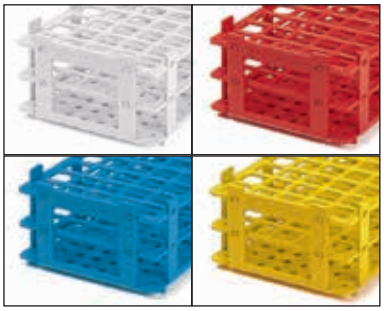
PS, transparent. Conical bottom. Pack of 2000 = 2 bags of 1000.

RCF max.	Outer-Ø mm	Height mm	Cat. No.
1000	16	105	**1147 40**

Test tube rack

available in 6 sizes and four colors

PP. Sturdy construction, stackable. Versatile and inexpensive racks for common diameter test tubes. Filled PP, density 1.2 g/cm³. Will not float in waterbath. Alphanumerical positions for clear sample identification. Wide spaces between positions. Operating temperature -20 to 90 °C. Autoclavable at 121 °C (2 bar), acc. DIN EN 285. Racks are supplied in three-pieces for convenient and permanent assembly. Pack of 5.



for Ø up to mm	Positions	Length mm	Width mm	Height mm	white Cat. No.	blue Cat. No.	red Cat. No.	yellow Cat. No.
13	6 x 14	265	126	75	**43400 00**	**43400 01**	**43400 02**	**43400 03**
18	5 x 11	265	126	75	**43400 10**	**43400 11**	**43400 12**	**43400 13**
20	4 x 10	265	126	75	**43400 20**	**43400 21**	**43400 22**	**43400 23**
25	4 x 8	265	126	88	**43400 30**	**43400 31**	**43400 32**	**43400 33**
30	3 x 7	265	126	88	**43400 40**	**43400 41**	**43400 42**	**43400 43**
16	5 x 11	265	126	75	**43400 60**	**43400 61**	**43400 62**	**43400 63**

Test tube rack

PTFE. Excellent chemical resistance. Operating temperature -200 to 250 °C.
Pack of 1.

for Ø up to mm	Positions	Length mm	Width mm	Height mm	Cat. No.
13	21	180	60	60	**1155 10**
19	10	180	60	70	**1155 15**
30	4	180	60	80	**1155 20**

Microcentrifuge tube rack

Filled PP, sturdy construction. Stackable racks with alphanumerical positions.
Operating temperature -20 to 90 °C. Autoclavable at 121 °C (2 bar), acc. DIN EN 285.
Density 1.2 g/cm³. Will not float in waterbath. Racks are supplied in two-pieces (Ø 11 mm, for microcentrifuge tubes) or three-pieces (Ø 13 mm, for cryogenic tubes). The racks can be assembled securely and permanently with minimum handling. Generous spacing between positions, so that tubes with screw cap and snap lids can be positioned easily.
Pack of 5.

for Ø up to mm	Positions	Length mm	Width mm	Height mm	white Cat. No.	blue Cat. No.	red Cat. No.	yellow Cat. No.
13	6 x 14	265	126	38	**43410 00**	**43410 01**	**43410 02**	**43410 03**
11	8 x 16	265	126	38	**43410 50**	**43410 51**	**43410 52**	**43410 53**

Pasteur pipettes

disposable

PE-LD. Very good reproducibility of the number of drops per milliliter. Ideal for aliquots. The integrated pipetting bulb depresses easily, minimizing fatigue from frequent pipetting. Resistant to gas or gamma radiation sterilization. Pack of 500.

Graduation ml	Withdraw volume ml	Outer-Ø tip mm	Length mm	Drop quantity of ml	Cat. No.
–	3.0	2.8	148	28-33	**7477 50**
0.25 / 0.5 / 0.75 / 1	3.4	3.0	152	25-30	**7477 55**
0.5 / 1 / 1.5 / 2 / 2.5 / 3	3.5	3.3	152	21-28	**7477 60**
0.5 / 1 / 1.5 / 2	2.0	2.9	153	22-26	**7477 65**
–	3.9	3.0	150	22-27	**7477 70**
0.25 / 0.5 / 0.75 / 1	1.0	1.0	144	68-72	**7477 75**

Dropping pipettes

with integrated bellows

PE-LD. For sampling and decanting infectious or toxic liquids. Graduated. Pack of 100.

Capacity ml	Length mm	Cat. No.
1.5	133	**1254 10**
5	194	**1254 20**

Dropping pipette

with integrated pipetting bulb

PE-LD. Pack of 250.

Capacity ml	Length mm	Cat. No.
1.8	98	**1254 00**

Pasteur pipettes

Soda-lime glass. ISO 7712. Long drawn-out capillary tip. Suction end with constriction for a cotton plug. Pack of 1000 = 4 boxes of 250.

Capacity ml	Inner-Ø tip mm	Outer-Ø mm	Length suction tube, mm	Length tip mm	Total length mm	Cat. No.
2	1.0	7	25	45	145	**7477 15**
2	1.0	7	25	120	225	**7477 20**

Rubber cap

Natural rubber (NR). Pipetting aid for glass pasteur pipettes. Pack of 100.

Cat. No.	1247 00

All products can also be found in our online catalog at:
www.brand.de

Disposable micropipettes, intraMARK

BLAUBRAND®, DE-M marking, with ring mark

DIN ISO 7550. Volumes greater than 5 µl are with DE-M marking.
Calibrated to contain (TC, In). Color code to ISO for clear identification.
CE-marked according to IVD-Directive 98/79 EC.
Pack quantity 1000 = 4 boxes of 250. 200 µl: Pack of 800 = 4 boxes of 200.

Mark(s) at µl	Color Code	Length mm	Accuracy ≤ ± %	Reproducibility ≤ %	Cat. No.
1*/2*/3*/4*/5	white	125	0.30	0.6	**7087 07**
10	orange	125	0.25	0.5	**7087 09**
20	black	125	0.25	0.5	**7087 18**
25	2 x white	125	0.25	0.5	**7087 22**
20 + 40	2 x red	125	0.25	0.5	**7087 28**
40	2 x red	125	0.25	0.5	**7087 27**
50	green	125	0.25	0.5	**7087 33**
50 + 100	blue	125	0.25	0.5	**7087 45**
100	blue	125	0.25	0.5	**7087 44**
200	red	125	0.25	0.5	**7087 57**

* no DE-M marking

Disposable micropipettes, intraEND

BLAUBRAND®, DE-M marking, without ring mark

DIN ISO 7550. Volumes greater than 5 µl are with DE-M marking.
Volume defined by end-to-end filling. Calibrated to contain (TC, In).
CE-marked according to IVD-Directive 98/79 EC. Pack quantity 1000 = 4 boxes of 250.
One pipetting aid, cat. no. 7091 10, included in each pack (> 1 µl).

Capacity µl	Length mm	Accuracy ≤ ± %	Reproducibility ≤ %	Cat. No.
1*	29	0.5	1.5	**7091 01**
2*	29	0.5	1.0	**7091 03**
3*	29	0.5	1.0	**7091 05**
5	29	0.5	1.0	**7091 07**
10	29	0.5	1.0	**7091 09**
20	29	0.5	1.0	**7091 18**
25	29	0.5	1.0	**7091 22**
50	29	0.5	1.0	**7091 33**
100	60	0.5	2.0	**7091 44**

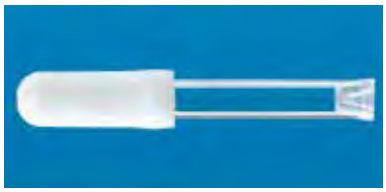
* no DE-M marking

Disposable Delbrück micropipettes, intraEND

BLAUBRAND®, DE-M marking, to Prof. Delbrück

DIN ISO 7550. Volume defined by end-to-end filling. Calibrated to contain (TC, In).
Sodium-heparinized. Ideal for capillary blood sampling. With a length of only 30 mm, the pipette can be placed directly into a microcentrifuge tube, where it will release the sample during centrifugation. CE-marked according to IVD-Directive 98/79 EC.
Pack quantity 1000 = 10 boxes of 100.

Capacity µl	Length mm	Accuracy ≤ ± %	Reproducibility ≤ %	Cat. No.
20	30	0.5	1.0	**7086 60**
50	30	0.5	1.0	**7086 64**



Pipetting aid

For BLAUBRAND® intraEND micropipettes (> 1 µl). Consisting of the PET plastic tube, silicone adapter, and TPE suction bellows with venting hole. Pack of 10.

Cat. No.	7091 10

Pipette holder

For intraEND and Delbrück micropipettes and test tubes (EASYCAL™). Pack of 10.

Cat. No.	7086 05

Micro haematocrit capillaries

without calibration mark, heparinized or non-heparinized

DIN ISO 12772 and BS 4316-68. With color code. For use in haematocrit centrifuges. Heparinized: heparinized with sodium heparinate over internal surface, red color code, for capillary blood. Non-heparinized: Blue color code, for use with heparinized venous blood. CE-marked according to IVD-Directive 98/79 EC.
Pack quantity 1000 = 10 glass boxes of 100.

Description	Color-Code	Length mm	Wall thickness mm	Inner-Ø mm	Outer-Ø mm	Cat. No.
heparinized	red	75 ± 0.5	0.2 ± 0.025	1.15 ± 0.05	1.55 ± 0.05	**7493 11**
non-heparinized	blue	75 ± 0.5	0.2 ± 0.025	1.15 ± 0.05	1.55 ± 0.05	**7493 21**

Haematocrit sealing compound

Non-drying cement on a plastic plate. For quick sealing of micro-haematocrit capillaries. Up to 24 capillaries can be placed vertically in numbered positions along the sides of the tray. CE-marked according to IVD-Directive 98/79 EC. Pack of 10.

Cat. No.	7495 10

Note! Hold the capillaries (~ 2/3 full) near the empty end, and stick the empty end into the cement with a slight twist to seal it.

Counting Chambers

Counting chambers serve to determine the number of particles per volume unit of a liquid. The particles (e.g., leucocytes, erythrocytes, thrombocytes, bacteria, fungus spores, pollen) are visually counted under a microscope. BLAUBRAND® counting chambers are precision measuring instruments.

Counting chamber with spring clips

Counting chamber without spring clips

CE IVD

BRAND counting chamber and haemacytometer cover glasses are CE-marked according to IVD-Directive 98/79 EC.

Description of functional characteristics

The microscope-slide-sized base plate is made of special optical glass. Milled grooves divide the surface into two large fields (outside) and three narrow ridges (inside). The two outer fields are for inscriptions, whereas the ridges are ground and polished. The central ridge (= chamber bottom) has two engraved sets of rulings for counting, separated by a groove. Generally the chamber bottom on the central ridge is 0.1 mm lower (= chamber depth) than the two outer ridges. Hence, when a cover glass is placed on top, there is a gap of 0.1 mm between the glass and the central ridge. The lateral boundaries of the volume to be counted are formed by the imaginary planes projected vertically onto the boundary lines of the ruling.

Equation for particle determination (for general use)

$$\text{Particles per µl volume} = \frac{\text{Counted particles}}{\text{Counted surface (mm}^2\text{)} \cdot \text{Chamber depth (mm)} \cdot \text{Dilution}}$$

Example: Erythrocytes

Chamber: Improved Neubauer

1. Counted particles: 528 erythrocytes
2. Counted surface: 5 group squares, equivalent to 0.2 mm^2
3. Chamber depth: 0.1 mm
4. Dilution: 1:200

$$\frac{528 \cdot 200}{0.2 \cdot 0.1 \cdot 1}$$

$= 5.28 \cdot 10^6$ ery/µl blood

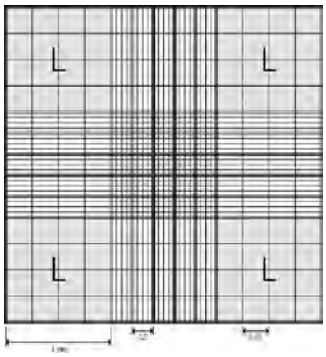
= 5.28 Mio ery/µl blood

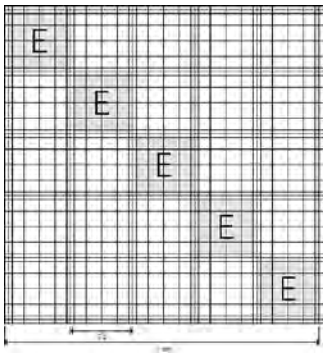
Pack quantities for all counting chambers:

1 Counting chamber, complete with 2 haemacytometer cover glasses, in transparent plastic box.

Cleaning

For cleaning, we recommend the disinfectant cleaner Mucocit®-T (page 313).





Large central square

Improved Neubauer

double ruling, with or without spring clips

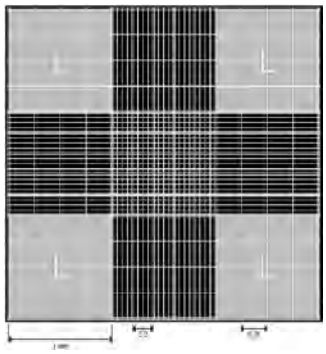
The ruling shows 9 large squares of 1 mm² each. The four large squares in the corners marked "L" for counting leucocytes are each subdivided into 16 squares with 0.25 mm sides.

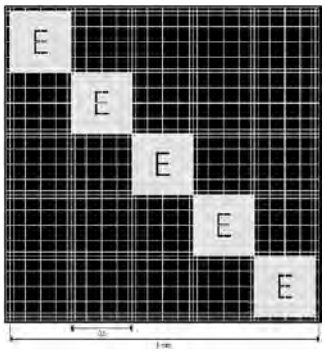
The large square in the center is subdivided into 25 group squares of 0.2 mm sides. Each group square consists of 16 mini squares with 0.05 mm sides, each having an area of 0.0025 mm².

The 5 group squares marked "E" are used for counting thrombocytes and erythrocytes.

All group squares have triple boundary lines on each side. The central line is the limiting line and determines whether cells in the marginal area shall be included in the count or not. CE-marked according to IVD-Directive 98/79 EC.

Description	Chamber depth	Cat. No.
without spring clips	0.1 mm	**7178 05**
with spring clips	0.1 mm	**7178 20**





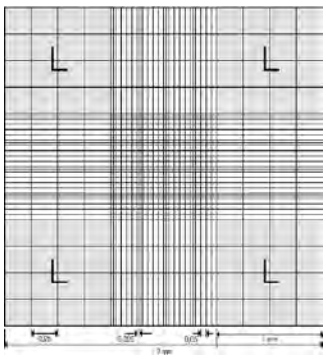
Large central square

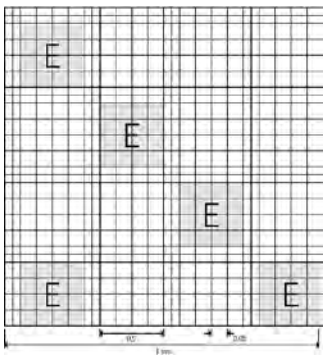
Improved Neubauer, bright-line

double ruling, without spring clips

Same ruling as Improved Neubauer, but with rhodium-coated chamber bottom. Rulings are engraved into the rhodium layer and appear bright under normal microscope settings. By altering the contrast, the microscope image can be reversed, so that the rulings appear brighter or darker, as required. CE-marked according to IVD-Directive 98/79 EC.

Description	Chamber depth	Cat. No.
without spring clips	0.1 mm	**7178 10**





Large central square

Neubauer

double ruling, with or without spring clips

The ruling shows 9 large squares of 1 mm² each. The four large squares in the corners marked "L" for counting leucocytes are each subdivided into 16 squares with 0.25 mm sides.

The large square in the center is subdivided into 16 group squares of 0.2 mm sides. Each group square consists of 16 mini squares with 0.05 mm sides, each having an area of 0.0025 mm².

The 5 group squares marked "E" are used for counting thrombocytes and erythrocytes.

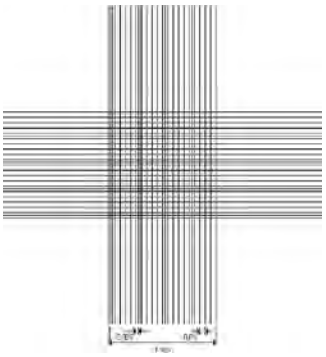
Contrary to the more advanced Improved Neubauer counting chambers, the counting area of each group square is limited by the outer one of the triple boundary lines. CE-marked according to IVD-Directive 98/79 EC.

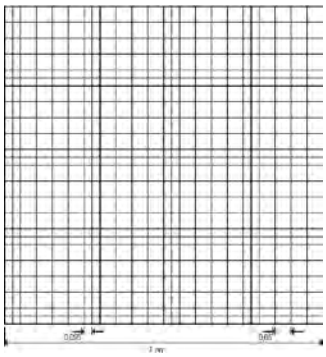
Description	Chamber depth	Cat. No.
without spring clips	0.1 mm	**7186 05**
with spring clips	0.1 mm	**7186 20**

Thoma

double ruling, with or without spring clips

Rulings correspond to the central large square of the Neubauer chamber. The mini squares have an area of 0.0025 mm² each. Since the outer large squares are not completed, the Thoma chamber is only used for counting thrombocytes and erythrocytes. CE-marked according to IVD-Directive 98/79 EC.





Large central square

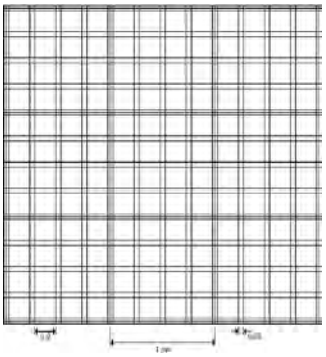
Haemacytometer cover glasses for counting chambers see page 257.
We recommend in mm: 20 x 26 x 0.4 Haemacytometer cover glasses for all counting chambers in our range (except Fuchs-Rosenthal: size in mm: 24 x 24 x 0.4, Nageotte: size in mm: 22 x 30 x 0.4).

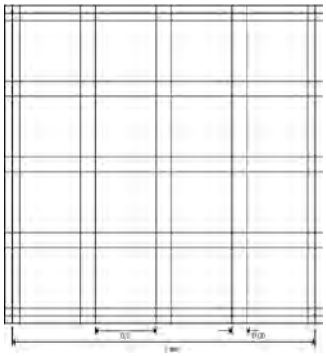
Description	Chamber depth	Cat. No.
without spring clips	0.1 mm	**7180 05**
with spring clips	0.1 mm	**7180 20**

Bürker

double ruling, with or without spring clips

The ruling shows 9 large squares of 1 mm² each. These are used for counting leucocytes. Each large square is subdivided by double lines (0.05 mm apart) into 16 group squares with 0.2 mm sides. The group squares correspond in size to the Neubauer counting chamber, but have no further subdivisions. They are used for counting thrombocytes and erythrocytes. The double lines form mini squares with an area of 0.0025 mm².
CE-marked according to IVD-Directive 98/79 EC.





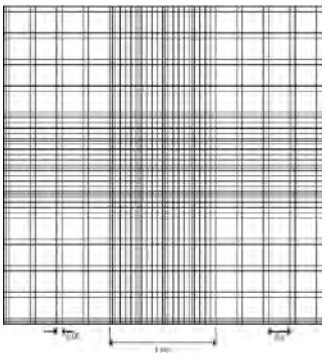
Large central square

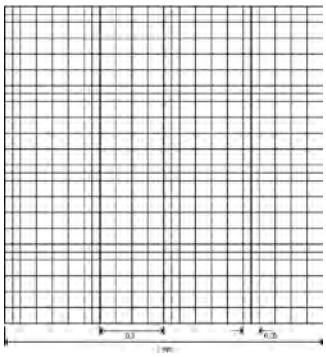
Description	Chamber depth	Cat. No.
without spring clips	0.1 mm	**7189 05**
with spring clips	0.1 mm	**7189 20**

Bürker-Türk

double ruling, with or without spring clips

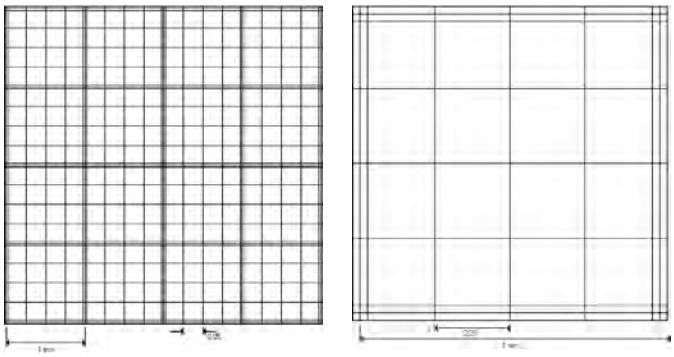
Combination of the Bürker and Thoma systems. The chamber depth is 0.1 mm. The ruling shows 9 large squares of 1 mm² each. The large squares are subdivided into 16 group squares with 0.2 mm sides. In the central large square, each group square is subdivided into 16 mini squares with 0.05 mm sides (= 0.0025 mm²). CE-marked according to IVD-Directive 98/79 EC.





Large central square

Description	Chamber depth	Cat. No.
without spring clips	0.1 mm	**7195 05**
with spring clips	0.1 mm	**7195 20**



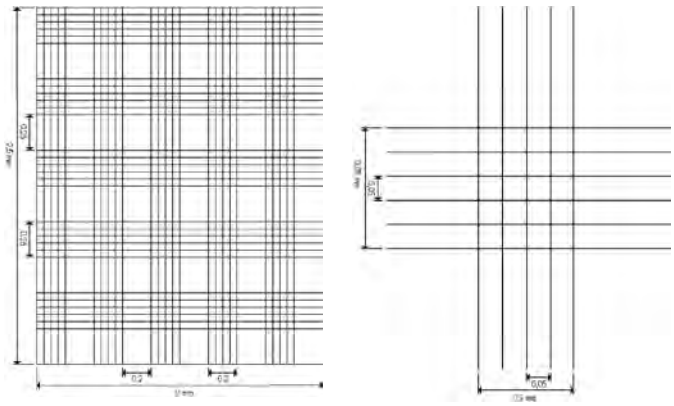
Large square

Fuchs-Rosenthal

double ruling, with or without spring clips

The ruling differs from the customary systems for blood cell counts by its large area of 16 mm². The ruling shows 16 large squares of 1 mm². Each large square is subdivided into 16 mini squares with 0.25 mm sides and an area of 0.0625 mm². This chamber is frequently used for counting cells in the cerebrospinal fluid. CE-marked according to IVD-Directive 98/79 EC.

Description	Chamber depth	Cat. No.
without spring clips	0.2 mm	**7198 05**
with spring clips	0.2 mm	**7198 20**



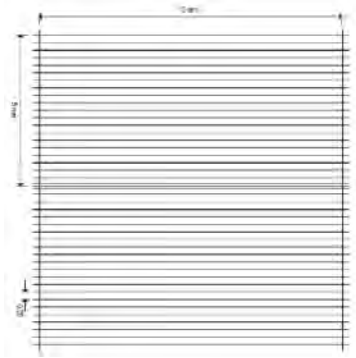
Large square

Malassez

double ruling, without spring clips

The ruling is rectangular, covering an area of 5 mm².
The large rectangles measure 0.25 x 0.20 = 0.05 mm².
They are each subdivided into 20 mini squares with an area of 0.0025 mm². This chamber is commonly used for counting cells in the cerebrospinal fluid, or for counting nematodes.
CE-marked according to IVD-Directive 98/79 EC.

Description	Chamber depth	Cat. No.
without spring clips	0.2 mm	**7190 05**



Nageotte

double ruling, without spring clips

The chamber depth is 0.5 mm. The square area of 100 mm² is subdivided into 40 rectangles with an area of 0.25 x 10 = 2.5 mm² each. This chamber is commonly used for counting cells in the cerebrospinal fluid, or for counting nematodes. CE-marked according to IVD-Directive 98/79 EC.

Description	Chamber depth	Cat. No.
without spring clips	0.5 mm	**7213 05**

Haemacytometer cover glasses

for counting chambers

Pure white (clear) borosilicate glass, hydrolytic class 1, DIN ISO 8255. Refractive index n_e = 1.52 ± 0.01; Abbe number v_e = 56.5 ± 0.5. Flatness tolerance ± 3 µm. Haemacytometer cover glasses differ from ordinary cover glasses by their plain ground and polished surface. CE-marked according to IVD-Directive 98/79 EC.
Packing: 2 cover glasses in a plastic bag, separated by tissue paper.
Pack quantity: 10 boxes at 10 cover glasses = 100 cover glasses per carton.

Length mm	Width mm	Thickness mm	Cat. No.
24	24	0.4	**7230 14**
20	26	0.4	**7230 15**
22	30	0.4	**7230 16**

Cover glasses for microscope slides

Pure white (clear) borosilicate glass, hydrolytic class 1, with excellent chemical resistance. Thickness No. 1 (0.13 to 0.17 mm). Refractive index n_e = 1.52 ± 0.01, Abbe number v_e = 56.5 ± 0.5. Fully automated production guarantees "ready-for-use" quality – clean, dust and grease-free, distortion-free, flatness within ± 3 µm.
Pack quantities: Square shape: 2000 = 10 boxes of 200.
Rectangular shape: 1000 = 10 boxes of 100.

Description	Size mm	Cat. No.
square shape	18 x 18	**4700 45**
	20 x 20	**4700 50**
	22 x 22	**4700 55**
	24 x 24	**4700 60**
rectangular shape	24 x 40	**4708 16**
	24 x 50	**4708 19**
	24 x 60	**4708 20**

Microscope slides

White (clear) soda-lime glass, hydrolytic class 3. Thickness approx. 1 mm, size approx. 76 x 26 mm (DIN ISO 8037-1). **We recommend using slides with ground edges to reduce the risk of injury.** To protect against penetrating humidity the entire packing unit is also optionally available sealed in an aluminium bag.
Pack quantity 2500 = 50 boxes of 50.

Description	Cat. No.
ground edges	**4747 43**
ground edges, twin frosted end	**4747 44**
cut edges	**4747 01**
cut edges, twin frosted end	**4747 02**

Note! Not suitable for storage or transport at high humidity!

Cavity slides

White (clear) soda-lime glass, hydrolytic class 3. Rectangular ground edges. Thickness 1.2 - 1.5 mm, size in mm: 76 x 26. Concavities of 15-18 mm Ø, depth 0.6 - 0.8 mm. Pack of 50.

Description	Cat. No.
1 concavity	**4755 05**
2 concavities	**4755 35**
3 concavities	**4755 65**

Staining trough with tray

Soda-lime glass. For 10 slides, size in mm: 76 x 26. With lid.
Please order staining trough, tray, and wire handle separately. Pack of 10.

Description	Length mm	Width mm	Height mm	Cat. No.
Staining trough with lid	105	85	70	**4722 00**
Tray for 10 slides	91	70	48	**4720 00**
Wire handle to move tray (stainless steel)				**4731 00**

Staining trough, Hellendahl

Soda-lime glass. For 16 slides, size in mm: 76 x 26. Pack of 10.

Description	Length mm	Width mm	Height mm	Cat. No.
with lid	100	50	95	**4726 00**

Staining trough, Hellendahl extended

Soda-lime glass. For 16 slides, size in mm: 76 x 26. Pack of 10.

Description	Length mm	Width mm	Height mm	Cat. No.
with lid	60	55	105	**4727 00**

Staining trough, Schiefferdecker

Soda-lime glass. For 10 slides, size in mm: 76 x 26. Pack of 10.

Description	Length mm	Width mm	Height mm	Cat. No.
with lid	85	70	45	**4725 00**

Staining trough, Coplin

Soda-lime glass. For 10 slides, size in mm: 76 x 26. Pack of 10.

Description	Ø mm	Height mm	Cat. No.
with lid	80	115	**4728 00**

Staining trough, Hellendahl extended

PMP, transparent. For 16 slides, size in mm: 76 x 26 (8 pairs back-to-back). Pack of 4.

Description	Length mm	Width mm	Height mm	Cat. No.
with lid	57	57	90	**4744 00**

Staining trough, Schiefferdecker

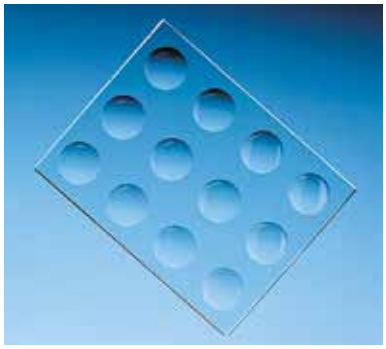
PMP, transparent. For 20 slides, size in mm: 76 x 26 (10 pairs back-to-back). Pack of 4.

Description	Length mm	Width mm	Height mm	Cat. No.
with lid	86	70	51	**4744 10**

Spotting tile

Soda-lime glass. 12 polished cavities 20-22 mm Ø, depth 2 mm, capacity approx. 0.2 ml. Ground rectangular edges. Pack of 1.

Description	Length mm	Width mm	Height mm	Cat. No.
Capacity approx. 0.2 ml	130	100	6	**4735 00**



Staining trough with tray

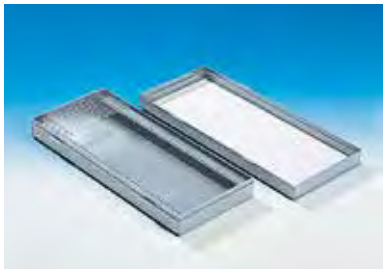
PMP. Transparent. With two lids: one to help protect against evaporation when not in use; one with a handle slot facilitating the staining process. Tray of polypropylene.

Description	Length mm	Width mm	Height mm	Pack of	Cat. No.
Staining trough, without tray	101	83	70	4	**4743 00**
Tray (PP) for 20 slides				2	**4743 05**

Staining trough with tray

POM. For 25 slides, size (in mm) 76 x 26. The close-fitting lid helps protect against evaporation. Staining tray with fold down handle.

Description	Length mm	Width mm	Height mm	Pack of	Cat. No.
staining trough complete	98	88	52	5	**4718 00**
tray with handle	91	79	38	5	**4714 00**
trough	98	88	52	5	**4715 00**



Slide boxes

PS. For slides, size (in mm) 76 x 26. Numbered slots in base. Lid with index card. Pack of 1.

For ... slides	Length mm	Width mm	Height mm	Cat. No.
25	120	96	35	**4758 00**
50	230	97	35	**4759 00**
100	230	187	35	**4760 00**

Slide box

PP, sturdy design. Screw lid with sealing wire lug. Ideal for storing or shipping 5 thick or 10 thin slides. Slides protrude 10 mm above the box, to facilitate removal. Pack of 10.

Description	Cat. No.
Maximum internal dimensions Ø x H in mm: 45 x 90	**4769 00**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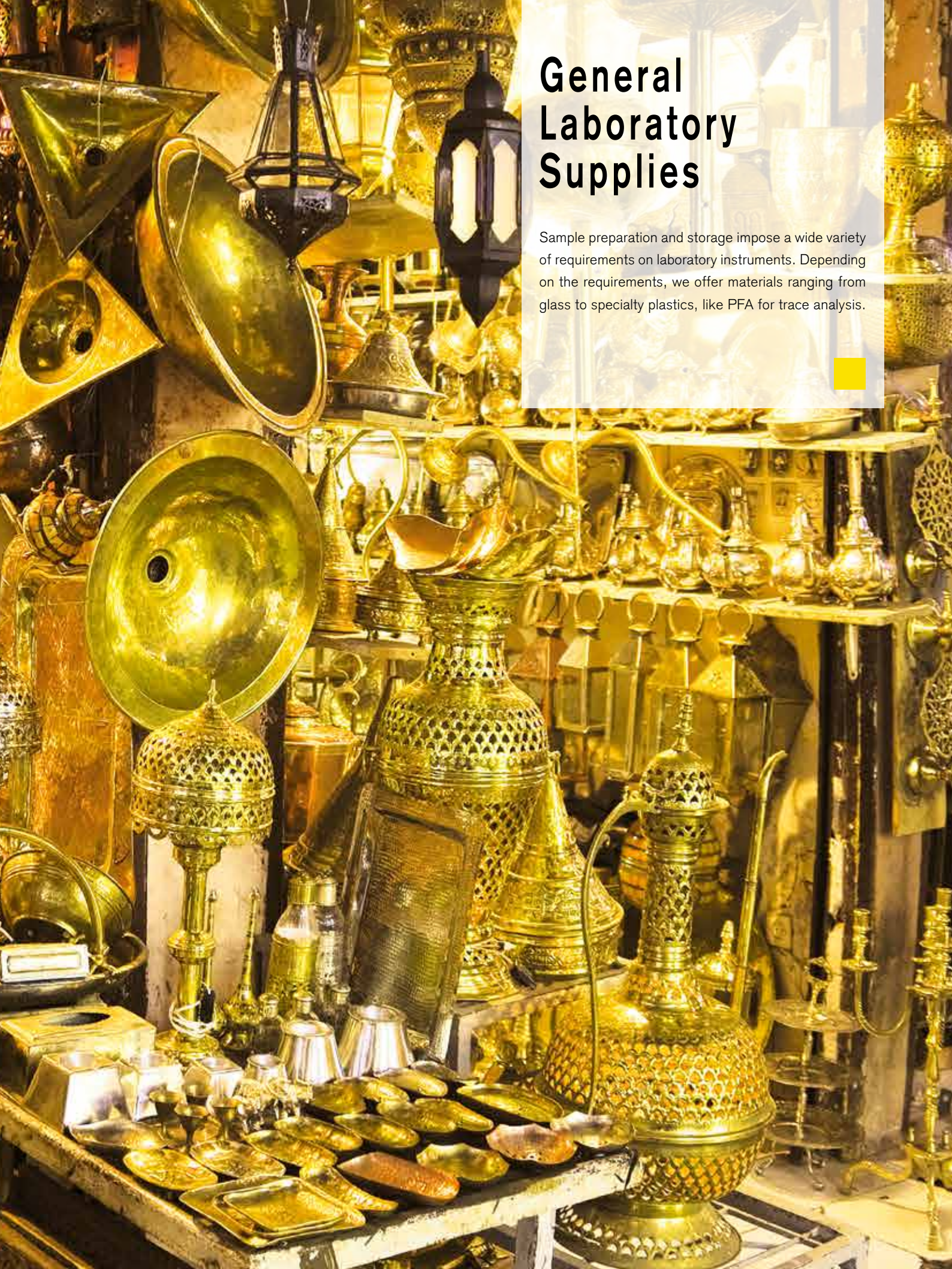


General Laboratory Supplies

Sample preparation and storage impose a wide variety of requirements on laboratory instruments. Depending on the requirements, we offer materials ranging from glass to specialty plastics, like PFA for trace analysis.

PARAFILM® M Sealing film

for manual applications

Physical properties

Toxicity: non-toxic
Melting point: 60 °C
Flash point: 301 °C
Temperature range (continuous use):
-45 °C to +50 °C
Stretching ability: 200%
Elongation at tear: 300%

Gas permeability in 24 hours at 23 °C with 50% relative humidity:
O_2 (oxygen): ≤ 350 cm^3/m^2
N_2 (nitrogen): ≤ 105 cm^3/m^2
CO_2 (carbon dioxide): ≤ 1100 cm^3/m^2

Water vapor permeability in 24 hours at 37 °C and 90% relative humidity: 0.8 g/m^2

Practical features

Elastic PARAFILM® M sealing film always fits, whether for beakers or Erlenmeyer flasks, weighing bottles or graduated cylinders. It protects your samples from contamination or evaporation, and prevents leakage from overturned containers. PARAFILM® M can be stretched by up to 200%, and be sealed to irregular shapes and surfaces.

Material

PARAFILM® M is free of plasticizers, and consists largely of polyolefins and paraffin waxes. If PARAFILM® M should come into contact with food, the guidelines of the locally valid food handling laws should be followed. PARAFILM® M complies with the general requirements of the FDA (Food and Drug Administration) for use under 55 °C, as well as satisfying GMP (Good Manufacturing Practice).

Chemical resistance

PARAFILM® M is resistant up to 48 hours against many polar substances, e.g., saline solutions, inorganic acids and alkaline solutions. After this period embrittlement may occur.

Effects of 48 hours of exposure at 23 °C

Acids:	
Hydrochloric acid 36.5%	resistant
Sulfuric acid 98%	resistant
Nitric acid 95%	resistant*
Alkaline solutions:	
Sodium hydroxide 22%	resistant
Ammonia 28%	resistant
Saline solutions:	
Sodium chloride 20%	resistant
Potass. permanganate 5%	resistant*
Iodine solution 0.1 mol/l	resistant*
Organic solvents:	
Methanol	resistant
Ethanol	resistant
Isopropanol	resistant
Diethylether	not resistant
Chloroform	not resistant
Carbon tetrachloride	not resistant
Benzene	not resistant
Toluene	not resistant

* Brown discoloration

Storability

PARAFILM® M can be stored for at least 3 years without loss of quality under storage condition between 7 °C and 32 °C and a relative humidity of 50%.

PARAFILM® M Sealing film

Width mm	Length m	Pack of	Cat. No.
50	75	24	**7016 11**
100	38	12	**7016 05**
100	75	12	**7016 06**
500	15	6	**7015 01**

PARAFILM® M Cutter

The handy PARAFILM® M Cutter is convenient for clean storage and cutting of PARAFILM® M sealing film.
Suitable for 50 mm and 100 mm wide rolls.
Pack of 1.

Cat. No.	**7016 50**

Erlenmeyer flasks

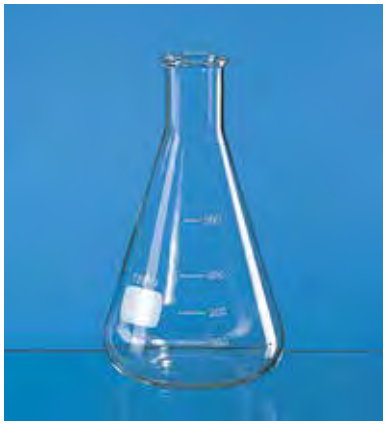
Note! The abbreviation Boro 3.3 represents the internationally designated borosilicate glass type 3.3.

Narrow neck

Boro 3.3. DIN ISO 1773. With beaded rim and graduation.
Pack of 10 (3000 ml: Pack of 2; 5000 ml: Pack of 1).

Capacity ml	Neck outer-Ø mm	Flask outer-Ø mm max.	Height mm	Cat. No.
25	22	42	75	**927 14**
50	22	51	90	**927 17**
100	22	64	105	**927 24**
200*	34	79	131	**927 32**
250	34	85	145	**927 36**
300*	34	87	156	**927 39**
500	34	105	180	**927 44**
1000	42	131	220	**927 54**
2000	50	166	280	**927 63**
3000	52	187	310	**927 68**
5000	52	220	365	**927 73**

* in addition to the ISO range

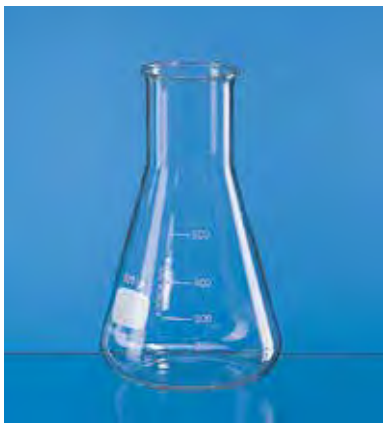


Wide neck

Boro 3.3. DIN EN ISO 24450. With beaded rim and graduation. Pack of 10.

Capacity ml	Neck outer-Ø mm	Flask outer-Ø mm max.	Height mm	Cat. No.
25*	31	43	70	**928 14**
50	34	51	85	**928 17**
100	34	64	105	**928 24**
200*	50	79	131	**928 32**
250	50	85	140	**928 36**
300*	50	87	156	**928 39**
500	50	105	175	**928 44**
1000	50	131	220	**928 54**
2000*	72	153	276	**928 63**

* in addition to the ISO range



Beakers

Low form

Boro 3.3. DIN 12331/ISO 3819.
With graduation and spout.
Pack of 10
(3000 ml: Pack of 4; 5000 ml: Pack of 1).

Capacity ml	Ø x Height mm	Cat. No.
5*	22 x 30	**912 10**
10*	26 x 35	**912 12**
25	34 x 50	**912 14**
50	42 x 60	**912 17**
100	50 x 70	**912 24**
150	60 x 80	**912 29**
250	70 x 95	**912 36**
400	80 x 110	**912 41**
600	90 x 125	**912 48**
800	100 x 135	**912 53**
1000	105 x 145	**912 54**
2000	132 x 185	**912 63**
3000	152 x 210	**912 68**
5000	170 x 270	**912 73**

* without graduation

Tall form

Boro 3.3. DIN 12331/ISO 3819.
With graduation and spout.
Pack of 10
(3000 ml: Pack of 2).

Capacity ml	Ø x Height mm	Cat. No.
50	38 x 70	**906 17**
100	48 x 80	**906 24**
150	54 x 95	**906 29**
250	60 x 120	**906 36**
400	70 x 130	**906 41**
600	80 x 150	**906 48**
800	90 x 175	**906 53**
1000	95 x 180	**906 54**
2000	120 x 240	**906 63**
3000	135 x 280	**906 68**

Beakers, low form

with blue printed scale or embossed

ISO 7056. With graduation, beaded rim and spout. Cleaning at temperatures below 60 °C is recommended to preserve marks and inscriptions. For autoclaving (121 °C), beakers with an embossed scale should be selected.

NEW!

PP, high clarity

Capacity ml	Subdivision ml	Height mm	max. Ø mm	Pack of	Blue scale Cat. No.	Embossed scale Cat. No.
10*	2	36	30	12	**876 02**	–
25	5	50	38	12	**876 04**	**878 04**
50	10	60	47	12	**876 06**	**878 06**
100	10	70	55	12	**876 08**	**878 08**
150*	20	80	66	12	**876 10**	**878 10**
250	25	95	77	6	**876 12**	**878 12**
400*	50	112	87	6	**876 14**	**878 14**
500	50	118	94	6	**876 16**	**878 16**
600*	50	127	100	6	**876 18**	**878 18**
1000	100	147	120	6	**876 20**	**878 20**
2000	200	187	149	6	**876 22**	**878 22**
3000*	250	212	170	4	**876 24**	**878 24**
5000	500	247	203	4	**876 26**	**878 26**

* in addition to ISO 7056

NEW!

PMP, transparent

Capacity ml	Subdivision ml	Height mm	max. Ø mm	Pack of	Blue scale Cat. No.	Embossed scale Cat. No.
10*	2	36	30	12	**875 02**	–
25	5	50	38	12	**875 04**	**877 04**
50	10	60	47	12	**875 06**	**877 06**
100	10	70	55	12	**875 08**	**877 08**
150*	20	80	66	12	**875 10**	**877 10**
250	25	95	77	6	**875 12**	**877 12**
400*	50	112	87	6	**875 14**	**877 14**
500	50	118	94	6	**875 16**	**877 16**
600*	50	127	100	6	**875 18**	**877 18**
1000	100	147	120	6	**875 20**	**877 20**
2000	200	187	149	6	**875 22**	**877 22**
3000*	250	212	170	4	**875 24**	**877 24**
5000	500	247	203	4	**875 26**	**877 26**

* in addition to ISO 7056

Graduated beakers with handle

with blue printed scale or embossed

PP, high clarity. Ergonomic handle for secure grip. Functional spout to minimize spills. Cleaning at temperatures below 60 °C is recommended to preserve marks and inscriptions. For autoclaving (121 °C), beakers with an embossed scale should be selected.

NEW!

PP, high clarity

Capacity ml	Subdivision ml	Height mm	max. Ø mm	Pack of	Blue scale Cat. No.	Embossed scale Cat. No.
50	2	70	40	24	**408 02**	**410 02**
100	2	80	50	24	**408 04**	**410 04**
250	5	120	74	12	**408 06**	**410 06**
500	10	140	92	12	**408 08**	**410 08**
1000	20	181	117	6	**408 10**	**410 10**
2000	50	213	152	6	**408 12**	**410 12**
3000	50	242	172	6	**408 14**	**410 14**
5000	100	270	204	6	**408 16**	**410 16**

Beakers, low form

ETFE, translucent. Excellent chemical resistance.
With graduation, beaded rim and spout. Pack of 1.

Capacity ml	Subdivision ml	Height mm	Ø mm	Cat. No.
25	5	50	32	**902 24**
50	10	59	39	**902 28**
100	20	72	50	**902 38**
250	50	96	67	**902 48**
400	50	109	77	**902 52**
500	100	122	88	**902 54**
600	100	125	91	**902 56**
1000	100	143	105	**902 62**

Beakers, low form

PFA. ISO 7056. Easy to read embossed scale, wear-resistant when used frequently. Space-saving stackable design. Autoclavable, easy to clean, withstands temperatures from -200 °C to 260 °C. Pack of 1.

Capacity ml	Subdivision ml	Height mm	Ø mm	Cat. No.
25	5	50	32	**901 20**
50	10	59	39	**901 28**
100	20	72	50	**901 38**
250	50	96	67	**901 48**
500	100	122	88	**901 54**
1000	100	141	109	**901 62**

Beakers, low form

PTFE. Excellent thermal and chemical resistance. With reinforced rim and spout. Without graduation. Pack of 1.

Capacity ml	Ø mm	Height mm	Cat. No.
5	20	26	**903 05**
10	24	33	**903 08**
25	32	47	**903 20**
50	43	55	**903 28**
100	54	68	**903 38**
150	59	75	**903 44**
250	66	97	**903 48**
400	80	125	**903 52**
500	100	125	**903 54**
1000	105	155	**903 62**
2000	125	205	**903 64**

Sampling dippers

PTFE. With reinforced rim and spout. PTFE handle with steel core. Optional extension rod for increased handle length. Pack of 1. (Extension rod, length 600 mm. Pack of 1. Cat. No. 904 70)

Capacity ml	Ø mm	Height mm	Cat. No.
100	55	65	**904 38**
250	70	95	**904 48**
500	80	125	**904 54**
1000	105	155	**904 62**

Erlenmeyer flasks, wide neck

with screw cap

PP, high clarity. With graduation. Neck with standard ground socket. Pack of 6 (1000 ml: Pack of 4).

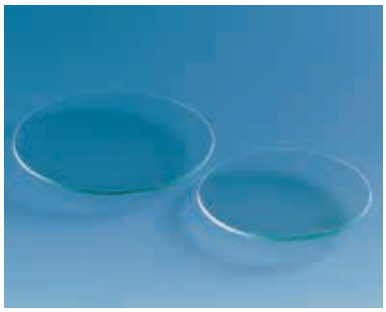
(Conical joint stopper, PE-LD: STJ 34/35 Cat. No. 1444 40, STJ 45/40 Cat. No. 1444 45. Pack of 1.)

Capacity ml	Thread	Flask outer-Ø mm max.	Height mm	Neck size	Cat. No.
50	GL 40	52	90	34/35	**931 70**
100	GL 40	64	110	34/35	**931 72**
250	GL 52	85	140	45/40	**931 75**
500	GL 52	108	180	45/40	**931 80**
1000	GL 52	135	220	45/40	**931 85**

Watch glasses

Soda-lime glass. DIN 12341.
Fire-polished edges. Stress-reduced to minimize risk of shattering.
Pack of 10.

Ø mm	Cat. No.
40	**1500 10**
50	**1500 15**
60	**1500 20**
70	**1500 30**
80	**1500 40**
90	**1500 45**
100	**1500 50**
120	**1500 60**
125	**1500 65**
150	**1500 70**
200	**1500 80**



Watch glasses

PTFE. Ideal for covering PTFE beakers.
Excellent chemical resistance.
Pack of 1.

Ø mm	for PTFE beakers size ml	Cat. No.
20	1	**1509 00**
30	5 - 10	**1509 02**
40	25	**1509 04**
50	50	**1509 05**
65	100	**1509 07**
75	150	**1509 10**
80	250	**1509 12**
100	400 - 500	**1509 15**
125	600 - 1000	**1509 20**
150	2000	**1509 22**

Evaporating dishes

PP. Shallow form without spout.
Pack of 1.

Capacity ml	Height mm	max. Ø mm	Cat. No.
50	25	70	**455 05**
170	35	105	**455 10**

Evaporating dishes

PFA, snap-on lid PE. Evaporating dishes are autoclavable, easy to clean and withstand temperatures from -200 °C to +260 °C (The snap-on lid is not autoclavable). Pack of 1.

Capacity ml	Cat. No.
25	**458 00**
50	**458 02**

Capacity ml	max. Ø mm	Height mm	Cat. No.
5	25	20	**455 40**
25	45	30	**455 45**
75	60	40	**455 50**

Evaporating dishes

PTFE. Crucible form without spout.
Excellent chemical resistance.
Pack of 1.

Capacity ml	max. Ø mm	Height mm	Cat. No.
25	40	35	**456 15**
50	50	40	**456 17**
100	65	55	**456 20**
150	80	40	**456 21**
180	80	50	**456 22**
250	95	45	**456 23**
350	100	60	**456 25**

Evaporating dishes

PTFE. Conical with spout.
Pack of 1.

Capacity ml	max. Ø mm	Height mm	Cat. No.
25	40	25	**457 03**
50	65	25	**457 05**
100	80	30	**457 10**
180	80	45	**457 18**
350	100	55	**457 22**

Crystallizing dishes

PTFE. Cylindrical without spout.
Pack of 1.

max. Ø mm	Height mm	Cat. No.
125	80	**1107 05**
150	90	**1107 10**

Mortars with pestle

Melamine formaldehyde (MF), white.
Resistant to boiling and autoclavable (121 °C). With foot and spout.
Pack of 1.

Centrifuge tubes, ungraduated

AR-GLAS® or Boro 3.3. Wall thickness approx. 1.0 mm. Withstands RCF up to 3500.

Description	Glass	Capacity ml	Outer-Ø mm	Height mm	Pack of	Cat. No.
Conical bottom, beaded rim	AR-GLAS®	15	17	113	100	**7780 12**
Conical bottom, beaded rim	Boro 3.3	15	17	113	100	**7780 13**
Cone-pointed bottom, rimless	AR-GLAS®	11	16,5	98	100	**7790 12**
Round bottom, rimless	AR-GLAS®	13	16,5	98	200	**7790 22**

Centrifuge tubes, graduated

conical bottom

AR-GLAS® or Boro 3.3. Capacity 15 ml. Graduations and inscriptions in high contrast white enamel. Pack of 10.

Graduation from - to ml approx.	Glass	Subdivision ml	Ø mm	Height mm	Wall thickness mm	RCF max.	Cat. No.
0 - 10	AR-GLAS®	0.1	17	113	ca. 1.0	3500	**7783 12**
0 - 10	Boro 3.3	0.1	17	113	ca. 1.0	3500	**7783 13**
0 - 15	AR-GLAS®	0.1	17	113	ca. 1.0	3500	**7787 12**
0 - 15	Boro 3.3	0.1	17	113	ca. 1.0	3500	**7787 13**

Test tubes, graduated

with spout and without stopper, or with standard ground joint neck and PP stopper

Boro 3.3. Graduation and inscriptions in high contrast white enamel.
Wall thickness approx. 1.2 mm. Pack of 10.

Description	Capacity ml approx.	Subdivision ml	Neck size	Ø mm	Height mm	Cat. No.
With spout, without stopper	10	0.1	–	15	150	**1143 08**
With spout, without stopper	20	0.2	–	17	180	**1143 16**
With spout, without stopper	25	0.2	–	17	200	**1143 21**
With spout, without stopper	30	0.5	–	19	200	**1143 24**
Standard ground joint neck with PP stopper	10	0.1	12/21	15	165	**1145 08**
Standard ground joint neck with PP stopper	20	0.2	14/23	17	200	**1145 16**
Standard ground joint neck with PP stopper	25	0.2	14/23	17	220	**1145 21**
Standard ground joint neck with PP stopper	30	0.5	14/23	19	220	**1145 24**

Sample tubes

with screw cap

PFA-screw cap with integrated seal lip. Individually calibrated ring mark at 10 ml. Autoclavable, easy to clean, withstands temperatures from -200 °C to +260 °C. Pack of 1. (Replacement screw-cap, PFA. Pack of 1. Cat. No. 1292 52)

Capacity ml	Ø mm	Height mm	Thread GL	Cat. No.
15	22	110	25	**7794 20**

Funnels

plain interior

Boro 3.3. Angled at 60°, ground and fire-polished upper rim.
Short stem. Pack of 1.

Funnel outer-Ø mm	Stem outer-Ø mm	Stem length mm	Cat. No.
35	6	35	**1455 05**
40	6	40	**1455 07**
50	7	50	**1455 15**
55	8	55	**1455 20**
60	8	60	**1455 25**
70	8	70	**1455 30**
80	9	80	**1455 35**
100	10	100	**1455 40**
120	16	120	**1455 45**
150	16	150	**1455 50**
200	26	175	**1455 60**

Funnels

fluted interior

Boro 3.3. For rapid filtration. Angled at 60°, ground and fire-polished upper rim. Short sterm. Pack of 10 (Cat. No. 1456 38: Pack of 1).

Funnel outer-Ø mm	Stem outer-Ø mm	Stem length mm	Cat. No.
70	8	70	**1456 11**
80	10	80	**1456 16**
100	10	100	**1456 19**
150	16	150	**1456 31**
200	26	175	**1456 38**

Funnels

plain interior

PP.

Funnel outer-Ø mm	Stem outer-Ø mm	Stem length mm	Pack of	Cat. No.
30	2	25	24	**1470 00**
30	5	25	24	**1470 05**
40	5	35	24	**1470 10**
50	9	43	24	**1470 15**
75	10	55	12	**1470 20**
100	13	77	12	**1470 25**
120	14	90	12	**1470 30**
150	17	95	12	**1470 35**

Funnels

fluted interior

PP. For rapid filtration. Angled at 60°. External flutings allow air to escape during filtration.

Funnel outer-Ø mm	Stem outer-Ø mm	Stem length mm	Pack of	Cat. No.
25	4	39	20	**1482 05**
35	5	38	20	**1482 10**
45	5	44	20	**1482 15**
65	9	63	20	**1482 20**
80	10	69	20	**1482 25**
100	11	82	1	**1482 35**
120	11	85	1	**1482 37**
150	14	115	1	**1482 40**
180	14	143	1	**1482 45**

Powder funnels

Boro 3.3. Ground and fire-polished upper rim. With short, wide stem. Pack of 1.

Upper Ø mm	Lower Ø mm	Cat. No.
50	18	**1465 06**
60	18	**1465 08**
70	20	**1465 11**
80	22	**1465 16**
90	25	**1465 17**
100	25	**1465 19**
120	30	**1465 23**

Powder funnels

PP. With short, wide stem.

Funnel outer-Ø mm	Stem outer-Ø mm	Stem length mm	Pack of	Cat. No.
60	15	19	20	**1480 20**
80	15	23	20	**1480 25**
100	25	23	20	**1480 30**
120	30	28	1	**1480 35**
150	35	42	1	**1480 40**
180	40	48	1	**1480 45**

Carboy funnels

PP. Pack of 1.

Funnel outer-Ø mm	Stem outer-Ø mm	Stem length mm	Cat. No.
210	25	90	**1470 40**
260	30	100	**1470 45**
350	32	170	**1470 50**
400	40	150	**1470 55**
440 (PE-HD)	35	140	**1470 60**

Standard ground joint funnels

PP. Half-round body. Stem fits standard ground sockets. Ideal for filling liquids or powders into multi-neck flasks. Pack of 10 (Cat. No. 949 15: Pack of 5).

Distance to flat side mm	Stem fits socket size	Cat. No.
40	14/23	**949 05**
50	19/26	**949 10**
80	29/32	**949 15**

Buchner funnels

PP. Two detachable pieces facilitate cleaning. Use with suggested filter paper. Pack of 1.

Nominal size mm	Filter disk Ø mm	for filter paper Ø mm	Cat. No.
45	45	45	**1485 05**
55	55	55	**1485 10**
70	72	70	**1485 15**
80	82	70	**1485 20**
90	93	90	**1485 25**
110	120	110	**1485 30**
160	160	150	**1485 35**
240	240	240	**1485 40**

Filter disks for Buchner funnels

PE-HD 1 mm mesh. Insert between the perforated support plate of the Buchner funnel, and the filter paper. Prevents filter paper sticking. Pack of 10.

Ø mm	Cat. No.
45	**1486 05**
55	**1486 10**
70	**1486 15**
80	**1486 20**
90	**1486 25**
110	**1486 30**
160	**1486 35**
240	**1486 40**

Separating funnels

PP, high clarity for observation of contents. With PP screw cap and special conical PTFE stopcock with retention device. Autoclavable (121 °C). Pack of 1.

Capacity ml	Cat. No.
125	**1400 04**
250	**1400 05**
500	**1400 06**
1000	**1400 07**

Holder for separating funnels

PP. For conical separating funnels up to 1000 ml. Easily mounted on support rods with an outer-Ø 8-14 mm with a locking nut. Pack of 1.

Cat. No.	**1403 00**

Funnel holders

PP. To support 1 or 2 funnels with top outer-Ø of 50 to 120 mm. Easily mounted on support rods with an outer-Ø 8-14 mm with a locking nut.
Pack of 5.

Description	Cat. No.
for 1 funnel	**1485 00**
for 2 funnels	**1485 02**

Filter funnel supports

PP plates with aluminum support rod. Ø x length in mm: 12.7 x 595.
To support 2 or 4 funnels with top outer Ø of 50 to 120 mm.
Adjustable funnel height. Pack of 1.

Description	Length base plate mm	Width base plate mm	Cat. No.
for 2 funnels	250	140	**745 06**
for 4 funnels	450	140	**745 11**

Filter funnels

Boro 3.3. Pack of 1.

Identification Code	Porosity	Capacity ml	Ø Filter disk mm	Stem outer-Ø mm	Cat. No.
3 D	3	50	35	10	**4640 03**
3 D	4	50	35	10	**4640 04**
11 D	3	75	45	10	**4647 13**
11 D	4	75	45	10	**4647 14**
17 D	3	125	60	10	**4654 23**
17 D	4	125	60	10	**4654 24**
25 D	3	500	95	22	**4661 33**
25 D	4	500	95	22	**4661 34**

Filter crucibles

Boro 3.3. Pack of 10.

Identification Code	Porosity	Capacity ml	Ø Filter disk mm	Cat. No.
1 D	1	30	30	**4580 21**
1 D	2	30	30	**4580 22**
1 D	3	30	30	**4580 23**
1 D	4	30	30	**4580 24**
2 D	1	50	40	**4587 31**
2 D	2	50	40	**4587 32**
2 D	3	50	40	**4587 33**
2 D	4	50	40	**4587 34**

Filter adapters

Boro 3.3. Suitable for filter crucibles, according to identification code above. Pack of 10.

Identification Code	Upper Ø mm	Overall length mm	Cat. No.
1 D	41	125	**4636 16**
2 D	50	132	**4637 32**

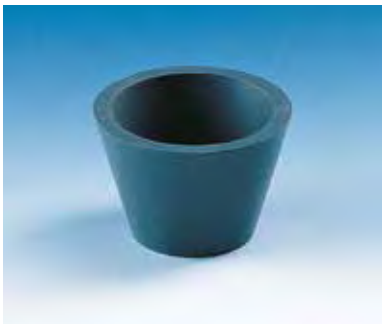
Porosity	Identification ISO 4793	Nominal max. pore size, µm
1	P 160	100 - 160
2	P 100	40 - 100
3	P 40	16 - 40
4	P 16	10 - 16

Rubber sleeves

Rubber (EPDM). Suitable for filter crucibles, according to identification code. Pack of 10.

Identification Code	Outer Ø mm	Cat. No.
1 D	41	**4620 26**
2 D	49	**4622 31**

Rubber gaskets



Rubber (EPDM). Conical gaskets to place between filter funnel and filter flask. Pack of 10.

Upper outer-Ø mm	Lower outer-Ø mm	Lower inner-Ø mm	Cat. No.
22	11	6	**4625 12**
28	16	9	**4626 17**
35	20	14	**4627 23**
42	25	18	**4628 27**
50	32	22	**4629 32**
63	43	33	**4630 36**
71	52	42	**4631 39**
84	61	50	**4632 43**
Rubber gasket set. Pack of 1.			**4625 00**

Filter flasks with socket

(Buchner filter flasks)

Boro 3.3. DIN 12476, ISO 6556. Lateral socket for pushing in vacuum tubing with outer diameter 15-18 mm. Pack of 1.

Capacity ml	max. outer-Ø mm	Height mm	Neck inner-Ø mm	Cat. No.
250	85	155	33.7	**737 14**
500	105	185	33.7	**737 19**
1000	135	230	45	**737 24**
2000	166	265	60	**737 29**

Desiccators

with knob lid

Boro 3.3. DIN 12491. Precisely ground flat flanges. Base ring surface studded to improve stability and help prevent cracks. Interchangeable lid. Pack of 1.

Nominal size mm	Ø mm	Height mm	Cat. No.
150	215	252	**650 31**
200	270	309	**650 38**
250	320	357	**650 43**

Desiccators

with socket in the lid

Boro 3.3. DIN 12491. Precisely ground flat flanges. Base ring surface studded to improve stability and help prevent cracks. Interchangeable lid. Socket, ground joint neck size 24/29, with interchangeable stopcock. Pack of 1.

Nominal size mm	Ø mm	Height mm	Cat. No.
150	215	316	**652 31**
200	270	368	**652 38**
250	320	417	**652 43**

Spare parts for desiccators of Boro 3.3

Needle-valve stopcock for desiccators

Boro 3.3. Cone size 24/29. Suitable for desiccators with lid socket. PTFE spindle, aperture 0-4 mm. Lateral venting hole helps to reduce turbulence. Nozzle with outer diameter 10 mm. Pack of 1.

Cat. No.	824 15

Lid with knob

Boro 3.3. Pack of 1.

Nominal size mm	Ø mm	Height mm	Cat. No.
150	215	93	**656 31**
200	270	102	**656 38**
250	320	113	**656 43**

Lid with socket

Boro 3.3. Pack of 1.

Nominal size mm	Ø mm	Height mm	Cat. No.
150	215	84	**657 31**
200	270	92	**657 38**
250	320	118	**657 43**

Desiccators

PC lid. PP base and desiccant tray. Venting stopper with non-return valve in lid. Seal between lid and base: polychlorobutadiene rubber (CR) O-ring, compressed by vacuum. Lightweight and easy to handle. Pack of 1.

Nominal size mm	Ø mm	Height mm	Cat. No.
150	170	195	**658 05**
200	235	240	**658 10**
250	285	300	**658 15**

Spare parts for desiccators of PC/PP

Sealing rings

CR. Pack of 1.

Nominal size mm	Cat. No.
150	**658 20**
200	**658 22**
250	**658 24**

Venting stopper

PC. Pack of 1.

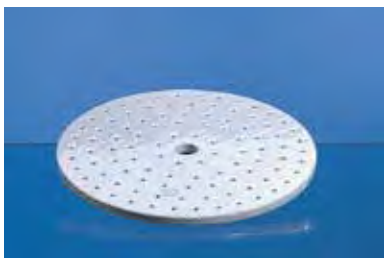
Cat. No.	658 04

Accessories for desiccators of Boro 3.3 or PC/PP

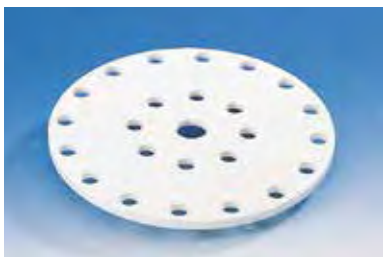
Desiccator plates

Porcelain or PP. For glass and plastic desiccators. Central hole approx. 20 mm diameter, small perforations approx. 5 mm diameter. Pack of 1.

Nominal size mm	Ø mm	Porcelain Cat. No.	PP Cat. No.
150	140	**659 65**	**660 15**
200	190	**659 75**	**660 25**
250	235	**659 80**	**660 30**



Porcelain



PP

Gas wash bottles, Drechsel pattern

BISTABIL. With P1 filter disc.

Boro 3.3 glass bottle and head. DIN 12596. With filter disc of porosity P1 (approx. 100-160 µm pore size). Drechsel pattern heads provide optimal stability. Overall height 275 mm, standard ground joint neck size 29/32, hose nozzles with outer diameter 11 mm. Pack of 1.

Capacity ml	Cat. No.
100	**782 38**
250	**782 48**
500	**782 54**
1000	**782 62**

Gas wash bottles, Drechsel pattern

BISTABIL. Without filter disc.

Boro 3.3 glass bottle and head. DIN 12596. Without filter disc. Drechsel-pattern heads provide optimal stability. Overall height 275 mm, standard ground joint neck size 29/32, hose nozzles with outer diameter 11 mm. Pack of 1.

Capacity ml	Cat. No.
100	**781 38**
250	**781 48**
500	**781 54**
1000	**781 62**

Wash bottles, without head

Boro 3.3. Standard ground joint neck size 29/32, to DIN 12463. Pack of 1.

Capacity ml	Neck size	Ø mm	Height mm	Description	Cat. No.
100	29/32	40	200	with base Ø 55 mm	**1269 38**
250	29/32	55	200	with base Ø 75 mm	**1269 48**
500	29/32	75	200	without base	**1269 54**
1000	29/32	107	200	without base	**1269 62**

Wash bottle head with P1 filter disk

for gas wash bottles, Drechsel pattern

Boro 3.3. DIN 12596. Size 29/32. Length below top of cone 185 mm. Accommodates all bottle sizes to DIN 12463. Filter disk outer diameter 25 mm, porosity P1 (approx. 100-160 µm pore size). Pack of 1.

Cat. No.	782 00

Wash bottle head without filter disk

for gas wash bottles, Drechsel pattern

Boro 3.3. DIN 12596. Size 29/32. Length below top of cone 185 mm. Accommodates all bottle sizes to DIN 12463. Tube outer diameter 8 mm. Pack of 1.

Cat. No.	781 00

Gas wash bottles

PFA. Head with S40 thread. Frit, PTFE, with approx. 100 µm pore size for optimum gas pearling in the liquid. High-quality fluoroplastics make a wide range of applications possible. Pack of 1.
(For wash bottles, PFA, S40 thread see page 302).

Capacity ml	Ø mm	Height mm	Tubing connection Inner-Ø/outer-Ø mm	Heads Cat. No.	Gas wash bottle, complete Cat. No.
250	55	180	4/6	**783 00**	**783 48**
500	75	210	4/6	**783 01**	**783 54**
1000	107	249	5/8	**783 02**	**783 62**

Gas sampling tubes

BISTABIL
(Gas collecting tubes)

Boro 3.3. DIN 12473-1. With straight bore stopcocks size 3 NS/14 with retention device. One end with capillary tube (inner-diameter 2.7 mm, outer diameter 8 mm), other end with hose nozzle (outer diameter 9 mm). With marking area. Pack of 1.

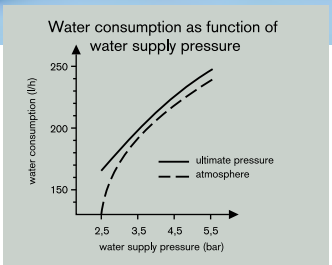
Capacity ml	Cat. No.
100*	**2350 10**
250*	**2350 20**
500	**2350 30**

* in addition to the DIN range

Water jet pump

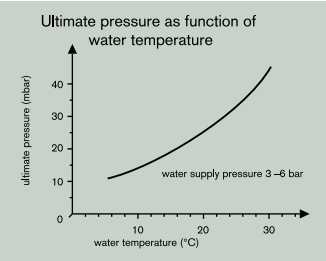
Pump fluid: water
Overall length: approx. 210 mm
(R 3/4" connector fitted)
Weight: approx. 33 g
(R 3/4" connector fitted)

- High chemical resistance, fluid path consists of PP, FKM and PTFE
- Operating temperature up to max. 80 °C
- Integrated non-return valve increases safety
- Simple operation and easy to clean
- Detachable vacuum connection
- Variety of supplied adapters simplify connections to most water sources. Optional reducing adapters are available.



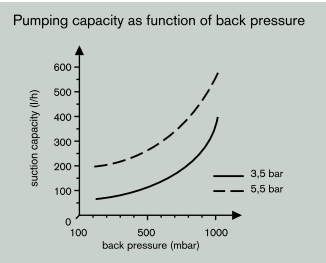
Very low water consumption

The flow configuration has been optimized, resulting in a 33 % reduction of water consumption (190 litres/h at 3.5 bar water supply pressure).



Constant ultimate pressure

The ultimate pressure of 16 mbar (water temperature: 12 °C) is reached across a wide range of water supply pressures (from 3 to 6 bar).



High suction capacity

Flow rate of approx. 400 litres/h of air (against atmospheric pressure, at a water supply pressure of 3.5 bar at 12 °C water temperature).

Ordering data

Water jet pump includes:

sleeve nut R 3/4", reducing adapter R 1/2", and tubing connector (hose nozzle) of 10-12 mm outer diameter

Suction line connection:
Detachable hose nozzle of 6-9 mm outer diameter, with screw cap GL 14.
Pack of 1.

Cat. No.	1596 00

Accessories

Reducing adapter R 3/8".
Pack of 1.

Cat. No.	1596 65

Reducing adapter M 22 x 1
(thread for screen tap). Pack of 1.

Cat. No.	1596 70

Tubing

PVC. Particularly high-grade material, manufactured to a first-class standard. Good flexibility and chemical resistance make this tubing ideal for use with apparatus assemblies. Autoclavable (121 °C). Packing unit 20 meters.

inner-Ø mm	outer-Ø mm	Wall thickness mm	Cat. No.
2	4	1	**1432 55**
4	6	1	**1432 60**
5	8	1,5	**1432 65**
6	9	1,5	**1432 70**
7	11	2	**1432 75**
8	12	2	**1432 80**
10	14	2	**1432 85**
12	17	2,5	**1432 90**

Tubing

Silicone (SI). Translucent. Autoclavable (121 °C). Note: limited chemical resistance when used with concentrated acids. Packing unit 25 meters.

inner-Ø mm	outer-Ø mm	Wall thickness mm	Cat. No.
2	4	1	**1433 52**
3	5	1	**1433 55**
4	6	1	**1433 56**
4	7	1,5	**1433 57**
5	8	1,5	**1433 58**
6	9	1,5	**1433 59**
6	10	2	**1433 60**
7	10	1,5	**1433 61**
8	12	2	**1433 62**
10	15	2,5	**1433 64**

Flow indicator

Styrene-acrylonitrile (SAN), transparent. Optimizes cooling water flow during distillation. This helps to decrease operating costs by reducing water consumption. Operating pressure max. 2 bar, operating temperature for SAN max. 30 °C.
L x W x H in mm: 88 x 17 x 40.
For tubing of inner-Ø 6-11 mm.
Pack of 5.

Cat. No.	1340 80

Spring clips

Spring steel, coated with zinc and polyethylene. Non-scratching, good chemical resistance. For wall mounting of cylindrical apparatus components, e.g., pipes, tubing, etc. Pack of 1.

Grip Ø mm	Bore mm	Cat. No.
6.5	2.5	**760 05**
9.5	2.5	**760 10**
13	3.0	**760 15**
16	3.0	**760 20**
19	3.5	**760 25**
25	3.5	**760 35**
29	4.0	**760 40**
32	4.0	**760 45**
42	4.0	**760 50**
51	4.0 *	**760 55**

* 2 bores

Tubing Connectors and Tubing Adapters

straight

PP, translucent. Connects tubing of different diameters. Pack of 10.

for tubing inner-Ø mm	Length mm	Cat. No.
5 - 17	110	**1524 00**

straight

PP, translucent.
Pack of 10.

for tubing inner-Ø mm	Length mm	Cat. No.
3 - 5	47	**1527 05**
6 - 10	55	**1527 10**
9 - 13	57	**1527 15**

straight

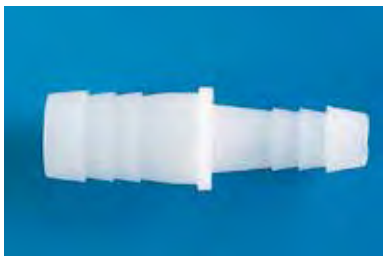
PE-HD. Pack of 10.

for tubing inner-Ø mm	Length mm	Cat. No.
10 - 11	45	**1527 55**
12 - 14	74	**1527 60**
19 - 21	74	**1527 65**
24 - 26	84	**1527 70**

straight

PP, grey.
Pack of 20 (Cat. No. 1522 70 and 1522 75: Pack of 10).

for tubing inner-Ø mm	Length mm	Cat. No.
4 - 5	39	**1522 50**
5 - 7	52	**1522 55**
7 - 9	59	**1522 60**
9 - 11	59	**1522 65**
11 - 13	66	**1522 70**
13 - 15	66	**1522 75**



straight (tubing adapter)

PE-HD. Pack of 10.

for tubing inner-Ø mm	Length mm	Cat. No.
8 - 10 / 11 - 14	66	**1525 05**
12 - 14 / 18 - 20.5	73	**1525 10**

Tubing Connectors and Tubing Adapters

straight (tubing adapter)

PP, translucent.
Pack of 10.

for tubing inner-Ø mm	Length mm	Cat. No.
3 - 5 / 6 - 10	55	**1526 05**
3 - 5 / 9 - 13	55	**1526 10**
6 - 10 / 9 - 13	59	**1526 15**

L-shape

PP, translucent.
Pack of 20 (Cat. No. 1532 30 and 1532 35 pack of 10).

for tubing inner-Ø mm	Length mm	Cat. No.
3 - 4	15	**1532 05**
5	21	**1532 10**
6 - 7	25	**1532 15**
8 - 9	30	**1532 20**
10 - 11	36	**1532 25**
12 - 13	42	**1532 30**
14 - 15	48	**1532 35**

T-shape

PP, translucent. Length 1 = Length of straight-through tube,
Length 2 = Length of side arm including Ø of straight-through tube.
Pack of 20 (Cat. No. 1528 20 and 1528 25: Pack of 10).

for tubing inner-Ø mm	Length 1 mm	Length 2 mm	Cat. No.
3 - 4	20	15	**1528 00**
4 - 5	30	23	**1528 03**
6 - 7	40	31	**1528 05**
8 - 9	55	39	**1528 10**
10 - 11	69	47	**1528 15**
12 - 13	79	53	**1528 20**
14 - 15	89	60	**1528 25**

Y-shape

PP, transparent. Length1 = overall length, length 2 = distance between the two arms from one outer edge to the other.
Pack of 20 (Cat. No. 1529 15 and 1529 20: Pack of 10).

for tubing inner-Ø mm	Length 1 mm	Length 2 mm	Cat. No.
3	24	14	**1529 00**
4 - 5	35	21	**1529 03**
6 - 7	54	34	**1529 05**
8 - 9	64	40	**1529 07**
10 - 11	74	47	**1529 10**
12 - 13	87	53	**1529 15**
14 - 15	98	60	**1529 20**

Tubing Connectors

X-shape

PP, translucent.
Pack of 20 (Cat. No. 1531 30 and 1531 35: Pack of 10).

for tubing inner-Ø mm	Length mm	Cat. No.
2 - 3	26	**1531 05**
5	35	**1531 10**
6 - 7	42	**1531 15**
9	50	**1531 20**
10 - 11	62	**1531 25**
12 - 13	74	**1531 30**
14 - 15	84	**1531 35**

Y-shape (120°)

PP, grey. Three arms at equal angles of 120°.
Pack of 20 (Cat. No. 1530 25 and 1530 30: Pack of 10).

for tubing inner-Ø mm	Length mm	Cat. No.
4 - 5	26	**1530 05**
6 - 7	35	**1530 10**
8 - 9	42	**1530 15**
10 - 11	50	**1530 20**
12 - 13	62	**1530 25**
13 - 15	74	**1530 30**

Plug-in coupling

PP. The two parts fit together with a cone-and-socket joint. Not suitable for pressure applications.
Pack of 25.

for tubing inner-Ø mm	Length mm	Cat. No.
6 - 9	68	**1523 00**

Non-return valve

PE-HD. For tubing of inner diameter 6-9 mm. Length 80 mm. FKM valve disk not suitable for pressure applications. Pack of 10.

Cat. No.	1340 02

Straight-bore stopcocks

with nozzles

PTFE, valve lever PP.
Outstanding chemical resistance.
Two integrated hose nozzles.
Pack of 1.

for tubing inner-Ø mm	Bore mm	Cat. No.
3	2	**886 10**
4	2	**886 15**
5	3	**886 20**
6	3	**886 25**
7	4	**886 30**
8	4	**886 35**
9	5	**886 40**

T-bore stopcocks

with nozzles

PTFE, valve lever PP.
Outstanding chemical resistance.
Three integrated hose nozzles.
Pack of 1.

for tubing inner-Ø mm	T-bore mm	Cat. No.
3	2	**886 50**
4	2	**886 55**
5	3	**886 60**
6	3	**886 65**
7	4	**886 70**
8	4	**886 75**
9	5	**886 80**

Straight-bore stopcocks

with nozzles

PE-HD. For operation under ambient pressure only. Two integrated hose nozzles.
Pack of 1.

for tubing inner-Ø mm	Bore mm	Length mm	Cat. No.
12.5	9	97	**885 05**
9.5	7	80	**885 10**

Conical joint clips

POM. Will not scratch glass surfaces.
Excellent resilience and stability.
Outstanding chemical resistance.
Operating temperature up to 150 °C.
Pack of 1.

For size	Color	Cat. No.
10/19	turquoise	**556 38**
12/21	violet	**556 39**
14/23	yellow	**556 40**
19/26	blue	**556 42**
24/29	green	**556 44**
29/32	red	**556 46**
34/35	orange	**556 47**
45/40	brown	**556 49**

Conical joint clips

Coated steel spring

PTFE. Will not scratch glass surfaces.
Outstanding chemical resistance.
Excellent resilience and good stability.
Operating temperature up to 200 °C.
Pack of 1.

For size	Cat. No.
10/19	**555 60**
12/21	**555 62**
14/23	**555 64**
19/26	**555 69**
24/29	**555 74**
29/32	**555 79**
34/35	**555 84**
45/40	**555 95**

Stopcock grease, silicone-free

Ideal for lubricating burette stopcocks.
Easy to remove, e.g., with Mucasol®.
Good acid- and base-resistance. Operating temperature range -40 to +320 °C.
Tube of 60 g. Pack of 1.

Cat. No.	616 10

Silicone paste

Low viscosity. Operating temperature from -40 to +160 °C. For greasing ground joints.
Tube of 50 g. Pack of 1.

Cat. No.	616 05

Ground joint sleeves

PTFE. Greaseless seal will not contaminate sample. Outstanding chemical resistance at operating temperatures from -200 to +260 °C.
Thin walled sleeves (0.05 mm thick) fit snugly without adding bulk. Joints fit perfectly, without a protruding rim simplifying use of joint clips. Wide range of applications, including vacuum to 0.1 mbar, e.g., for rotary evaporators.
Pack of 10.

For size	Cat. No.
7/16	**514 16**
10/19	**514 17**
12/21	**514 18**
14/23	**514 19**
19/26	**514 20**
24/29	**514 21**
29/32	**514 22**
34/35	**514 23**
45/40	**514 24**
50/42	**514 25**
55/44	**514 26**
60/46	**514 27**
40/38	**514 30**

Sockets

with grip collar

PTFE. Greaseless seal will not contaminate sample. Outstanding chemical resistance at operating temperatures from -200 to +260 °C. Sturdy design for permanent use. With grip collar and sealing rings for excellent tightness. Low leakage rate: $Q < 1 \cdot 10^{-4}$ mbar · l · s^{-1}.
Pack of 1.

Size	Cat. No.
10/19	**514 63**
14/23	**514 64**
19/26	**514 65**
24/29	**514 66**
29/32	**514 67**
34/35	**514 68**
45/40	**514 69**

Rubber stoppers

Natural rubber (NR), red.

upper-Ø mm	lower-Ø mm	Height mm	Pack of	Cat. No.
9	5	20	25	**1443 80**
12	8	20	25	**1443 82**
14	11	20	25	**1443 84**
16	12	20	25	**1443 85**
18	14	20	25	**1443 86**
22	17	25	25	**1443 88**
24	18	30	25	**1443 89**
27	21	30	25	**1443 90**
32	26	30	25	**1443 91**
35	29	30	5	**1443 93**
38	31	35	5	**1443 94**
44	36	40	5	**1443 95**
49	41	40	5	**1443 96**
55	47	40	1	**1443 97**
60	50	45	1	**1443 98**
65	56	45	1	**1443 99**

Silicone stoppers

SI, natural-colored.

upper-Ø mm	lower-Ø mm	Height mm	Pack of	Cat. No.
9	5	20	10	**1443 05**
12	8	20	10	**1443 10**
14	11	20	10	**1443 15**
16	12	20	10	**1443 20**
18	14	20	10	**1443 25**
22	17	25	10	**1443 30**
24	18	30	10	**1443 35**
27	21	30	10	**1443 40**
32	26	30	10	**1443 45**
35	29	30	10	**1443 50**
38	31	35	5	**1443 55**
44	36	40	5	**1443 60**
49	41	40	5	**1443 65**
55	47	40	5	**1443 70**
75	64	55	5	**1443 75**

Conical ground joint stoppers

PP. Hollow, with sealing ribs and square grip. Autoclavable (121 °C).
Pack of 10 (Cat. No. 1444 40, 1444 45 and 1444 46: Pack of 1).

Size	Cat. No.
7/16	**1444 05**
10/19	**1444 10**
12/21	**1444 15**
14/23	**1444 20**
19/26	**1444 25**
24/29	**1444 30**
29/32	**1444 35**
34/35*	**1444 40**
45/40*	**1444 45**
60/46*	**1444 46**

* PE-LD, with octagonal grip

Conical ground joint stoppers

PTFE. Solid, with sealing ribs and ergonomically designed grip. Resistant to temperatures up to 270 °C.
Pack of 1.

Size	Cat. No.
10/19	**1444 48**
14/23	**1444 50**
19/26	**1444 53**
24/29	**1444 55**
29/32	**1444 58**
34/35	**1444 59**

Conical ground joint stoppers

BISTABIL

Boro 3.3. DIN 12252.
Hollow, with drip tip and hexagonal grip.
Pack of 1.

Size	Cat. No.
7/16	**1446 05**
10/19	**1446 10**
12/21	**1446 15**
14/23	**1446 20**
19/26	**1446 25**
24/29	**1446 30**
29/32	**1446 35**
34/35	**1446 40**
45/40	**1446 45**

Conical ground joint stoppers

Boro 3.3. DIN 12252.
Solid or semi-hollow, with octagonal grip.
Pack of 1.

Size	Description	Cat. No.
12/21	solid	**1445 15**
14/23	solid	**1445 20**
19/26	solid	**1445 25**
24/29	solid	**1445 30**
29/32	semi-hollow	**1445 35**
34/35	semi-hollow	**1445 40**
45/40	semi-hollow	**1445 45**

Stirrers

Good operating characteristics due to steel-core shafts. Resistant to breakage.
PP propeller greatly reduces scratching if stirrer inadvertently hits vessel wall.
Pack of 1.

Propeller, PP. Shaft PE-coated.

Stirrer shaft Ø mm	Stirrer shaft length mm	Rotor Ø mm	Cat. No
6	380	45	**1356 00**

Propeller, PTFE

Stirrer shaft Ø mm	Stirrer shaft length mm	Rotor Ø mm	Cat. No
6	400	40	**1342 90**
6	500	40	**1342 91**
9.5	550	60	**1342 92**
9.5	650	60	**1342 93**

2 moveable paddles, PTFE

Stirrer shaft Ø mm	Stirrer shaft length mm	Rotor Ø mm	Cat. No
6	400	50	**1342 86**
6	500	50	**1342 87**
9.5	550	70	**1342 88**
9.5	650	70	**1342 89**

Anchor, PTFE

Stirrer shaft Ø mm	Stirrer shaft length mm	Rotor Ø mm	Cat. No
6	500	75	**1342 96**
9.5	550	100	**1342 97**
9.5	650	140	**1343 00**

Magnetic Stirring Bars, PTFE

PTFE. High magnetic strength and long life due to Alnico V magnetic cores, fully encapsulated with high-grade PTFE. Strict quality control ensures the magnetic strength, position of the magnetic core, surface quality, crack resistance, and uniform thickness of the PTFE coating. Maximum operating temperature 270 °C.
BRAND provides the right magnetic stirring bar for virtually any application. Rough vessel surfaces or abrasive sediments can quickly deteriorate the PTFE coating and thus shorten the life of stirring bars. This can be prevented by using reduced contact surface (e.g., with pivot ring) stirring bars.

Storing conditions:
To prevent demagnetization stirring bars using Alnico V magnetic cores should not be stored in a random mass but should be kept "paired" and should not be dropped on hard or steel surfaces.

Cylindrical

PTFE. Round, smooth surface, for universal applications. Pack of 10.

Length mm	Bar Ø mm	Cat. No.
2.5	2.5	**1371 00**
3.5	3.5	**1371 01**
5	2	**1371 02**
6	3	**1371 03**
8	3	**1371 04**
12	4.5	**1371 05**
7	2	**1371 06**
8	1.7	**1371 07**
10	3	**1371 08**
13	3	**1371 09**
15	4.5	**1371 10**
15	1.7	**1371 11**
10	6	**1371 13**
15	6	**1371 14**
20	6	**1371 15**
25	6	**1371 20**
30	6	**1371 25**
35	6	**1371 27**
40	8	**1371 30**
45	8	**1371 32**
50	8	**1371 35**
57*	27	**1371 37**
60	9	**1371 40**
70	9	**1371 45**
80	9	**1371 50**
108*	27	**1371 55**
159*	27	**1371 60**

* flattened sides, pack of 1.

Cylindrical, with pivot ring

PTFE. For vessels with slightly uneven bottoms. The pivot ring reduces the contact surface and enables the stirrer to adopt the optimum stirring position. Pack of 10.

Length mm	Bar Ø mm	Ring Ø mm	Cat. No.
8	3	4	**1374 04**
12	4.5	6	**1374 05**
15	4.5	6	**1374 10**
20	6	8	**1374 15**
25	6	7	**1374 20**
30	6	7.5	**1374 25**
35	6	8	**1374 27**
40	8	8.5	**1374 30**
45	8	10	**1374 32**
50	8.5	11	**1374 35**
60	8.5	11	**1374 37**
70	8.5	10	**1374 45**

Cylindrical, conical

PTFE. Round, smooth surface. Diameter increases toward the center to reduce the contact surface. Pack of 10.

Length mm	Bar Ø mm	Cat. No.
10	4	**1371 68**
15	5	**1371 70**
20	7	**1371 75**
25	8	**1371 78**
30	8	**1371 80**
40	8	**1371 85**
50	8	**1371 90**
60	8	**1371 95**
70	10	**1371 97**
80	10	**1371 99**

Triangular

PTFE. Wedge-shaped. Ideal for dissolving solids and mixing of sediments due to scraping action. Angular surface creates high turbulence even at low speeds. Pack of 10.

Length mm	Bar Ø mm	Cat. No.
12	6	**1378 05**
20	8	**1378 07**
25	8	**1378 10**
25	14	**1378 12**
35	10	**1378 15**
40	14	**1378 17**
50	12	**1378 20**
55	14	**1378 22**
80	14	**1378 26**

Triangular, with pivot rim

PTFE. Angular surface creates high turbulence even at low speeds. For vessels with slightly uneven bottoms. The pivot rim reduces the contact surface and enables the stirrer to adopt the optimum position. Pack of 10.

Length mm	Height mm	Cat. No.
12	6	**1378 40**
25	8	**1378 42**
35	10	**1378 44**
50	12	**1378 46**
80	18	**1378 48**

Octagonal, with pivot ring

PTFE. Angular surface creates high turbulence even at low speeds. For vessels with slightly uneven bottoms. The pivot ring reduces the contact surface and enables the stirrer to adopt the optimum position. Pack of 10.

Length mm	Bar Ø mm	Ring Ø mm	Cat. No.
13	8	10	**1376 07**
15	8	9.5	**1376 08**
25	8	9.5	**1376 10**
25	10	11	**1376 12**
38	8	9.5	**1376 15**
38	10	11	**1376 17**
51	8	9.5	**1376 18**
51	10	11	**1376 20**
64	10	11	**1376 22**
75	12	14.5	**1376 25**

Magnetic Stirring Bars, PTFE

Double-ended

PTFE. Excellent centering, small contact surface and high turbulence even at low speeds. Pack of 10.

Length mm	Bar Ø mm	Ends Ø mm	Cat. No.
37	8	20	**1379 30**
54	8	20	**1379 35**

Oval

PTFE. Ideal for vessels with round bottom, e.g., round-bottom flasks. Pack of 10.

Length mm	max. Ø mm	Cat. No.
10	5	**1373 00**
15	6	**1373 01**
20	10	**1373 02**
25	12	**1373 05**
32	15	**1373 07**
34	15	**1373 10**
40	20	**1373 12**
50	20	**1373 15**
65	20	**1373 20**
70	20	**1373 25**

Crosshead

PTFE. Steady spinning position. Excellent stirring action. Pack of 10.

Ø mm	Height mm	Cat. No.
10	5	**1376 30**
20	9	**1376 32**
25	10	**1376 34**
30	12	**1376 36**
38	15	**1376 38**

Disc

PTFE. Convex shape for good centering. Particularly effective stirring action. Pack of 10.

Ø mm	Height mm	Cat. No.
9	6*	**1379 26**
10	6	**1379 27**
20	10	**1379 28**
30	12	**1379 29**

* Also suitable for cuvettes size 10 x 10 mm.

Magnetic Stirring Bars, PTFE

Round, with crosshead

PTFE. Specialshape for small vessels. Particularly effective stirring action. Pack of 10.

Ø mm	Height mm	Cat. No.
10	8	**1379 05**
14	10	**1379 10**
17	13	**1379 15**
22	15	**1379 17**
30	12	**1379 19**

Spherical

PTFE. Ideal for test tubes or for eccentric stirring motion. Pack of 1.

Ø mm	Cat. No.
12	**1379 50**

Magnetic stirring bar retrievers

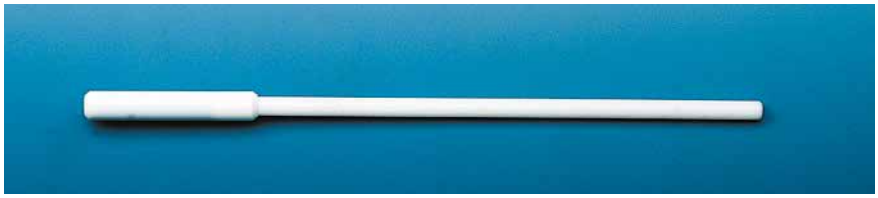
PP. Magnetic core fully sealed. Pack of 1.

Length mm	Ø mm	Cat. No.
300	10	**1377 50**
450	10	**1377 55**

Magnetic stirring bar retrievers

PTFE. Magnetic core fully sealed. Pack of 1.

Length mm	Ø mm	Cat. No.
150	8	**1377 00**
250	8	**1377 10**
350	8	**1377 20**



Stirring rods

AR-GLAS®. Glass tube, fused and sealed at both ends. Pack of 50.

Length mm	Ø mm	Cat. No.
200	5	**1358 05**
200	6	**1358 10**
250	6	**1358 15**
250	8	**1358 20**
300	8	**1358 25**

Stirring rods

PTFE. With spatulate ends.
Pack of 1.

Length mm	Bar Ø mm	Cat. No.
150	8	**1362 10**
200	8	**1362 15**
250	8	**1362 20**
300	8	**1362 25**

Stirring rods with steel core

PTFE coated steel core. Can be bent as required; the shape is permanently retained. Round ends. Pack of 1.

Length mm	Bar Ø mm	Cat. No.
100	6	**1363 05**
150	6	**1363 10**
200	6	**1363 15**
250	6	**1363 20**
300	6	**1363 25**
350	6	**1363 30**
400	6	**1363 35**

Spatulas

Impact-resistant PS. Available with double spatulate ends or a spatulate and spoon combination. Pack of 10.

Length mm	Description	Cat. No.
150	Double spatula	**1398 10**
180	Double spatula	**1398 15**
180	Spatula / spoon	**1398 17**
210	Spatula / spoon	**1398 20**

Spatula with steel core

PE-HD coated steel core. Two differently shaped spatulate ends (approx. 16 mm wide). Pack of 1.

Length mm	Ø mm	Cat. No.
260	7	**1361 00**

Spatula

PP. Two differently shaped spatulate ends (approx. 15 mm wide). Pack of 10.

Length mm	Ø mm	Cat. No.
245	6	**1361 10**

Forceps

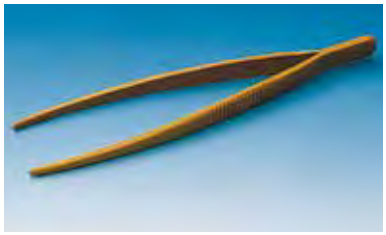
PMP. Pointed ends. Autoclavable (121 °C). Pack of 10.

Length mm	Cat. No.
115	**1128 05**
145	**1128 10**

Forceps

POM, glass-fiber reinforced. Round ends. Pack of 5.

Length mm	Cat. No.
250	**1130 20**



Forceps

PTFE. Pointed ends. Outstanding chemical and thermal resistance. Pack of 1.

Length mm	Cat. No.
100	**1131 05**
150	**1131 10**
200	**1131 15**

Forceps

PTFE. Rectangular ends. Outstanding chemical and thermal resistance. Pack of 1.

Length mm	Cat. No.
100	**1131 25**
150	**1131 30**
200	**1131 35**

Scoops

PP, white. 2 to 100 ml: Pack of 12; 250 to 1000 ml: Pack of 6.

Capacity ml	Length mm	Cat. No.
2	60	**1391 02**
5	80	**1391 03**
10	100	**1391 05**
25	135	**1391 10**
50	160	**1391 15**
100	200	**1391 20**
250	260	**1391 25**
500	315	**1391 30**
1000	385	**1391 35**

Scoops

PE, natural-colored. Pack of 6.

Capacity ml	Length mm	Cat. No.
500	350	**1390 35**
1000	400	**1390 40**

Weighing dishes, square shape

Impact-resistant PS, antistatic. Light and flat design. Ideal for weighing. Wall thickness approx. 0.2 mm. Pack of 500.

Capacity ml	Length mm	Width mm	Height mm	Cat. No.
7	45	45	7	**1555 40**
100	84	84	24	**1555 42**
250	140	140	21	**1555 44**

Weighing dishes, diamond shape

Impact-resistant PS, antistatic. Light and flat design. Ideal for weighing. Wall thickness approx. 0.2 mm. Pack of 500.

Capacity ml	Length mm	Width mm	Height mm	Cat. No.
25	70	45	12	**1555 46**
30	80	56	14	**1555 48**
100	120	90	17	**1555 50**

Jars with screw cap

PE-LD. Thick-walled, slightly conical. Screw cap with sealing cone. Pack of 10.

Capacity ml	max. Ø mm	Height mm	Cat. No.
5	23	34	**619 50**
10	23	52	**619 55**
30	37	53	**619 60**
60	37	92	**619 65**
90	57	62	**619 70**
180	57	108	**619 75**

Sample jars with screw cap

PFA. For sampling, transport and storage. PFA screw cap with integrated seal lip. Autoclavable, easy to clean, withstands temperatures from -200 °C to +260 °C. Pack of 1.

Capacity ml	Height mm	Ø mm	Thread	Cat. No.
30	54	38	GL 40	**620 05**
60	90	38	GL 40	**620 10**
90	62	54	GL 56	**620 15**
180	112	54	GL 56	**620 20**

Thread	Cat. No.
GL 40	**1292 54**
GL 56	**1292 56**

Replacement screw caps for PFA sample jars

PFA. Pack of 1.

Laboratory bottles

Boro 3.3. Threaded to DIN ISO 4796. Studded base for stability and abrasion resistance. Graduated, with marking area. Screw cap and pouring ring PP. Autoclavable (121 °C). Pack of 10 (5000 ml to 20 000 ml: Pack of 1).

Capacity ml	Thread	Ø mm	Height mm	Cat. No.
25*	GL 25	36	74	**1225 20**
50	GL 32	46	91	**1225 28**
100	GL 45	56	105	**1225 38**
250	GL 45	70	144	**1225 48**
500	GL 45	86	183	**1225 54**
1000	GL 45	101	232	**1225 62**
2000	GL 45	136	268	**1225 64**
5000	GL 45	186	338	**1225 70**
10000	GL 45	234	412	**1225 74**
20000	GL 45	300	510	**1225 78**

* integrated glass ring, no additional pouring ring

Thread	Screw Cap Cat. No.	Pouring ring Cat. No.
GL 25	**1226 20**	**–**
GL 32	**1226 28**	**1226 62**
GL 45	**1226 38**	**1226 64**

Spare parts for laboratory bottles

PP. Pack of 10.

Threaded bottles

Soda-lime glass (amber). Screw cap PP, pouring ring PE-LD. Space-saving square base. The bottles are available ethylene-acrylate coated or uncoated.
Pack of 1.

Synthetic-coating for better protection

The ethylene-acrylate coating envelops the glass bottle like a protective skin. Should the bottle break, the splintering hazards are reduced considerably. The maximum operating temperature for coated bottles is 80 °C.
To preserve the coating, do not clean at temperatures exceeding 60 °C.

Capacity ml	Width mm	Height mm	Thread	coated Cat. No.	uncoated Cat. No.
100	50	125	GL 32	**7040 02**	**7040 12**
250	65	160	GL 32	**7040 04**	**7040 14**
500	80	195	GL 32	**7040 06**	**7040 16**
1000	95	230	GL 45	**7040 08**	**7040 18**
2500*	140	300	GL 45	**7040 10**	**7040 20**

* cylindrical shape

Conical-shoulder bottles, narrow-mouth

PP. Standard ground joint and interchangeable stoppers (PP, square). 5000 ml size with additional carrying handle. 10 000 ml size with two carrying handles.

Capacity ml	Neck size	Ø mm	Height mm	Pack of	Cat. No.
100	14/23	52	106	10	**1298 38**
250	19/26	70	136	10	**1298 48**
500	24/29	76	172	10	**1298 54**
1000	29/32	106	209	10	**1298 62**
2000*	GL 32	130	240	6	**1298 66**
5000*	GL 45	175	325	1	**1298 70**
10000*	GL 63	222	394	1	**1298 74**

* with screw cap

Conical-shoulder bottles, wide-mouth

PP. Standard ground joint and interchangeable stoppers (PE, octagonal).

Capacity ml	Neck size	Ø mm	Height mm	Pack of	Cat. No.
100	29/32	52	106	10	**1299 38**
250	34/35	70	136	10	**1299 48**
500	45/40	86	172	10	**1299 54**
1000	60/46	110	209	10	**1299 62**
2000*	GL 63	130	244	6	**1299 66**

* with screw cap

Narrow-mouth bottles

PE-LD, flexible, translucent. Economical multipurpose bottle.
With or without screw cap.

Capacity ml	Ø mm	Height mm	Thread	Pack of	with cap Cat. No.	without cap Cat. No.
10	26	50	GL 14	100	**1294 08**	**1290 08**
20	31	58	GL 14	100	**1294 16**	**1290 16**
30	34	66	GL 14	100	**1294 24**	**1290 24**
50	39	85	GL 18	100	**1294 28**	**1290 28**
100	45	106	GL 18	50	**1294 38**	**1290 38**
250	59	140	GL 25	50	**1294 48**	**1290 48**
500	75	180	GL 25	50	**1294 54**	**1290 54**
1000	94	212	GL 28	25	**1294 62**	**1290 62**
2000	117	264	GL 28	25	**1294 64**	**1290 64**

Screw caps for narrow-mouth bottle, PE-LD

Thread	Pack of	Cat. No.
GL 14	100	**1292 00**
GL 18	50	**1292 02**
GL 25	50	**1292 04**
GL 28	25	**1292 06**

Narrow-mouth bottles, amber

PE-LD, opaque. For storage of light-sensitive substances.
With screw cap. Pack of 1.

Capacity ml	Ø mm	Height mm	Thread	Cat. No.
50	39	85	GL 18	**1302 28**
100	45	106	GL 18	**1302 38**
250	59	140	GL 25	**1302 48**
500	75	180	GL 25	**1302 54**
1000	94	212	GL 28	**1302 62**
2000	117	264	GL 28	**1302 64**

Wide-mouth bottles

PE-LD, flexible, translucent. With or without screw cap.

Capacity ml	Ø mm	Height mm	Thread	Pack of	with cap Cat. No.	without cap Cat. No.
50	38	80	GL 32	100	**1296 28**	**1293 28**
100	48	94	GL 32	50	**1296 38**	**1293 38**
250	62	126	GL 40	50	**1296 48**	**1293 48**
500	76	155	GL 50	50	**1296 54**	**1293 54**
1000	93	208	GL 65	25	**1296 62**	**1293 62**
2000	120	246	GL 65	25	**1296 64**	**1293 64**

Thread	Pack of	Cat. No.
GL 32	25	**1292 08**
GL 40	25	**1292 10**
GL 50	25	**1292 12**
GL 65	25	**1292 14**

Screw caps for wide-mouth bottle, PE-LD

Wide-mouth square bottles

PE-HD, translucent. Screw cap with sealing cone, PP, blue, with cadmium-free pigments. Tamper-proof closure with pull-off retaining ring. Space-saving square base. Pack of 1.

Capacity ml	Length mm	Width mm	Height mm	Thread	Cat. No.
100	45	45	101	GL 32	**1304 12**
250	60	60	127	GL 45	**1304 14**
500	75	75	161	GL 54	**1304 18**
1000	85	85	210	GL 54	**1304 22**
1500	111	111	209	GL 80	**1304 24**
2500	122	122	258	GL 80	**1304 26**
4000	142	142	294	GL 80	**1304 28**

Thread	Cat. No.
GL 32	**1303 20**
GL 45	**1303 22**
GL 54	**1303 24**
GL 80	**1303 26**

Replacement screw caps for wide-mouth bottles

PP. Pack of 1.

Wide-mouth bottles

PTFE. Outstanding chemical and thermal resistance. Sturdy, strong-walled design. With screw cap. Pack of 1.

Capacity ml	Ø mm	Height mm	Neck inner-Ø mm	Cat. No.
5	22	35	10	**1305 05**
10	26	50	12	**1305 08**
25	33	61	19	**1305 20**
50	43	76	25	**1305 28**
100	52	88	35	**1305 38**
150	60	90	35	**1305 44**
250	67	120	42	**1305 48**
500	80	150	52	**1305 54**
1000	100	185	57	**1305 62**
2000	120	240	60	**1305 64**

Wide-mouth bottles

PFA. High-quality bottles, specially designed for long-term storage of solvents and standards (trace analysis). PFA screw cap with integrated seal lip and buttress thread. Autoclavable, easy to clean, temperature resistant from -200 °C to +260 °C.
Pack of 1.

Capacity ml	Ø mm	Height mm	Thread	Cat. No.
250	61	150	S 40	**1287 48**
500	76	179	S 40	**1287 54**
1000	96	217	S 40	**1287 62**
2000	130	245	S 40	**1287 64**

Thread	Cat. No.
S 40	**1292 62**

Replacement screw cap for wide-mouth PFA bottles

PFA. Pack of 1.

Narrow-mouth bottles

PFA. High-quality bottles, specially designed for long-term storage of solvents and standards (trace analysis). PFA screw cap with integrated seal lip and buttress thread. Autoclavable, easy to clean, temperature resistant from -200 °C to +260 °C.
Pack of 1.

Capacity ml	Ø mm	Height mm	Thread	Cat. No.
50	37	86	S 28	**1289 28**
100	45	120	S 28	**1289 38**
250	61	160	S 28	**1289 48**
500	76	190	S 28	**1289 54**
1000	96	240	S 28	**1289 62**

Thread	Cat. No.
S 28	**1292 60**

Replacement screw cap for narrow-mouth PFA bottles

PFA. Pack of 1.

Narrow-mouth bottles

Technical quality PFA, ETFE screw caps. These bottles include components made of reprocessed PFA material from our production process. Physical properties and chemical resistance equivalent to highly-pure PFA.
Pack of 1.

Capacity ml	Ø mm	Height mm	Thread	Cat. No.
50	37	90	GL 18	**1304 80**
100	45	114	GL 18	**1304 82**
250	61	157	GL 25	**1304 84**
500	76	189	GL 25	**1304 86**
1000	96	233	GL 32	**1304 88**

Thread	Cat. No.
GL 18	**1292 70**
GL 25	**1292 72**
GL 32	**1292 74**

Replacement screw caps for narrow-mouth bottles, technical quality PFA

ETFE. Pack of 1.

Wash bottles

without venting valve

PE-LD, flexible. Wide-mouth. Capacity 250 ml and 500 ml. High-quality wash bottles with integrated wash stream and sealing cone closure. Large opening for convenient filling. Label with designation of contents and general safety statements in English (with CAS numbers and NFPA codes) and German (with CAS numbers). Pack of 5.

With venting valve (metal ball)

for distilled water and organic solvents only; to avoid dripping caused by overpressure

		without venting valve		with venting valve	
Name of solvent	**Color stopper**	**250 ml Cat. No.**	**500 ml Cat. No.**	**250 ml Cat. No.**	**500 ml Cat. No.**
Dist. water	white	**1440 78**	**1440 84**	**1440 18**	**1440 24**
Acetone	red	**1440 79**	**1440 85**	**1440 19**	**1440 25**
Methanol	green	**1440 80**	**1440 86**	**1440 20**	**1440 26**
Isopropanol	blue	**1440 81**	**1440 87**	**1440 21**	**1440 27**
Ethanol	orange	**1440 82**	**1440 88**	**1440 22**	**1440 28**
- none -	yellow	**1440 83**	**1440 89**	**–**	**–**

Wash bottles

with interchangeable wash head

PE-LD, flexible. Detachable threaded wash head. Adjustable height delivery tube.
Pack of 50 (1000 ml: Pack of 25).

Capacity ml	Ø mm	Total height mm	Thread	Cat. No.
100	45	196	GL 18	**1441 38**
250	59	240	GL 25	**1441 48**
500	75	279	GL 25	**1441 54**
1000	94	322	GL 28	**1441 62**

Wash heads

Thread	Pack of	Cat. No.
GL 18	50	**1292 20**
GL 25	50	**1292 22**
GL 28	25	**1292 24**

Narrow-mouth wash bottles

Technical quality PFA, ETFE screw caps, FEP wash elements. These bottles include components made of reprocessed PFA material from our production process. The tip opening can be enlarged by cutting. High temperature and chemical resistance.
Pack of 1.

Capacity ml	Ø mm	Height mm	Thread	Cat. No.
250	61	157	GL 25	**1438 48**
500	76	189	GL 25	**1438 54**
1000	96	233	GL 32	**1438 62**

Thread	Cat. No.
GL 25 - with FEP delivery tube	**1292 73**
GL 32 - with FEP delivery tube	**1292 75**

Replacement Wash Heads

ETFE. Pack of 1.

Dropping bottles with pipette

Soda-lime glass. The interchangeable ground joint stopper has an integrated dropping pipette with rubber cap. Pack of 1.

Capacity ml	Ø mm	Total height mm	Description	Cat. No.
50	45	130	Clear glass	**1246 33**
100	55	150	Clear glass	**1246 39**
50	45	130	Amber glass	**1245 29**
100	55	150	Amber glass	**1245 39**

Rubber caps

Natural rubber (NR). Fitting all sizes.
Pack of 100.

Cat. No.	1247 00

Dropping bottles

PE-LD, flexible. Detachable threaded cap with dropper nozzle and attached spout cap.

Capacity ml	Ø mm	Total height mm	Thread	Pack of	Cat. No.
20	31	88	GL 14	100	**1252 16**
30	34	96	GL 14	100	**1252 24**
50	39	115	GL 18	100	**1252 28**
100	45	136	GL 18	50	**1252 38**
250	59	170	GL 25	50	**1252 48**
500	75	209	GL 25	50	**1252 54**
1000	94	240	GL 28	25	**1252 62**

Caps with dropper nozzle, PE-LD

Thread	Pack of	Cat. No.
GL 14	100	**1292 30**
GL 18	50	**1292 32**
GL 25	50	**1292 34**
GL 28	25	**1292 36**

Dropping bottles

PTFE, flexible. Outstanding chemical resistance. Dropper nozzle with screw cap.
Pack of 1.

Capacity ml	Ø mm	Height mm	Cat. No.
25	33	93	**1253 16**
50	43	100	**1253 28**

Atomizers

PE-HD. By turning the nozzle, delivery can be varied from a fine spray to a solid stream. Pack of 5.

Capacity ml	Cat. No.
400	**1441 80**
850	**1441 90**

Aspirator bottles, with stopcock

PE-HD. With screw cap and plastic carrying handle. With PP stopcock, 3/4" connection. Pack of 1.

Capacity l	Ø mm	Height mm	Neck inner-Ø mm	Cat. No.
5	165	335	45	**1311 70**
10	210	420	54	**1311 74**

Spare stopcock

Fits all sizes. With PP adapter and 2 FKM seals. Pack of 1

Cat. No.	1311 00

Storage bottles

Narrow mouth

PE-HD. Narrow mouth. With screw cap and carrying handle. Pack of 1.

Capacity l	Ø mm	Height mm	Neck inner-Ø mm	Cat. No.
5	165	335	45	**1308 70**
10	210	420	54	**1308 74**

Storage bottles

Wide mouth

PE-HD. With screw cap and carrying handle. Pack of 1.

Capacity l	Ø mm	Height mm	Neck inner-Ø mm	Cat. No.
5	165	320	85	**1309 70**
10	210	395	120	**1309 74**

Jerry cans

PE-HD. With screw cap and threaded pourer.
Pack of 1.

Capacity l	Length mm	Width mm	Height mm	Cat. No.
5	260	130	260	**1316 60**
10	260	140	415	**1316 62**
20	330	165	470	**1316 64**

Buckets

PE-HD. With or without push-on lid. With graduation and handle. Without spout.
Pack of 1.
(Please order push-on lid separately!)

Capacity l	Height mm	Cat. No.
5	240	**717 72**
10	300	**717 74**

Push-on lids for buckets PE-LD

PE-LD. Pack of 1.

For bucket l	Cat. No.
5	**717 71**
10	**717 76**

Buckets

PP. With spout, reinforced rim and handle.
Pack of 1.

Capacity l	Height mm	Cat. No.
12	300	**723 76**
15	340	**723 78**

Trays (photographic trays)

PP, white. Ribbed bottom improves stability, reinforced rim, slightly sloping walls. Stackable. Pack of 1.

Length mm	Width mm	Height mm	Cat. No.
225	180	45	**1566 40**
300	240	70	**1566 42**
370	310	75	**1566 44**
510	410	120	**1566 46**
625	530	140	**1566 48**
840	645	160	**1566 50**

Tidy tray

PVC. Designed for use as utility trays or drawer organizers. Ideal for storing magnetic stirring bars, etc. Pack of 1.

Compartments	Length mm	Width mm	Height mm	Cat. No.
5	402	302	60	**7685 05**
12	402	302	60	**7685 10**

Ice bucket

Durable, rigid polyurethane foam. For bench-top cold storage. Excellent insulating properties. Sturdy, octagonal design for improved stability. Tapered side with molded handles and flat lid for easy handling and storage. Suitable for chemical disinfection. Operating temperature -196 °C to +95 °C. Pack of 1.

Capacity l	Length mm	Width mm	Height mm	Cat. No.
4.5	330	280	180	**1561 00**

Pipette rinsing systems

Trouble-free and gentle cleaning of pipettes with repetitive siphon rinsing. Water supply connection via hose nozzle, outer-Ø 12 mm. The complete cleaning system consists of a rinsing apparatus, soaking jar and pipette basket. Please order each component separately.

Rinsing apparatus

PE-HD. Adjust the water flow to approx. 2 l/min. Pack of 1.

for pipette length mm	Capacity l	inner-Ø mm	Base Ø mm	Height mm	Cat. No.
460	13	150	315	740	**291 20**
600	17	150	315	1000	**291 25**

Soaking jars

PE-HD. Pack of 1.

for pipette length mm	Capacity l	inner-Ø mm	Base Ø mm	Height mm	Cat. No.
460	10	150	240	510	**292 10**
600	12.5	150	240	660	**292 15**

Pipette baskets

PE-HD. Pack of 1.

for pipette length mm	Basket height incl. handle mm	Base Ø mm	Basket height mm	Cat. No.
360	495	145	280	**290 05**
460	645	145	280	**290 10**
600	870	145	280	**290 15**

Pipette jar

with lid

PP, lid PE-HD. The jar is suitable for dust-proof storage of pipettes up to 400 mm long. Pack of 1.

Base Ø mm	Height mm	inner-Ø mm	Cat. No.
130	430	83	**288 00**

Draining rack

PS. Integrated wide draining trough. Pegs can be inserted as required. Peg holes are closed at the back – preventing leakage toward the wall. Suitable for glass graduated cylinders of up to 250 ml and beakers up to 1000 ml. Supplied complete with drain tubing and accessories for wall mounting. Width 450 mm, height 630 mm, 72 pegs (Ø 16 mm, length 120 mm). Pack of 1.

Cat. No.	951 05

Special pegs

for draining rack

PS. Special pegs for narrow-mouthed or small vessels, e.g., test tubes, small volumetric flasks and graduated cylinders. Outer diameter 6 mm, length 120 mm. Pack of 11.

Cat. No.	951 11

Pipette stand

PP. Holds up to 94 pipettes of different sizes. Rotary model, with additional rotary tip rest to protect the pipette tips. Suitable for all graduated and one-mark pipettes. Slightly-curved stand base rim helps retain dripping liquids. Diameter 230 mm, height 450 mm. Pack of 1.

Cat. No.	309 00

Pipette tray

PVC. Practical tray for pipettes of any size. Length 280 mm, width 220 mm, height 29 mm. Pack of 1.

Cat. No.	283 00

Pipette tray

PVC. Drawer organizer.
Four compartments for approx. 30 graduated pipettes (1 - 20 ml). Length 420 mm, width 300 mm, height 30 mm.
Pack of 1.

Cat. No.	283 05

Pipette tray

PVC. Nine oblong dividers, open on one side. For small-volume pipettes.
Length 355 mm, width 300 mm, height 45 mm. Pack of 1.

Cat. No.	7685 15

MonoDest 3000 E

MonoDest 3000 N

Water Stills

MonoDest 3000 E and 3000 N

- Simple operation and easy to clean (without dismantling the apparatus)
- Compact design
- Stainless steel heaters
- Separate circuits for feed and cooling water
- Low water consumption
- Thermostatically controlled heating cut-off switch provides a high level of safety if the water supply is interrupted

MonoDest: items supplied

Basic unit including power cable, PVC tubing (7 m, inner diameter 10 mm), pinchcock for sump drain; operating manual. Pack of 1.

MonoDest 3000 E

Ideal for applications requiring small quantities of pure water. Particularly high water quality level (conductivity 0.7 µS/cm) is obtained by the special design of the condenser.

Cat No.	562 20

MonoDest 3000 N

The low-cost alternative to the MonoDest 3000 E. Recommended for applications where conductivity of 1.5 µS/cm is sufficient.

Cat. No.	562 15

Accessories and spare parts for MonoDest 3000 E and N. Pack of 1.

Description	Cat. No.
Glass part, Boro 3.3, for MonoDest 3000 N	563 30
Glass part, Boro 3.3, for MonoDest 3000 E	563 60
Base for MonoDest 3000 E and N	563 65

Technical data

		MonoDest 3000 E	MonoDest 3000 N
Power consumption	W	3000	3000
Rated current	A	14	14
Voltage	V/Hz	220-240/50-60	220-240/50-60
Tap water connection:			
Minimum pressure	bar	2	2
Distillate output			
with tap water	l/h	4.2	4.2
with deionized water	l/h	4.0	4.0
Conductivity of distillate			
referenced to 25 °C	µS/cm	0.7	1.5
Distillate temperature	°C	96	96
Cooling water consumption			
with tap water	l/h	45	45
with deionized water	l/h	55	55
Cooling water temperature:			
Inlet	°C	16	16
Outlet			
with tap water	°C	64	64
with deionized water	°C	48	48
Heater	Material	Stainless steel 1.4529	Stainless steel 1.4529
Glass parts	Material	Boro 3.3	Boro 3.3
Height	mm	750	600
Space required (without distillate bottle)	mm	220 x 220	220 x 220
Weight	kg	6	6

Cleaning

Manual Detergents for Cleaning and Disinfection

Gentle to materials

The special formulation of active ingredients achieves optimum cleaning results even at low temperatures, brief soaking times and low alkalinity. Glass surfaces and graduations will last longer.

Safe on tests

Detergents and disinfecting detergents can be removed without residue. Thus, even sensitive tests in hematology, serology, microbiology and enzymatic analytical chemistry are not affected. Simply observe the recommended concentrations and rinse thoroughly with water.

Environmentally friendly

All BRAND detergents and disinfecting detergents conform to current legislation and regulations. They are free from formaldehyde, and contain biodegradable surfactants and other ingredients that are not harmful to the environment. Phosphate content is considerably reduced.

User-friendly

Our cleaners and disinfecting cleaners have a very broad spectrum of activity. Therefore, only a small number of products are needed for a great variety of procedures.
These cleaners and disinfecting cleaners do not contain caustic alkali. This is why they are particularly gentle to material, and are fully effective even in hard water.

Cost efficient

Normally soiled instruments will become clean when using the recommended concentration of detergent. For heavy soiling, it is recommended to heat the solution within the indicated limits. However, an excessively high concentration will not increase the cleaning performance. Please note the technical information on page 342-343.

Abbreviations:
Association for Applied Hygene (VAH)
Robert Koch-Institute (RKI)
German Society for Hygene and Microbiology (DGHM)
German Veterinary Medical Society (DVG)

General cleaning basics can be found on page 342-343.

Mucasol®

Universal detergent

Liquid, alkaline high-performance concentrate for immersion and ultrasonic baths. Universal cleaner for laboratory equipment and instruments made of glass, porcelain, plastic, rubber and metal.
Items are cleaned in ~ 10 - 30 minutes, without mechanical help. Mucasol® replaces chromosulfuric acid, is free from chlorine and caustic alkalis, is non-toxic, non-aggressive and biodegradable. Prolonged exposure of zinc and non-anodized aluminium surfaces should be avoided.

Ingredients:
> 30% phosphates,
< 5% anionic surfactants, amphoteric surfactants, complexing agents, corrosion inhibitors, auxiliary agents
Concentration for use:
Ultrasonic bath:
0.2 - 2% (1.4 - 14 ml/l)
Immersion bath:
0.7 - 3% (5 - 22 ml/l)
Chemical and physical specifications:
Light green, clear liquid
Density: approx. 1.4 g/ml
pH value (0.7%): approx. 11.5
pH value (3%): approx. 11.7

Description	Pack of	Cat. No.
2 liter bottle (2.8 kg)	6	**440 03**
5 liter can (7 kg)	1	**440 05**

EDISONITE® CLASSIC

Universal detergent

Alkaline detergent. Powder compound for immersion and ultrasonic bath. Ideal for removal of natural fats and oils, proteins and blood. Durable protection against corrosion damage.

Ingredients:
> 30% phosphates,
< 5% anionic surfactants, non-ionic surfactants, corrosion inhibitors, auxiliary agents
Concentration for use:
0.5 - 1% (5 - 10 g/l)
Chemical and physical specifications:
Light green powder
Bulk density: approx. 850 kg/m^3
pH value (0.5%): approx. 11.5
pH value (1%): approx. 11.5
Use on zinc and non-anodized aluminium is restricted.

Description	Pack of	Cat. No.
1 kg jar	6	**443 01**
5 kg bucket	1	**442 05**

EDISONITE® SUPER

Universal detergent

Neutral detergent. Powder compound for immersion and ultrasonic bath. Ideal for removal of natural fats and oils, proteins and blood.
EDISONITE® SUPER is recommended for optical glass, for plastics sensitive to alkalis and rubbers.

Ingredients:
> 30% phosphates,
5 - 15% anionic surfactants,
corrosion inhibitors, auxiliary agents
Concentration for use:
0.5 - 1% (5 - 10 g/l)
Chemical and physical specifications:
Light green powder
Bulk density: approx. 800 kg/m^3
pH value (0.5%ig): approx. 7.5
pH value (1%ig): approx. 7.5

Description	Pack of	Cat. No.
1 kg jar	6	**443 61**
5 kg bucket	1	**443 65**

Mucocit®-T

Instrument disinfecting detergent

Particularly suited for sensitive instruments. Free of phosphates, aldehydes, phenols and chlorine derivates. Fresh scent. CE-marked according to MPG (German Medical Products Law).

Ingredients:
100 g Mucocit®-T contain:
3.9 g didecyldimethylammoniumchloride,
4.5 g alkylpropylenediamino-
1,5-bisguanidiniumacetate,
2 g bis(-aminopropyl)-laurylamine,
2.8 g laurylpropylenediamine,
5 - 15% non-ionic surfactants,
auxiliary agents
Chemical and physical specifications:
Clear, blue liquid, fresh smell
Density: approx. 1 g/ml
pH value (1%, 20 °C): approx. 10.5

Microbiological efficiency/ concentration for use:
Disinfection of instruments: Bacteria (incl. Tuberculosis and mycobacteria) and fungi with high organic burden according to DGHM/VAH directives:
1% (10 ml/l)/1 hour
2% (20 ml/l)/30 minutes
3% (30 ml/l)/15 minutes
Limited virucidal efficacy* (incl. HIV, HBV, HCV) 1% (10 ml/l)/5 minutes
Inactivation of rotaviruses:
2% (20 ml/l)/5 minutes

Description	Pack of	Cat. No.
2 liter bottle	6	**448 22**
5 liter can	3	**448 25**

* As recommended by the RKI, Bundesgesundheitsblatt 01/2004

Pursept®-AF disinfection concentrate

Surface disinfecting detergents

Cleaning and disinfection of floors, walls and fittings in one operation. Appropriate for use in the foods sector. CE-marked according to MPG (German Medical Products Law).

Ingredients:
100 g Pursept®-AF contain:
12.5 g didecyl-dimethyl-ammoniumchloride,
1.5 g bis(aminopropyl)-laurylamine,
< 5% NTA, < 5% non-ionic surfactants,
auxiliary agents, scents
Chemical and physical specifications:
Clear, green liquid, Density approx.: 1 g/ml
pH value (1%, 20 °C): approx. 10

Microbiological efficiency/ concentration for use:
Surface disinfection: Bacteria and fungi with high organic burden according to DGHM/VAH directives: 0.25% (2.5 ml/l)/4 hours
0.5% (5 ml/l)/1 hour
1% (10 ml/l)/30 minutes
2% (20 ml/l)/15 minutes
Limited virucidal efficacy* (incl. HIV, HBV, HCV): 1% (10 ml/l)/15 minutes
Inactivation of rotaviruses:
0.25% (2.5 ml/l)/2 minutes
Effectiveness against TbB:
2% (20 ml/l)/1 hour

Description	Pack of	Cat. No.
2 liter bottle	6	**448 50**
5 liter can	3	**448 55**

* As recommended by the RKI, Bundesgesundheitsblatt 01/2004

- DGHM/VAH-tested
- RKI-compliant
- Aerosol-free disinfectant wipes
- Fresh scent

- Free of aldehydes
- Effective in only 15 seconds
- DGHM/VAH tested and RKI-compliant, with aerosol-free application (disinfectant wipes)
- Fresh scent

Pursept®-A Xpress

Fast acting ready-to-use

Surface disinfecting detergents

Refillable pump-atomizer without propellant.

Ingredients:
100 g Pursept®-A Xpress contain:
55 g ethanol,
0.03 g n-alkyl-aminopropyl-glycine,
auxiliary agents
Chemical and physical specifications:
Clear, colorless liquid
Density: approx. 0.9 g/ml
pH value: approx. 7.5

Microbiological efficiency of the undiluted working solution:
Surface disinfection: Bacteria and fungi with little organic burden with mechanics acc. to DGHM/VAH directives: 15 seconds
Limited virucidal efficacy*
(incl. HIV, HBV, HCV): 15 seconds
Effectiveness against TbB: 30 seconds

* As recommended by the RKI, Bundesgesundheitsblatt 01/2004

Description	Pack of	Cat. No.
1 liter bottle	10**	**448 30**
5 liter can	3	**448 35**
Atomizer head	1	**448 32**

** 10 bottles + 1 atomizer head

- Free of aldehydes
- Effective in only 15 seconds
- DGHM/VAH-tested and RKI-compliant
- Fresh scent

Pursept®-A Xpress disinfection tissues

Surface disinfecting detergents

Simply wipe the surfaces with the tissue and leave to soak.

Ingredients:
1 Pursept®-A Xpress tissue contains approx.: 1027 mg ethanol,
0.56 mg n-alkyl-aminopropyl-glycine,
auxiliary agents
Chemical and physical specifications:
Active solution (Pursept®-A Xpress):
Clear, colorless liquid, fresh smell
Density: approx. 0.9 g/ml
pH value: approx. 7.5
Tissues: FCC-bleached (oxidation bleach), bio-degradable

Microbiological efficiency of the undiluted working solution:
Surface disinfection: Bacteria and fungi with little organic burden with mechanics acc. to DGHM/VAH: 15 seconds
Limited virucidal efficacy*
(incl. HIV, HBV, HCV): 15 seconds
Effectiveness against TbB: 30 seconds

* As recommended by the RKI, Bundesgesundheitsblatt 01/2004

Description	Pack of	Cat. No.
Dispenser box (150 tissues*)	6	**448 40**
Refill unit (150 tissues*)	6	**448 45**

* 135 x 222 mm

Pursept® Wipes XL and Pursept®-A Xpress, to disinfect the workplace, lab table or clean bench quickly and reliably. Wipes can be stored in the refillable dispenser box.

Pursept® Wipes XL

Wipes are made of 100% polyester, specially designed to be tear-proof and lint-free. They offer optimal disinfectant delivery together with excellent contaminant uptake.

Description	Pack of	Cat. No.
70 wipes (230 x 280 mm) per roll	6	**448 70**

Dispenser Box for Pursept® Wipes XL, empty

Refillable dispenser box for practical and space-saving storage of Pursept® Wipes XL, a perfect way to keep pre-soaked wipes from drying out.

Description	Pack of	Cat. No.
Dispenser box for 70 wipes (230 x 280 mm)	3	**448 75**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Water jet pumps
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Tubing connectors, adapters, stopcocks
Ground joint stoppers and acc.
Magnetic stirring bars (PTFE)
Forceps, scoops, weigh. dishes, jars
Bottles, dropping bottles
Pipette cleaning/draining rack
Tube racks
Water stills
Detergents/Disinfectants
Scaffolding components
Dispensing Equipment / OEM - Products
Sample preparation and storage impose a wide variety of requirements on laboratory instruments. Depending on the requirements, we offer materials ranging from glass to specialty plastics, like PFA for trace analysis.
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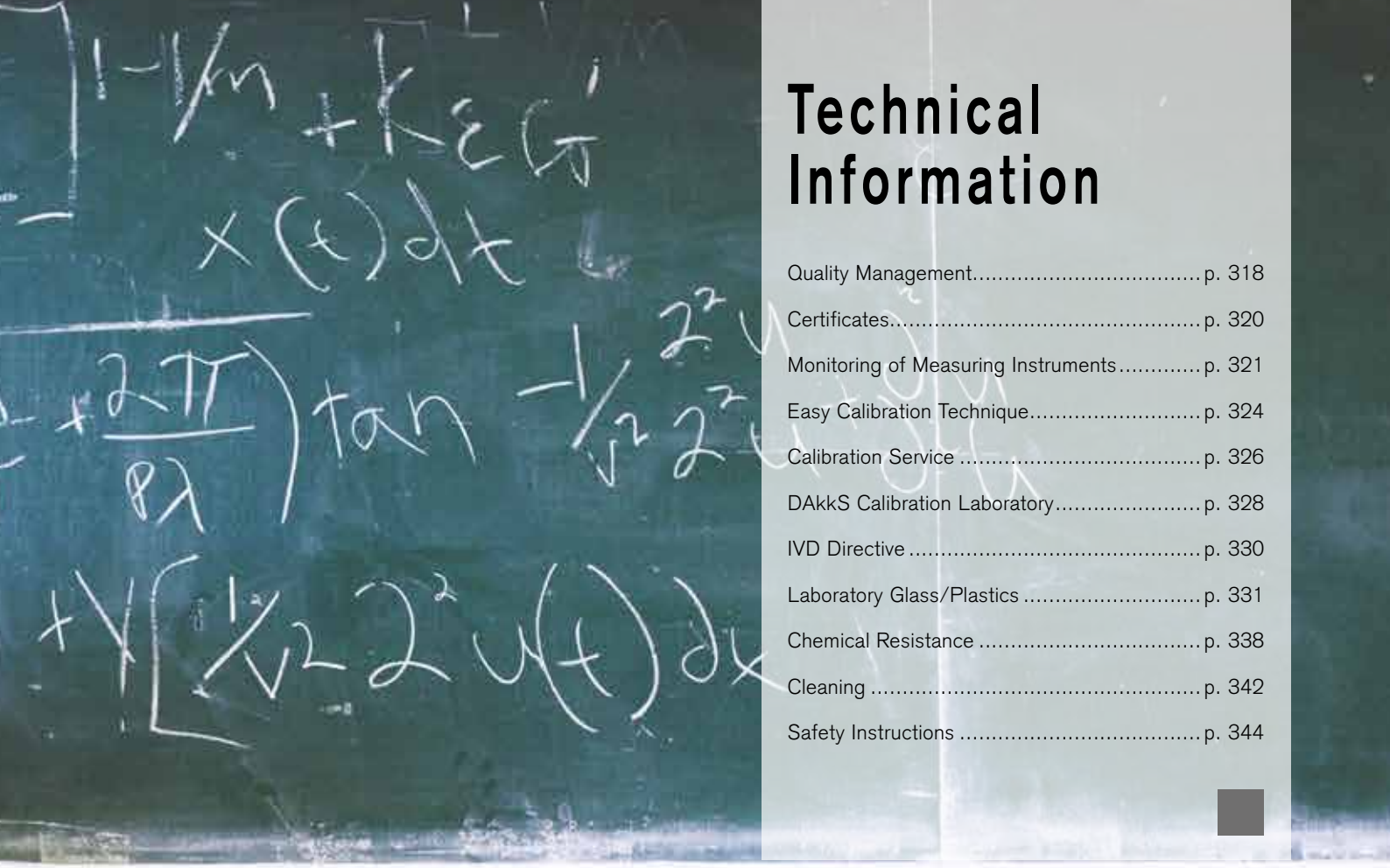


Technical Information

Quality Management

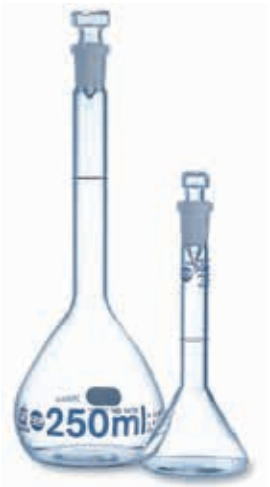
Quality management is briefly described for liquid handling instruments and BLAUBRAND® volumetric instruments

Quality management at BRAND begins at product conception and continues through the design process and production. Routine checks throughout the entire manufacturing process result in volumetric instruments with the smallest possible deviation from the true volume (accuracy) and narrow scatter of individual values (coefficient of variation). The final step of this Statistical Process Control is random finished product sampling according to DIN ISO 3951.

The quality management system applied at BRAND and certified to DIN EN ISO 9001 is a combination of process monitoring and random checks. The accepted quality level (AQL) is less than or equal to 0.4., i.e., the limiting values are met with a statistical certainty of at least 99.6 %.

All measuring instruments used in quality control are regularly checked and are referenced to the national standards of PTB (The German Federal Institute of Physics and Metrology). Quality management according to DIN EN ISO 9001 is the basis for issuing of calibration certificates (e.g., our certificates of performance).

All test results are documented and filed for 7 years. If the batch or serial number is known, each specific test result on the date of production can be traced.



DE-M Declaration of conformity

For volumetric instruments to be ready for use in legally regulated areas such as the medical and pharmaceutical fields (manufacture and testing of medicinal products), the German Measurement and Calibration Regulation requires a Declaration of Compliance from the manufacturer. This is met with the mark "DE-M"*.

With the DE-M marking, the manufacturer declares that the instrument in question meets the requirements of the German Measurement and Calibration Regulation and applicable standards. In general the product itself carries the DE-M marking or, with disposables, the packaging.

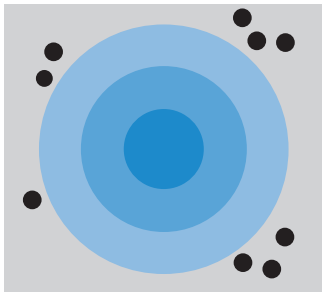
* as of January 1, 2015
BRAND will change the mark on volumetric instruments to "DE-M" starting January 1, 2015.

Precision

What do "Error Limit, Accuracy, Coefficient of Variation and Precision" mean in volumetric measuring?

An illustration of Precision and Accuracy

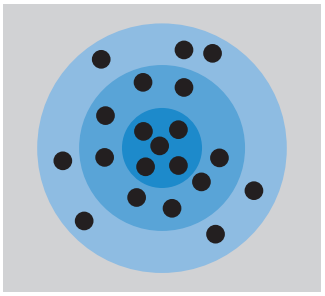
The dart board simulates the volume range around the centered specified value, the black dots simulate the different measured values of a specified volume.



Poor accuracy:
Hits far off center.

Poor reproducibility:
Hits widely scattered.

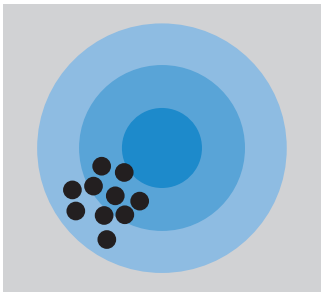
Result:
These volumetric instruments are of inferior quality.



Good accuracy:
On average, hits are evenly distributed around center.

Poor reproducibility:
No gross errors, but hits widely scattered.

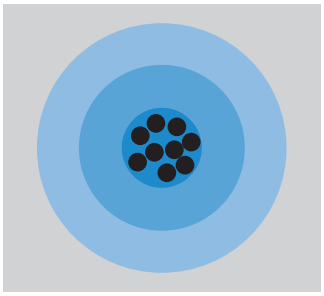
Result:
All deviations are "equally probable".
Instruments exceeding the permissible limit should be removed from service.



Poor accuracy:
Although all hits are close together, the center (true volume) is still missed.

Good reproducibility:
All hits are close together

Result:
Improperly controlled production, with systematic variation. Instruments exceeding the permissible limit should be removed from service.



Good accuracy:
All hits are near the center, i.e., the specified value.

Good reproducibility:
All hits are close together.

Result:
The volumetric instruments have minute systematic errors, narrow scatter; the permissible limit is not exhausted. These instruments should remain in service.

To describe accuracy, the term "Error limit" is used for glass volumetric devices, while for liquid handling devices the statistical terms "Accuracy [%]" and "Coefficient of Variation [%]" have become established.

❶ Error limit

The term "Error limit" (EL) in the corresponding standards defines the maximum permissible deviation from the specified value.

❷ Accuracy (A)

Accuracy (A) indicates the closeness of measured mean volume to the specified value, i.e., systematic measurement variation. Accuracy is defined as the difference between the measured mean volume ($\overline{V}$) and the specified value ($V_{spec.}$), related to the specified value in percent.

❸ Coefficient of Variation (CV)

Coefficient of variation (CV) indicates the closeness of values of repeated measurements, i.e., random measurement variation. Coefficient of variation is defined as standard deviation in percent, related to the mean volume.

❹ Partial volumes

Generally A and CV are related to the nominal volume ($V_{nominal}$). These values are in % and have to be converted for partial volumes ($V_{part.}$). In contrast, there is no conversion for partial volumes, if A and CV are stated in volume units (e.g., ml).

❺ Error limit of A and CV

A good estimate for the error limit (EL) of the instrument, e.g., for the nominal volume ($V_{nominal}$), can be calculated using the values for accuracy and coefficient of variation.

❻ Precision (reproducilibity)

It describes the closeness in volume units between the different values in a set of measurements.

❶ $EL \geq \left| V_{measured} - V_{spec.} \right|$

❷ $A\,[\%] = \frac{\overline{V} - V_{spec.}}{V_{spec.}} \cdot 100$

❸ $CV\,[\%] = \frac{s \cdot 100}{\overline{V}}$

❹ $A_{part.}\,[\%] = \frac{V_{nominal}}{V_{part.}} \cdot A_{nominal}\,\%$

(analog $CV_{part.}\,[\%]$)

❺ $EL \geq \frac{|A\%| + 2CV\%}{100\%} \cdot V_{nominal}$

Certificates

BLAUBRAND® Volumetric Instruments

One batch certificate per packing unit!

All reusable BLAUBRAND® volumetric instruments are individually calibrated and are supplied with one batch certificate per packing unit. This facilitates the initial performance verification – also with the monitoring of measuring equipment – as the data can directly be transferred from the certificate. Batch and individual certificates can also be downloaded at www.brand.de

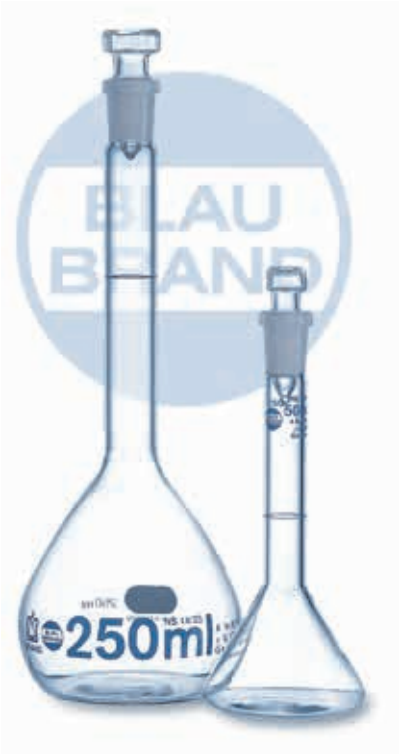
DE-M

All BLAUBRAND® volumetric instruments kept and used for measurements in legally regulated applications are marked DE-M. The manufacturer BRAND uses this mark to certify the conformity of the instruments with the German Measurement and Calibration Regulation (replaces the previous Calibration Regulation)*.

* as of January 1, 2015
BRAND will change the mark on volumetric instruments to "DE-M" starting January 1, 2015.

Certificate of performance (Works certificate)

Batch and individual certificates are works certificates. Both are based on the regulations for test and calibration procedures of laboratory instruments according to DIN EN ISO 9001, DIN EN ISO 10012-1 and DIN EN ISO 4787. All certificates document the traceability of measuring results to national standards (PTB) which recognize the SI units (International System of Units).



Batch certificate

All reusable BLAUBRAND® volumetric instruments have an easy-to-read digital batch number. The works certificate records the batch number, the mean value, the standard deviation of the batch and date of issue.

15.02

(Batch number: year of manufacture/batch)

Individual certificate

Both the instrument and the certificate show an individual serial number in addition to the batch number. The works certificate records the measured volume, the uncertainty of measurement and the date of issue.

15.02 0756

(Individual serial number: year of manufacture/batch/consecutive instrument number)

USP certificate

Selected BLAUBRAND® volumetric instruments can be delivered with volume error limits in compliance with United States Pharmacopeia (USP) with batch certificate and on request, with individual certificate. The instrument shows the requested error limit and the USP sign.

DAkkS calibration certificate

This certificate is issued by the DAkkS calibration laboratory at BRAND. Due to the extensive international cooperation of the DAkkS (formerly DKD) German accreditation body (EA Agreement, ILAC-MRA) the DAkkS calibration certificate is internationally recognized. Both the instrument and the certificate show an individual serial number and the laboratory's registration number as well as the year and month of issue. More information can be found on page 328.

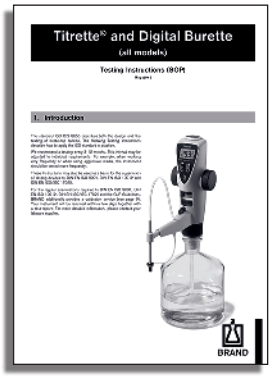
Ordering information for BLAUBRAND® volumetric instruments can be found on page 173.

Monitoring of Measuring Instruments

GLP, ISO/IEC 17 025, ISO 9001

Analytical laboratories have to verify and document the accuracy of all measuring instruments used in order to achieve reliable analysis. This especially applies to laboratories operating according to GLP guidelines, DIN EN ISO/IEC 17 025, or certified to DIN EN ISO 9001.

Information for **BRAND Calibration Service** on page 326.



Testing instructions (SOPs)

To simplify the monitoring of measuring instructions BRAND offers Standard Operating Procedures (SOPs) for the specific testing of every volumetric instrument at www.brand.de. The testing procedures are outlined step-by-step. At the end of each SOP there is a report to be used for documentation.

Testing Instructions (SOPs), Information on Volumetric Measurement, and a demoversion of EASYCAL™ software can be requested directly from BRAND and are also available at www.brand.de.

The monitoring of measuring instruments requires that the instrument's performance data be known and documented before being admitted to use and confirmed at appropriate intervals. The frequency of checks depends on the results of previous calibrations.
These tests are necessary to ensure continued accuracy of instruments which may have changed due to aggressive chemicals, or method and frequency of cleaning. The test cycle must be specified by the user. Typical monitoring intervals for liquid handling instruments are every 3-12 months; for glass volumetric instruments, every 1-3 years. Performance certificates issued by BRAND show all instrument data required for monitoring so initial inspection may be eliminated. Also before disposing a measuring instrument, a final test is neccessary (see DIN 32 937).
Performance certificates are supplied as standard for liquid handling instruments and for reusable BLAUBRAND® volumetric instruments (see pages 173, 320).

EASYCAL™ Software

BRAND has developed the EASYCAL™ software that operates under WINDOWS®, to further simplify the monitoring of measuring instruments.
Upon entry of instrument data and weighing values, the software performs all calculations automatically. In addition, EASYCAL™ generates electronic and printed test records which can be saved for subsequent use.
(For more information on EASYCAL™ software, see page 109-112.)

Testing

The gravimetric test for liquid handling instruments is performed according to DIN EN ISO 8655; for glass volumetric instruments, DIN EN ISO 4787 is applied. Traceability of measuring devices to national standards needs to be ensured. For instruments calibrated to contain (TC, In) the mass of water contained, and for instruments calibrated to deliver (TD, Ex), the mass of water delivered, will be weighed on a balance. The mass of water measured has to be adjusted to account for parameters like water density and air buoyancy on the balance. The thermal coefficient of expansion of glass volumetric instruments has to be taken into account.

Testing scope

While liquid handling instruments are tested individually, the use of statistical methods to monitor glass volumetric instruments is recommended. The following equation to determine the minimum random quantity (a) out of the total quantity (n) has proven effective in actual use:

$$a = \sqrt{n}$$

Note! Random samples have to be taken from each production batch in use.

Information on volumetric measurement

BRAND provides a booklet on working with volumetric instruments outlining proper use and possible operating errors.

Calculations

Monitoring of measuring instruments

Measuring values obtained in the course of a monitoring procedure are to be evaluated as follows:

Example: Transferpette® adjustable volume, 20-200 µl

Gravimetric testing values at 21.5 °C (Z = 1.0032)	
Tested volume (µl):	200.0000
Specified value (mg):	199.3620
x_1	200.2000
x_2	199.6000
x_3	199.4900
x_4	199.7000
x_5	199.7000
x_6	199.2900
x_7	199.3500
x_8	199.4100
x_9	199.2000
x_{10}	199.1900

1. Calculation of the mean volume

The weighing parameters obtained using the gravimetric test are simply the mass values corresponding to the pipetted volume. In order to obtain the actual volume, a correction must be calculated.
A mean volume ($\bar{x}$) of the weighing values is then calculated by dividing the sum of the weighings by the number of weighings made. This mean mass is then multiplied by a correction factor (Z, units of µl/mg) to give the mean volume ($\bar{V}$) delivered. The factor Z combines density of water, testing temperature and atmospheric pressure. For a typical temperature of 21.5 °C and air pressure of 1013 mbar (hPa), Z=1.0032 µl/mg.

$$\bar{V} = \bar{x} \cdot Z$$

$$\bar{V} = \frac{x_1 + x_2 + x_3 + \ldots + x_n}{n} \cdot Z$$

$$\bar{V} = \frac{200.2 + 199.6 + 199.49 + \ldots + 199.19}{10} \cdot 1.0032$$

$$\bar{V} = 199.513 \cdot 1.0032$$

$$\bar{V} = 200.1514$$

2. Calculation of accuracy

$$A\,[\%] = \frac{\bar{V} - V_{spec.}}{V_{spec.}} \cdot 100$$

$$A\,[\%] = \frac{200.1514 - 200}{200} \cdot 100$$

$$A\,[\%] = 0.076$$

Extract from the table "Factor Z for Liquid Handling Instruments"

Temperature °C	Factor Z ml/g	Temperature °C	Factor Z ml/g
18	1.00245	22.5	1.00338
18.5	1.00255	23	1.00350
19	1.00264	23.5	1.00362
19.5	1.00274	24	1.00374
20	1.00284	24.5	1.00386
20.5	1.00294	25	1.00399
21	1.00305	25.5	1.00412
21.5	1.00316	26	1.00425
22	1.00327		

3. Calculation of the standard deviation, necessary for the determination of coefficient of variation

$$s = Z \cdot \sqrt{\frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + (x_3 - \bar{x})^2 + \ldots + (x_n - \bar{x})^2}{n-1}}$$

$$s = 1.0032 \cdot \sqrt{\frac{(200.2 - 199.51)^2 + (199.6 - 199.51)^2 + (199.49 - 199.51)^2 + \ldots + (199.19 - 199.51)^2}{9}}$$

$$s = 1.0032 \cdot \sqrt{\frac{0.8393}{9}}$$

$$s = 0.306$$

4. Calculation of the coefficient of variation

$$CV\,[\%] = \frac{s \cdot 100}{\bar{V}}$$

$$CV\,[\%] = \frac{0.306 \cdot 100}{200.1514}$$

$$CV\,[\%] = 0.153$$

The result for the calculated example is:

Results of the gravimetric testing:	
Tested volume (µl):	200.0000
Mean volume (µl):	200.1514
A [%]	0.076
CV [%]	0.153
A [%] specified*	0.600
CV [%] specified*	0.200

* Error limits specified by the manufacturer of instrument. See your operating manual for specifications.

⇒ This pipette meets specifications.

If the calculated values for Accuracy (A [%]) and Coefficient of Variation (CV [%]) are less than or equal to the factory published specifications, the instrument is calibrated to operate within specifications.

Note:

If there are no specifications for partial volumes, the values $A_{nominal}$ [%] and $CV_{nominal}$ [%] which are related to the nominal volume $V_{nominal}$ must be converted.

For a partial volume of 20 µl this means:

$$A_{20\,\mu l}[\%] = \frac{V_{nominal}}{V_{20\,\mu l}} \cdot A_{nominal}\,[\%]$$

$$A_{20\,\mu l}[\%] = \frac{200\ \mu l}{20\ \mu l} \cdot 0.5\%$$

$$A_{20\,\mu l}[\%] = 5\%$$

The calculation of $CV_{20\,\mu l}$ is analog.

What to do if the instrument is not within the factory-specified error limits?

1. Check whether all sections of the SOP are taken into account.
2. Follow the troubleshooting guide in the operating manual for assistance.
3. Adjust the calibration of the instrument in accordance with the operating manual.

If despite these steps the instrument still does not meet the specifications, remove from service and contact BRAND for support.

Easy Calibration Technique

ISO 9001 and GLP guidelines require routine calibration (approx. every 3-12 months) and readjustment of measuring instruments if necessary. Typically time-consuming readjustment can be finished in seconds with BRAND Liquid Handling instruments.

The following BRAND Liquid Handling instruments are equipped with this time-saving adjustment technology:

- No need to send the instruments out for calibration and adjustment.
- Accuracy can be adjusted to meet the needs of your special applications.
- No tools necessary for adjustment. Adjustments can be performed in seconds.

Easy Calibration of mechanical instruments

(e.g., bottle-top dispenser Dispensette®)

Example:
Gravimetric testing yields a delivered volume of 9.90 ml with a set volume of 10 ml (e.g., after a longer period of usage or for specific applications). Adjustment is quick and easy in five steps:

1. Open housing by sliding the latch and removing the front.

2. Lift gear lock lever to release.

3. Pull the red knob and set the display to actual delivered volume (e.g., 9.90 ml).

4. Reposition red knob and gear lock lever to the original position.

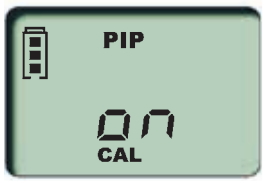
5. Replace housing – done! Alteration of factory setting is indicated by a red re-calibration flag.

Easy Calibration of electronic instruments

(e.g., Transferpette® electronic microliter pipette)

Example:
Gravimetric testing yields a delivered volume of 201.3 µl with a set volume of 200 µl. Adjustment in just a few steps:

1. Initial display



2. Activate calibration mode by pressing the MENU key for 3 seconds, and using the arrow keys to switch calibration mode to "on".

3. When the CAL display is flashing, calibration mode shows the initial volume.

4. Use the arrow keys on the Transferpette® electronic microliter pipette to set the determined volume.

5. After confirming the volume, the values for the tested and corrected volume in the display change. The CAL symbol remains on to confirm that the adjustment was performed. The factory setting can be restored at any time.

EASYCAL™ 4.0

To further facilitate calibration, BRAND has developed EASYCAL™ calibration software. Instrument specific Standard Operating Procedures (SOPs) describe step-by-step testing procedures. All necessary calculations are carried out automatically by the user-friendly software (please see page 109 for more information). A free demo version of EASYCAL™ and SOPs are available for download from www.brand.de.

BRAND also offers a **factory calibration service**. Please see page 326 for more information.

Calibration Service from BRAND

for Liquid Handling instruments

Instruments used for control, inspection, measuring and testing require written protocols for routine testing and calibration. A testing schedule and inspection and testing procedure must be defined. Documentation is required of the Accuracy and Coefficient of Variation testing that is performed.
Frequent confirmation can become time consuming and expensive. Measuring instruments must be taken out of service and may have to be adjusted or repaired. Maintaining an in-house calibration lab with specially trained personnel can be very costly.

BRAND offers full calibration service including instrument adjustment and repair. This reduces service downtime, saves money and provides an independent review organization for the calibration of the instruments.

BRAND calibration service is available for:

- Piston-operated pipettes (single and multichannel)
- Bottle-top dispensers
- Digital bottle-top burettes
- Repetitive pipettes (stepper)

Testing according to DIN EN ISO 8655

At BRAND, a team of qualified personnel working in temperature and humidity controlled rooms, using the most modern balances and calibration software, calibrate liquid handling instruments, regardless of their make, according to DIN EN ISO 8655.

Instruments with adjustable volumes such as Transferpette® microliter pipette or the Dispensette® bottle-top dispenser are tested at nominal volume, 50 % and 10 % or 20 % of the nominal volume.

Results of the calibration are documented with a detailed calibration certificate, which meets the requirements of many different testing procedures.

BRAND Calibration Service

- Calibration and adjustment of liquid handling instruments regardless of their make (BRAND instruments can be maintained and repaired if necessary).
- Detailed calibration certificate: works calibration certificate or DAkkS calibration certificate
- Upon request, we will issue an additional certificate that documents the metrological status of the instruments you send in for adjustment/maintenance/repair.
- Cost-efficient handling

Detailed Calibration Certificates

Works calibration certificate

Issued by BRAND works calibration service.

DAkkS calibration certificate

Issued by the DAkkS calibration laboratory at BRAND (also available for volumetric instruments of glass and plastics). You will find more information on the following pages.

Calibration order forms and declarations on the absence of health hazards are available for download from the Internet at **www.brand.de**.

DAkkS Calibration Laboratory at BRAND

Accredited by the DAkkS as calibration laboratory in the German calibration service

Since the beginning of 2010, DAkkS (Deutsche Akkreditierungsstelle GmbH) has been the sole provider of accreditation services for regulatory matters in Germany. The legal foundations for DAkkS are Regulation (EC) No. 765/2008 and the German Federal Accreditation Law (AkkStelleG).

DAkkS is the successor to DKD (Deutscher Kalibrierdienst) for calibration laboratories.

As a joint governmental-industrial body, DAkkS represents a link between the national standards established by Germany's PTB (Physikalisch-Technische Bundesanstalt) and the measuring instruments used in industrial and research laboratories, and by testing institutions and authorities.

It thus effectively complements the existing verification system, the primary focus of which is consumer protection.

DKD – well-known name, completely new function

Following the establishment of DAkkS, DKD is no longer active in accreditation matters, and it was reconstituted in 2011 with a new mission under guidance from the PTB. Since that time, DKD has been responsible for further developing the fundamentals of metrological calibration, expanding technical support, and promoting standardization in metrology.

DAkkS calibration laboratory

The former DKD calibration laboratory at BRAND for volumetric instruments was changed into an accredited calibration laboratory by the DAkkS according to DIN EN ISO/IEC 17 025. The calibration laboratory at BRAND is therefore authorized to issue DAkkS calibration certificates for the following volumetric instruments. They are available in several languages.

BRAND calibrates the following volumetric instruments, no matter if they are new or already in use:

- **Piston-operated pipettes,** from 0.1 µl to 10 ml
- **Multichannel piston-operated pipettes,** from 0.1 µl to 300 µl
- **Piston-operated burettes,** from 5 µl to 200 ml
- **Dispensers, dilutors,** from 5 µl to 200 ml
- **Glass volumetric instruments,** adjusted to contain (TC, In) from 1 µl to 10 l
- **Glass volumetric instruments,** adjusted to deliver (TD, Ex) from 100 µl to 100 ml
- **Plastic volumetric instruments,** adjusted to contain (TC, In) from 1 ml to 2000 ml
- **Plastic volumetric instruments,** adjusted to deliver (TD, Ex) from 1 ml to 100 ml
- **Glass density bottles,** from 1 cm^3 to 100 cm^3

For ordering volumetric instruments with DAkkS calibration certificate, add "DAkkS" as a prefix to the catalog number. To obtain a DAkkS calibration certificate for volumetric instruments already in use (regardless of their make), send the instruments to BRAND marked with the note "DAkkS calibration".

A major difference between works calibration services and DAkkS laboratories is the accurate determination of the respective uncertainty of measurement guaranteed by the accredited laboratory and supervised by the DAkkS.

DAkkS calibration certificate

The DAkkS calibration certificate documents officially the traceability of measuring results to national and international standards as required by the standards DIN EN ISO 9001 and DIN EN ISO/IEC 17 025 for the monitoring of measuring instruments.

When is a DAkkS calibration certificate necessary?

DAkkS calibration certificates are appropriate in uses in which calibrations of an accredited laboratory are requested, where high level calibrations are demanded and for calibration of reference standards and instruments for comparative measurements.

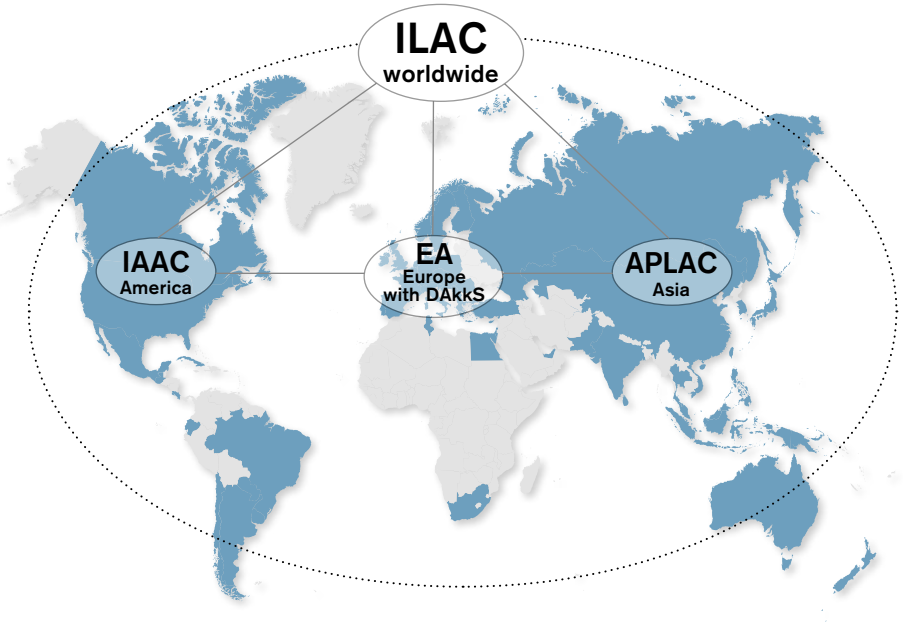
DAkkS – A member in the International Accreditation Network

DAkkS is a member of the **International Laboratory Accreditation Cooperation (ILAC),** the highest level international institution for laboratory calibration, and is a signatory to the MRA – Mutual Recognition Agreements.

The main objective of this international accreditation network is the mutual recognition of the professional services and results offered by accredited bodies, and to avoid technical barriers to trade and multiple accreditation.

The accreditation bodies that are signatories to the ILAC mutual recognition agreements (MRAs) recognize their mutual equivalence, and the equivalence of the calibration certificates issued by those same signatories. Likewise, signatories are obliged generally to promote and recommend recognition of the calibration certificates of other signatories (excluding factory calibration certificates).

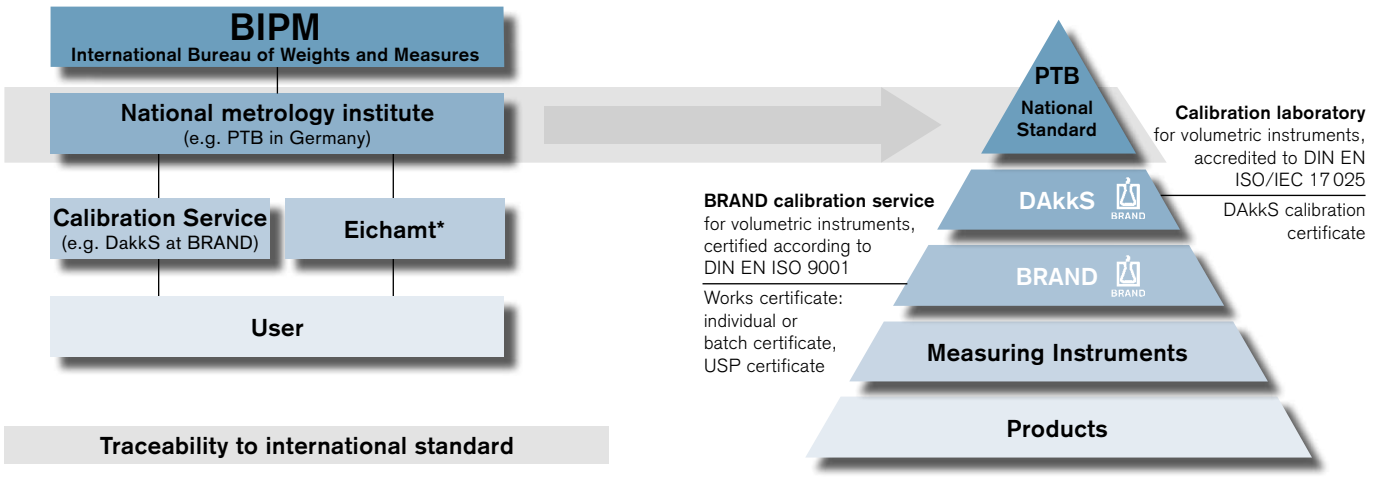
The complete information regarding the ILAC convention, as well as the list of all signatories can be read at www.ilac.org.



Signatory countries of the Mutual Recognition Agreement (MRA)

The DAkkS is a member of the EA (European Co-operation for Accreditation), which again is a member of the ILAC (International Laboratory Accreditation Cooperation). A multilateral agreement assures obligatory recognition of the DAkkS calibration certificate in a variety of countries.

Measurement traceability to international and national standard



Traceability to international standard

The BIPM (Bureau international des poids et measures) ensures the worldwide uniformity of measurements and weights.
Depending on the legal framework, there are two pathways to traceability, which both lead to the BIPM (International Bureau of Weights and Measures): Calibration, or – for all measuring instruments that fall under the Verification Act – verification.

* German State Office of Weights and Measures

Traceability to national standard

In Germany, the PTB (Physikalisch-Technische Bundesanstalt) is the national metrology institute. It observes the traceability to national standard.

IVD Directive

IVD Directive of EU

On December 7th, 1998, the EU directive for "In-vitro-Diagnostic Medical Devices" (IVD Directive) was published in the Official Journal of the European Communities and became effective since June 7th, 2000.

How to define In-Vitro-Diagnostic Medical Devices (IVD)?

An "In-Vitro-Diagnostic Medical Device" is any medical device used in-vitro for the examination of specimens, including blood- and tissue donations, derived from the human body.
IVD can be a reagent, calibrator, control material, kit, instrument, apparatus, equipment, system, or specimen receptacles, intended by the manufacturer to be specifically used for in-vitro diagnostic examination. IVD are mainly used to provide information

- concerning a physiological or pathological state
- concerning a congenital abnormality
- to monitor therapeutic measures.

What is a Medical Device?

The definition of a "Medical Device" includes any instrument, apparatus, appliance, material or other article, including the software necessary for its proper application, intended by the manufacturer to be used for human beings for the purpose of:

- diagnosis, prevention, monitoring, treatment or alleviation of disease, injury or handicap
- investigation, replacement or modification of the anatomy or of a physiological process
- control of conception.

Excluded are pharmacological or immunological means, which are regulated by appropriate drug laws.

CE Marking

The CE mark is the official marking required by the European Community. It shows the user, that this product fulfills all essential safety and environmental requirements as defined in the so-called European Directives. The manufacturer marks the instrument and produces a declaration of conformity describing the instruments' fulfillment with the guidelines and technical requirements.

BRAND medical products are all included in the class of in-vitro diagnostic (IVD) devices. This includes, for example:

- blood counting chambers
- haemacytometer cover glasses
- disposable capillary pipettes
- micro haematocrit capillaries
- haematocrit sealing compound
- sample cups for analyzers
- urine beaker
- feces container
- cryogenic tubes
- pipette tips
- PD-Tips
- Transferpette® microliter pipettes
- HandyStep® repetitive pipettes

Laboratory Glass

General Properties

Glass has very good chemical resistance against water, saline solutions, acids, alkalis and organic solvents and in this respect surpasses the majority of plastics. It is only attacked by hydrofluoric acid, and – at elevated temperatures – by strong alkalis and concentrated phosphoric acid. Further advantages of glass are its dimensional stability, even at elevated temperatures, and its high transparency.

Specific properties of individual glasses

For the laboratory, various glasses with different technical properties are available.

Soda-lime glass

Soda-lime glass (e.g., AR-GLAS®) has good chemical and physical properties. It is suitable for products which are usually subjected to short-term chemical exposure, and to limited thermal stress (e.g., pipettes, culture tubes).

Borosilicate glass (Boro 3.3, Boro 5.4)

Borosilicate glass has very good chemical and physical properties. The abbreviation Boro 3.3 stands for a borosilicate glass type 3.3 as specified in international standard DIN ISO 3585, for applications requiring very good chemical and thermal resistance (including resistance to thermal shock), and high mechanical stability. Typical applications are components for chemical apparatus, round-bottom flasks, and beakers.

Working with glass

When working with glass, it is essential to consider its limitations regarding resistance to thermal shock and to mechanical stress. Strict safety measures must be observed:

- Do not heat volumetric instruments, measuring cylinders and flasks on hot plates.
- Exothermic reactions such as diluting sulfuric acid or dissolving solid alkaline hydroxides must always be carried out while stirring and cooling the reagents, and in suitable vessels such as Erlenmeyer flasks – never in graduated cylinders or volumetric flasks!
- Glass instruments must never be exposed to sudden temperature changes. When taking them out of a drying cabinet while hot, never place on a cold or wet lab bench.
- For compressive loads, only glass instruments intended for this purpose may be used. For example, filtering flasks and desiccators may be evacuated only after confirming that they are in perfect condition. BRAND does not offer instruments for pressure applications.

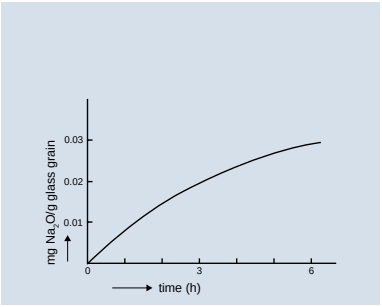
Chemical Resistance

Chemical interaction of glass with water and acids

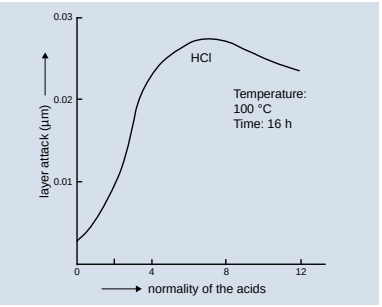
The chemical interaction of water and acids with glass surfaces is negligibly small; only very small amounts, primarily monovalent ions, are dissolved from the glass. This forms a very thin, almost non-porous layer of silica gel on the glass surface, inhibiting further attack. Exceptions are hydrofluoric acid and hot phosphoric acid which prevent the formation of the inert layer.

Chemical interaction of glass with alkalis

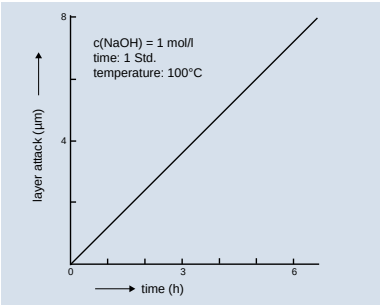
Alkalis attack glass surfaces as concentration and temperatures increase. Borosilicate glass 3.3 (Boro 3.3) limits surface erosion to the µm range; however, after prolonged exposure, volume changes and/or graduation destruction may occur.



Hydrolytic attack on Boro 3.3
as a function of time



Acid attack on Boro 3.3
as a function of acid concentration



Alkali attack on Boro 3.3
as a function of time

Hydrolytic resistance of glass grains

Borosilicate glass 3.3 meets hydrolytic resistance class 1 of DIN ISO 719 (98 °C), which is divided into 5 hydrolytical resistance classes. This means that when glass grain with a granulation rate of 300-500 µm is exposed to water at 98 °C for 1 hour, less than 31 µg Na_2O per gram of glass grain will be removed.

In addition, Borosilicate glass 3.3 also meets class 1 of DIN ISO 720 (121 °C), which is divided into 3 hydrolytical resistance classes. This means that when glass grain is exposed to water at 121 °C for 1 hour, less than 62 µg Na_2O per gram of glass grain will be removed.

Acid resistance

Borosilicate glass 3.3 meets class 1 of DIN 12116, which is divided into 4 acid resistance classes. Borosilicate glass is also called acid-resistant borosilicate glass, as the surface erosion after 6 hours of boiling in 6 N HCl is less than 0.7 mg/100 cm^2. Removal of alkali oxide according to DIN ISO 1776 is less than 100 µg Na_2O/100 cm^2.

Alkali resistance

Borosilicate glass 3.3 meets class 2 of DIN ISO 695, which is divided in 3 alkali resistance classes. Surface erosion after 3 hours of boiling in a mixture with equal volumes of sodium hydroxide solution (1 mol/l) and sodium carbonate solution (0.5 mol/l) is approximately 134 mg/100 cm^2.

Chemical resistance to	Water DIN ISO 719 (HGB Class 1-5)	Acids DIN 12116 (Class 1-4)	Alkalis DIN ISO 695 (Class 1-3)
Soda-lime glass (AR-GLAS®)	3	1	2
Borosilicate glass 3.3 (Boro 3.3)	1	1	2

Mechanical Resistance

Thermal stresses

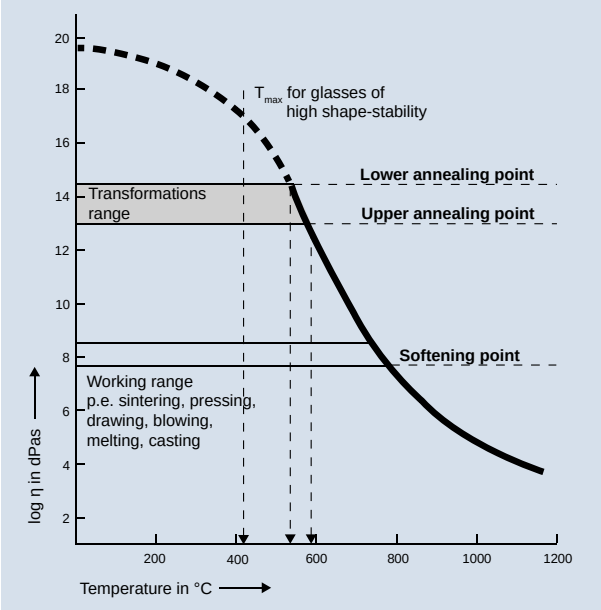
During the production and processing of glass, hazardous thermal stresses may be introduced. During the cooling of molten glass, the transition from the plastic state to the brittle state takes place in the range between the upper and lower annealing points. At this stage, existing thermal stress must be eliminated through a carefully controlled annealing process. Once the lower annealing point is reached, the glass may be cooled more rapidly, without introducing any major new stress.
Glass responds in a similar way when heated, e.g., through direct exposure to a Bunsen flame, to a temperature higher than the lower annealing point. Uncontrolled cooling may result in the "freezing in" of thermal stress which would considerably reduce resistance to breakage and mechanical stability.
To eliminate inherent stress, glass must be heated up to a temperature between the upper and lower annealing point, be kept at this temperature for approx. 30 minutes and be cooled by observing the prescribed cooling rates.

Resistance to temperature changes

When glass is heated to a temperature below the lower annealing point, thermal expansion and the poor thermal conductivity result in tensile and compressive stress. If, due to improper heating or cooling rates, the permissible mechanical strength is exceeded, breakage occurs. Apart from the coefficient of expansion α, which varies with each kind of glass, the wall thickness, the geometry of the glass body, and any existing scratches must be taken into account. Therefore, it is difficult to state specific numerical values for thermal shock resistance. However, a comparison of the α values shows that Boro 3.3 is much more resistant to thermal changes than, e.g., AR-GLAS®.

Mechanical stresses

From a technical viewpoint, glasses behave in an ideally elastic way. This means that, after exceeding the limits of elasticity, tensile and compressive stress does not result in plastic deformation, but breakage occurs. The tensile strength is relatively low and may be further diminished by scratches or cracks. For safety reasons, the tensile strength of Boro 3.3 in apparatus and plant design is calculated at 6 N/mm^2. The compressive strength, however, is approximately ten times as high.



Glass viscosity curve
Typical viscosity temperature curve using a borosilicate glass as an example.

	Upper annealing point (viscosity 10^{13} dPas)	Lower annealing point (viscosity $10^{14.5}$ dPas)	Linear expansion coefficient $\alpha_{20/300}$ 10^{-6} K^{-1}	Density g/cm^3
Soda-lime glass (AR-GLAS®)	530	495	9,1	2,52
Borosilicate glass 3.3 (Boro 3.3)	560	510	3,3	2,23

Plastics

Besides glass, plastics play a very important role in laboratories. In general, plastics can be divided into the three groups:

■ Elastomers

Polymers with loosely cross-linked molecules, exhibiting rubber-like elasticity at room temperature. Heating causes irreversible curing (vulcanization). The most popular elastomers are natural rubber and silicone rubber.

■ Thermosets

Polymers with tightly cross-linked molecules are very hard and brittle at room temperature; heating causes irreversible curing. These plastics are rarely used for plastic labware. The best known thermosets are the melamine resins. Melamine resin is produced by polycondensation of melamine with formaldehyde.

■ Thermoplastics

Polymers with a linear molecular structure with or without side branches are transformed into objects during molding operations without changing their thermoplastic properties. Thermoplastics are the materials commonly used in plastic labware production. Hence we provide here a brief description of some individual plastics explaining their structural, mechanical, chemical and physical properties. The most popular thermoplastics are polyolefins like polyethylene and polypropylene.

PS Polystyrene

Polystyrene is glass-clear, hard, brittle, and dimensionally stable due to its amorphous structure. PS has good chemical resistance to aqueous solutions but limited resistance to solvents. Disadvantages include low thermal stability and its tendency to suffer from stress-cracks.

SAN Styrene-acrylonitrile copolymer

This is a glass-clear material with good resistance to stress-cracking. It has slightly better chemical resistance than PS.

PMMA Polymethyl methacrylate

Rigid, glass-clear ("organic glass"). Resistant to atmospheric agents. Replaces glass in many applications where temperatures are below 90 °C and low chemical resistance is required. PMMA has excellent UV radiation stability.

PC Polycarbonate

These are thermoplastic linear carboxylic acid polyesters combining many of the properties of metals, glass and plastics. The materials are transparent and have good thermal properties between -130 to +130 °C. Note: PC may be weakened by autoclaving or exposure to alkaline detergents.

PA Polyamide

Polyamides are linear polymers with repeating amide chain linkages. With their favorable strength characteristics and high durability, polyamides can often be used as structural materials and for surface coating metals. They have good chemical resistance against organic solvents, but are easily attacked by acids and oxidizing agents.

PVC Vinyl chloride polymers

The vinyl chloride polymers are mainly amorphous thermoplastics with very good chemical resistance.
Their combination with plasticizers opens up many useful applications, ranging from artificial leather to injection molding components. PVC has good chemical resistance, especially with oils.

POM Polyoxymethylene

POM has superior properties with regard to hardness, rigidity, strength, durability, chemical resistance and favorable slip and abrasion characteristics. It can replace metals in many applications. POM can withstand temperatures up to 130 °C.

PUR Polyurethane

Polyurethane is a very versatile plastic, and is therefore used in a wide variety of applications.The molecules are formed by a polyaddition reaction of dialcohols with polyisocyanate.
As a material for the coating of BLAUBRAND® graduated flasks, a high-quality, scratch-resistant, transparent PUR type with a high modulus of elasticity is used. The working temperature can range from -30 to +80 °C. Brief exposure to higher temperatures of up to 135 °C are permissible, but over time this will lead to a reduction in elasticity.

PE-LD Low Density Polyethylene

The polymerization of ethylene under high-pressure results in a certain number of branches in the chain. The result is a less compact molecular structure than PE-HD, with very good flexibility and good chemical resistance, but less chemical resistance to organic solvents than PE-HD. Use is limited to temperatures below 80 °C.

PE-HD High Density Polyethylene

If the polymerization of ethylene is controlled by a catalytic process, a very small number of branches in the chain are obtained. The result is a more rigid and compact structure with enhanced chemical resistance and usability up to 105 °C.

PP Polypropylene

PP has a similar structure to Polyethylene, but with methyl groups at every second carbon atom of the chain. The major advantage, compared with PE, is its higher temperature resistance. It can be repeatedly autoclaved at 121 °C. Like the above mentioned polyolefins, PP has good mechanical properties and good chemical resistance but is sligthly more susceptible to be attacked by strong oxidizing agents than PE-HD.

PMP Polymethylpentene

PMP is similar to PP but has isobutyl groups instead of the methyl groups. Chemical resistance is comparable to PP but tends to suffer from tension cracks when exposed to ketones or chlorinated solvents. The most important qualities of PMP are its excellent transparency and good mechanical properties at temperatures up to 150 °C.

ETFE
Ethylene-Tetrafluoroethylene copolymer

ETFE is a copolymer of ethylene with chlorotrifluoroethylene and/or with tetrafluoroethylene. This plastic is remarkable for its excellent chemical resistance, but its temperature stability is lower in comparison with PTFE (at most 150 °C).

PTFE Polytetrafluoroethylene

PTFE is a fluorinated hydrocarbon with a macromolecular, partly crystalline structure. PTFE is resistant to virtually all chemicals. It offers the widest working temperature range, from -200 to +260 °C. Its surface is adhesion resistant. The slip properties and electrical insulation capacity of the material are better than those of FEP and PFA. The only disadvantage is that it can only be molded by sintering processes. PTFE is opaque. It is suitable for use in microwave ovens.

FEP
Tetrafluorethylene-perfluorpropylene copolymer

A fluorinated hydrocarbon with a macromolecular, partly crystalline structure. The surface is non-adhesive. The mechanical and chemical properties are comparable with PTFE, but the working temperature is limited to the range from -100 to +205 °C. Water absorption is extremely low. FEP is translucent.

PFA Perfluoroalkoxy copolymer

Fluorinated hydrocarbon with a high-molecular, partly crystalline structure. Its surface is adhesion-resistant. Mechanical properties and chemical inertness are comparable with those of PTFE.
The working temperature can range from -200 to +260 °C. The water absorption of PFA is extremely low. PFA is translucent.
PFA is manufactured without the addition of catalysts or plasticizers, and can be molded to produce an extremely smooth, readily cleanable surface, and is therefore particularly well suited for trace analysis.

General Properties

Resistance to breakage and low weight are important advantages of plastics. The application determines which plastic to select.

A variety of parameters should be considered: exposure time and concentration of chemicals, thermal stress (e.g., autoclaving), exertion of force, exposure to UV radiation, and aging, which may be caused by the action of detergents, or other environmental factors.

The recommendations listed below are based on technical literature and information provided by the manufacturers of raw materials. They were prepared carefully and are intended as general guidance. However, they cannot replace suitability testing perfomed by the user under actual working conditions.

Physical Properties

	Max. operating temperature (°C)	Brittle temperature (°C)	Micro wave suitability*	Density (g/cm³)	Elasticity	Transparency
PS	70	-20	no	1.05	rigid	transparent
SAN	70	-40	no	1.03	rigid	transparent
PMMA	65 to 95	-50	no	1.18	rigid	transparent
PC	125	-130	yes	1.20	rigid	transparent
PVC	80	-20	no	1.35	rigid	transparent
POM	130	-40	no	1.42	good	opaque
PE-LD	80	-50	yes	0.92	very good	translucent
PE-HD	105	-50	yes	0.95	good	translucent
PP	125	0	yes	0.90	moderate	translucent
PMP	150	0	yes	0.83	moderate	transparent
ETFE	150	-100	yes	1.70	moderate	translucent
PTFE	260	-200	yes	2.17	very good	opaque
FEP	205	-100	yes	2.15	moderate	translucent
PFA	260	-200	yes	2.17	moderate	translucent
PUR	80	-30	yes	1.20	very good	transparent
FKM	220	-30	–	–	very good	–
EPDM	130	-40	–	–	very good	–
NR	80	-40	no	1.20	very good	opaque
SI	180	-60	no	1.10	very good	translucent

* Observe chemical and temperature resistance

Sterilization

	Autoclaving* at 121 °C (2 bar), acc. DIN EN 285	β/γ-radiation 25 kGy	Gas (ethylene oxide)	Chemical (formalin, ethanol)
PS	no	yes	no	yes
SAN	no	no	yes	yes
PMMA	no	yes	no	yes
PC	yes[1)]	yes	yes	yes
PVC	no[2)]	no	yes	yes
POM	yes[1)]	yes (restricted)	yes	yes
PE-LD	no	yes	yes	yes
PE-HD	no	yes	yes	yes
PP	yes	yes (restricted)	yes	yes
PMP	yes	yes	yes	yes
ETFE	yes	no	yes	yes
PTFE	yes	no	yes	yes
FEP/PFA	yes	no	yes	yes
PUR	yes[3)]	–	yes	yes
FKM	yes	–	yes	yes
EPDM	yes	–	yes	yes
NR	no	no	yes	yes
SI	yes	no	yes	yes

* Before autoclaving, labware must be carefully cleaned and rinsed with distilled water. Always remove covers from containers!
[1)] Frequent autoclaving reduces mechanical stability.
[2)] With the exception of PVC tubing, which is autoclavable up to 121 °C.
[3)] Frequent autoclaving reduces elasticity.

Biological Properties

The following plastics are generally non-toxic to cell cultures:
PS, PC, PE-LD, PE-HD, PP, PMP, PTFE, FEP, PFA.

Chemical Properties

With regard to chemical resistance, plastics are classified as follows:

+	o	–
Excellent chemical resistance Continuous exposure to the substance does not cause damage within 30 days. The plastic may remain resistant for years.	**Good to limited chemical resistance** Continuous exposure to the substance causes minor damage, some of which is reversible, within 7-30 days (e.g., swelling, softening, decrease of mechanical strength, discoloration).	**Poor chemical resistance** Not suitable for continuous exposure to the substance. Immediate(!) damage may occur (loss of mechanical strength, deformation, discoloration, cracking, dissolution).

Abbreviations of the described plastics (to DIN 7728)

PS	Polystyrene
SAN	Styrene-acrylonitrile copolymer
PMMA	Polymethyl methacrylate
PC	Polycarbonate
PVC	Polyvinyl chloride
POM	Polyoxymethylene
PE-LD	Low-density polyethylene
PE-HD	High-density polyethylene
PP	Polypropylene
PMP	Polymethylpentene
ETFE	Ethylene-tetrafluoroethylene copolymer
PTFE	Polytetrafluoroethylene
FEP	Perfluoroethylene-propylene copolymer
PFA	Perfluoroalkoxy copolymer
PUR:	Polyurethane
FKM	Fluoro elastomer
EPDM	Ethylene-propylene-diene-rubber
NR	Natural rubber
SI	Silicone rubber

Chemical Resistance (Status as of: 0713)

	PS		SAN		PMMA		PC		PVC		POM		PE-LD		PE-HD	
	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C
Acetaldehyde	–	–	–	–	–	–	o	–	–	–	+	+	+	–	+	o
Acetic acid (glacial) 100%	–	–					–	–			–	–	+	o	+	+
Acetic acid 50%	o	o	+	o	–	–	+	o	+	o	o	–	+	+	+	+
Acetic anhydride	–	–					–	–	–	–	–	–	–	–	o	o
Acetone	–	–	–	–	–	–	–	–	–	–	+	+	+	o	+	+
Acetonitrile	–	–	–	–	–	–	–	–	–	–	+		+	o	+	o
Acetophenone	–	–	–	–	–	–	–	–	–	–	+		–	–	o	o
Acetyl chloride	–	–	–	–	–	–	–	–	–	–			+		+	
Acetylacetone	–	–	–	–	–	–	–	–	–	–	+		+		+	
Acrylic acid	–	–	–	–	–	–	–	–	–	–	–	–	+		+	
Acrylonitrile	–	–	–	–	–	–	–	–	–	–	–	–	+	+	+	+
Adipic acid	+	+	+	+	+	+	+	+	+	o	+	+	+	+	+	+
Allyl alcohol (2-Propene-1-ol)	o	o	o	–	–	–	o	o	o	–	+	+	+	+	+	+
Aluminium chloride	+	+	+	+	+	+	–	–	+	o	+	o	+	+	+	+
Aluminium hydroxide	o	o	o	o	o	o	o	–	+	+	+	+	+	+	+	+
Amino acids	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ammonium chloride	+	+	+	+	o	o	o	o	+	o	+	+	+	+	+	+
Ammonium fluoride	+	+	+	+	o	o	o	o	+	o	+	+	+	+	+	+
Ammonium hydroxide 30% (Ammonia)	o	–	+	o	+	+	–	–	+	o	o	o	+	+	+	+
Ammonium sulfate	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
n-Amyl acetate	–	–	–	–	+	+	–	–	–	–	+	+	o	–	+	o
n-Amyl alcohol (Pentanol)	o	o	+	+			+	+	o	o	+	+	+	+	+	+
Amyl chloride (Chloropentane)	–	–	–	–	–	–	–	–	–	–	+	+	–	–	–	–
Aniline	–	–	–	–	–	–	o	–	–	–	o	o	+	o	+	+
Aqua regia	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Barium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Benzaldehyde	–	–	–	–	–	–	o	–	–	–	+	+	+	+	+	+
Benzene	–	–	–	–	–	–	–	–	–	–	+	o	o	–	+	+
Benzine (gasoline)	–	–	–	–	+		o	–	o	–	+	+	o	–	+	+
Benzoyl chloride	–	–	–	–	–	–	–	–	–	–	+	o	o	–	+	+
Benzyl alcohol	–	–	–	–	–	–	o	o	o	o	+	+	o	–	o	–
Benzylamine	–	–	–	–	–	–	–	–	–	–	+		o	–	o	
Benzylchloride	–	–									+					
Boric acid, 10%	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bromine	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Bromobenzene	–	–	–	–	–	–	–	–	–	–			–	–	–	–
Bromoform	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Bromonaphthalene	–	–	–	–												
Butanediol	–	–	–	–							+	+	+	+	+	+
1-Butanol (Butyl alcohol)	o	–	+	o	o	–	o	o	o	o	+	+	+	+	+	+
n-Butyl acetate	–	–	–	–	–	–	–	–	–	–	+	o	o	o	+	+
Butyl methyl ether	–	–	–	–	–	–	–	–	–	–	+	+	o	–	o	–
Butylamine	–	–	–	–							+	+				
Butyric acid	–	–	–	–			o	–					–	–	o	–
Calcium carbonate	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Calcium chloride	+	+	+	+	+	+	+	+	o	–	+	+	+	+	+	+
Calcium hydroxide	+	o	+	o	+	+	–	–	+	+	+	+	+	+	+	+
Calcium hypochlorite	+	+	+	+	o	o	o	–	o	–	+	+	+	+	+	+
Carbon disulfide	–	–	–	–	–	–	–	–	–	–	+	+	–	–	–	–
Carbon tetrachloride	–	–	–	–	o	–	–	–	–	–	o	o	o	–	o	–
Chloro naphthalene											–	–				
Chloroacetaldehyde	–	–	–	–	–	–										
Chloroacetic acid	o	–	–	–	o	–	o	–	+	o	–	–	+	+	+	+
Chloroacetone	–	–	–	–	–	–										
Chlorobenzene	–	–	–	–	–	–	–	–	–	–			–	–	–	–
Chlorobutane	–	–	–	–	–	–					–	–	o	–	o	–
Chloroform	–	–	–	–	–	–	–	–	–	–	–	–	o	–	o	–
Chlorosulfonic acid											–	–				
Chromic acid 10%	–	–	–	–	o	–	+	o	+	o	o	o	+	+	+	+
Chromic acid 50%	–	–	o	o	–	–	o	–	+	–	–	–	+	o	+	o
Chromosulfuric acid	o	o	o	o	–	–	–	–	+	o	–	–	–	–	–	–
Copper sulfate	+	+	+	o	+	+	+	+	+	o	+	+	+	+	+	+
Cresol	–	–					–	–	–	–			–	–	o	–
Cumene (Isopropyl benzene)	–	–	–	–	–	–	–	–	–	–	+	–	o	–	+	o
Cyclohexane	–	–					–	–	–	–	+	+	o	–	o	–
Cyclohexanone	–	–					–	–	–	–			–	–	o	–
Cyclopentane	–	–					–	–	–	–			–	–	o	–
Decane							o		o		+				o	–
Decanol	o		o				o		+		+				+	
Dibenzyl ether	–	–	–	–	–	–					+				+	
Dibromoethane																
Dibutyl phthalate	–	–	–	–	–	–	–	–	–	–	+	+	o	–	o	–
Dichlorbenzene	–	–	–	–	–	–	–	–	–	–	–	–	o	–	o	–
Dichlormethane (Methylene chloride)	–	–					–	–	–	–			o	–	o	–
Dichloroacetic acid	o	–					o	–	o	–			o	–	o	o
Dichloroethane											–	–	o	–	o	–
Diesel oil (Heating oil)	–	–	–	–	o	–	–	–	o		+	+	o	–	+	o
Diethanolamine	–	–	–	–	–	–	–	–							o	
Diethyl ether	–	–	–	–	–	–	–	–	–	–	+	+	–	–	o	–
Diethylamine	o	o					–	–	–	–			–	–	o	–
Diethylbenzene	–	–					o	–	–	–			–	–	o	–
Diethylene glycol	o	–	+	+	–	–	o	o	–	–	+	o	+	+	+	+
Dimethyl sulfoxide (DMSO)	–	–	–	–	–	–	–	–	–	–			+	+	+	+
Dimethylaniline	–	–	–	–	–	–	–	–								
Dimethylformamide (DMF)	–	–	–	–	–	–	–	–	o	–	+	+	+	+	+	+
1.4 Dioxane	–	–	–	–	–	–	o	o	–	–	o	o	+	o	+	+
Diphenyl ether	–	–	–	–	–	–					o					
Ethanol (Ethyl alcohol)	o	–	o	–	–	–	+	o	+	o	+	+	+	+	+	+
Ethanolamine																
Ethyl acetate	–	–					–	–	–	–			+	+	+	+
Ethyl methyl ketone	–	–	–	–	–	–	–	–	–	–	–	–	o	–	o	–
Ethylbenzene	–	–	–	–	–	–	–	–	–	–			–	–	–	–
Ethylene chloride	–	–	–	–	–	–	–	–	–	–	o	–	–	–	–	–

The data for the chemical resistance of salts also apply to their aqueous solutions.

	PP		PMP		ETFE		PTFE		FEP/PFA		FKM	EPDM	NR	SI
	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	20 °C	20 °C	20 °C
Acetaldehyde	+	–	o	–	+	o	+	+	+	+	–	o	–	–
Acetic acid (glacial) 100%	+	o	+	o	+	+	+	+	+	+	–	o	o	o
Acetic acid 50%	+	+	+	+	+	+	+	+	+	+	–	–	–	–
Acetic anhydride	o	o	+	o	+	+	+	+	+	+	–	o	o	o
Acetone	+	+	+	+	+	o	+	+	+	+	–	+	o	–
Acetonitrile	+	o	o	–	+	+	+	+	+	+	–	–	–	–
Acetophenone	o	o	o	–	+	+	+	+	+	+	–	+	–	–
Acetyl chloride	+				+	+	+	+	+	+	+	–	–	–
Acetylacetone	+		+		+	+	+	+	+	+	–	+	–	–
Acrylic acid	+		+		+	+	+	+	+	+	–	–	–	–
Acrylonitrile	o	–	–	–	+	+	+	+	+	+	–	–	–	–
Adipic acid	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Allyl alcohol (2-Propene-1-ol)	+	+	+	o	+	+	+	+	+	+	+	+	o	–
Aluminium chloride	+	+	+	+	+	+	+	+	+	+	+	+	o	o
Aluminium hydroxide	+	+	+	o	+	+	+	+	+	+	+	+	+	+
Amino acids	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ammonium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ammonium fluoride	+	+	+	+	+	+	+	+	+	+	o	+	–	+
Ammonium hydroxide 30% (Ammonia)	+	+	+	+	+	+	+	+	+	+	–	+	+	o
Ammonium sulfate	+	+	+	+			+	+			–	+	o	o
n-Amyl acetate	o	–	+	o	+	+	+	+	+	+	–	o	o	–
n-Amyl alcohol (Pentanol)	+	+	+	+	+	+	+	+	+	+	o	o	o	–
Amyl chloride (Chloropentane)	–	–	–	–	+	+	+	+	+	+	+	–	–	–
Aniline	+	+	+	o	+	o	+	+	+	+	–	–	–	–
Aqua regia	–	–	–	–	+	+	+	+	+	+	–	–	–	–
Barium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Benzaldehyde	+	+	+	+	+	o	+	+	+	o	–	o	–	–
Benzene	+	o	o	o	+	+	+	+	+	+	o	–	–	–
Benzine (gasoline)	o	o	o	o	+	+	+	+	+	+	+	–	–	–
Benzoyl chloride	+	o	o	o	+	+	+	+			+	–	–	–
Benzyl alcohol	o	–	o	–	+	+	+	+	+	+	+	o	–	o
Benzylamine	o		o		+	+	+	+	+	+	+	o	–	o
Benzylchloride					+	+	+	+			+	–	–	–
Boric acid, 10%	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bromine	–	–	–	–	+	+	+	+	+	+	o	–	–	–
Bromobenzene	–	–	–	–	o	–	+	+	+	+	+	–	–	–
Bromoform	–	–	–	–	+	+	+	+	+	+			–	–
Bromonaphthalene					+	+	+	+	+	+				
Butanediol	+	+	+	+	+	+	+	+	+	+	–	+	o	–
1-Butanol (Butyl alcohol)	+	+	+	o	+	+	+	+	+	+	+	o	+	o
n-Butyl acetate	o	o	+	o	+	+	+	+	+	+	–	o	–	–
Butyl methyl ether	+	o	+	–	+	o	+	+	+	+	–	–	–	–
Butylamine					+	+	+	+			–	–	–	o
Butyric acid	–	–			+	+	+	+	+	+	o	–	–	–
Calcium carbonate	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Calcium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Calcium hydroxide	+	+	+	+	+	+	+	+	+	+	+	+	+	o
Calcium hypochlorite	+	+	+	o	+	+	+	+	+	+	+	+	–	o
Carbon disulfide	–	–	–	–	+	o	+	+	+	+	+	–	–	–
Carbon tetrachloride	–	–	–	–	+	+	+	+	+	+	+	–	–	–
Chloro naphthalene					+	+	+	+			+	–	–	–
Chloroacetaldehyde					+	+	+	+						
Chloroacetic acid	+	o	+	o	+	+	+	+	+	+	o	o	–	–
Chloroacetone					+	+	+	+			–	+	o	–
Chlorobenzene	–	–	–	–	+	o	+	+	+	+	o	–	–	–
Chlorobutane	o	–	o	–	+	+	+	+	+	+	o	–	–	–
Chloroform	–	–	o	–	+	o	+	+	+	o	o	–	–	–
Chlorosulfonic acid					o	–	+	+	+	+	–	–	–	–
Chromic acid 10%	+	+	+	+	+	+	+	+	+	+	+	–	–	o
Chromic acid 50%	o	o	o	o	+	+	+	+	+	+	+	–	–	–
Chromosulfuric acid	–	–	o	–	+	+	+	+	+	+	+	–	–	–
Copper sulfate	+	+	+	+	+	+	+	+	+	+	+	+	o	+
Cresol	o	o	–	–	+	o	+	+	+	+	+	–	–	–
Cumene (Isopropyl benzene)	o	–	–	–	+	+	+	+	+	+	+	–	–	–
Cyclohexane	o	–	–	–	+	o	+	+	+	+	+	–	–	–
Cyclohexanone	o	–	o	o	+	+	+	+	+	+	–	–	–	–
Cyclopentane	o	–	o	–	+	+	+	+	+	+	+	–	–	–
Decane	o		o		+	+	+	+	+	+	+	–	–	o
Decanol	+		+		+	+	+	+	+	+	+	+	o	o
Dibenzyl ether	+		o		+	+	+	+	+	+	–	o	–	–
Dibromoethane					o		+	+	+					
Dibutyl phthalate	+	o	+	o	+	+	+	+	+	+	o	o	–	o
Dichlorbenzene	o	–	–	–	+	o	+	+	+	+	+	–	–	–
Dichlormethane (Methylene chloride)	o	–	o	–	o	o	+	+	+	+	o	–	–	–
Dichloroacetic acid	o	–	+	+	+	o	+	+	+	+	–	–	–	–
Dichloroethane	o	–	o	–	+	+	+	+	+	+	o	–	–	–
Diesel oil (Heating oil)	+	o	o	–	+	+	+	+	+	+	+	–	–	–
Diethanolamine	o						+	+				o		
Diethyl ether	o	–	–	–	+	+	+	+	+	+	–	–	–	–
Diethylamine	o	–	o	o	+	o	+	+	+	+	–	o	o	
Diethylbenzene	–	–	–	–	+	o	+	+	+	+	+	–	–	–
Diethylene glycol	+	+	+	+	+	+	+	+	+	+	+	+	+	o
Dimethyl sulfoxide (DMSO)	+	+	+	+	+	+	+	+	+	+				+
Dimethylaniline					+	+	+	+	+	+	o	o	–	o
Dimethylformamide (DMF)	+	+	+	+	+	+	+	+	+	+	–	o	o	o
1.4 Dioxane	+	o	o	o	+	o	+	+	+	+	–	o	–	–
Diphenyl ether							+	+			o	–	–	–
Ethanol (Ethyl alcohol)	+	+	+	o	+	+	+	+	+	+	o	+	o	o
Ethanolamine	+				+	+	+	+	+	+	–	+	–	–
Ethyl acetate	+	o	o	–	+	+	+	+	+	+	–	o	–	
Ethyl methyl ketone	+	o	–	–	o	o	+	+	+	+	–	o	–	
Ethylbenzene	–	–	–	–	o	o	+	+	+	+	o	–	–	–
Ethylene chloride	o	–	–	–	+	+	+	+	+	+	o	–	–	–

Continued list of "Chemical Resistance"

	PS		SAN		PMMA		PC		PVC		POM		PE–LD		PE–HD	
	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C
Ethylene glycol (Glycol)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ethylene oxide	–	–	–	–	–	–	o	–	o	–	+	+	o	o	o	o
Fluoroacetic acid	–	–	–	–	–	–	–	–	–	–	–	–				
Formaldehyde 40%	–	–	+	+	–	–	+	o	o	–	+	+	+	+	+	+
Formamide											–	–	+	+	+	+
Formic acid 98-100%	+	o	o	o	–	–	+	o	–	–	–	–	+	+	+	+
Glycerol	+	+	+	+	+	+	+	+	+	+	o	o	+	+	+	+
Glycolic acid 70%													+	+	+	+
Heating oil (Diesel oil)	–	–	–	–	o	–	–	–	o	–	+	+	o	–	+	o
Heptane	–	–			o	–	+	o	–	–			o	–	o	o
Hexane	–	–	+	+	o	o	–	–	o	–	+	+	o	–	+	o
Hexanoic acid					+											
Hexanol					+								+	+	+	+
Hydriodic acid													+	+	+	+
Hydrobromic acid	o	–					+	+			–	–	+	+	+	+
Hydrochloric acid 10%	+	+	o	–	o	–	–	–	+		–	–	+	+	+	+
Hydrochloric acid 20%	+	+	o	–	o	–	o	o	o		–	–	+	+	+	+
Hydrochloric acid 37%	o	o	o	–	o	–	–	–	o	–	–	–	+	+	+	+
Hydrofluoric acid 40%	+	+	+	o	–	–	–	–	o	–	–	–	+	+	+	+
Hydrofluoric acid 70%	–	–	–	–	–	–	–	–	–	–	–	–	+	–	+	o
Hydrogen peroxide 35%	+	+	+	+	–	–	+	+	+	o	+	–	+	+	+	+
Iodine-potassium iodide solution	o	–	o	–	–	–	o	–	–	–	o	o	–	–	–	–
Isoamyl alcohol											+	+	+	+	+	+
Isobutanol (Isobutyl alcohol)	o	o	o	–	o	–	+	+	+	o	+	+	+	+	+	+
Isooctane	o	–	o	–			o									
Isopropanol (2-Propanol)	o	o	+	–	o	–	+	+	+	o	+	+	+	+	+	+
Isopropyl ether	–	–					–	–	–	–			–	–	–	–
Lactic acid	+	+	+	+	o	–	+	+	o	o	+	–	+	+	+	+
Mercury	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mercury chloride	+	o	+	+	+	+	+	+	–	–	o	o	+	+	+	+
Methanol	o	–	o	–	–	–	+	o	+	o	+	+	+	o	+	+
Methoxybenzene	–	–	–	–	–	–	–	–			o					
Methyl butyl ether	–	–	–	–	–	–	–	–	–	–	o		–	–	o	–
Methyl formate (Methyl methanoate)	–	–	–	–	–	–	–	–			+					
Methyl propyl ketone	–	–	–	–	–	–	–	–	–	–	+	+	+	o	+	+
Methylene chloride (Dichloro methane)	–	–	–	–	–	–	–	–	–	–	–	–	o	–	o	–
Mineral oil (Engine oil)	+		+		+	+	+		+	+	+	+	+	o	+	+
Nitric acid 10%	–	–	+	o	+	o	+	o	+	o	–	–	+	+	+	+
Nitric acid 30%	–	–	o	–	o	o	+	o	o	–	–	–	o	o	o	–
Nitric acid 70%	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Nitrobenzene	–	–	–	–	–	–	–	–	–	–	o	–	–	–	o	–
Oleic acid	–	–	–	–	–	–										
Oxalic acid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ozone	o	o	o	o	+	o	–	–	+	o	–	–	o	–	o	–
n-Pentane																
Peracetic acid							–	–			–	–				
Perchloric acid	–	–	–	–	–	–	–	–	o	–	–	–	+	–	+	–
Perchloroethylene	–	–	o	o	o	–	–	–	–	–	+	o	–	–	–	–
Petroleum	–	–			+		o	o	+	–	+	+	o	–	o	–
Petroleum ether	–	–			+				o	–	+	+	o			
Phenol	–	–	–	–	–	–	–	–	–	–	–	–	+	o	+	+
Phenylethanol															o	
Phenylhydrazine															o	
Phosphoric acid 85%	+	o	+	+	–	–	+	+	+	o	+	–	+	+	+	+
Piperidine															+	
Potassium chloride	o	o	o	o	+	+	+	+	+	o	+	+	+	+	+	+
Potassium dichromate																
Potassium hydroxide	o	o	o	o	+	+	–	–	o	o	+	+	+	+	+	+
Potassium permanganate	+	+	+	o	+	+	+	+	+	+	o	o	+	+	+	+
Propanediol (Propylene glycol)	+	+	–	–	o	o	+	o	o	–	+	+	+	+	+	+
Propanol	o		+	+	o		o		+	+	+	+	+	+	+	+
Propionic acid	o	–					–	–	o	–	–	–	o	–	+	o
Pyridine	–	–	–	–	–	–	–	–	o	–	+	o	+	o	+	o
Salicylaldehyde	–	–	–	–			o	o	–	–			+	+	+	+
Salicylic acid	+	+	+	+					o	–	–	–	+	+	+	+
Silver acetate	o	o	o	o	o	o	+	+	o	o	o	o	+	+	+	+
Silver nitrate	o	o	+	+	+	+	+	+	o	o	o	o	+	+	+	+
Sodium acetate	+	+	+	+	–	–	+	+	o	o	+	o	+	+	+	+
Sodium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sodium dichromate	+	o	+	o	+	o	+	–	+	+	+	+	+	+	+	+
Sodium fluoride	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sodium hydroxide	+	+	+	+			–	–	+	+	+	+	+	+	+	+
Sulfuric acid 60%	–	–	+	o	–	–	o	o	o	–	–	–	+	+	+	+
Sulfuric acid 98%	–	–	–	–	–	–	–	–	–	–	–	–	o	–	o	–
Tartaric acid	+	+	+	+	o	o	+	+	+	+	+	+	+	+	+	+
Tetrachloroethylene																
Tetrahydrofuran (THF)	–	–	–	–	–	–	–	–	–	–	o	o	o	–	o	–
Tetramethylammonium hydroxide							–	–			–	–				
Toluene	–	–	–	–	–	–	–	–	–	–	+	+	o	–	o	o
Trichloroacetic acid	o	–					o	–	o	–			o	–	o	o
Trichlorobenzene	–	–					–	–	–	–			–	–	–	–
Trichloroethane	–	–	–	–	–	–	–	–	–	–	o	–	–	–	o	–
Trichloroethylene	–	–	–	–	–	–	–	–	–	–	–	–	–	–	o	–
Trichlorotrifluoro ethane	–	–	–	–												
Triethanolamine	–	–	–	–												
Triethylene glycol	+	+	+	+	o	o	+	o	o	–	+	o	+	+	+	+
Trifluoro ethane	–	–	–	–												
Trifluoroacetic acid (TFA)	–	–	–	–							–	–				
Tripropylene glycol	+	+	+	+	o	o	+	o	o	–	+	o	+	+	+	+
Turpentine	–	–	o	o	+	+	–	–	+	+	+	+	o	–	o	–
Urea	+	+	+	+	+	+	–	–	o	–	+	+	+	+	+	+
Xylene	–	–	–	–	–	–	–	–	–	–	+	+	o	–	o	–
Zinc chloride	+	+	+	+	–	–	+	+	+	o	+	o	+	+	+	+
Zinc sulfate	+	+	+	+	o	o	+	+	+	o	o	–	+	+	+	+

The data for the chemical resistance of salts also apply to their aqueous solutions.

	PP		PMP		ETFE		PTFE		FEP/PFA		FKM	EPDM	NR	SI
	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	20 °C	20 °C	20 °C
Ethylene glycol (Glycol)	+	+	+	+	+	+	+	+	+	+	0	+	0	+
Ethylene oxide	o	–	o	–	+	+	+	+	+	+	–	–	–	–
Fluoroacetic acid							+				–	–	–	–
Formaldehyde 40%	+	+	+	+	+	+	+	+	+	+	o	+	o	o
Formamide	+	+	+	+	+	+	+	+	+	+	o	o	+	
Formic acid 98-100%	+	+	+	o	+	+	+	+	+	+	–	o	o	–
Glycerol	+	+	+	+	+	+	+	+	+	+	o	+	o	+
Glycolic acid 70%	+	+	+	+	+	+	+	+	+	+	o	+	+	+
Heating oil (Diesel oil)	+	o	o	–	+	+	+	+	+	+	+	–	–	–
Heptane	o	o	o	o	+	+	+	+	+	+	+	–	–	o
Hexane	+	o	o	–	+	+	+	+	+	+	+	–	–	o
Hexanoic acid							+	+						
Hexanol	+	+	+	+	+	+	+	+	+	+	+	–	o	o
Hydriodic acid	+	+	+	+	+	+	+	+	+	+	+	+		
Hydrobromic acid	+	+	+	+	+	+	+	+	+	+	+	o	o	–
Hydrochloric acid 10%	+	+	+	+	+	+	+	+	+	+	+	+	o	o
Hydrochloric acid 20%	+	+	+	+	+	+	+	+	+	+	+	+	o	–
Hydrochloric acid 37%	+	+	+	+	+	+	+	+	+	+	o	+	o	–
Hydrofluoric acid 40%	+	+	+	+	+	+	+	+	+	+	o	o	–	–
Hydrofluoric acid 70%	+	o	+	o	+	+	+	o	+	+	–	–	–	–
Hydrogen peroxide 35%	+	+	+	+	+	+	+	+	+	+	+	o	–	o
Iodine-potassium iodide solution	+	+	+	o	+	+	+	+	+	+	+	+	+	–
Isoamyl alcohol	+	+	+	+	+	+	+	+	+	+	o	o	o	o
Isobutanol (Isobutyl alcohol)	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Isooctane					+	+	+	+	+	+	+	–	–	–
Isopropanol (2-Propanol)	+	+	+	+	+	+	+	+	+	+	+	+	+	o
Isopropyl ether	–	–	–	–	+	o	+	+	+	+	–	–	–	–
Lactic acid	+	+	+	+	+	+	+	+	+	+	+	o	o	o
Mercury	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mercury chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Methanol	+	+	+	+	+	+	+	+	+	+	–	+	o	+
Methoxybenzene					+	+	+	+	+	+	–	–	–	–
Methyl butyl ether	+	+	+	o	+	o	+	+	+	+	–	–	–	–
Methyl formate (Methyl methanoate)					+	+	+	+	+	+		o	–	o
Methyl propyl ketone	+	o	o	o	+	+	+	+	+	+	–	o	–	–
Methylene chloride (Dichloro methane)	o	–	–	–	+	+	+	+	+	+	o	–	–	–
Mineral oil (Engine oil)	+	+	+	+	+	+	+	+	+	+	+	–	–	o
Nitric acid 10%	+	+	+	+	+	+	+	+	+	+	o	o	–	–
Nitric acid 30%	o	–	o	–	+	+	+	+	+	+	o	–	–	–
Nitric acid 70%	–	–	–	–	+	+	+	+	+	+	–	–	–	–
Nitrobenzene	–	–	–	–	+	+	+	+	+	+	–	–	–	–
Oleic acid					+	+	+	+	+	+	o	–	–	–
Oxalic acid	+	+	+	+	+	+	+	+	+	+	+	+	o	o
Ozone	o	–	+	+	+	+	+	+	+	+	+	+	–	+
n-Pentane					+	+	+	+	+	+	+	–	–	–
Peracetic acid					+	+	+	+	+	+				–
Perchloric acid	+	–	o	–	+	+	+	+	+	o	+	o	–	–
Perchloroethylene	–	–	–	–	+	+	+	+	+	+	o	–	–	–
Petroleum	o	–	o	o	+	+	+	+	+	+	+	–	–	o
Petroleum ether					+	+	+	+	+	+	+	–	–	–
Phenol	+	+	o	o	+	+	+	+	+	+	o	–	–	–
Phenylethanol	o				+	+	+	+	+	+				
Phenylhydrazine	o				+	+	+	+	+	+	o	–	o	–
Phosphoric acid 85%	+	+	+	+	+	+	+	+	+	+	+	o	–	–
Piperidine	+				+	+	+	+	+	+	–	–	–	–
Potassium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Potassium dichromate							+	+			o	+	o	o
Potassium hydroxide	+	+	+	+	+	+	+	+	+	+	–	+	o	–
Potassium permanganate	+	+	+	+	+	+	+	+	+	+	+	+	o	–
Propanediol (Propylene glycol)	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Propanol	+	+	+	+	+	+	+	+	+	+	+	+	+	o
Propionic acid	+	o	+	o	+	o	+	+	+	+	+	o	–	–
Pyridine	o	o	+	o	–	–	+	+	+	+	–	–	–	–
Salicylaldehyde	+	+	+	+	+	–	+	+	+	+				
Salicylic acid	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Silver acetate	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Silver nitrate	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sodium acetate	+	+	+	+	+	+	+	+	+	+	–	+	+	o
Sodium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sodium dichromate	+	+	+	+	+	+	+	+	+	+	+	+	+	o
Sodium fluoride	+	+	+	+	+	+	+	+	+	+	+	+	o	o
Sodium hydroxide	+	+	+	+	+	+	+	+	+	+	o	+	o	o
Sulfuric acid 60%	+	+	+	+	+	+	+	+	+	+	+	–	–	–
Sulfuric acid 98%	–	–	+	+	+	+	+	+	+	+	+	–	–	–
Tartaric acid	+	+	+	+	+	+	+	+	+	+	+	o	+	+
Tetrachloroethylene					o		+	+	+		o	–	–	–
Tetrahydrofuran (THF)	o	–	o	–	+	o	+	+	o	o	–	–	–	–
Tetramethylammonium hydroxide					+	+	+	+	+	+	–	+		
Toluene	o	–	o	–	+	+	+	+	+	+	o	–	–	–
Trichloroacetic acid	o	–	+	+	+	o	+	+	+	+	–	o	o	o
Trichlorobenzene	–	–	o	o	+	o	+	+	+	+				
Trichloroethane	–	–	–	–	+	+	+	+	+	+	+	–	–	–
Trichloroethylene	–	–	–	–	+	+	+	+	+	+	o	–	–	–
Trichlorotrifluoro ethane					o	–	+	+	+	+				
Triethanolamine							+	+	+	+	–	o	o	–
Triethylene glycol	+	+	+	+	+	+	+	+	+	+	+	+	o	+
Trifluoro ethane							+	+	+	o	+	–	–	–
Trifluoroacetic acid (TFA)							+	o	+	–	–			
Tripropylene glycol	+	+	+	+	+	+	+	+	+	+			+	+
Turpentine	–	–	o	o	+	+	+	+	+	+	+	–	–	–
Urea	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Xylene	–	–	o	–	+	+	+	+	+	+	o	–	–	–
Zinc chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Zinc sulfate	+	+	+	+	+	+	+	+	+	+	+	+	o	+

Cleaning

Manual and Machine Cleaning

Glass and plastic labware can be cleaned manually, in an immersion bath, or in a laboratory washing machine.
Labware should be cleaned immediately after use – at low temperatures, with brief soaking times, and low alkaline detergents. Labware which has come into contact with infectious substances should first be cleaned and afterwards, if necessary, autoclaved. This is the only way to prevent baking-on the substance, and subsequent damage to the labware by any adhering chemical residues.

Attention! ☞ Carefully disinfect labware before cleaning when there is a risk of injury during cleaning procedure.

Wiping and scrubbring method

The generally accepted wiping and scrubbing method with a cloth or sponge soaked in cleaning solution is the most popular cleaning method. Labware must never be treated with abrasive scouring agents or pads which might damage the surface.

Immersion method

For the immersion method, labware is soaked in the cleaning solution for 20 to 30 minutes at room temperature, then rinsed with tap water, and finally with distilled water. Only for stubborn residues should the soaking time be extended and the temperature increased.

Ultrasonic bath

Both glass and plastic labware may be cleaned in an ultrasonic bath. However, direct contact with the sonic membranes must be avoided.

Machine cleaning

Machine cleaning with a laboratory washing machine is more gentle to labware than cleaning in an immersion bath. The labware is only exposed to the cleaning solution for the relatively short flushing periods when sprayed by the jet or ejector nozzles.

- Lightweight objects will not be tossed and damaged by the jet if they are secured in washing nets.
- Labware is protected against scratching when the wire baskets in the washing machine are plastic coated.

Glass labware

With glass labware, prolonged immersion times in alkaline media above 70 °C should be avoided. Such treatment, particularly with volumetric instruments, might cause volume changes through glass corrosion, and destruction of graduations.

Plastic labware

Plastic items generally have smooth, non-wetting surfaces and can usually be cleaned effortlessly under low alkalinity conditions. Polystyrene or polycarbonate labware, e.g., centrifuge tubes, must only be cleaned manually with neutral detergents. Prolonged exposure even to low alkaline detergents will impair their strength. The chemical resistance of these plastics should be verified in each case.

Cleaning in trace analysis

To minimize metallic traces, laboratory equipment is placed into 1N HCl or 1N HNO_3 at room temperature for not more than 6 hours. (Glass laboratory equipment is often boiled for 1 hour in 1N HNO_3.)

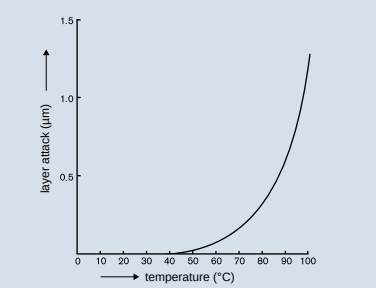
It is then rinsed with distilled water. To minimize organic contamination, laboratory equipment can first be cleaned with alkalis, or a solvent such as alcohol.

Gentle Cleaning

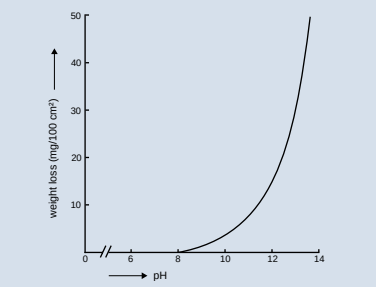
For gentle treatment of labware, clean immediately after use – at low temperatures, with brief soaking times, and at low alkalinity. Glass volumetric instruments should not be exposed to prolonged immersion times in alkaline media above 70 °C, as such treatment might cause volume changes through glass corrosion, and destruction of graduations.

Information

At 70 °C, a 1N sodium hydroxide solution will corrode a layer of approx. 0.14 µm off the surface of Boro 3.3 (borosilicate glass 3.3) within 1 hour. However, at 100 °C, a layer of 1.4 µm, or tenfold more, will be removed. Therefore, cleaning temperatures above 70 °C should be avoided and low alkaline cleaning agents are preferrable.



Typical curve of alkali attack on Boro 3.3 in relation to temperature, calculated from weight loss. c (NaOH) = 1 mol/l.
Exposure time: 1 hour.



Typical curve of alkali attack on Boro 3.3 in relation to pH value, at 100 °C.
Exposure time: 3 hours.

Disinfection and Sterilization

Disinfection

Laboratory instruments that have come into contact with infectious material or genetically modified organisms must be disinfected prior to reuse/disposal; i.e., they must be brought to a condition in which they no longer pose a risk.
Therefor laboratory instruments can be treated with disinfecting detergents for example. If necessary and suitable, the items may subsequently be sterilized (autoclaved).

Steam sterilization

Steam sterilization (autoclaving) is defined as the destruction or irreversible inactivation of all reproducible microorganisms under exposure to saturated steam at 121 °C (2 bar), according to DIN EN 285. For correct sterilization procedure, including biological security, please contact your sterilization officer.

The following points must be observed:

- Efficient steam sterilization is assured only if the steam is saturated and has unrestricted access to all contaminated areas.
- To prevent pressure build-up, containers or vessels must always be open.
- Contaminated reusable labware must be cleaned thoroughly before steam sterilization. Otherwise, residue will bake on during sterilization and microorganisms may not be effectively destroyed if they are protected by the residue. Furthermore, any adhering chemical residues may damage the surfaces due to the high temperatures.
- Not all plastics are resistant to steam sterilization. Polycarbonate, e.g., will lose its strength. Polycarbonate centrifuge tubes cannot be steam sterilized.
- During sterilization (autoclaving), plastic labware in particular should not be mechanically stressed (e.g., do not stack). Thus, to avoid shape deformation, beakers, flasks, and graduated cylinders should be autoclaved in an upright position.

Thermal resistance

All reusable BLAUBRAND® and SILBERBRAND volumetric instruments can be heated up to 250 °C in a drying cabinet or a sterilizer, without any subsequent volume deviations. However, as with all glass instruments, irregular heating or sudden temperature changes produce thermal stresses which may result in breakage. Therefore:

- Always place glass instruments into a cold drying cabinet or sterilizer; then heat slowly.
- At the end of the drying or sterilizing period, allow instruments to cool off slowly inside the switched-off oven.
- Do not heat up volumetric instruments on a hot plate.
- Pay special attention to the maximum operating temperatures of plastic instruments.

Safety Information

Handling of Hazardous Substances

The handling of hazardous chemicals, infectious, toxic or radioactive substances and genetically modified organisms, calls for a high degree of responsibility on the part of everyone involved, to ensure personal and environmental protection. The relevant regulations must be scrupulously observed including laboratory, professional association, environmental, radiation, waste disposal and generally accepted technical standards and guidelines (e.g., DIN or ISO).

Important information on safety

- Before use, laboratory instruments must be examined by the user for suitability and functionality.
- Before use, laboratory instruments should be examined for potential damage, especially instruments subjected to pressure or vacuum (e.g., desiccators, filter flasks, etc.).
- The hazards of working with defective labware should never be under-estimated (e.g., cuts, burns, risk of infection). If a professional repair is not practical, properly dispose of such items.
- Always hold pipettes near the suction end, and carefully insert the pipette into the adapter of the pipette controller until it is securely and firmly seated. Do not use force. Broken glass can cause injury!
- Instruments to be repaired must be cleansed of all residues and be sterilized, as necessary. Radioactively contaminated items must be decontaminated as prescribed by the radiation protection authorities. Volumetric glass instruments (e.g., volumetric flasks, graduated cylinders, etc.) should not be repaired when damaged. Exposure to heat may result in residual stress within the glass (greatly increasing the probability of breakage), or an uncontrolled cooling process may lead to permanent volume alterations.

  Cutting down damaged graduated cylinders shortens the distance between the upper graduation mark and the spout, as defined by DIN, resulting in an increased danger of chemicals being spilled.
- Waste must be disposed of according to local laws and regulations. This applies also to disposable articles. It must not pose a hazard to human beings or the environment.
- Please properly dispose of laboratory glassware, being sure to remove any potential contaminants. Please note that laboratory glassware is not recyclable.

Please see page 331 for other **safety information** that apply to glass instruments.

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General Terms and Conditions

BRAND GMBH + CO KG General Terms and Conditions

1. General

1.1. These General Terms and Conditions (GT&C) are intended for use in commercial transactions between businesses.

1.2. These GT&C shall apply for all, including future, contracts with the customer. Other terms and conditions shall not become part of the contract, even if we do not expressly object to them. Subsidiary agreements made before or at the time of conclusion of contract may only be invoked if they are immediately confirmed in writing. The waiver of the requirement for written form shall only be possible in writing. The language of the contract shall be German or English.
In the event of a discrepancy between the German language version of these GT&C and a version in any language, the German language version shall prevail.

1.3. Our offers are subject to change and non-binding. We reserve the right to make technical improvements to our products.

1.4. We may store and process data in our IT system necessary for the purpose of processing the contract.

1.5. A set-off by the customer shall not be permitted unless the counterclaims are undisputed or legally established, or pecuniary counterclaims arising from the right to refuse payment pursuant to Section 320 Bürgerliches Gesetzbuch (BGB) (German Civil Code).

1.6. Orders with a goods value of below € 250 shall be subject to a minimum order surcharge of € 50. Delivery shall be undertaken generally in packaging units (PU) according to the currently valid price list. For deliveries within five (5) working days or for order values up to € 500, we reserve the right to waive an order confirmation.

1.7. The place of jurisdiction shall be the court responsible for our head office in Wertheim/Mosbach, Germany. We shall also be entitled to appeal to the court responsible for the head office of our customer. We shall, furthermore, as plaintiffs have the right to invoke the Arbitration Court at the Chamber of Commerce and Industry in Frankfurt am Main, Germany. The Arbitration Court shall, in this case, make the final judgment in accordance with the Rules of Arbitration of the Chamber of Commerce and Industry in Frankfurt am Main without recourse to the ordinary courts of law. The instigation of legal dunning proceedings by us shall not signify the exertion of our right of choice; it shall be admissible in all cases.

1.8. German law shall apply exclusively under the exclusion of the conflict of laws principles of Private International Law and the UN Convention on Contracts for the International Sale of Goods (CISG).

2. Delivery

2.1 The place of performance shall be our factory in Wertheim, Germany. The risk shall transfer to the customer when the delivery leaves the ramp at our factory. This shall also apply to partial deliveries or where we have performed additional services, such as shipping; costs for transport, packaging or insurance; exportation and installation.

2.2 Insofar as we have agreed to orders on call, the customer must take delivery of the total amount within six (6) months, at the latest at the date confirmed by us.

2.3 In the case of a delay in the customer's acceptance of a delivery, we may, without prejudicing our claim for performance, have the goods put into storage at the cost of the customer or, after providing a warning and setting a deadline for the customer, otherwise dispose of them.

3. Delivery Period, Delay

3.1 Delivery times shall be ex works. Delivery periods shall begin on receipt of our order confirmation by the customer; however only after settlement of any technical issues pending from the conclusion of the contract; and after receipt of any documents to be provided to us by the customer, such as drawings, permits or approvals; and definitely not before receipt of agreed advance payments. The delivery period shall be considered to have been met if readiness for dispatch has been notified before the expiry of this period. Delivery shall be subject to us receiving our own supplies punctually and in good order.

3.2 Force Majeure and circumstances beyond our control, such as strikes, lock-outs, operational disruption, shortages of raw materials and equipment, delayed delivery or non-delivery by our suppliers, shall extend the delivery periods accordingly and shall release us from our delivery obligations if they, as a result, render delivery impossible. We shall also not be liable for the circumstances described above if they arise during an already existing delay. The same shall apply for any additional or amended services requested by the customer.

3.3 We shall be considered to be in default of delivery only if the customer has issued us with a reminder, has set a reasonable extension period which has elapsed.

3.4 In the case of delay damages, our liability for compensation shall be limited to 10% of the value of the delayed delivery/service. The limitation shall not apply in cases of wilful intent, gross negligence and/or injury to life, limb or health. The customer shall be obliged to immediately inform us in writing of any likely consequences of delay.

4. Prices, Terms of Payment

4.1 Prices shall be EXW (Incoterms® 2010 ex works), Wertheim and exclusive of statutory VAT, if applicable. Costs of packaging, transportation, freight and insurance shall be borne by the customer. Prices shall also be exclusive of the cost of returning and recycling/disposing of old equipment.

4.2 Invoices shall be payable to our account in EUROs (€) without deductions and free of charges and expenses. Payment shall be made immediately or by the date stated. The determinant factor shall be the receipt of payment. Cheques and bills of exchange shall only be accepted on account of performance and at the cost of the customer.

4.3 In the case of customers, with whom we are working for the first time or with whom we do not work regularly, after delay in payment or in the case of reasonable doubt as to the creditworthiness of the customer, we shall reserve the right to make individual deliveries dependent on a pre-payment or a security deposit to the value of the invoice amount.

4.4 Should the period between conclusion of contract and agreed delivery exceed four (4) months, so may we, at our discretion, demand a reasonable additional charge equivalent to the increase in our costs up until delivery. For deliveries on call, our current price shall apply.

4.5 In the case of an agreed return of goods that are free of defects, the customer shall be charged a checking and processing fee of 20% of the invoice amount (minimum € 50).

4.6 Should the customer be in arrears with payment, our debt claims against him shall be due immediately, and we shall not be obliged to make any further deliveries based on current delivery contracts.

4.7 If payment is delayed, we shall charge - notwithstanding further damage compensation claims - interest on arrears at the statutory rate.

4.8 We may offset amounts payable to the customer (e.g. from credit notes) against our claims against the customer.

5. Retention of Title, Assignment of Future Claims

5.1 The goods delivered shall remain our property until the complete and unlimited payment. Should we still have further claims against the customer, we shall then retain our property rights until payment of these has been effected.

5.2 The customer may neither use goods subject to retention of title nor combine them with other objects to which a third party may have rights. Should, however, goods subject to retention of title become, through their combination with other objects, part of a new (complete) item, we shall be a proportional co-owner of this new item directly, even if this latter component is regarded as the main component. Our proportion of co-ownership shall be determined by the ratio of the invoice value of the goods to the value of the new item at the time of combination.

5.3 The customer may resell goods subject to retention of title in the course of his normal business as long as he has not assigned, pledged or otherwise encumbered his claims from the resale.

5.4 The customer shall assign to us in advance as collateral any claims against his customers from the resale of the goods subject to retention of title (see Clause 5.3) and/or newly formed items (see Clause 5.2) to the value of our invoice for the goods subject to retention of title. As long as the customer is not in default of payment for the goods subject to retention of title, he may collect the assigned claims in the ordinary course of business. He may, however, only use the proportional proceeds for the payment to us for the goods subject to retention of title.

5.5 At the customer's request, we shall release collateral at our discretion if and to the extent that the nominal value of the collateral exceeds 120% of the nominal value of our outstanding debt claims against the customer.

5.6 The customer shall be required to inform us immediately of any attachments, seizures or any other third-party dispositions relating to the goods that are reserved or co-owned by us.

5.7 In the event of failure to pay bills of exchange or cheques, or failure or recall of a payment made via SEPA Direct Debit Scheme, suspension of payments or insolvency of the customer or of the end buyer, the rights of the customer under Clause 5.3. shall no longer be valid. The customer must then immediately inform the buyer of our extended retention of title; he may use the assignment of relevant proportional proceeds only to pay for the delivered goods.

5.8 Where payment is delayed and in the cases covered in Clause 5.7, we shall be entitled to withdraw from the contract and/or, without withdrawing from the contract, demand the return of any goods subject to retention of title still in possession of the customer and to collect the assigned receivables ourselves. In order to ascertain our rights, we shall be entitled to have all of our customer's documents/books concerning our reserved rights examined by a person who is subject to the professional duty of confidentiality.

6. Warranty, Limitation of Liability

6.1 We warrant that our delivered goods (including any agreed installation) are free of defects at time of risk transfer. The required quality, durability and use of our delivered goods are based solely on the agreed written specification, product description and/or operating manuals. Any information beyond this, in particular in preliminary discussions, advertising and/or referencing industrial standards shall only become part of the contract if they are expressly referenced in writing.

6.2 Should the customer requires the delivered goods for purposes other than those agreed, he must take responsibility himself for examining their special suitability for this - also in terms of product safety - and ensure their compliance with all relevant technical, legal or regulatory provisions before the intended use. We shall not be liable for any usability that was not expressly confirmed by us in writing. In the case of material or design requirements of the customer, we shall accept no liability for the suitability or permissibility of the desired materials or designs, and shall, in this respect, have no particular testing obligation. Compliance with safety-related and occupational health regulations depends on the location and operating conditions of which we have no prior knowledge. Action for ensuring compliance shall therefore be the responsibility of the customer or his buyer.

6.3 We shall not be liable for the consequences of improper handling, use, maintenance and operation of the delivered goods; the consequences of normal wear and tear, in particular of wearing parts, such as pistons, seals, valves; the breakage of glass, plastic or ceramic parts; for the consequences of chemical, electrochemical or electrical influences; or non-observance of the operating instructions.

6.4 If a notice of defect is justified, we shall initially only be required to provide supplementary performance. Supplementary performance shall be, at our discretion, either rectification of the defect or delivery of goods free of defects. Further warranty claims shall only apply in the event of rejection, impossibility or failure of the supplementary performance. The customer shall bear additional expenses, which arise from the fact that the goods were taken after delivery to a location other than the agreed place of performance.

6.5 The customer must, immediately upon receipt of the goods, inspect them carefully, also in terms of product safety, and notify obvious defects immediately in writing; any hidden defects must be immediately notified upon discovery. The customer must notify the carrier immediately of any transport damage. Failure to observe the testing and notification obligation shall void any customer claims for defects.

6.6 Our liability for slight negligence shall be limited to claims for injury to life, limb or health, to claims under the Produkthaftungsgesetz (German Product Liability Act) or to claims of culpable breach of fundamental contractual obligations through which the purpose of the contract is endangered. Otherwise, our liability for slightly negligent breach of fundamental contractual obligations is limited to the typically occurring damages which we could have foreseen when the contract was concluded.

6.7 Should the customer use the delivered goods in conjunction with environmentally harmful, toxic, radioactive or otherwise hazardous materials, he shall be obliged to clean them before returning them to us. If applicable, we may charge any necessary costs for decontamination/cleaning and disposal to the customer's account.

7. Limitation Period

The warranty period shall be one year and starts from the date of delivery of the goods to the customer. The same shall apply for claims for damages, irrespective of their legal basis. The limitation periods of Section 438 Para. 1 Nos. 1 and 2, Section 479 Para. 1 and Section 634a Para. 1 No. 2 of the BGB (German Civil Code) shall remain unaffected. The restriction of the limitation period shall not apply to claims based on fraudulent concealment of a defect, for claims under the Produkthaftungsgesetz (German Product Liability Act) or for damages resulting from injury to life, limb or health and other damages based on intent or gross negligence. The limitation period in respect of replaced or repaired goods shall not commence anew.

8. Software Use

8.1 If software is included in the scope of a delivery, the customer shall be granted a non-exclusive right to use the software and its associated documentation. It is provided for use on the designated delivery item. The use of the software on more than one system shall be prohibited.

8.2 The customer shall only be entitled to copy, transfer or translate the software or to convert it from object code to source code to the extent permitted by law (Sections 69a et seq. Urheberrechtsgesetz – German Copyright Act). The customer undertakes to refrain from removing manufacturer information, in particular copyright notices, or from changing these without our prior express consent or the prior express consent of the software supplier.

8.3 All other rights to the software and the documentation including copies thereof shall remain with us and/or the software supplier. The issue of sub-licences is not permitted.

9. Installation

9.1 Installation costs may be invoiced on a monthly basis. Fixed installation prices shall only cover the work that has been agreed upon. In other cases our current price list for installation and service costs shall apply.

9.2 The customer shall be responsible for providing the following at his own expense: lighting, motive power, if necessary, compressed air; water; electrical power for welding and heating, including the necessary connections; electrical installations to connect the products supplied by us; the devices required (such as lifting equipment); a lockable room that can be used for storing materials; tools and clothing during the installation.

10. Spare Parts, Maintenance/Repair and Calibration

10.1 For spare parts and maintenance, repair and calibration services, the current repair and exchange price list shall apply.

10.2 Insofar as there is an obligation on our part to maintain/supply spare parts, then this obligation shall be limited to a period of five (5) years from the date of delivery. If spare parts are not manufactured by us, or are no longer available on the market, for example electronic components, or if the raw material for their production is no longer available, our obligation to deliver spare parts shall lapse.

10.3 For calibration and maintenance, expendable items from BRAND production are normally used.

10.4 Maintenance and calibration services can only be provided if the customer has declared the devices sent to be safe to work on from a health hazard perspective.

10.5 For repair/service values of up to € 50, we reserve the right not to provide a separate cost estimate.

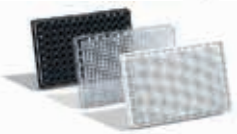
11. Legal Reservation, Industrial Property Rights, Confidentiality

11.1 We reserve ownership and all industrial property rights and copyrights to all moulds, tools or other devices, samples, pictures, and business and technical documents produced or provided by us. This also applies where the customer has wholly or in part taken on the costs hereof. The customer may use these only in the manner agreed with us. Without our written consent, he may not himself manufacture contractual objects delivered or have the same manufactured by third parties.

11.2 Insofar as we deliver goods according to the designs or other requirements specified by the customer (models, patterns etc.), the customer shall be liable to us by default for ensuring that, through the manufacture and delivery of these goods, the industrial property rights or other rights of third parties are not infringed. If the customer is at fault he shall reimburse us all damage resulting from any such infringement of rights.

11.3 Any information acquired from this business relationship and not deemed to be public knowledge must not be disclosed by the customer to third parties.

Status as of: September 2014



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