



**BRAND - Your Partner in the Lab.
Worldwide.**

General Catalog 900



Trademark Index

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STRATAGENE [®]	Agilent Technologies, Inc., USA
TaKaRa [®]	TAKARA SHUZO CO., LTD., Japan
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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.

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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.



Transferpette®

PIP

100

electronic

Dispensette 7A

µl

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.



Factory and Production

As the tasks multiplied, we have grown larger.



One of the world's largest cleanroom facilities, with approx. 6000 m² of production space, of which the cleanroom makes up 3200 m².



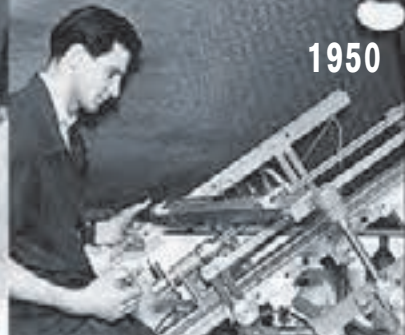
Journey through Time

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



1963



1964



1957

1967



1961

1973



1979



1984



1994



1985



1995



1986



2008



2011



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.







BRANDplates® 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.

The new tip system
from BRAND.

- starting on page 68



TipRack -
TipBox -
TipStack™



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.



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® 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.



Dispensette®
Bottle-top Dispenser



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 H₃PO₄, H₂SO₄, 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 mm²/s
temperature max. 40 °C
density max. 2.2 g/cm³

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 HNO₃, 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 mm²/s
temperature max. 40 °C
density max. 2.2 g/cm³

Areas of application

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

Bases	Saline solutions	Acids	Organic solvents	
			polar	non-polar
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.

Safety discharge system

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

Easy to use

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

Rotating valve block

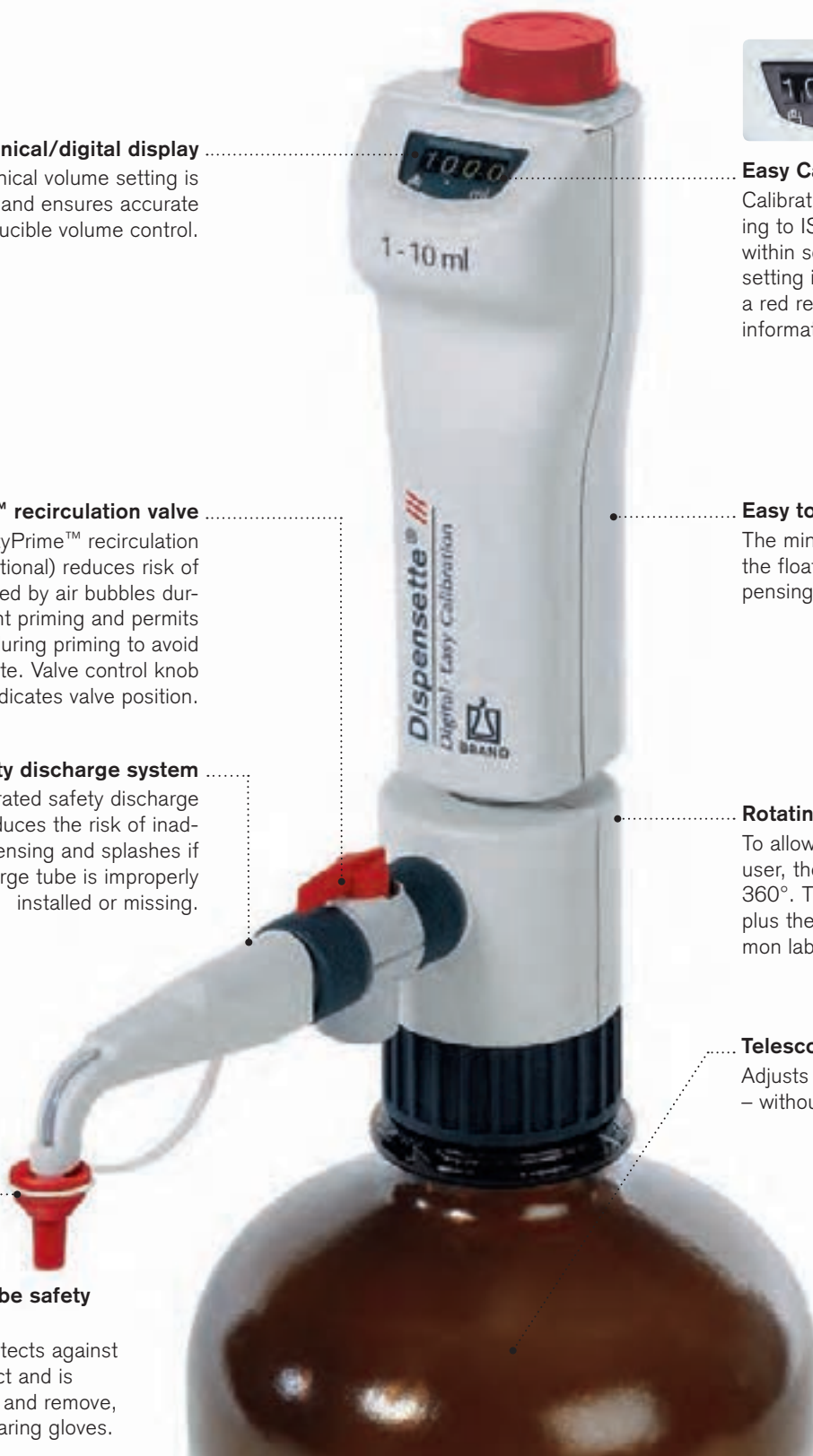
To allow the bottle label to face the user, the valve block can be rotated 360°. The 45 mm standard thread plus the included adapters fit common lab bottles.

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 micro-filter 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 CO₂.

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
- Conformity certified
- 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	Reagent	Disp. III	Disp. Organic	Reagent	Disp. III	Disp. Organic
Acetaldehyde	+	+	Cyclohexane		+	Methylene chloride		+
Acetic acid (glacial), 100%	+	+	Cyclohexanone	+	+	Mineral oil (Engine oil)	+	+
Acetic acid, 96%	+	+	Cyclopentane		+	Monochloroacetic acid	+	+
Acetic anhydride		+	Decane	+	+	Nitric acid, 30%	+	+
Acetone	+	+	1-Decanol	+	+	Nitric acid, 30-70% *		+
Acetonitrile	+	+	Dibenzyl ether	+	+	Nitrobenzene	+	+
Acetophenone		+	Dichloroacetic acid		+	Oleic acid	+	+
Acetyl chloride		+	Dichlorobenzene	+	+	Oxalic acid	+	
Acetylacetone	+	+	Dichloroethane		+	n-Pentane		+
Acrylic acid	+	+	Dichloroethylene		+	Peracetic acid		+
Acrylonitrile	+	+	Dichloromethane		+	Perchloric acid	+	+
Adipic acid	+		Diesel oil (Heating oil), bp 250-350 °C		+	Perchloroethylene		+
Allyl alcohol	+	+	Diethanolamine	+	+	Petroleum, bp 180-220 °C		+
Aluminium chloride	+		Diethyl ether		+	Petroleum ether, bp 40-70 °C		+
Amino acids	+		Diethylamine	+	+	Phenol	+	+
Ammonia, 20%	+	+	Diethylene glycol	+	+	Phenylethanol	+	+
Ammonia, 20-30%		+	1,2 Diethylbenzene	+	+	Phenylhydrazine	+	+
Ammonium chloride	+		Diethylene glycol	+	+	Phosphoric acid, 85%	+	+
Ammonium fluoride	+		Dimethyl sulfoxide (DMSO)	+	+	Phosphoric acid, 85% + Sulfuric acid, 98%, 1:1	+	+
Ammonium sulfate	+		Dimethylaniline	+		Piperidine	+	+
n-Amyl acetate	+	+	Dimethylformamide (DMF)	+	+	Potassium chloride	+	
Amyl alcohol (Pentanol)	+	+	1,4 Dioxane		+	Potassium dichromate	+	
Amyl chloride (Chloropentane)		+	Diphenyl ether	+	+	Potassium hydroxide	+	
Aniline	+	+	Essential oil		+	Potassium permanganate	+	
Barium chloride	+		Ethanol	+	+	Propionic acid	+	+
Benzaldehyde	+	+	Ethanolamine	+	+	Propylene glycol (Propanediol)	+	+
Benzene (Benzol)	+	+	Ethyl acetate	+	+	Pyridine	+	+
Benzine (Petroleum benzin), bp 70-180 °C		+	Ethylbenzene		+	Pyruvic acid	+	+
Benzoyl chloride	+	+	Ethylene chloride		+	Salicylaldehyde	+	+
Benzyl alcohol	+	+	Fluoroacetic acid		+	Scintillation fluid	+	+
Benzylamine	+	+	Formaldehyde, 40%	+		Silver acetate	+	
Benzylchloride	+	+	Formamide	+	+	Silver nitrate	+	
Boric acid, 10%	+	+	Formic acid, 100%		+	Sodium acetate	+	
Bromobenzene	+	+	Glycerol	+	+	Sodium chloride	+	
Bromonaphthalene	+	+	Glycol (Ethylene glycol)	+	+	Sodium dichromate	+	
Butanediol	+	+	Glycolic acid, 50%	+		Sodium fluoride	+	
1-Butanol	+	+	Heating oil (Diesel oil), bp 250-350 °C		+	Sodium hydroxide, 30%	+	
n-Butyl acetate	+	+	Heptane		+	Sodium hypochlorite	+	
Butyl methyl ether	+	+	Hexane		+	Sulfuric acid, 98%	+	+
Butylamine	+	+	Hexanoic acid	+	+	Tartaric acid	+	
Butyric acid	+	+	Hexanol	+	+	Tetrachloroethylene		+
Calcium carbonate	+		Hydriodic acid	+	+	Tetrahydrofuran (THF) **/**		+
Calcium chloride	+		Hydrobromic acid		+	Tetramethylammonium hydroxide	+	
Calcium hydroxide	+		Hydrochloric acid, 20%	+	+	Toluene		+
Calcium hypochlorite	+		Hydrochloric acid, 20-37 %		+	Trichloroacetic acid		+
Carbon tetrachloride		+	Hydrogen peroxide, 35%		+	Trichlorobenzene		+
Chloro naphthalene	+	+	Isoamyl alcohol	+	+	Trichloroethane		+
Chloroacetaldehyde, 45%	+	+	Isobutanol	+	+	Trichloroethylene		+
Chloroacetic acid	+	+	Isocetane		+	Trichlorotrifluoro ethane		+
Chloroacetone	+	+	Isopropanol (2-Propanol)	+	+	Triethanolamine	+	+
Chlorobenzene	+	+	Isopropyl ether	+	+	Triethylene glycol	+	+
Chlorobutane	+	+	Lactic acid	+		Trifluoro ethane		+
Chloroform		+	Methanol	+	+	Trifluoroacetic acid (TFA)		+
Chlorosulfonic acid		+	Methoxybenzene	+	+	Turpentine		+
Chromic acid, 50%	+	+	Methyl benzoate	+	+	Urea	+	
Chromosulfuric acid	+		Methyl butyl ether	+	+	Xylene		+
Copper sulfate	+		Methyl ethyl ketone	+	+	Zinc chloride, 10%	+	
Cresol		+	Methyl formate	+	+	Zinc sulfate, 10%	+	
Cumene (Isopropyl benzene)	+	+	Methyl propyl ketone	+	+			

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: 0713/12

* use ETFE/PTFE bottle adapter

** use PTFE seal

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 is conformity certified and 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* ≤ ± %	μl	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* ≤ ± %	μl	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* ≤ ± %	μl	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. Conformity certified to DIN 12600. A = Accuracy, CV = Coefficient of variation

Dispensette® Organic, Digital · Easy Calibration

Capacity ml	Subdivision ml	A* ≤ ±		CV* ≤		without SafetyPrime™	with SafetyPrime™
		%	µl	%	µl	recirculation valve Cat. No.	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* ≤ ±		CV* ≤		without SafetyPrime™	with SafetyPrime™
		%	µl	%	µl	recirculation valve Cat. No.	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* ≤ ±	CV* ≤	without SafetyPrime™	with SafetyPrime™
	%	µl	%	µl
			recirculation valve Cat. No.	recirculation valve Cat. No.
5	0.5	25	0.1	5
10	0.5	50	0.1	10
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. Conformity certified to DIN 12600. 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
■ for Dispensette® Organic	25, 50, 100	fine tip	120	7079 18
	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

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

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

FEP/PP.
Pack of 1.



Cat. No. **7079 28***

* not suitable for HF and Peroxide

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



Nominal volume ml	Discharge tube		Cat. No.
	Outer Ø mm	Inner Ø mm	
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

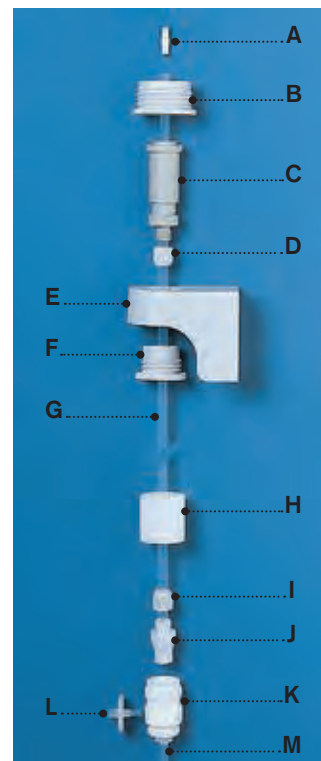
- Dispense accurate volumes directly from drums and bulk refills
- The Dispensette® can be mounted on a wall, a ring stand or on lab furniture
- A filter in the drum adapter minimizes risk of contaminating high-purity reagents
- A quick-release connector with integrated valves allows quick changing of 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, Al₂O₃-ceramic, PFA, ETFE, FEP or PTFE
4. for Peroxide (due to catalytic reaction)
5. for carbon disulfide (CS₂), 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 bottle-top dispenser a superior choice for trace analysis.



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), Al₂O₃ sapphire and platinum-iridium or tantalum, depending on design.

Operating limits

Vapor pressure max. 600 mbar
viscosity max. 500 mm²/s
temperature max. 40 °C
density max. 3.8 g/cm³

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 is conformity certified and 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. Conformity certified to DIN 12600. 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



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).



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.



Replaceable dispensing cartridge

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

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.



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 ₂ O ₃ /Pt-Ir
Discharge tube*	PP	PTFE/ETFE/FEP/PFA/borosilicate glass/Al ₂ O 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	Reagent	seri- pettor®	seripet- tor® pro	Reagent	seri- pettor®	seripet- tor® pro
Acetaldehyde		+	Calcium chloride	+	+	Monochloroacetic acid		+
Acetic acid, 5%	+	+	Calcium hydroxide	+	+	Nitric acid, 10%		+
Acetic acid, 96%		+	Calcium hypochlorite		+	Oxalic acid	+	+
Acetic acid (glacial), 100%		+	Chloroacetaldehyde, 45%		+	Perchloric acid		+
Acetone		+	Chloroacetic acid		+	Phenol		+
Acetonitrile		+	Chromic acid, 50%		+	Phosphoric acid, 85%		+
Acetophenone	+		Copper sulfate	+	+	Piperidine		+
Acetylacetone	+	+	Cumene (Isopropyl benzene)		+	Potassium chloride	+	+
Acrylic acid		+	Diethylene glycol	+	+	Potassium dichromate	+	+
Acrylonitrile		+	Dimethyl sulfoxide (DMSO)		+	Potassium hydroxide	+	+
Adipic acid	+	+	Dimethylaniline		+	Potassium hydroxide in ethanol	+	+
Agar (60 °C)	+		Ethanol	+	+	Potassium permanganate	+	+
Allyl alcohol	+	+	Formaldehyde, 40%	+	+	Propionic acid	+	+
Aluminium chloride	+	+	Formamide	+	+	Propylene glycol (Propanediol)	+	+
Amino acids	+	+	Formic acid, 100%		+	Pyridine		+
Ammonia, 30%	+	+	Glycerol	+	+	Pyruvic acid	+	+
Ammonium chloride	+	+	Glycol (Ethylene glycol)	+	+	Salicylaldehyde		+
Ammonium fluoride	+	+	Glycolic acid, 50%	+	+	Salicylic acid	+	+
Ammonium sulfate	+	+	Hexanoic acid	+	+	Silver acetate	+	+
Amyl alcohol (Pentanol)	+	+	Hexanol		+	Silver nitrate	+	+
n-Amyl acetate		+	Hydriodic acid	+	+	Sodium acetate	+	+
Aniline		+	Hydrobromic acid		+	Sodium chloride	+	+
Barium chloride	+	+	Hydrochloric acid, 37%		+	Sodium dichromate	+	+
Benzaldehyde		+	Hydrogen peroxide, 35%	+		Sodium fluoride	+	+
Benzyl alcohol		+	Isoamyl alcohol		+	Sodium hydroxide, 30%	+	+
Benzylamine		+	Isobutanol	+	+	Sodium hypochlorite 20% (active chlorine approx. 10%)		+
Benzylchloride		+	Isopropanol (2-Propanol)	+	+	Sulfuric acid, 10%	+	+
Boric acid, 10%	+	+	Lactic acid	+	+	Tartaric acid		+
Butanediol	+	+	Methanol	+	+	Urea	+	+
1-Butanol		+	Methyl benzoate		+	Zinc chloride, 10%	+	+
Butylamine		+	Methyl ethyl ketone		+	Zinc sulfate, 10%	+	+
n-Butyl acetate		+	Methyl propyl ketone		+			
Calcium carbonate	+	+	Mineral oil (Engine oil)		+			

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/cm ³	up to 2.2 g/cm ³
Temperature	15 to 40 °C	15 to 40 °C
	agar cultures up to 60 °C	
Viscosity	2 ml instrument: 300 mm ² /s	2 ml instrument: 300 mm ² /s
	10 ml instrument: 150 mm ² /s	10 ml instrument: 150 mm ² /s
	25 ml instrument: 75 mm ² /s	25 ml instrument: 75 mm ² /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, 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®

PP, 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
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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

PP. 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.

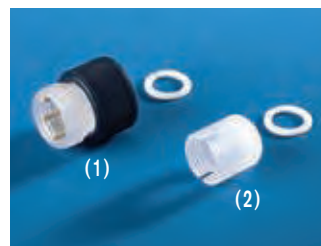


Filling valve seripettor® pro

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
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(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.



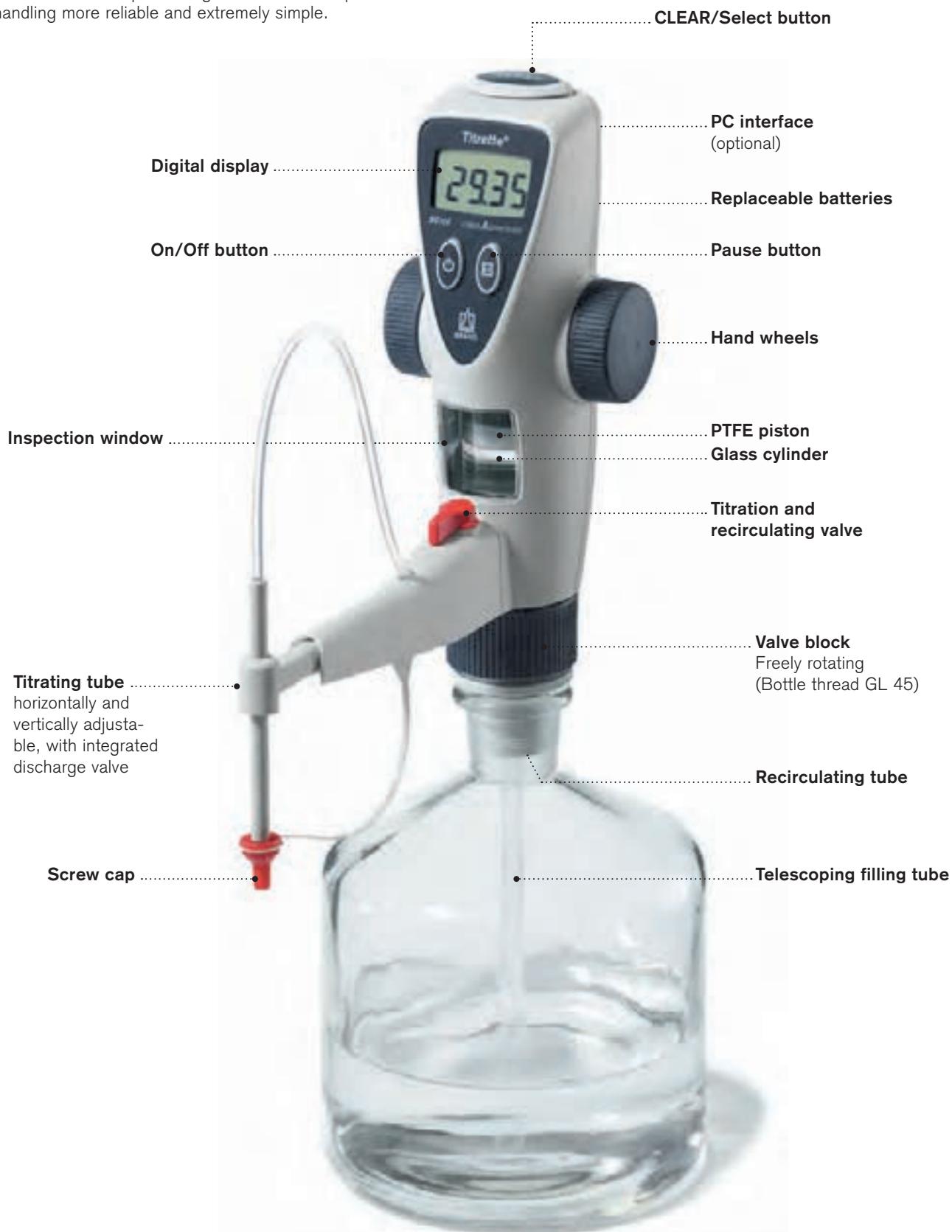
Titrette®

Bottle-top Burette



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.

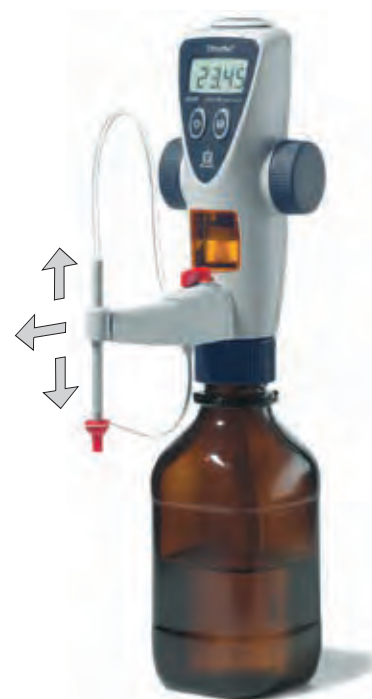
Light-weight and compact

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 mm²/s
- Altitude: maximum 3000 m above sea level
- Relative humidity: 20% to 90%

Comparison of error limits

Volume ml	Partial volume ml	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
		A* ≤ ± %	μl	CV* ≤ %	μl	A* ≤ ± %	μl	CV* ≤ %	μl	EL** ± μl
10 <i>NEW!</i>	10	0.10	10	0.05	5	0.3	30	0.1	10	20
	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. Conformity certified to DIN 12600.

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 is conformity certified and 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 <i>NEW!</i>	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.)



Titration 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
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Inspection window

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

Cat. No.	6783
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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
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Drying tube

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

Cat. No.	7079 30
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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

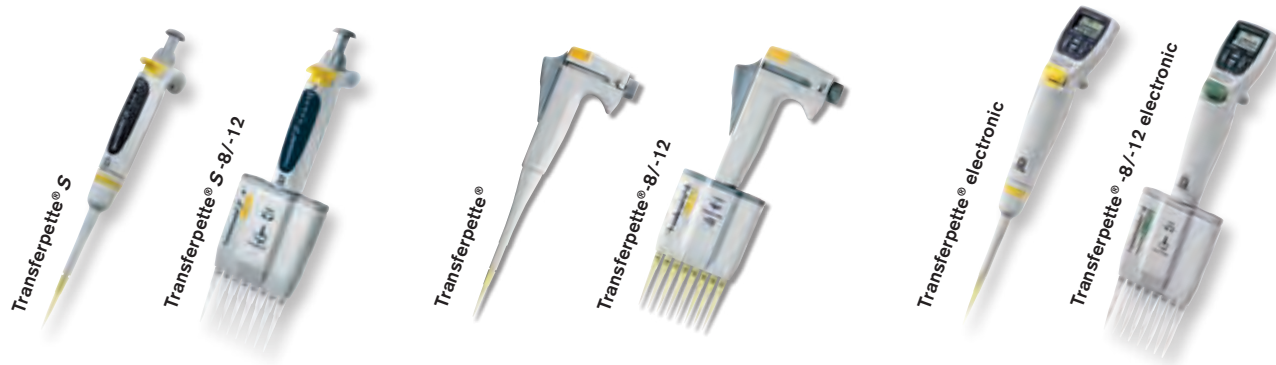
BRAND has been developing and manufacturing single-channel and multichannel piston-operated pipettes for more than 25 years. Special attention is always paid to optimum ergonomics and reduction of injuries caused by prolonged strain (such as Repetitive Strain Injury Syndrome, RSI).



Transferpette® Pipetting System

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 Science



Models

Lightweight – robust – low force:

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

There are 9 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.

Tip cone

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

Volume adjustment

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

Easy Calibration Technique

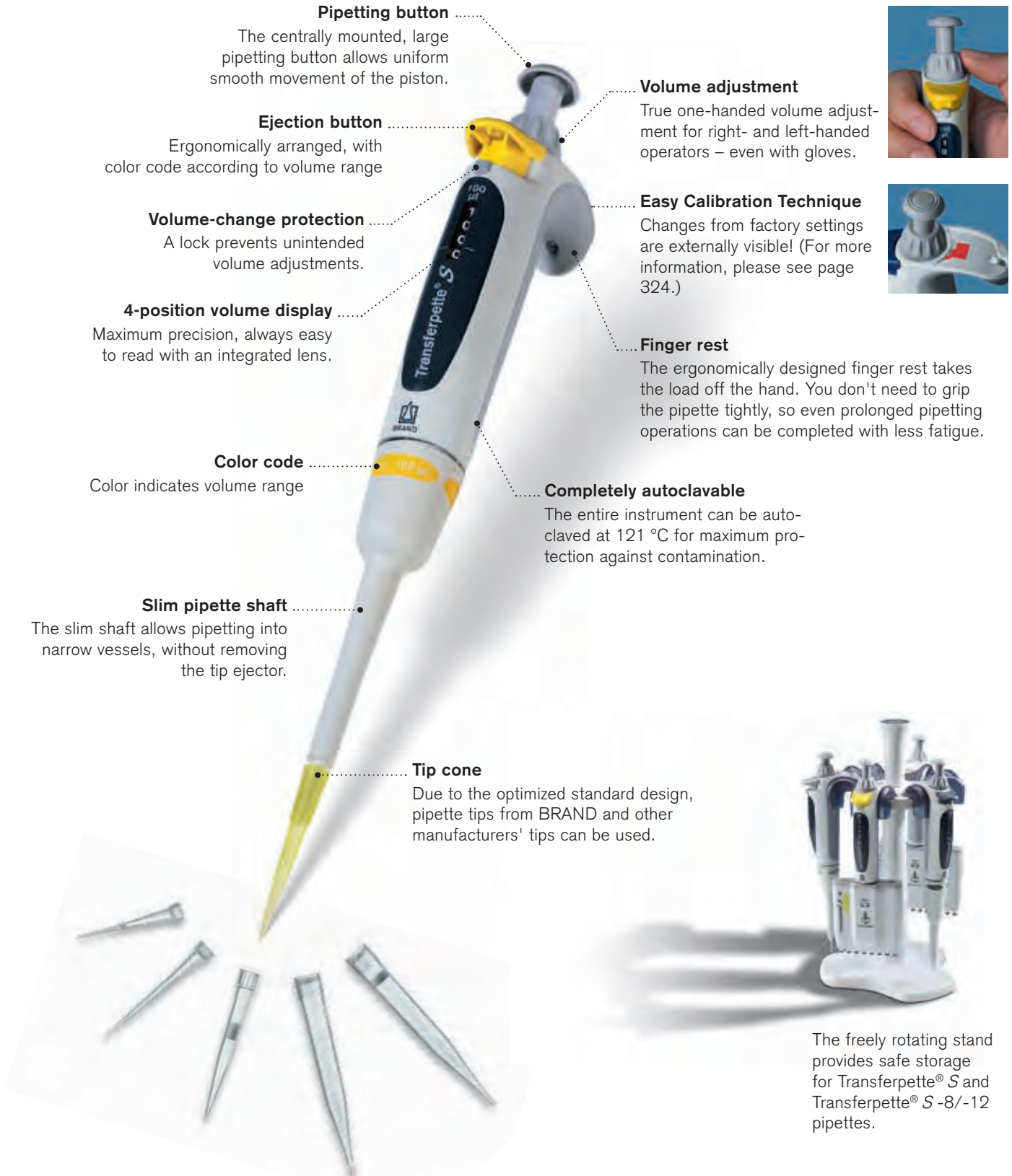
Changes from factory settings are externally visible! (For more information, please see page 324.)

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.



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 is conformity certified and 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
● 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. Conformity certified to DIN 12600. 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 is conformity certified and 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	0.1	7037 06
● 10 - 100	M8-100	0.8	0.3	0.2	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	0.1	7037 26
● 10 - 100	M12-100	0.8	0.3	0.2	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. Conformity certified to DIN 12600. 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.

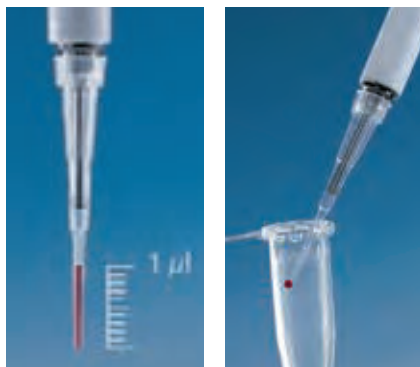
Features

- 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

Transferpette®



Transferpette®-12



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.

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

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

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.



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 is conformity certified and 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 is conformity certified and 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. Conformity certified to DIN 12600. 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 is conformity certified and 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

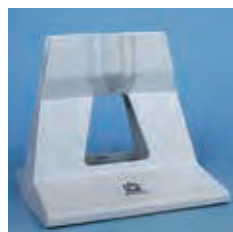
Capacity, µl (color-coded)	A* ≤ ± % µl	CV* ≤ % µl	Subdivision µl	Cat. No.
● 0.5 - 10	1.6 0.16	1.0 0.1	0.05	7036 20
● 2 - 20	1.0 0.2	0.6 0.12	0.1	7036 22
● 2.5 - 25	1.0 0.25	0.6 0.15	0.1	7036 24
● 5 - 50	0.8 0.4	0.4 0.2	0.1	7036 26
● 10 - 100	0.8 0.8	0.3 0.3	0.1	7036 28
● 20 - 200	0.8 1.6	0.3 0.6	1	7036 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. Conformity certified to DIN 12600. 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.



Transferpette® electronic



Transferpette®-8 electronic



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



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

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.



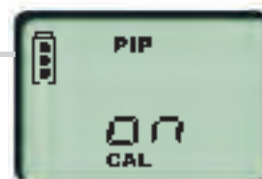
Dispensing (DISP Mode)

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.



Charging connector jack

Large, clear display

Intuitive operation of all functions using 4 keys

Large pipetting button

Ergonomically arranged ejection button with color code according to volume range.

Individually adjustable finger rest

Slim ergonomic grip

Color indicates volume range

The pipette shaft can be unscrewed and is entirely autoclavable (121 °C).

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



Ordering Data

Transferpette® electronic

Items supplied:

Each Transferpette® electronic pipette is conformity certified and supplied with performance certificate, battery, AC adapter, silicone oil.

Capacity, µl (color-coded)	Subdiv. µl	A* ≤ ± %		CV* ≤ %		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 without AC adapter	7053 29 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 without AC adapter	7053 30 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 without AC adapter	7053 33 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 without AC adapter	7053 36 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 without AC adapter	7053 37 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. Conformity certified to DIN 12600. 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 receive 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 is conformity certified and 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* ≤ ± % µl		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). 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. Conformity certified to DIN 12600. 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* ≤ ± % µl	CV* ≤ % µl	With AC adapter for	Cat. No.
● 0.5 - 10	0.01	1.2 0.12	0.8 0.08	Europe (continental) UK/Ireland USA/Japan Australia	7054 49 7054 59 7054 69 7054 79
● 1 - 20	0.02	1.0 0.2	0.5 0.1	Europe (continental) UK/Ireland USA/Japan Australia	7054 50 7054 60 7054 70 7054 80
● 5 - 100	0.1	0.8 0.8	0.25 0.25	Europe (continental) UK/Ireland USA/Japan Australia	7054 53 7054 63 7054 73 7054 83
● 10 - 200	0.2	0.8 1.6	0.25 0.5	Europe (continental) UK/Ireland USA/Japan Australia	7054 54 7054 64 7054 74 7054 84
● 15 - 300	0.5	0.6 1.8	0.25 0.75	Europe (continental) UK/Ireland USA/Japan Australia	7054 56 7054 66 7054 76 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. Conformity certified to DIN 12600. 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.

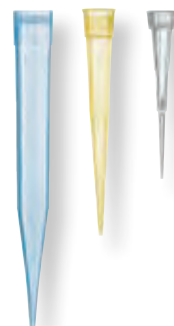
- High-purity polypropylene, free from DiHEMDA and oleamide
- Manufactured without lubricants
- Cadmium-free pigments
- Graduation for a quick volume check
- All tips and filter tips up to 1000 µl are free of DNA (< 40 fg), RNase (< 8.6 fg), endotoxins (< 1 pg) and ATP (< 1 fg)
- Autoclavable at 121 °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)methyl dodecyl ammonium (DIHEMA) 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 pipette tips and filter tips up to 1000 µl are now free from DNA, RNases, endotoxins and ATP, independent of the packaging formats. 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.

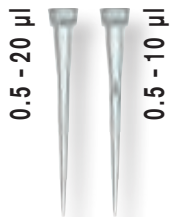
For the production of disposable items, Class 8, 7, and 5 cleanrooms are available, all validated according to ISO 14644-1. Compliance with ISO 14644-1 is certified by external, independent auditors.

Pipette tips and Filter Tips Sizes and Description



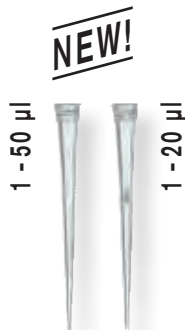
0.1 - 20 µl 0.1 - 1 µl (Filter)

The nano-cap™ tip was specially developed for the nano-liter 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.



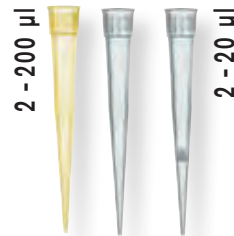
0.5 - 20 µl 0.5 - 10 µl (Filter)

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.



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.



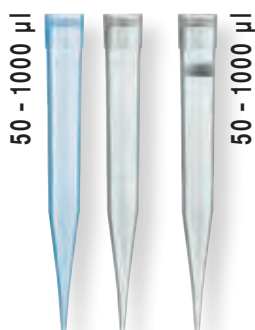
TipBox, sterile and non-sterile

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).



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, 100 and 300 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

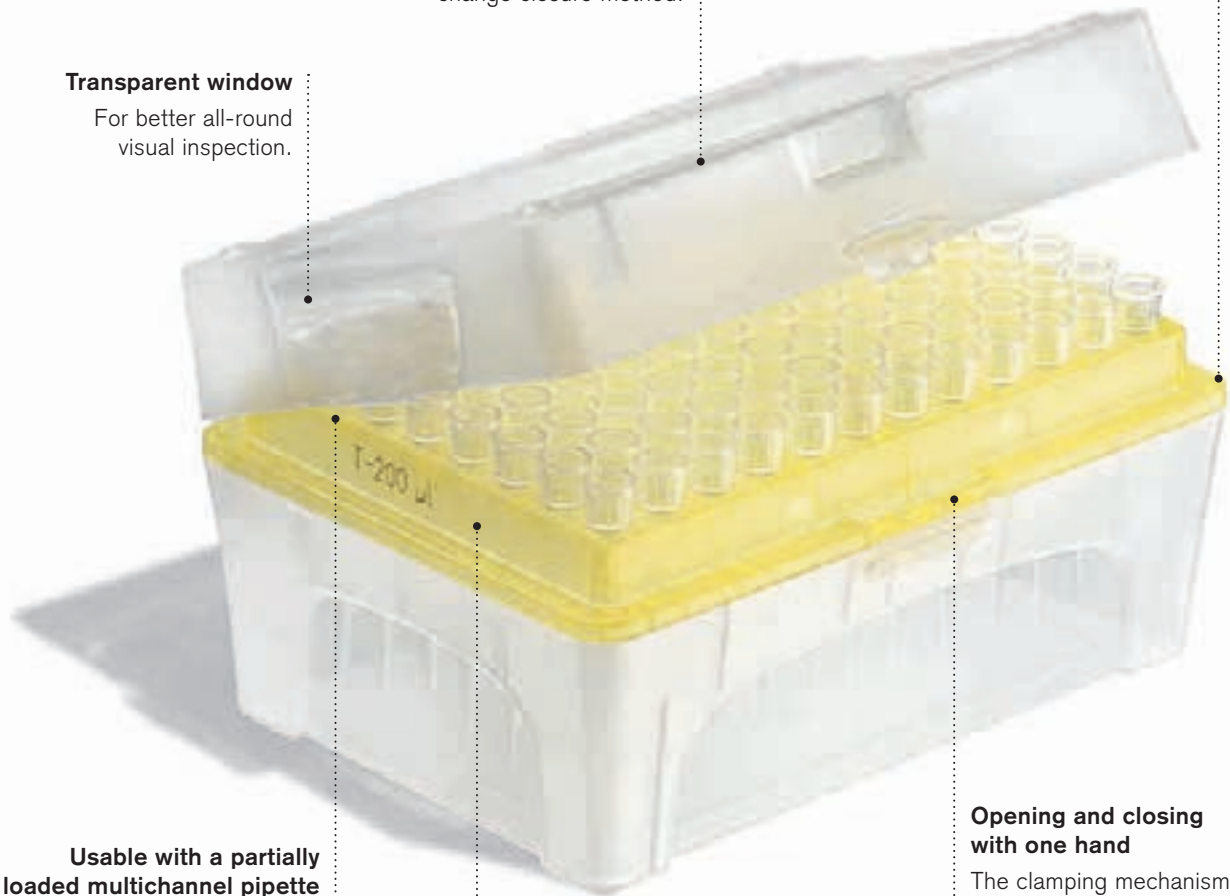
The tip-tray is fabricated from especially rigid PP.

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.

Opening and closing with one hand

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

Colored tip-trays with side panel labeling

The contents of the box are always clearly visible.



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

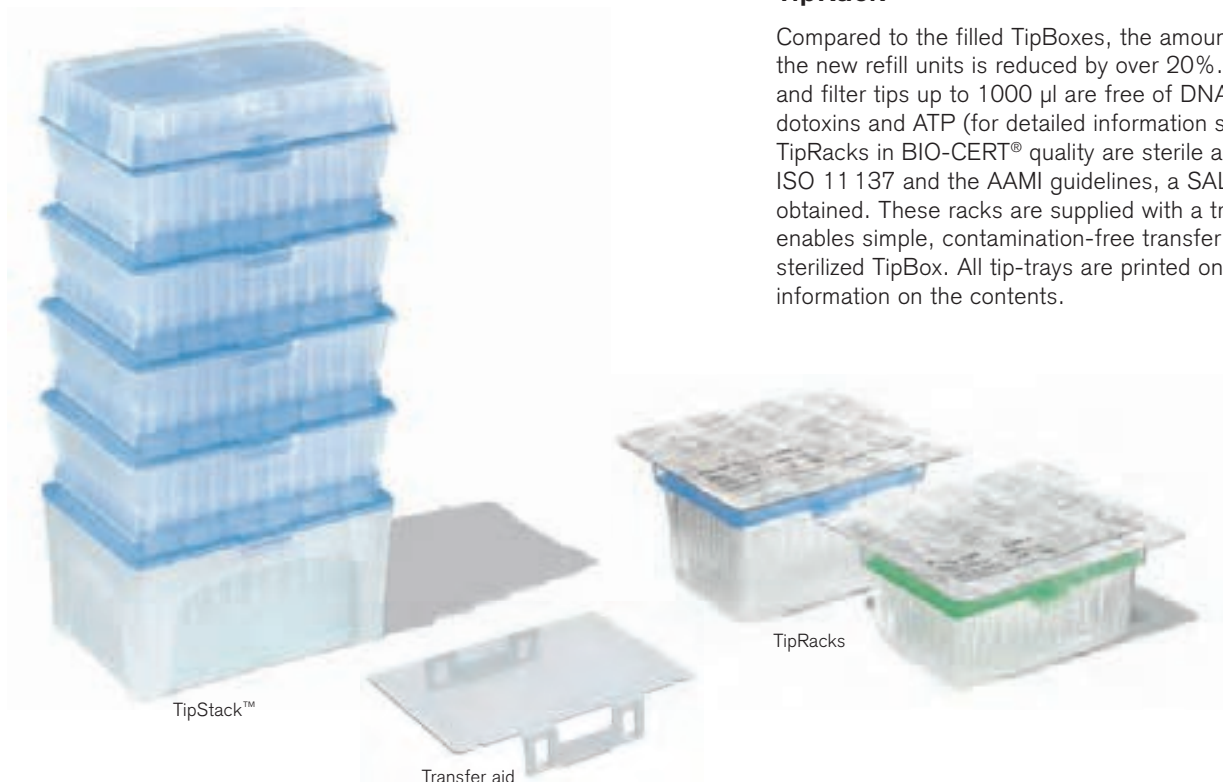


The TipBox is optimized for pipette tips and filter tips up to 300 µl. Stackable.

TipRack, TipStack™ and Transfer Aid

TipRack

Compared to the filled TipBoxes, the amount of waste with the new refill units is reduced by over 20%. All 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 11137 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.



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.

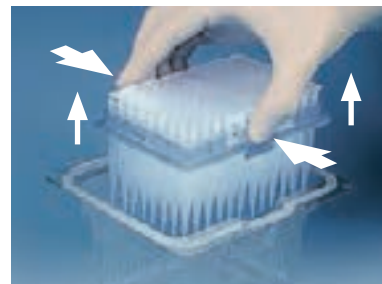
- All components are recyclable
- Reduced amount of waste
- Sterilizable and reusable TipBox
- High purity of the pipette tips and filter tips
- Space-saving design



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!



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

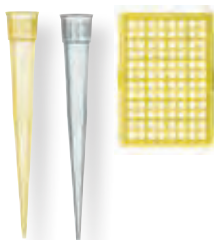
1 - 50 µl



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	1000	1 bag, 1000 each	7320 10	-
bulk XXL	10000	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™	-	-	-	-

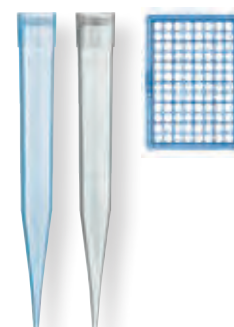
5 - 300 µl



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

	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
bulk	1000	2 bags, 500 each	7320 12	-
bulk XXL	5000	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



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™	-	-	-	-





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

	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

2 - 20 µl



Filter tips, 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

5 - 100 µl



Filter tips, 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

5 - 200 µl



Filter tips, 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

50 - 1000 µl



bulk

racked

TipBox





Ultra Low Retention Pipette Tips

The surfaces of the Ultra Low Retention tips are produced through a special, patented 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

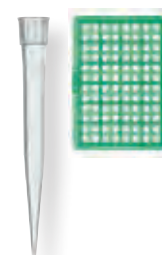
2 - 200 µl



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

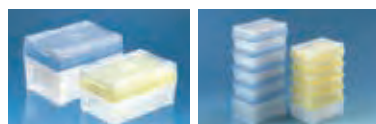
	Quantity	Pack of	non-sterile Cat. No.	sterile Cat. No.
TipBox	480	5 boxes, 96 each	7323 12	–
TipBox sterile	960	10 boxes, 96 each	–	7323 32
TipStack™	960	2 x 5 racks, 96 each	7323 52	7323 72

50 - 1000 µl



TipBox

TipStack™



Ultra Low Retention Filter Tips

0.1 - 1 μ l



ULR filter tips, 0.1 - 1 μ l

	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 μ l



ULR filter tips, 0,5 - 10 μ l

	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

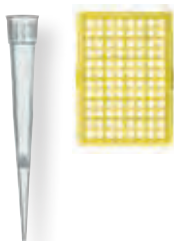
1 - 20 μ l



ULR filter tips, 1 - 20 μ l

	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

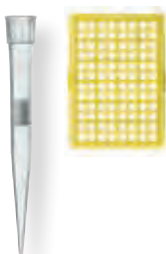
2 - 20 μ l



ULR filter tips, 2 - 20 μ l

	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 μ l



ULR filter tips, 5 - 100 μ l

	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

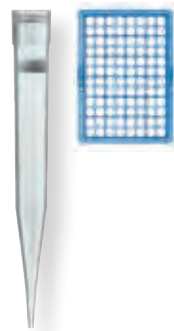
5 - 200 µl



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



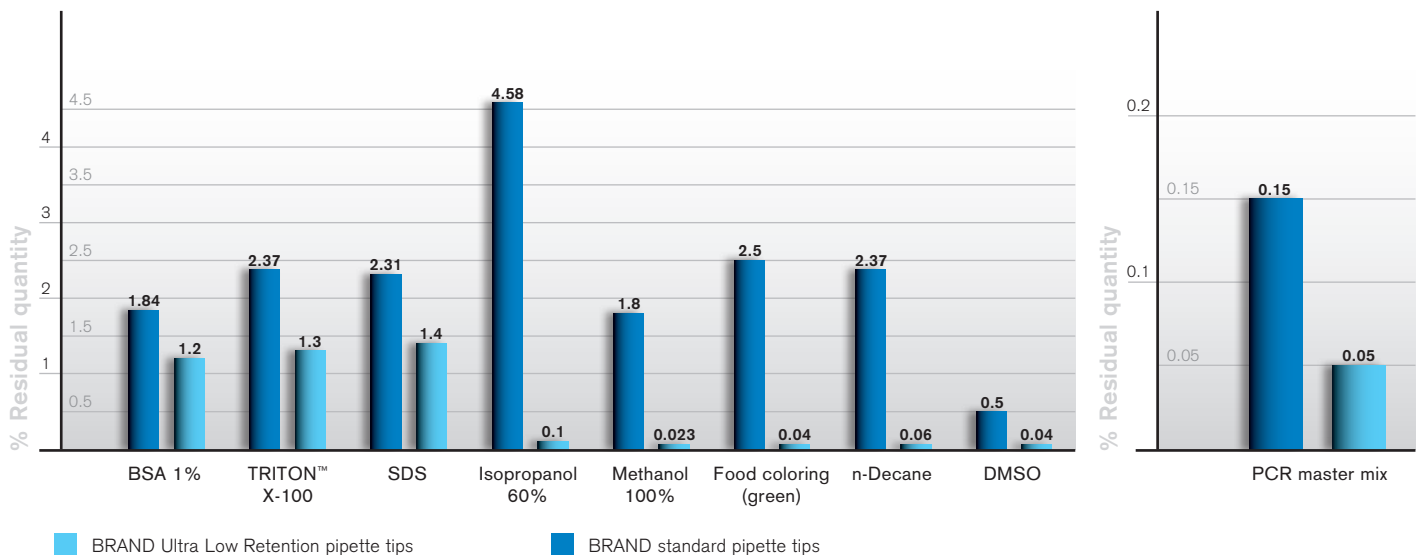
TipBox



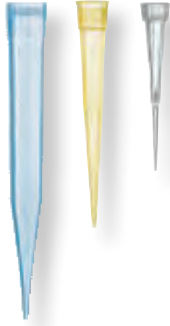
Comparison chart

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

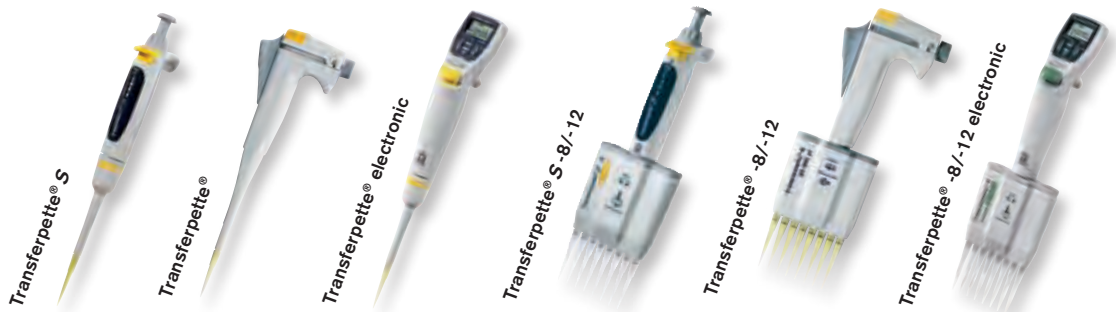


Optimum results are achieved in combination with BRAND microliter pipettes. BRAND quality tips seat perfectly for precise analyses.

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®.

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**	20 µl	20 µl**	25 µl	50 µl	100 µl	200 µl	200 µl***	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	✓	✓		✓		✓													✓	✓						
0.5 - 20 µl		✓		✓		✓													✓	✓						
1 - 50 µl		✓		✓		✓													✓	✓						
2 - 200 µl*			✓		✓		✓	✓	✓	✓	✓										✓	✓	✓	✓	✓	✓
5 - 300 µl			✓		✓		✓	✓	✓	✓	✓										✓	✓	✓	✓	✓	✓
50 - 1000 µl*												✓	✓	✓	✓											
0.5 - 5 ml																✓	✓									
1 - 10 ml																		✓								
0.1 - 1 µl	✓				✓														✓							
0.5 - 10 µl		✓		✓		✓													✓	✓						
1 - 20 µl		✓		✓		✓													✓	✓						
2 - 20 µl			✓		✓		✓	✓	✓	✓	✓	✓									✓	✓	✓	✓	✓	✓
5 - 100 µl			✓		✓		✓	✓	✓	✓	✓	✓									✓	✓	✓	✓	✓	✓
5 - 200 µl											✓										✓	✓	✓	✓	✓	✓
50 - 1000 µl														✓	✓											

✓ = Tip volume less than pipette's nominal volume
 * Bulk tips are yellow or blue colored, racked tips are colorless in a yellow-colored or blue-colored tip tray
 ** Transferpette® with yellow color code
 *** Transferpette® with blue color code

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

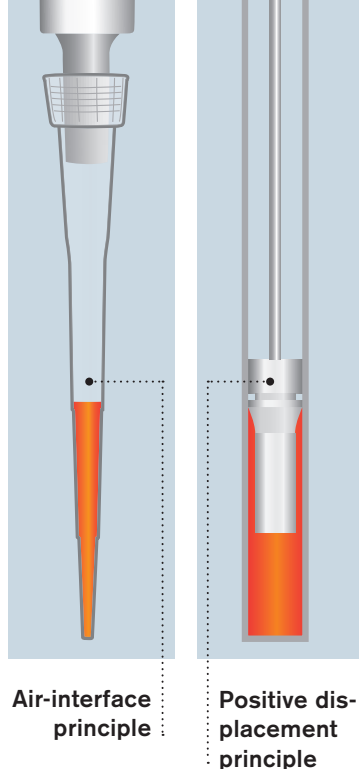


A Closer Look...

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.



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* ≤ ± % μl	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* ≤ ± % μl	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. Conformity certified to DIN 12600. A = Accuracy, CV = Coefficient of variation



Items supplied:

Each Transferpettor pipette is conformity certified and supplied with performance certificate.

Accessories and Spare Parts

Caps, glass

Conformity certified.
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

Conformity certified.
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

Conformity certified.
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

Conformity certified. 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

Conformity certified.
Pack of 3, with mounting block.



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

Seals, PE

Conformity certified.
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
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Transferpettor-Station

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



Cat. No.	7019 60
----------	---------

Piston rod

Conformity certified.
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



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



- 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 (HandyStep® S with PD-Tips from BRAND, 20 °C 'Ex', \bar{H})

PD-Tip size ml	Volume range µl	A* ≤ ± %			CV* ≤ %		
		Stroke setting ± % of nominal volume			Stroke setting ± % of nominal volume		
		1 ± 20%	3 ± 60%	5 ± 100%	1 ± 20%	3 ± 60%	5 ± 100%
0.1	2 - 10	8.0	2.7	1.6	5.0	3.0	2.0
0.5	10 - 50	4.0	1.33	0.8	1.4	0.73	0.6
1	20 - 100	4.0	1.33	0.8	1.0	0.38	0.4
1.25	25 - 125	4.0	1.33	0.8	0.8	0.38	0.3
2.5	50 - 250	3.5	1.17	0.7	0.8	0.3	0.2
5	100 - 500	2.5	0.83	0.5	0.6	0.27	0.2
10	200 - 1000	1.5	0.5	0.4	0.5	0.23	0.2
12.5	250 - 1250	1.5	0.5	0.3	0.3	0.23	0.2
25*	500 - 2500	1.5	0.5	0.3	0.4	0.23	0.2
50*	1000 - 5000	1.5	0.5	0.3	0.4	0.23	0.15

A* = Accuracy, CV* = Coefficient of variation

The nominal volume is the maximum adjustable partial volume for each PD-Tip size.

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. H₂O, 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 is conformity-certified, with 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.

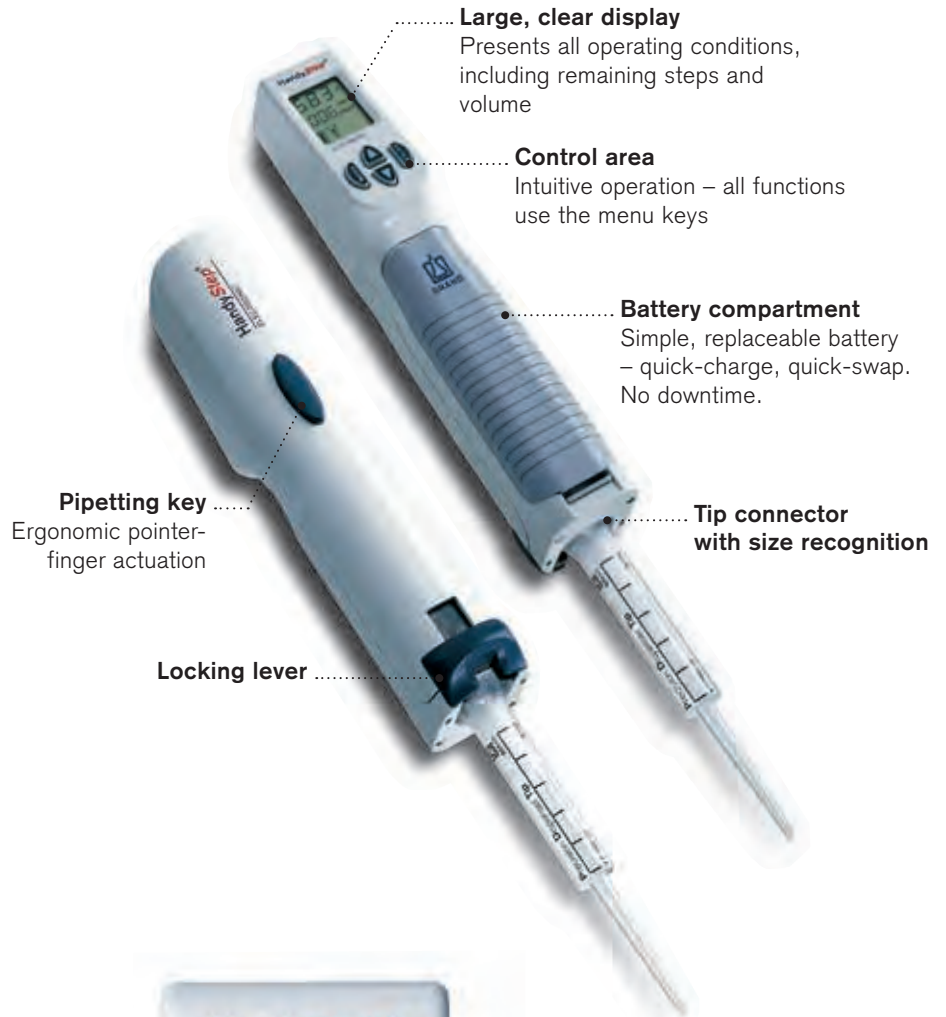


HandyStep® electronic Repetitive Pipette



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**



Large, clear display
Presents all operating conditions, including remaining steps and volume

Control area
Intuitive operation – all functions use the menu keys

Battery compartment
Simple, replaceable battery – quick-charge, quick-swap. No downtime.

Pipetting key
Ergonomic pointer-finger actuation

Tip connector with size recognition

Locking lever



Step volume **Volume unit**

Number of steps **Function**

Battery status **Dispensing**
..... **Speed**

Menu selection key **Selection key 1**

Selection key 2 **Confirmation key**



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 HandyStep® electronic repetitive pipette with PD-Tips from BRAND, conformity certified

HandyStep® electronic with PD-Tip	Volume range	Subdivision	Nominal volume (A* ≤ ± %)				Nominal volume (CV* ≤ %)				
			100%	50%	10%	1%	100%	50%	10%	1%	
0.1 ml	1 µl - 100 µl	1 µl - 100 µl	0.1 µl	1.0	1.2	1.6	16	0.5	1.0	2.0	12
0.5 ml	5 µl - 500 µl	5 µl - 100 µl 100 µl - 500 µl	0.1 µl 1 µl	0.9	0.9	0.9	9	0.25	0.5	1	6
1.0 ml	10 µl - 1 ml	10 µl - 1 ml	1 µl	0.6	0.6	0.9	8	0.2	0.3	0.6	4
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	8	0.15	0.3	0.6	3.5
2.5 ml	25 µl - 2500 µl	25 µl - 1000 µl 1 ml - 2.5 ml	1 µl 10 µl	0.5	0.5	0.8	8	0.1	0.2	0.4	2.5
5.0 ml	50 µl - 5000 µl	50 µl - 1000 µl 1 ml - 5 ml	1 µl 10 µl	0.5	0.5	0.8	8	0.08	0.15	0.3	1.5
10.0 ml	100 µl - 10 ml	100 µl - 10 ml	10 µl	0.4	0.4	0.5	5	0.08	0.15	0.25	1.25
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	0.4	0.4	0.5	5	0.08	0.15	0.25	1.25
25.0 ml	250 µl - 25 ml	250 µl - 10 ml 10 ml - 25 ml	10 µl 100 µl	0.3	0.3	0.3	3	0.08	0.15	0.25	1.25
50.0 ml	500 µl - 50 ml	500 µl - 10 ml 10 ml - 50 ml	10 µl 100 µl	0.3	0.3	0.3	3	0.08	0.25	0.5	2.5

* 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 is conformity certified and 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 conformity-certified 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 with HandyStep® electronic repetitive pipette from BRAND

PD-Tip size, ml	Volume range	Nominal volume (A* ≤ ± %)				Nominal volume (CV* ≤ %)			
		100%	50%	10%	1%	100%	50%	10%	1%
0.1	1.0 µl - 100 µl	1.0	1.2	1.6	16.0	0.5	1.0	2.0	12.0
0.5	5.0 µl - 500 µl	0.9	0.9	0.9	9.0	0.25	0.5	1.0	6.0
1.0	10.0 µl - 1 ml	0.6	0.6	0.9	8.0	0.2	0.3	0.6	4.0
1.25	12.5 µl - 1250 µl	0.6	0.6	0.9	8.0	0.15	0.3	0.6	3.5
2.5	25.0 µl - 2500 µl	0.5	0.5	0.8	8.0	0.1	0.2	0.4	2.5
5.0	50.0 µl - 5000 µl	0.5	0.5	0.8	8.0	0.08	0.15	0.3	1.5
10.0	100 µl - 10 ml	0.4	0.4	0.5	5.0	0.08	0.15	0.25	1.25
12.5	125 µl - 12.5 ml	0.4	0.4	0.5	5.0	0.08	0.15	0.25	1.25
25.0	250 µl - 25 ml	0.3	0.3	0.3	3.0	0.08	0.15	0.25	1.25
50.0	500 µl - 50 ml	0.3	0.3	0.3	3.0	0.08	0.25	0.5	2.5

* 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





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


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



Adapter

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

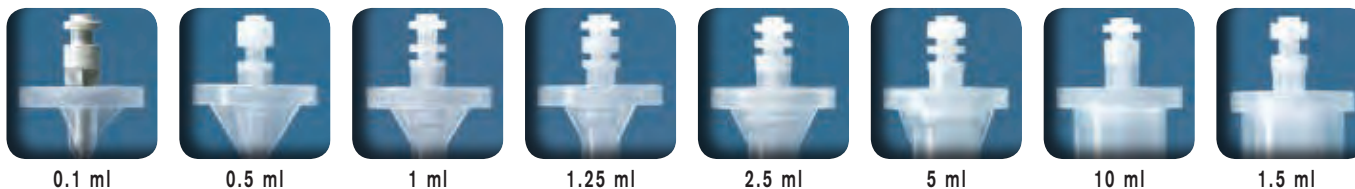
Description	Cat. No.
non-sterile	7023 98
BIO-CERT®	7023 99

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

1.5 ml



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

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

Pipetting Aids

A Closer Look...



- Recharging-indicator (LED)
- Battery compartment cover
- Mode selection (gravity-delivery/blow-out)
- Variable motor speed
- Pipetting buttons



- 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.

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

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, conformity certified, 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

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

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

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

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 solutions
- 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.



QuikSip™ BT-Aspirator



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
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Spare parts Quik-Sip™

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

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



cell-culture™-unit

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

Cat. No.	259 50
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BRANDplates® Insert System,
 please see page 159.

Accessories and Spare Parts



8-channel manifold

PP. Autoclavable (121 °C).
 Pack of 1.

Cat. No.	7045 26
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Dispensing cartridge

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

Cat. No.	7045 04
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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



Cap

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

Cat. No.	7045 54
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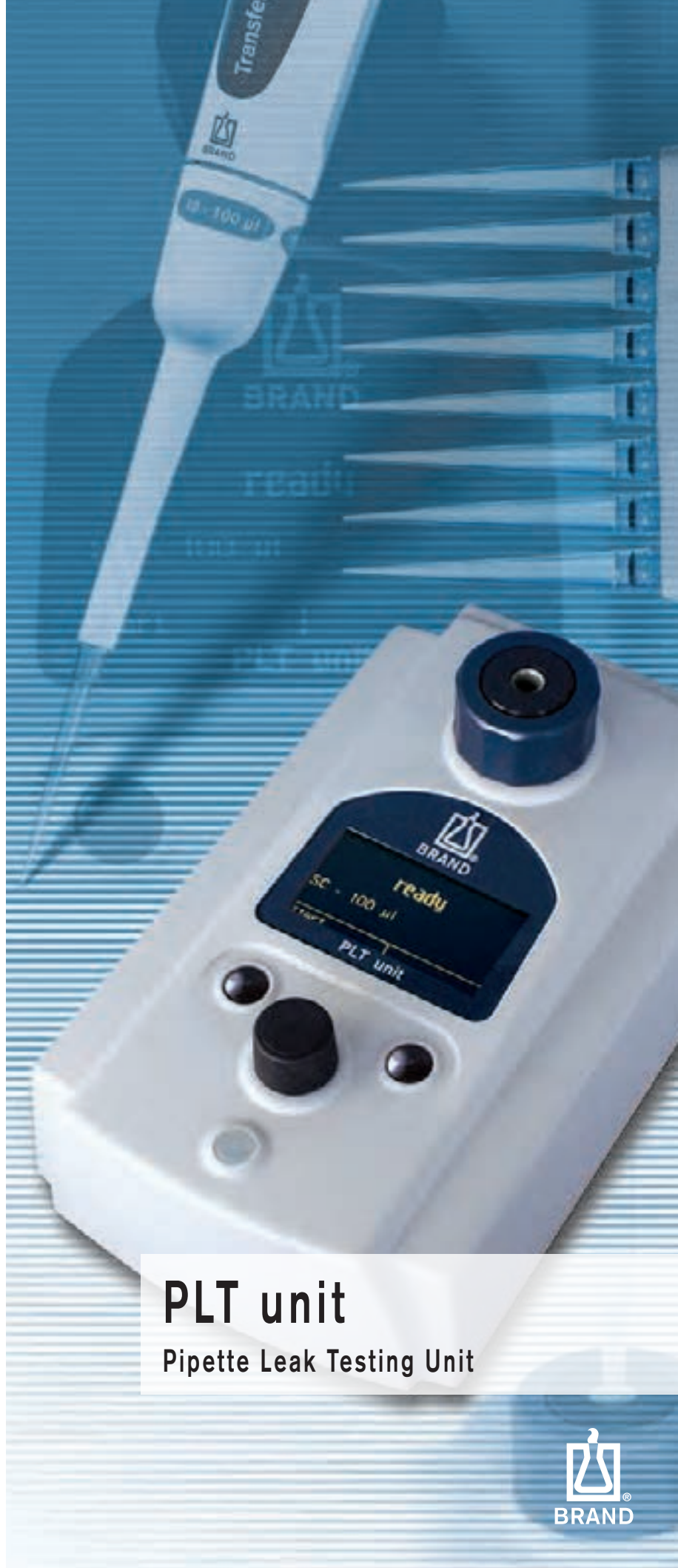
Membrane filter

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

Cat. No.	265 35
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* buttress rim

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.



PLT unit

Pipette Leak Testing Unit

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 μ l/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.)



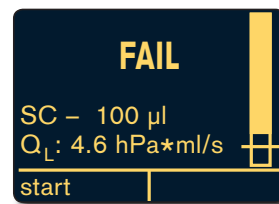
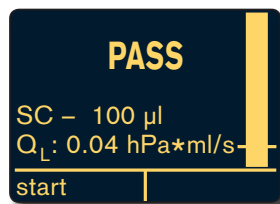
Limit values

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.

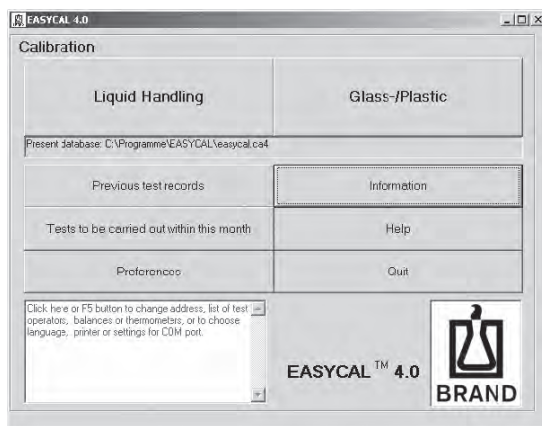
- Reliable transmission, calculation and saving of measurement data.



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.

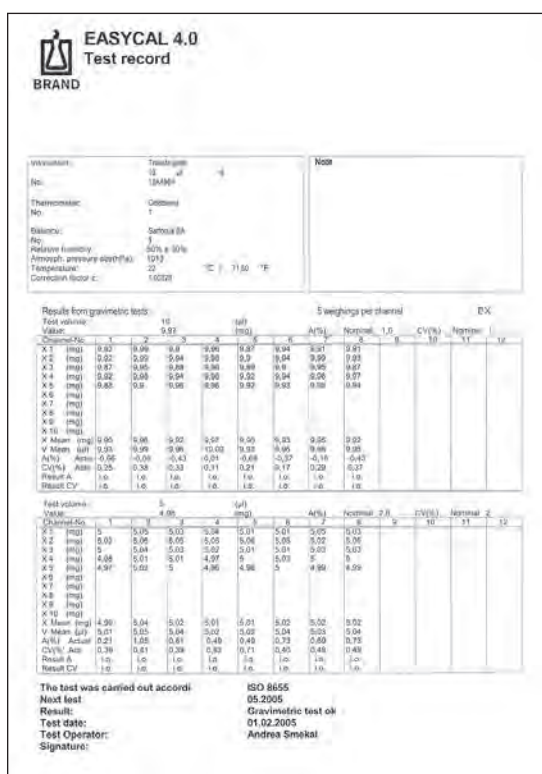
In the case of multichannel pipettes, the result of each individual channel is compared with the error limits.

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.



Start screen:

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

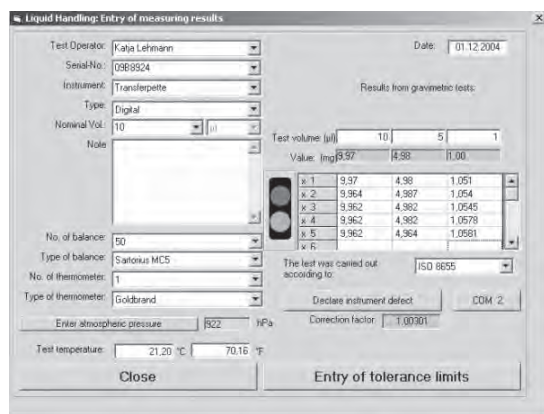


You can print out a clear and conclusive report to GLP standards. The test results are also stored in an easily sorted database. The test certificate can be saved in various formats (e.g., MICROSOFT® Word or Excel).

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.



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

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!



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

Micro-weighing container

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



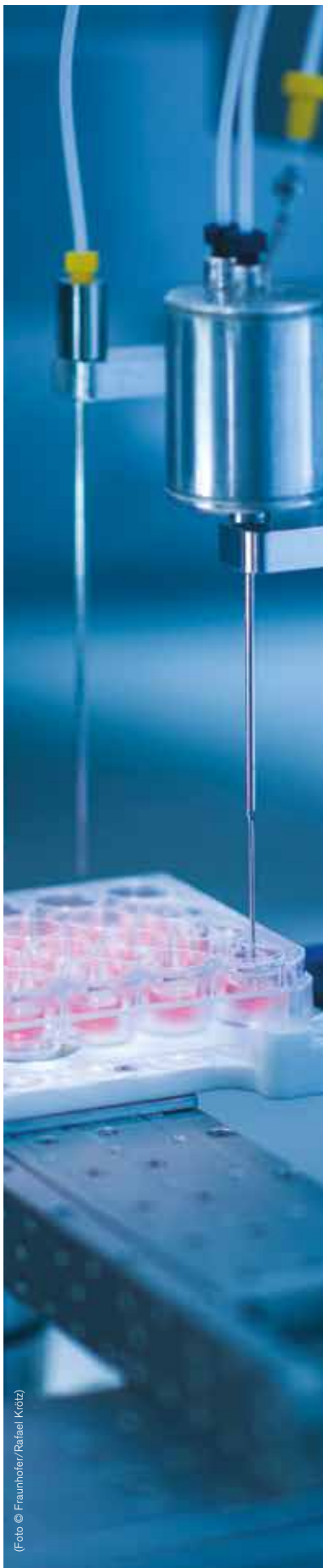


Life Science

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 Kötz)

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) methyl-dodecyl-

ammonium (DiHEMDA) and 9-octadecanamide (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**
Physicochemical treatments can modify the surface so as to be suitable for applications in cell culture or immunanalytics.

* 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 human DNA	free of RNase	free of endotoxins	free of ATP	free of cytotoxic substances acc. ISO 10993
Pipette tips and filter tips standard		✓	✓	✓	✓	
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	✓	✓	✓	✓		✓
BRANDplates® standard		✓	✓	✓		✓
BRANDplates® sterile	✓	✓	✓	✓		✓
UV-Cuvettes micro		✓	✓	✓		

BIO-CERT®

BIO-CERT® products correspond to the highest quality grade. They are sterile, free from human 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 ($< 4 \times 10^{-14}$ g/tip = 40 fg), to avoid false positive results, e.g., in PCR*, and free from RNases ($< 8.6 \times 10^{-15}$ g/tip = 8.6 fg), to make it possible to work with RNA.

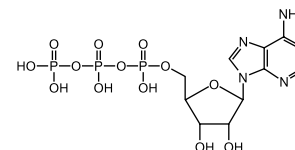
* The Polymerase Chain Reaction (PCR) is covered by international patents. Use of the PCR process may require a license.

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 amoebocyte lysate (LAL) test. The detection limit is 0.01 EU/ml. This corresponds to an endotoxin concentration of $< 1 \times 10^{-12}$ 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 $< 1 \times 10^{-15}$ 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 BRANDplates® for cell culture are checked for their effects on cell cultures using an in vitro cytotoxicity test. BRANDplates® are free from cytotoxic substances according to DIN EN ISO 10993.

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:

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

Example:

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

Speed **n = 6000 min⁻¹**

$$\begin{aligned} \text{RCF} &= 1.118 \cdot 180 \cdot \left(\frac{6000}{1000}\right)^2 \\ &= 7245 \end{aligned}$$



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_r 20 min)	5.4	0.3	7.9	31.4

Pack of 1000

(1 bag).

Cat. No.	7805 07
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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_r 20 min)	8.5	0.3	10.75	40.8

Pack of 500

(1 bag).

Cat. No.	7805 00
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Pack of 3000

(6 bags of 500).

Cat. No.	7805 02
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BIO-CERT®

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

Cat. No.	7804 00
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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.

NEW!

1.5 ml, with lid closure

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.

RCF max.	Outer-Ø mm	Height mm
30 000 (at -5 °C, t_e 20 min)	10.7	38.8

Pack of 1000
(1 bag).

Cat. No. **7805 40**



1.5 ml, without lid

PP.

RCF max.	Outer-Ø mm	Height mm
6 000 (at 20 °C, t_e 20 min)	11	39.5

Pack of 12 000
(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
20 000 (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.

Fast
Fast opening and closing with 1¼ turn of cap.

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

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 17000 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

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

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



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	1.4	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, 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



Screw caps 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 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
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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!

q!PCR PCR Plates:


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

q!PCR PCR Tubes:

Tubes with highly transparent caps for sensitive detection of fluorescence signals

q!PCR 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
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

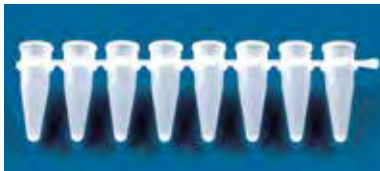
White PCR products offer significantly better results for qPCR, and are specifically recommended by many thermal cycler manufacturers.

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	7813 40	7813 34
	rose	7813 21	7813 41	-
	yellow	7813 22	7813 42	-
	green	7813 23	7813 43	-
	blue	7813 24	7813 44	-
	white	7813 25	-	-

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

* 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.

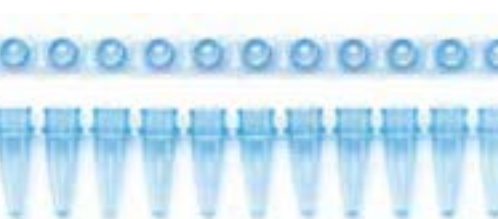
Pack of 120 Strips, 960 vessels total.

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

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, elevated rim	clear	40 (5 plates per bag)	7814 11
Standard profile, elevated rim	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, elevated rim	clear	20 (5 plates per bag)	7814 15
Standard profile, elevated rim	white	20 (5 plates per bag)	7814 16



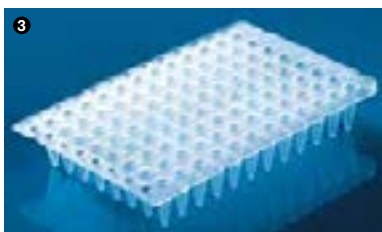
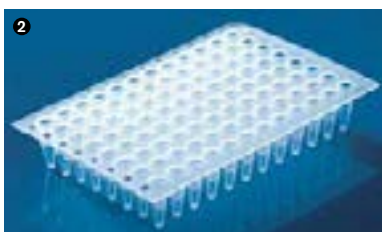
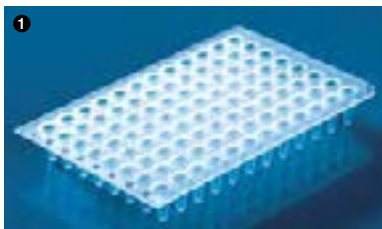


qPCR 96-well PCR Plates

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 TiO₂ (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!

96-well, non-skirted

PP. 0.2 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.



Low profile



Standard profile



Standard profile, elevated rim

Description	Color	Cut corner	Pack of	Cat. No.
1 Low profile	clear	H12	50 (5 plates per bag)	7813 66
Low profile	white	H12	50 (5 plates per bag)	7813 67
2 Standard profile	clear	A12	50 (5 plates per bag)	7813 68
Standard profile	white	A12	50 (5 plates per bag)	7813 69
3 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.



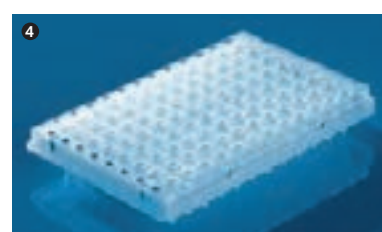
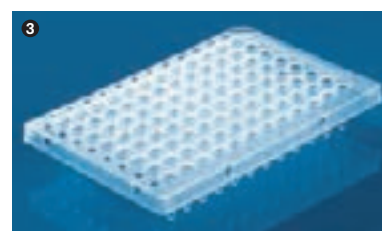
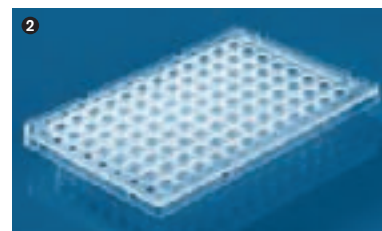
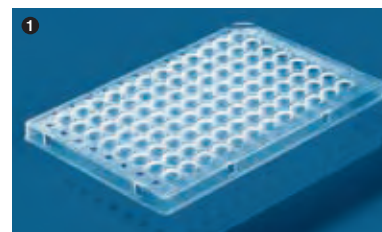
Low profile Low profile, raised skirt Standard profile Standard profile, elevated rim

NEW!

96-well, semi-skirted

PP. 0.2 ml 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.
1 Low profile	clear	A12	50 (5 plates per bag)	7813 71
Low profile	white	A12	50 (5 plates per bag)	7813 72
2 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
3 Standard profile	clear	A12	50 (5 plates per bag)	7813 75
Standard profile	white	A12	50 (5 plates per bag)	7813 76
4 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

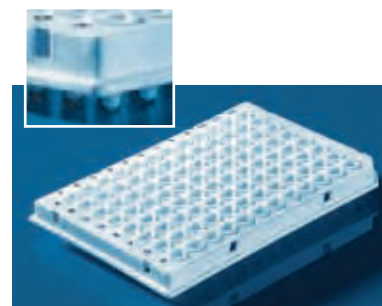
Suitable for Roche® LightCycler® 480 and other thermal cyclers

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.

NEW!



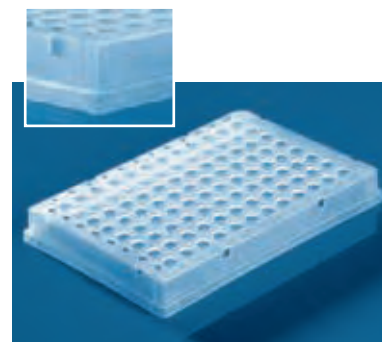
96-well, skirted

PP. 0.2 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.

NEW!





384-well PCR Plates

384-well, skirted

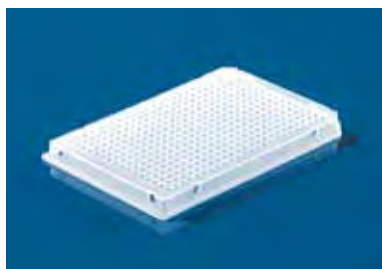


PP. The 40 μ l wells can hold sample volumes of 2 μ l to 30 μ l. This helps to reduce reagent costs and shortens cycle times. The plates can be filled using multichannel pipettes or robotic systems. A detailed compatibility table can be found on page 134.

Description	Color	Cut corner	Pack of	Cat. No.
Skirted, PP	clear	A12, H12	50 (10 plates per bag)	7813 45
Skirted, PP	clear	A12	50 (10 plates per bag)	7813 47
Skirted, rigid plate	clear	A12	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 μ l to 30 μ l. 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	
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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.

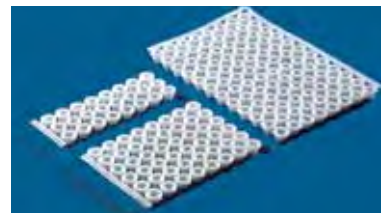
Cat. No.	7812 60
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PCR sealing mats

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

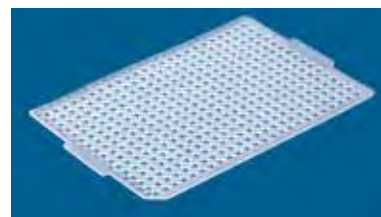
Product	Material	Pack of	Cat. No.
24-well mat (for Cat. No. 7814 11)	TPE	10	7814 02
48-well mat (for Cat. No. 7814 15)	TPE	10	7814 03
96-well mat (for Cat. No. 7813 50, 7814 00)	TPE	5	7814 05



384-well

Product	Material	Pack of	Cat. No.
384-well mat (for Cat. No. 7813 45, 7813 47)	silicone*	10	7814 08

* autoclavable five times



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

PP. Allows visual inspection. Temperature range -40 °C to +125 °C. Single film. Packs of 100 sheets.

Cat. No.	7813 90
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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	
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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
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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 72	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		x		x
number of wells	24		48		96		96		96	96		96		96		96		96		96	96		384		384		384
standard well	x		x		x		x		x	x						x											
Low Profile well												x		x				x		x							
cut corner																											
APPLIED BIOSYSTEMS®						H12	A12	H12		H12		H12	A12	A12		A1				H1		A12 + H12		A12		A12	A12 + H12
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																		•									
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®																											
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					•		•		•							•				•							
Opticon					•		•		•							•				•							
Opticon 2					•		•		•							•				•							
Opticon 4					•		•		•							•				•							
Corbett Research																											
Palm Cycler 96																•											
Palm Cycler 384							•																	•	•	•	
Eppendorf®																											
Mastercycler® Gradient	•		•				•		•	•						•				•							
Mastercycler® ep	•		•		•		•		•							•				•							
Mastercycler®					•		•		•							•				•							
Mastercycler® M384					•		•		•							•				•		•		•	•	•	
Mastercycler® ep Realplex					•		•		•							•				•							

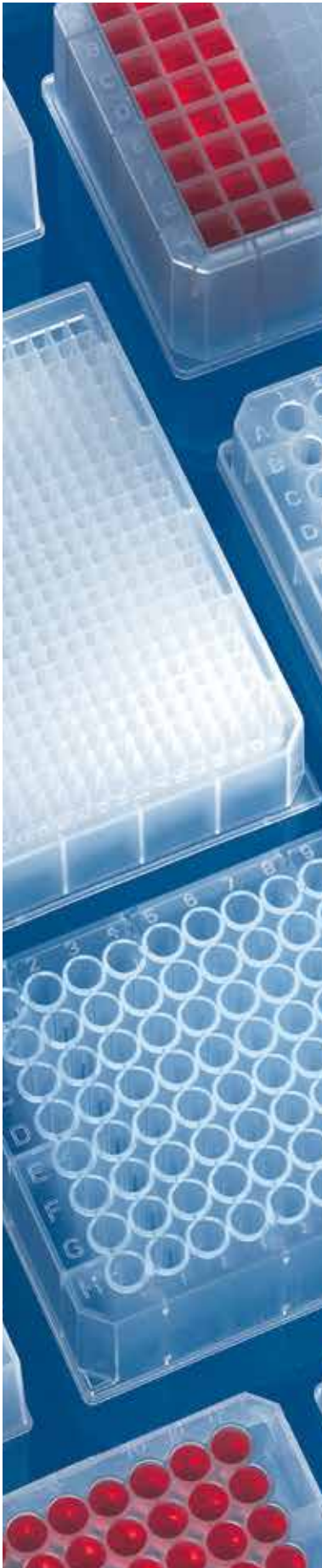
continued

	non-skirted					semi-skirted					r.s.-s.*	skirted																	
	7814 11	7814 72	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		x		x		x		x		x		x		x		x		
Low Profile well																													
cut corner						H12		A12		H12		H12		A12		A12		A1		H1		A12 + H12		A12		A12		A12 + H12	
Ericomp																													
Single Block	●		●		●		●		●		●		●		●		●		●		●		●		●		●		●
Twin Block	●		●		●		●		●		●		●		●		●		●		●		●		●		●		●
Power Block																													
Delta Cycler	●		●		●		●		●		●		●		●		●		●		●		●		●		●		●
Esco																													
Swift																													
Flexi																													
Gene																													
Genius																													
G-Storm																													
GS1/ GS4/ GSX																													
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																													

* r. s.-s. = raised skirt semi-skirted

● = compatible - = not compatible □ = no information

Status as of: 0114

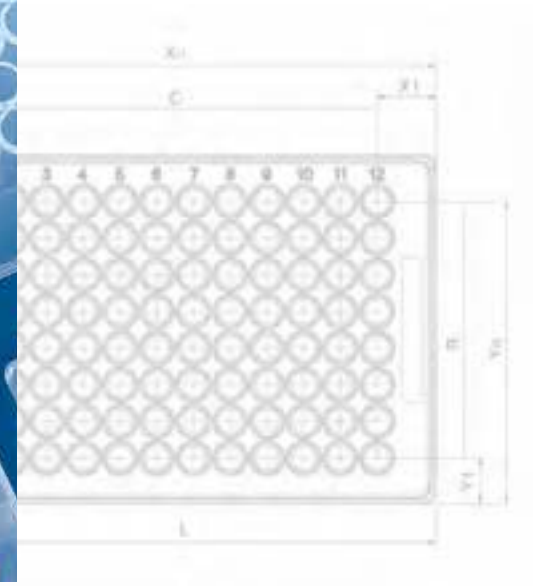


Sample Storage

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.

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%.



96-well

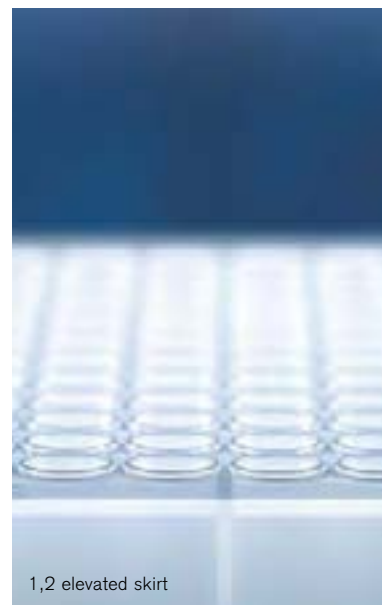
U-bottom wells, non-sterile

PP and PS. Capacities 0.5 ml, 1.1 ml, 1.2 ml Low Profile and 2.2 ml.

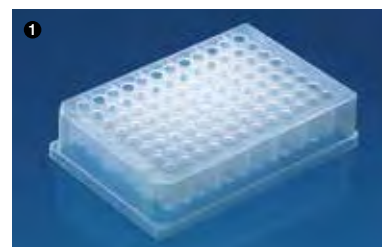
	Capacity ml	Material	well shape	Height mm	Pack of	Cat. No.
❶	0,5	PP	round	28.5	48	7013 46
❷	1,1	PP	round	40.6	24	7013 50
	1,1*	PS	round	41.0	32	7013 52
❸	1,2 elevated skirt	PP	round	41.4	32	NEW! 7013 42
	1,2 Low Profile**	PP	round	26.5	50	7013 40
❹	2,2	PP	square	44.0	24	7013 54

* Not autoclavable, usable down to -20 °C

** Not checked for absence of DNA, RNases, and DNases



1,2 elevated skirt



NEW!



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.

for ELISA, PCR

PP. Allows visual inspection.
Temperature range -40 °C to +125 °C. Single film.
Packs of 100 sheets.

Cat. No. 7813 90



for automation

PE top, underside PP with adhesive. Easy to pierce with pipette tips. Inert, chemically resistant. Temperature range -40 °C to +90 °C. Single film.
Packs of 50 sheets.

Cat. No. 7013 70



for ELISA, Real-Time PCR

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

Cat. No. 7813 91

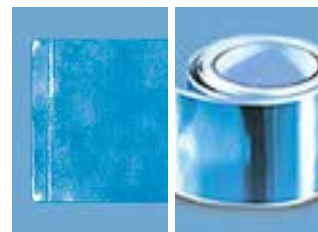


for cold storage

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



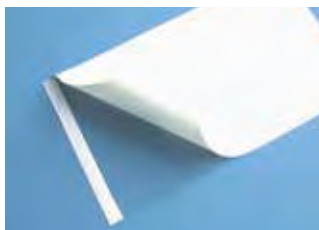
Roll

Cat. No. 7813 80

for storage, ELISA, PCR

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

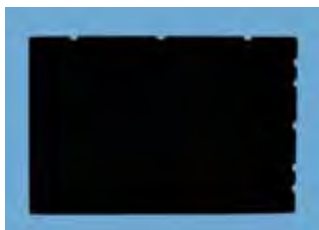
Cat. No. 7013 67



for fluorescence measurement

Vinyl, black. Light-absorbent. Temperature range -40 °C to +80 °C. Single film.
Packs of 50 sheets.

Cat. No. 7013 71



for cell and tissue culture

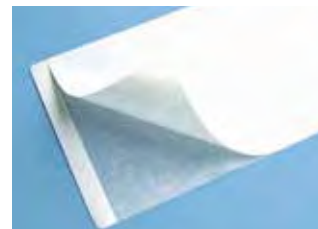
Rayon. Gas-permeable. Temperature range -20 °C to +80 °C. Single film.
Non-sterile: pack of 100 sheets, sterile: pack of 50 sheets.

Non-sterile

Cat. No. 7013 64

Sterile

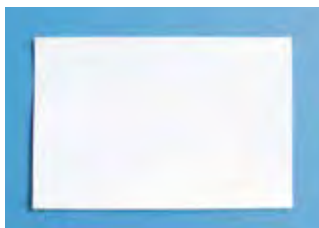
Cat. No. 7013 65



for luminescence measurement

Vinyl, white. Reflective. Temperature range -40 °C to +80 °C. Single film.
Packs of 50 sheets.

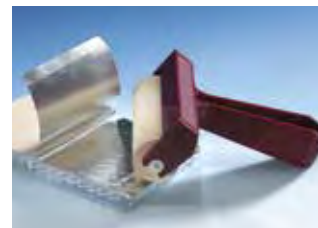
Cat. No. 7013 72



Roller

Hard rubber. For simple, even pressure of self-adhesive films. Pack of 1.

Cat. No. 7013 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/cm³, 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



BRANDplates® Microplates

Modern research methods require high-quality disposables.

BRANDplates® 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 BRANDplates® 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 BRANDplates® Selection Guide, available on the internet at www.brand.de.





BRANDplates®

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

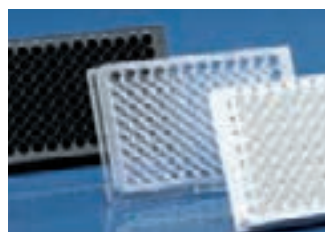
- Sterilized via β -radiation.
- Especially suited for bacteriological assays.

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



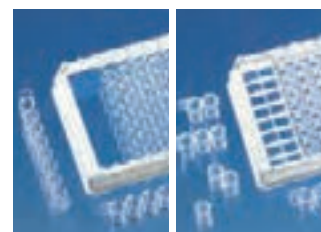
2 with transparent bottom

NEW!



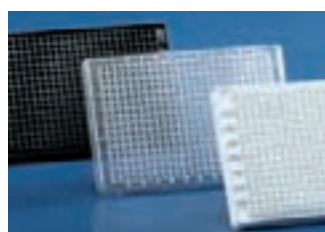
3 with UV-transparent film bottom

NEW!



4 Strip plates (without and with grid)

384-well microplates



1 Standard



2 with transparent bottom

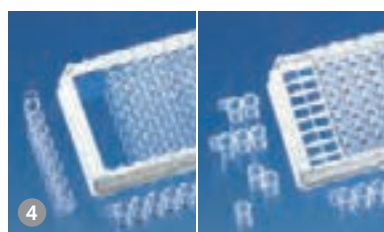
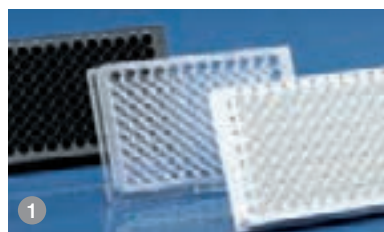
1536-well microplates



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.

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	 F-bottom	350 µl	50 (5 bags of 10 plates)	7816 14 
black, UV-transparent	 F-bottom	350 µl	50 (5 bags of 10 plates)	7816 15 
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 
transparent, with grid, strips of 8 wells, divisible	F-bottom	350 µl	100 (4 bags of 25 plates)	7823 01 

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 BRANDplates® microplates can be found on page 164.

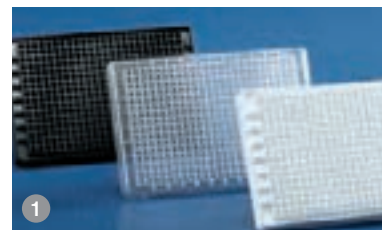
384-well Microplates

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.

BRANDplates®

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.



BRANDplates® Surfaces for Immunoassays

immunoGrade™, hydroGrade™ and lipoGrade™ – three surfaces with different affinities to different types of molecules. The BRANDplates® microplates are suitable for a broad section of applications like ELISA, RIA, FIA, etc.

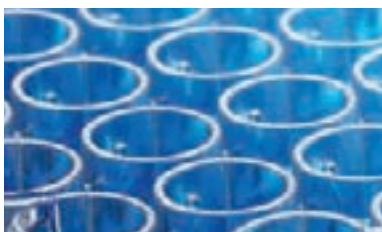


immunoGrade™ (high-binding)*

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

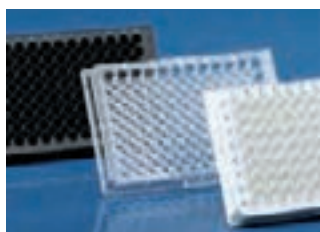
- Strongly hydrophobic (lipophilic), for immobilization of biomolecules with predominantly hydrophobic regions.
- An alternative to the immunoGrade™ surface for the immobilization of molecules, such as lipoproteins or peptides.
- Specially suited for liquid phase assays when the reaction component should 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

96-well microplates

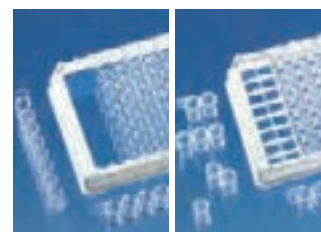


1 Standard



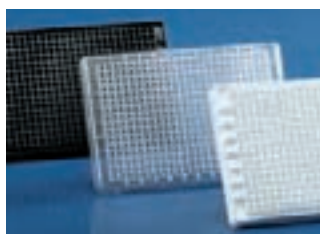
2 with transparent bottom

NEW!



3 Strip plates (without and with grid)

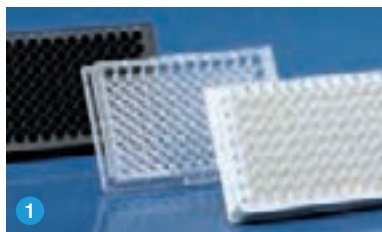
384-well microplates



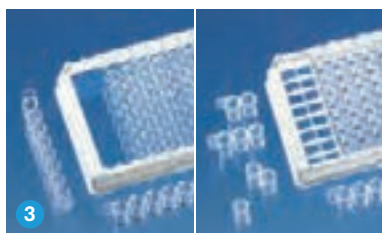
1 Standard



2 with transparent bottom



NEW!



96-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 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
transparent, with grid, strips of 8 wells, divisible	F-bottom	350 µl	100 (4 bags of 25 plates)	7823 06

NEW!
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

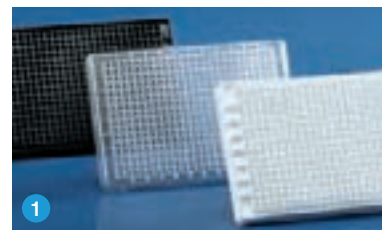
384-well Microplates

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

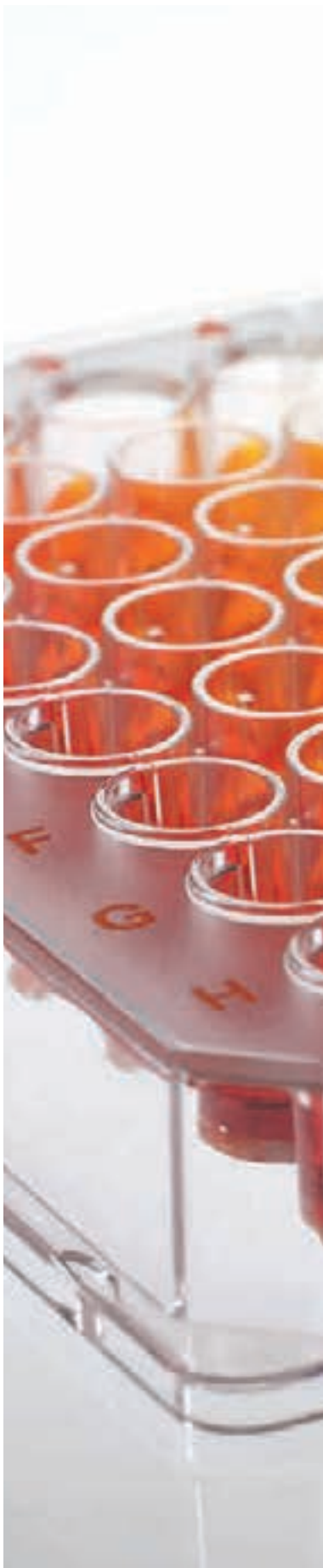


lipoGrade™

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 BRANDplates® microplates can be found on page 164.



BRANDplates®

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 BRANDplates® microplates into the field of cell culture.

BRANDplates® Surfaces for Cell Culture

Adherent cells prefer polar surfaces that possess hydrophilic functional groups. In contrast suspension cells prefer extremely 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.

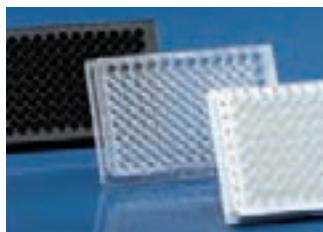


Application Specifications

	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

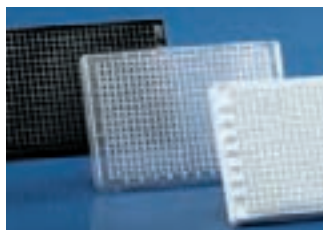


1 Standard



2 with transparent bottom

384-well microplates

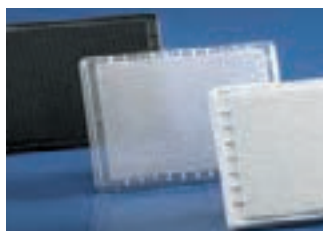


1 Standard



2 with transparent bottom

1536-well microplates



1 Standard



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

Accessories for cell culture applications (Transferpette® multichannel pipettes, accu-jet® pro, QuikSip™) can be found on page 59, 99, 104.

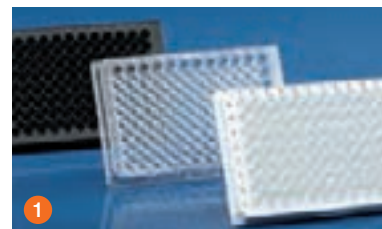
cellGrade™

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

96-well Microplates



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 bottom				
white	F-bottom	330 µl	7820 94	7820 90
black	F-bottom	330 µl	7820 95	7820 91

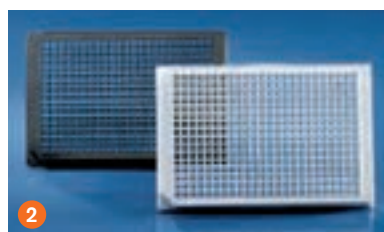
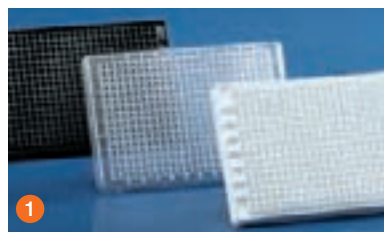
* 1 bag of 5 plates ** individually wrapped, with lid

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 BRANDplates®
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

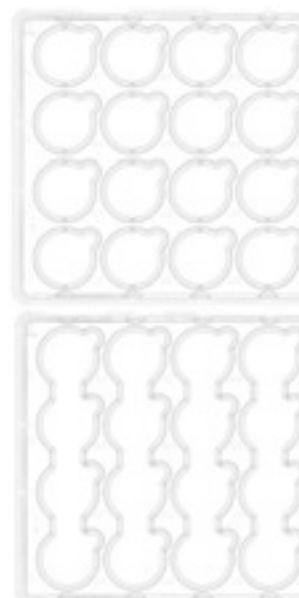


NEW!

BRANDplates® Insert System

The new BRANDplates® 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!

BRANDplates® 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

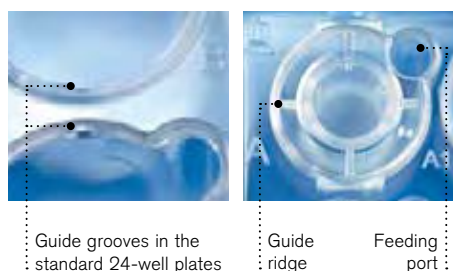
- With special inlet channels, for automated in vitro preparation of human tissues. The Inlet Opening System* enables rapid, consistent changing of media, from submersion culture to air-lift culture. The special inlet channels enable adjustment of the medium level without damage to the skin model.
- 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 10993-5, 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 cm²)		
Pore size 0.4 µm	1 x 10 ⁸	2 x 10 ⁶
Pore size 1.0 µm	2 x 10 ⁷	2 x 10 ⁶
Pore size 3.0 µm	2 x 10 ⁶	6 x 10 ⁵
Pore size 8.0 µm	1 x 10 ⁵	6 x 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



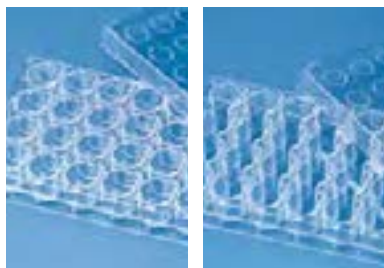
Ordering Data

Insert strips and plates available individually packed or as a system (6-well plates filled with 6 insert strips).

BRANDplates® 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

BRANDplates® 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



BRANDplates® 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 BRANDplates® microplates Selection Guide at www.brand.de

96-well Microplates

Type		Non-treated		Immunological surfaces			Cell culture surfaces			
Standard		pureGrade™	pureGrade™ S	immunoGrade™	hydroGrade™	lipoGrade™	cellGrade™	cellGrade™ plus	cellGrade™ premium	inertGrade™
Color	Bottom / Well volume									
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		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		pureGrade™	pureGrade™ S	immunoGrade™	hydroGrade™	lipoGrade™	cellGrade™	cellGrade™ plus	cellGrade™ premium	inertGrade™
transparent	F / 350 µl	7816 14 ¹	–	–	–	–	–	–	–	–
	F / 350 µl	7816 15	–	–	–	–	–	–	–	–
Strip plates		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		pureGrade™	pureGrade™ S	immunoGrade™	hydroGrade™	lipoGrade™	cellGrade™	cellGrade™ plus	cellGrade™ premium	inertGrade™
Color	Bottom / Well volume									
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		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		pureGrade™	pureGrade™ S	immunoGrade™	hydroGrade™	lipoGrade™	cellGrade™	cellGrade™ plus	cellGrade™ premium	inertGrade™
Color	Bottom / Well volume									
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 BRANDplates® 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

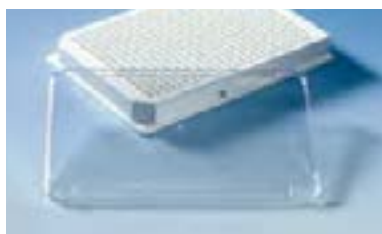


Condensation rings	Height	Sterile	Pack of	Cat. No.
yes	8 mm	–	100 (5 lids per bag)	7821 50
no	8 mm	–	100 (5 lids per bag)	7821 51

Lids for 96-well plates with transparent bottom

Lids for all 384-well plates

For BRANDplates® 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 BRANDplates® 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

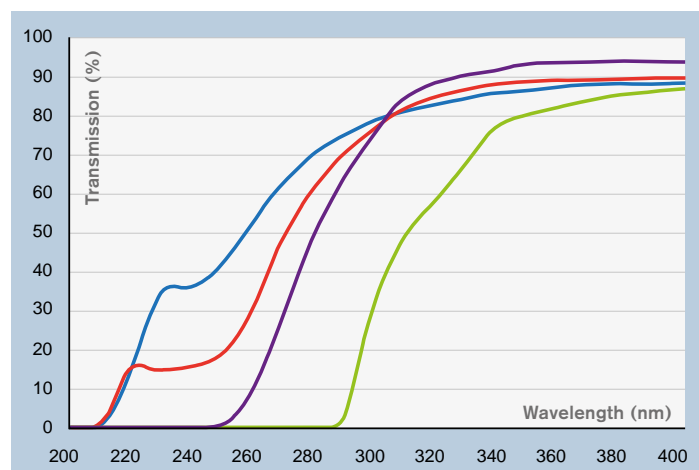


Technical Data

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



— UV-Cuvette micro — Standard cuvette PMMA
 — UV-Cuvette semi-micro/macro — Standard cuvette PS

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.

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.

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.

Various photometric methods are currently available for determining the concentration and purity of nucleic acids and proteins.

Protein determination using UV cuvettes:

$$C_{\text{Protein (mg/ml)}} = 1.55 \times A_{280 \text{ nm}} - 0.76 \times A_{260 \text{ nm}}$$

Nucleic acid determination using UV cuvettes:

$$C_{\text{DNA (µg/ml)}} = 50 \times A_{260 \text{ nm}} \times \text{dilution factor}$$

$$C_{\text{RNA (µg/ml)}} = 40 \times A_{260 \text{ nm}} \times \text{dilution factor}$$



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 are according to DIN 12 600 admissible for conformity certification.



Graduation:
ring marks at major graduations



Marks and inscriptions in high contrast blue enamel. It represents the optimum combination of resistance and readability.

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



Marks and inscriptions in high contrast white enamel.

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

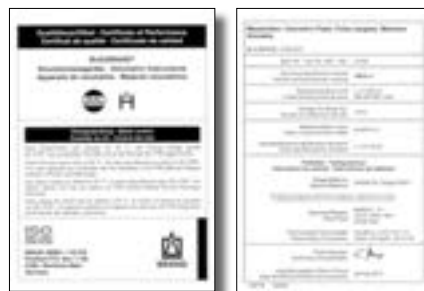
All reusable BLAUBRAND® and SILBERBRAND volumetric instruments can be heated up to 250 °C in a dry box or sterilizer without having to worry about a change in volume. Use only gradual heating and cooling because abrupt temperature changes cause thermal stress and may result in glass breakage.

BLAUBRAND® Volumetric instruments with certificate



Conformity certified

All BLAUBRAND® volumetric instruments are conformity certified. With the sign **BH**, BRAND confirms that the instruments are manufactured according to "Eichordnung", the German Federal Weights and Measures Regulations. This sign of conformity is printed directly on the instruments, according to DIN 12 600.



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.

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:

13.02

(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:

13.02 0756

(Individual serial number: year of manufacture/batch/continuous 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

Manufacturer

BLAUBRAND trademark for the highest quality grade volumetric instruments

Nominal volume

Error limit



Symbol for the conformity certification of BRAND, according to 'Eichordnung', the German Federal Weights and Measures Regulations and to DIN 12 600

ISO association mark

Country of origin

Reference temp. (20 °C), waiting time (5 seconds), calibration (TD, Ex = to deliver)

Class 'A', the highest quality grade, 'S' for swift delivery

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®	SILBERBRAND
				waiting time 5 s	no waiting time
				Error limit ± ml	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.

BLAUBRAND 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,
conformity certified

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.

NEW!

Bulb pipettes, 1 mark, USP

BLAUBRAND®, class AS,
conformity certified


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	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

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,
conformity certified

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



Capacity ml	Error limit \pm 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, 2 marks

BLAUBRAND®, class AS, conformity certified

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 \pm 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, 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.

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 \pm ml	Length mm \pm 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.

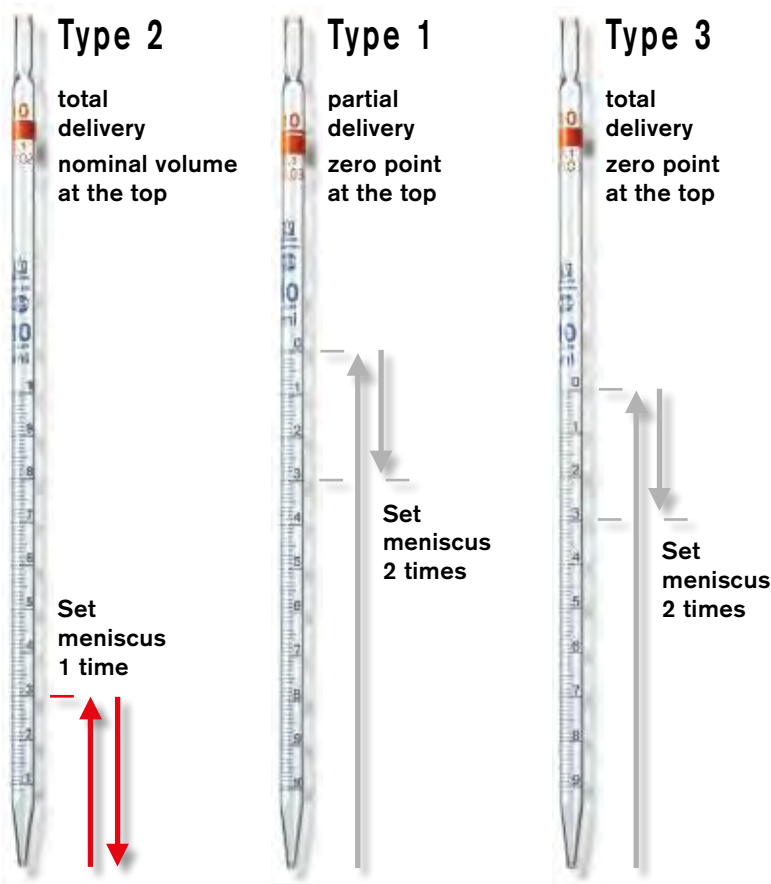
In contrast, with types 1 and 3, there is a risk of over-dispensing while setting the meniscus for partial volumes the second time. In such a case, the sample would have to be prepared again.

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.



BLAUBRAND® Graduated Pipettes, Class AS



Technical data, available sizes

Graduated pipettes are calibrated to contain (TC, In) respectively to deliver (TD, Ex).

Capacity ml	Subdiv. ml	Color-Code (ISO 1769)	Length mm (± 10 mm)	BLAUBRAND® waiting time 5 s		SILBERBRAND no waiting time	
				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, conformity certified

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, not conformity certified



Graduated pipettes, Type 2, total delivery, USP **NEW!**

BLAUBRAND®, class AS, nominal volume at the top, conformity certified

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, conformity certified

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, conformity certified

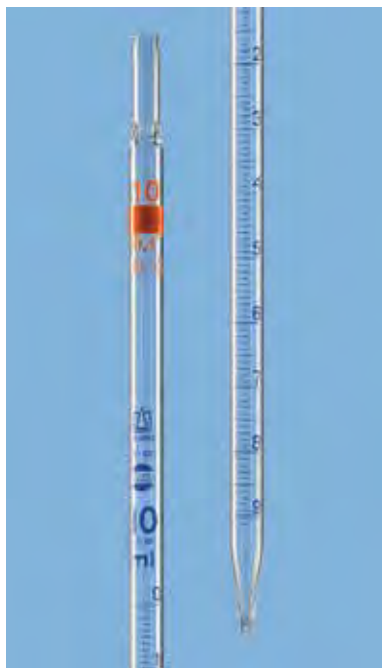
AR-GLAS®. DIN EN ISO 835. Calibrated to deliver (TD, Ex).

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, not conformity certified





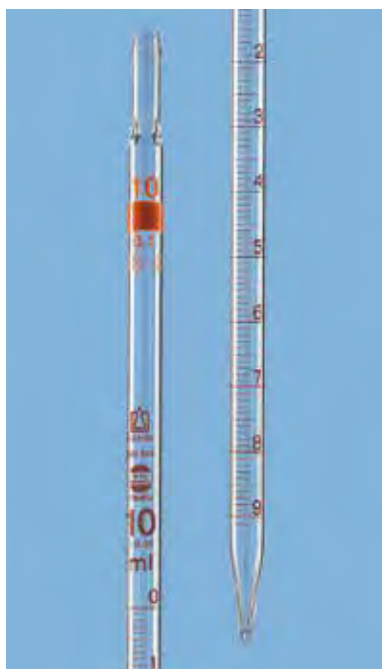
Graduated pipettes, Type 3, total delivery

BLAUBRAND®, class AS, zero point at the top, conformity certified

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, not conformity certified



Graduated pipettes, Type 3, total delivery

BLAUBRAND® ETERNA, class AS, zero point at the top, conformity certified

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

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.

Cotton cord

100% cotton wool, degreased, approx.
13 g/10 m. Pack of 1 kg.

Cat. No.	282 05
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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 \pm 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

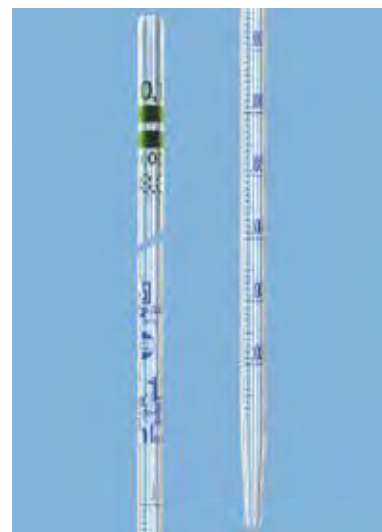


Graduated pipettes, calibrated to contain

BLAUBRAND®, class A, conformity certified

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 \pm 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

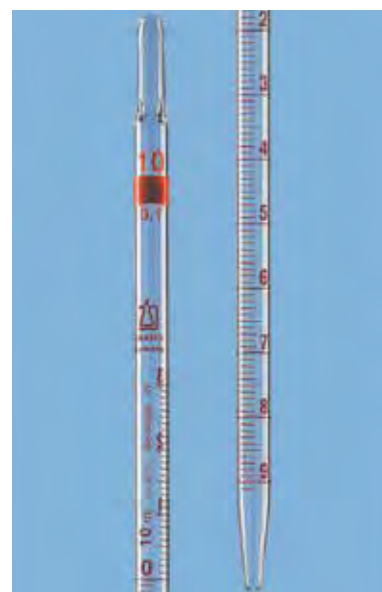


Graduated pipettes, serological

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 \varnothing approx. mm	Subdivision ml	Error limit \pm 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

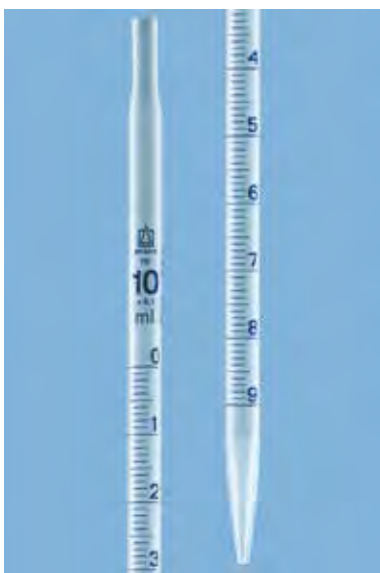


Graduated pipettes, piston type

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



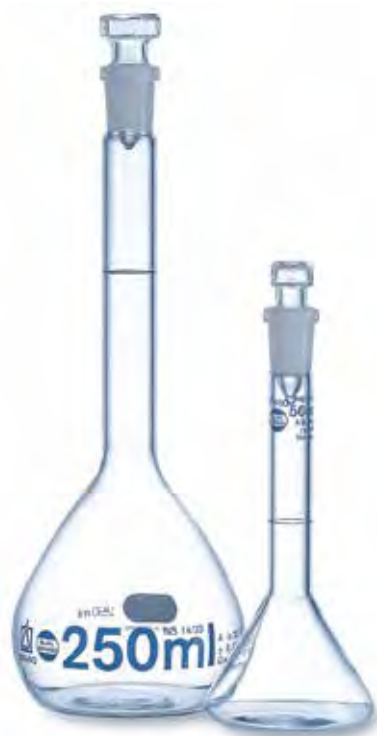
Graduated pipettes, made of plastic

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



Note! The abbreviation Boro 3.3 represents the internationally designated borosilicate glass type 3.3.

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).

BLAUBRAND® Volumetric Flasks – Durable Quality

Specifications, available sizes

Volumetric flasks are always calibrated to contain (TC, In).

Volumetric flasks, trapezoidal

			BLAUBRAND®
Capacity ml	Neck inner Ø mm	Neck size	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

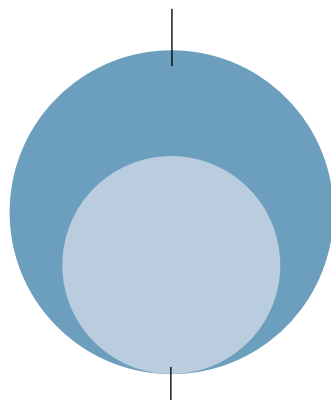
W = Wide neck

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

			BLAUBRAND®	SILBERBRAND
Capacity ml	Neck inner Ø mm	Neck size	Error limit ± ml	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
10 000	48 ± 4	45/40	2.0	–

W = Wide neck



Volumetric flasks, trapezoidal

BLAUBRAND®, class A, conformity certified

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, conformity certified

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 W	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, conformity certified

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, conformity certified

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, conformity certified

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, conformity certified

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, conformity certified

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, conformity certified

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, conformity certified

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 \pm 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 \pm 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 \pm ml	Cat. No.
Sample volume 100 ml	–	0.2	3655 38
Volume range 0 - 5 ml	0.1	0.1	
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



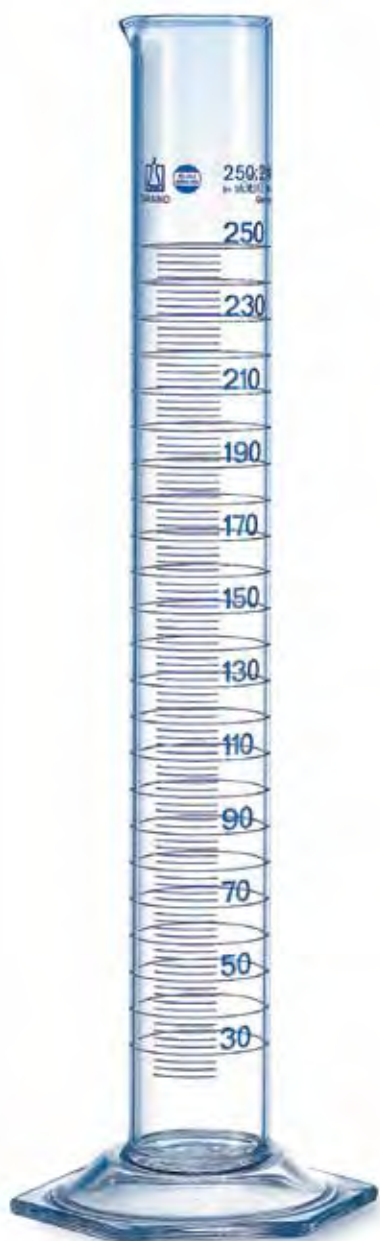
Volumetric flasks, PP, high clarity

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





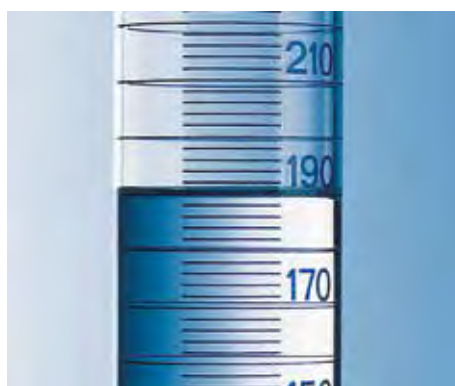
Graduated Cylinders

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®	SILBERBRAND	SILBERBRAND
		tall form	tall form	low form
		Error limit ± ml	Error limit ± ml	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

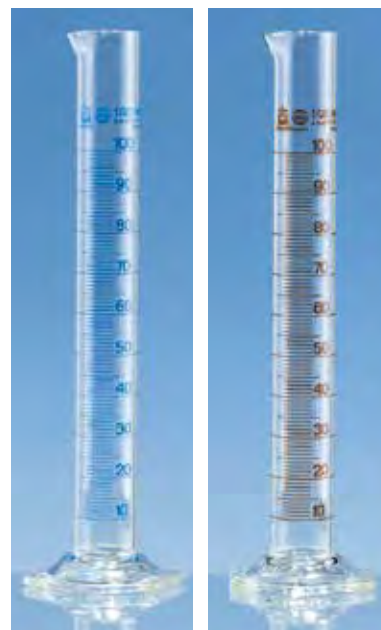
Our class A plastic measuring cylinders made of PMP (conformity certified) are low-price high-quality alternative to glass cylinders (see page 194-195).

Graduated cylinders, tall form

BLAUBRAND® or BLAUBRAND® ETERNA, class A, conformity certified, 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, conformity certified, 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



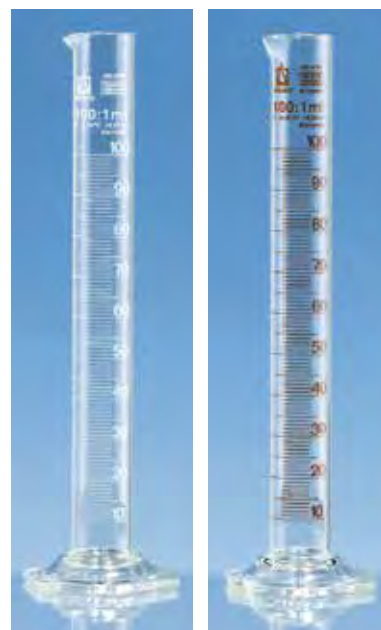
Note!  On request, also available with USP individual certificate.

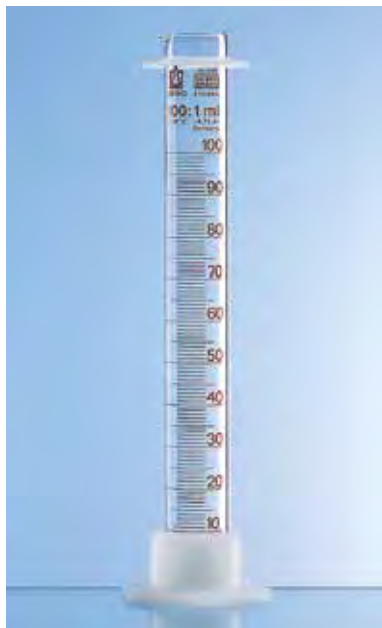
Graduated cylinders, tall form

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

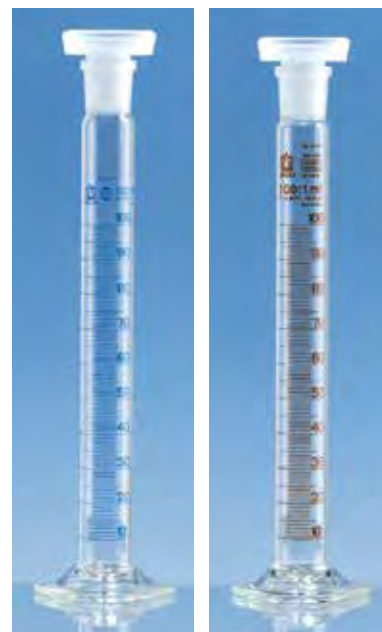
Mixing cylinders

BLAUBRAND®, class A, conformity certified,
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

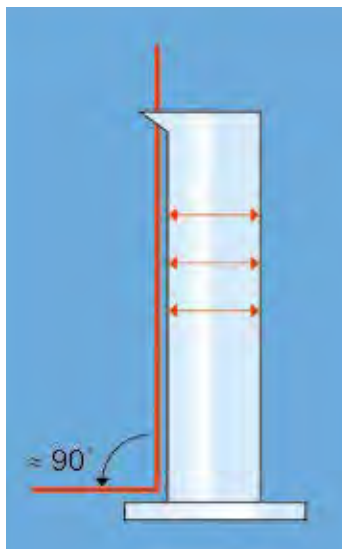
Borosilicate glass 4.1.
Capacity 1000 ml. Neck size 29/32.
Pack of 1.

Description	Cat. No.
Borosilicate glass 4.1	1269 63

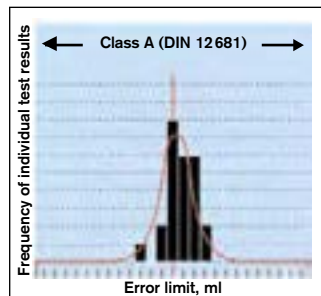
Plastic Graduated Cylinders

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

Conformity certified, 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.

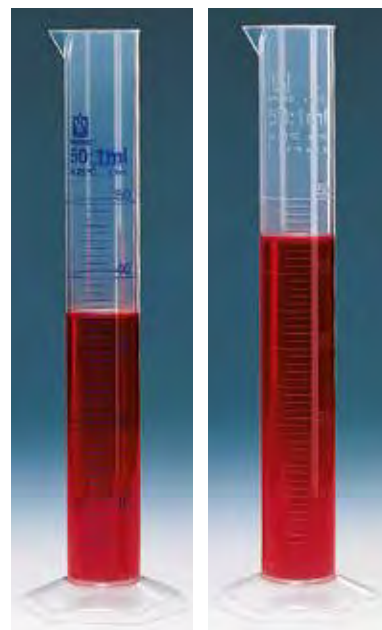
Capacity ml	Subdivision ml	Error limit A ± ml	Height mm	Cat. No.
10	0.2	0.10	145	351 08
25	0.5	0.25	170	351 20
50	1	0.5	200	351 28
100	1	0.5	250	351 38
250	2	1.0	315	351 48
500	5	2.5	360	351 54
1000	10	5	440	351 62
2000	20	10	535	351 64

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

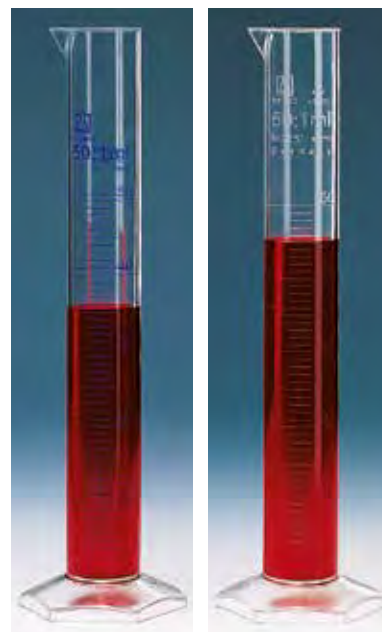


Graduated cylinders, PMP

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

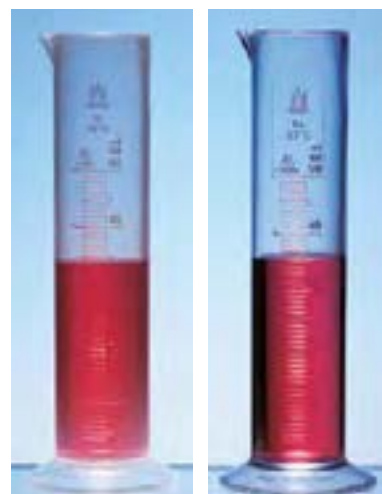


Graduated cylinders, PP and SAN

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 necessary 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, conformity certified

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 \pm 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, conformity certified

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 \pm 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, conformity certified

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 \pm 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, conformity certified

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 \pm 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 \pm 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 \pm 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 \pm 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 \pm 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!

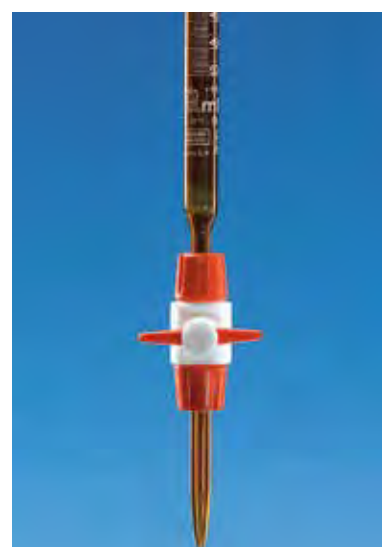
Compact Burettes

BLAUBRAND®, class AS, conformity certified

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.

Description	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
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Spare burette tips

for Compact burettes and Compact automatic burettes

Pack of 1.

For burettes	Description	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 \pm 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 \varnothing 8 mm.

For use with PTFE stopcock (Cat. No. 118 00).

Pack of 2.

Capacity ml	Subdivision ml	Error limit \pm 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





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.

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

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
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Amber glass

Cat. No.	115 05
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Automatic burettes, Pellet pattern, with intermediate stopcock

BLAUBRAND®, class AS, conformity certified

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 \pm 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 \pm 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, conformity certified

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 \pm 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 \pm 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 \pm 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 \pm 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 \pm 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 \pm 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, conformity certified

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 \pm 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, conformity certified

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 \pm 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
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Spare burette tips

for all Compact burettes and Compact automatic burettes

Pack of 1.

For burettes	Description	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

Bases

Pack of 1.

Spare filling tube

PVC, transparent.
Inner-Ø 5 mm, Outer-Ø 7 mm, length 1 m.
Pack of 1.

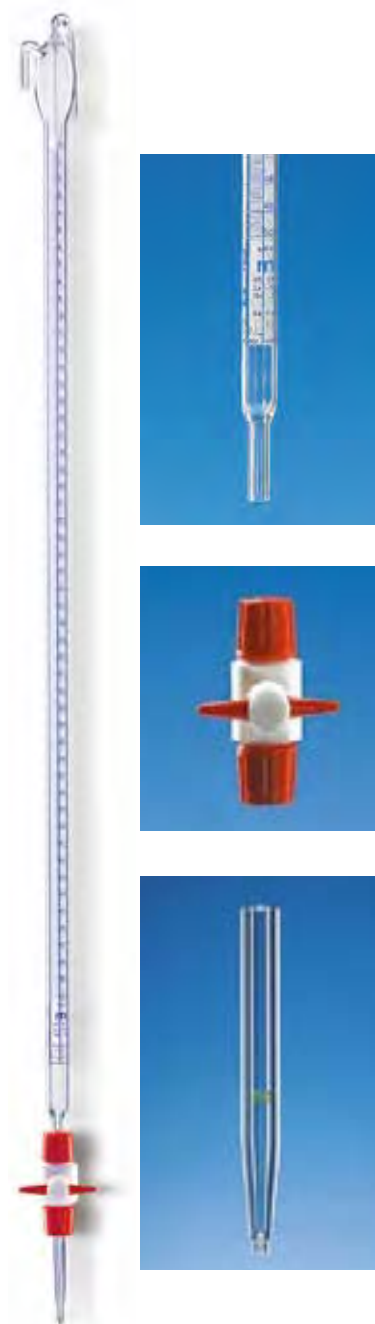
Cat. No.	115 25
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For bottle ml	Ø bottle mm	Cat. No.
500	75	237 25
1000	94	237 28

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
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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



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 cm³ 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



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 cm³ is specified to a precision of 3 decimal places. Pack of 1.

Nominal capacity cm ³	Cat. No.
10	434 08
25	434 20
50	434 28
100	434 38



Inscriptions in high contrast blue enamel

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 cm ³	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 ± 0.01 ml. 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)

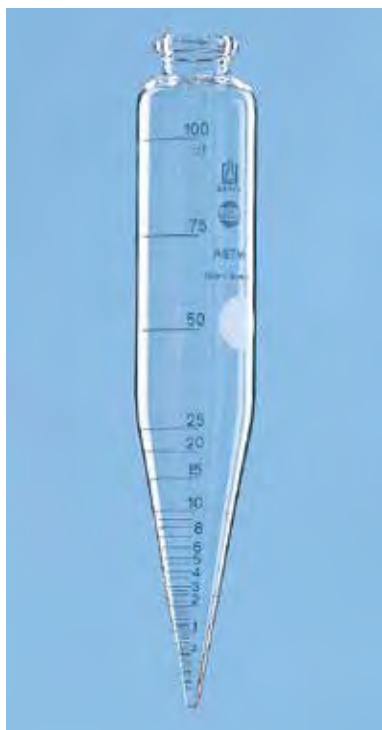
$$RCF = 1.118 \cdot r \cdot \left(\frac{n}{1000}\right)^2$$

(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
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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



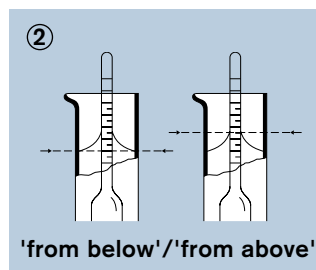
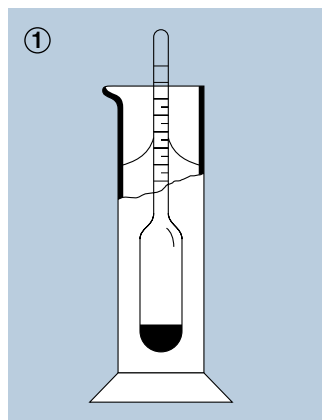


Hydrometers

Measuring Procedures

Hydrometers determine the density of liquids or the concentration of dissolved matter.

Density is frequently indicated in g/cm^3 (g/ml) or in $^{\circ}\text{Baumé}$. Concentration is indicated in percentage by volume ($\text{Vol.}\%$) or in percentage by mass ($\text{Weight}\%$). Permissible deviations are within ± 2 graduation marks.



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 ± 2) 10^{-6}K^{-1}


t Measuring temperature $^{\circ}\text{C}$

t_0 Reference temperature $^{\circ}\text{C}$

ρ Density reading g/ml

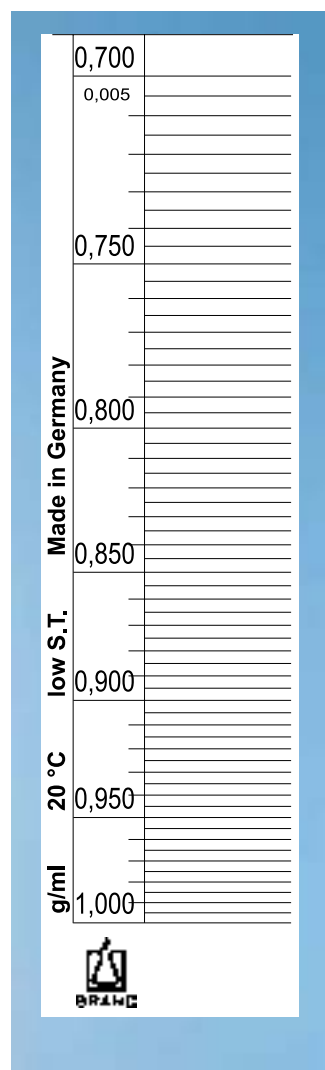
2. Sample

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.

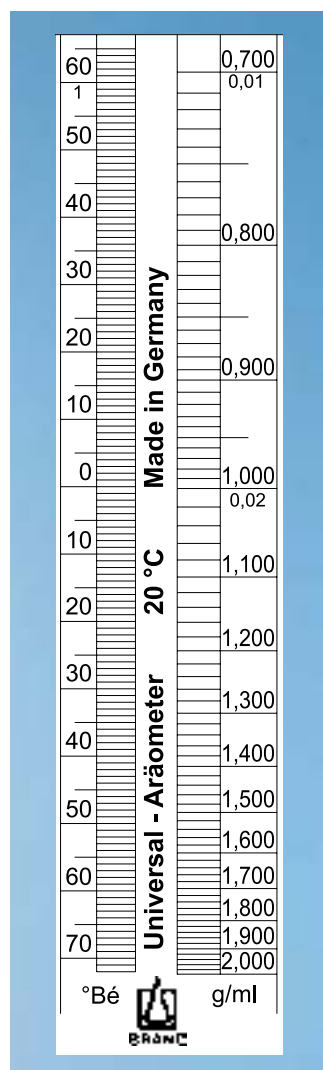
For hydrometers no certificates are provided.

Range finder hydrometers



Subdivisions 0.005 g/cm³,
reference temperature 20 °C.
Without thermometer,
approx. 260 - 300 mm long.
Pack of 1.

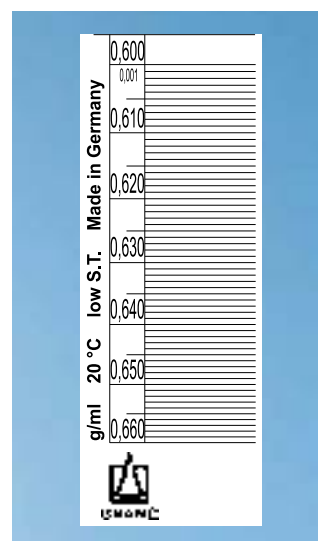
Range g/cm ³	Cat. No.
0.700 - 1.000	9700 10
1.000 - 1.500	9700 12
1.500 - 2.000	9700 14



Subdivisions 0.01 g/cm³,
reference temperature 20 °C.
Without thermometer,
approx. 360 mm long.
Pack of 1.

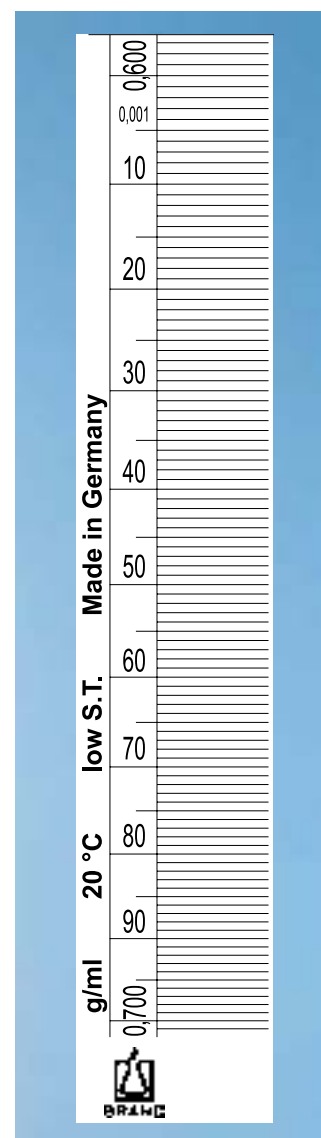
Range g/cm ³	Cat. No.
0.700 - 2.000	9705 10

General purpose hydrometers



Subdivisions 0.001 g/cm³,
reference temperature 20 °C.
Without thermometer,
approx. 160 mm long.
Pack of 1.

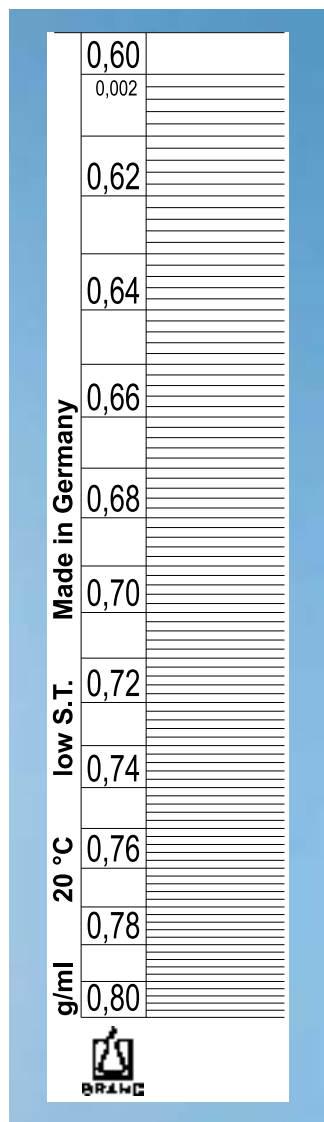
Range g/cm ³	Cat. No.
0.600 - 0.660	9660 30
0.650 - 0.710	9660 31
0.700 - 0.760	9660 32
0.760 - 0.820	9660 33
0.820 - 0.880	9660 34
0.880 - 0.940	9660 35
0.940 - 1.000	9660 36
1.000 - 1.060	9660 37
1.060 - 1.120	9660 38
1.120 - 1.180	9660 39
1.180 - 1.240	9660 40
1.240 - 1.300	9660 41
1.300 - 1.360	9660 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/cm ³	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

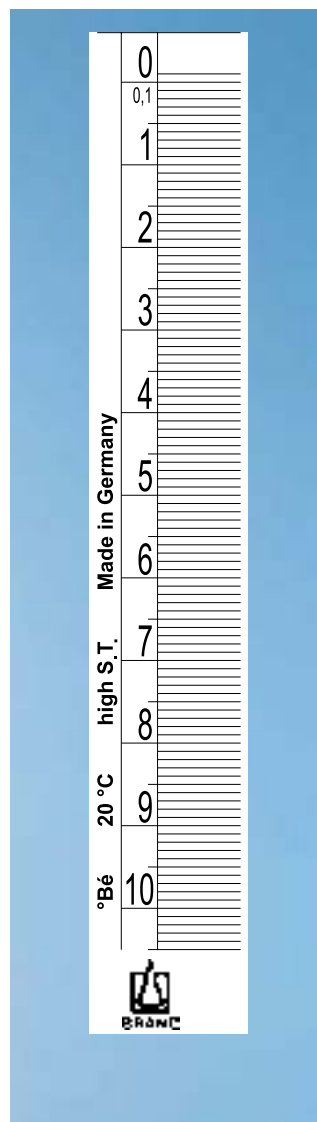
General purpose hydrometers



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.

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.

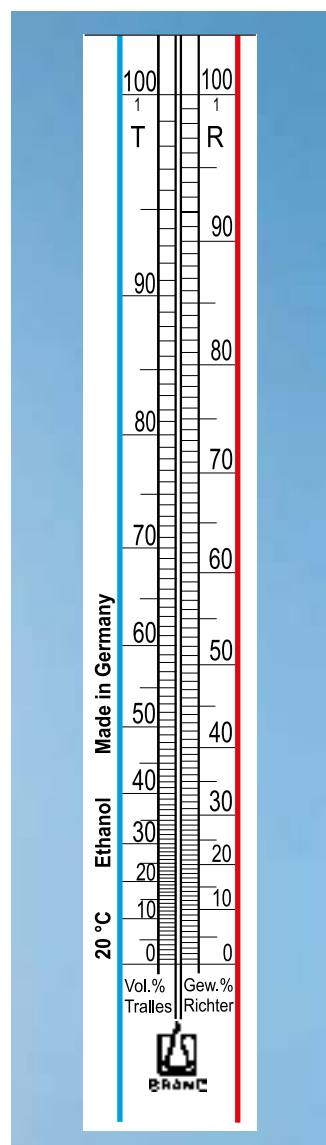
Without thermometer.
Reference temperature 20 °C.
Pack of 1.

Range g/cm ³	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

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**

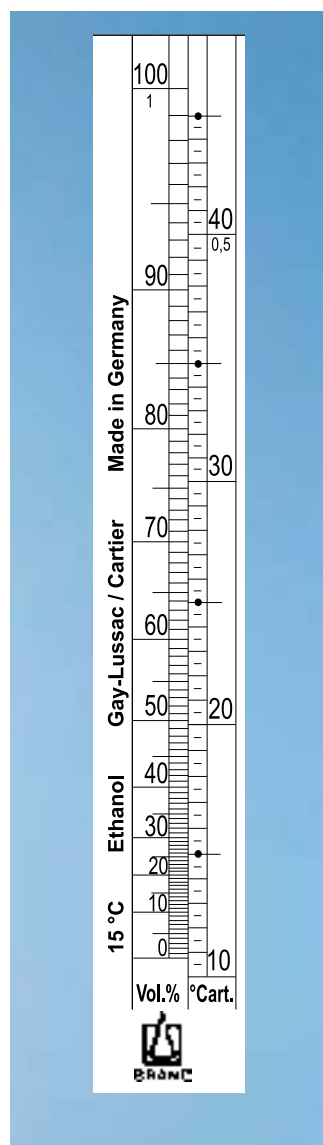
Subdivisions:
1 weight % / 1 vol.%,
reference temperature 20 °C,
range 0-100% (weight/vol.).
Pack of 1.

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, refer-
ence temperature 15 °C,
range 0-100 vol.% /
10-45 °Cartier. Pack of 1.

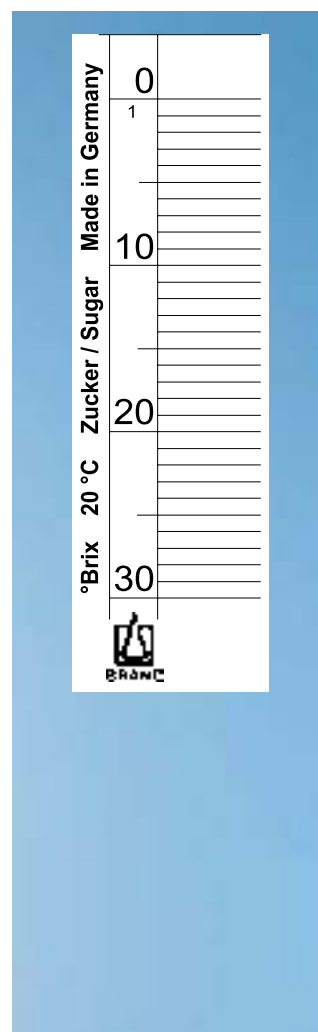
Without thermometer:
approx. 260 mm long

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**

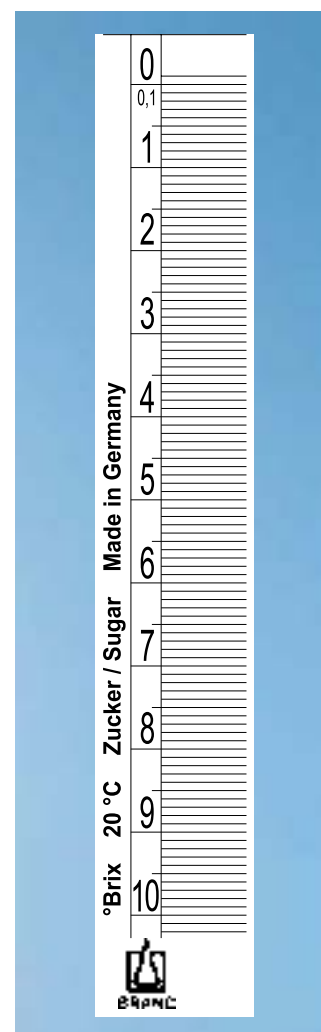
Sugar hydrometers

**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



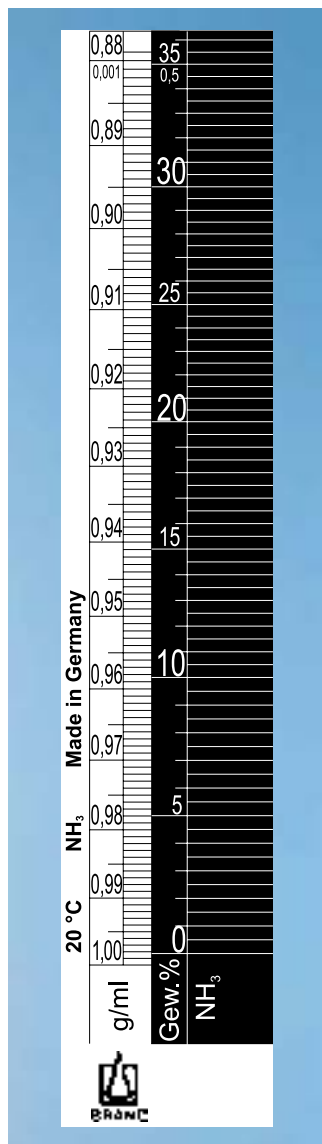
Subdivisions: 0.1 °Brix.
Reference temperature 20 °C.

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 ₃ OH	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".

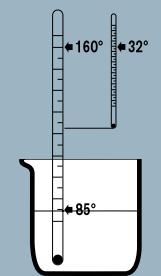
This means that the meniscus of the mercury column is level with the surface of the liquid being measured.

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: $t = 160\text{ °C}$

Immersion point: $t' = 85\text{ °C}$

Emerging mercury column:

Mean temperature: $t' = 32\text{ °C}$

Length in °C (on scale): $n = 160 - 85 = 75$

Corrected temp.: $t_k = 161.5\text{ °C}$



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

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

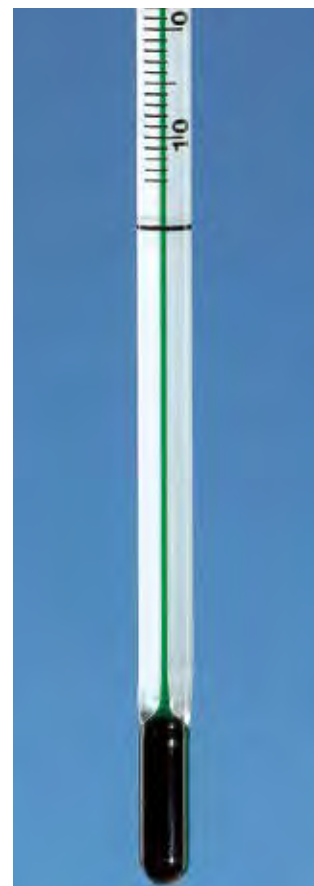
Solid-stem thermometers, without mercury

for general purpose, SILBERBRAND

Calibrated for partial immersion. Immersion depth 76 mm. Stem \varnothing 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



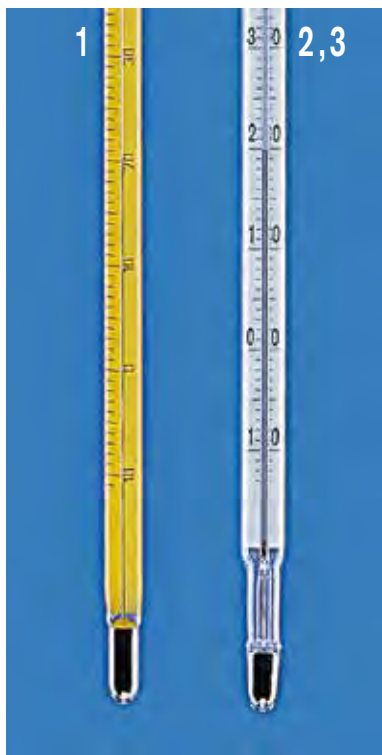
Pocket thermometers, solid-stem

DIN 12770, for general purpose, SILBERBRAND

In nickel-plated metal case with bayonet catch and clip. Case \varnothing 12 mm, overall length 140 mm. Calibrated for total immersion. Stem \varnothing 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

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 \varnothing 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 \varnothing 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

3 Precision low-temperature thermometer

solid-stem thermometer, GOLDBRAND

Calibrated for total immersion. Stem \varnothing 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



1 Dropping point thermometer, Ubbelohde pattern

Precision enclosed-scale thermometer with very small, rapid response mercury bulb, to DIN 12785, GOLDBRAND

Calibrated for total immersion. Top tube \varnothing 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 12785, GOLDBRAND

Calibrated for 180 mm immersion. Top tube \varnothing 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 12785, GOLDBRAND

Calibrated for total immersion. Stem \varnothing 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

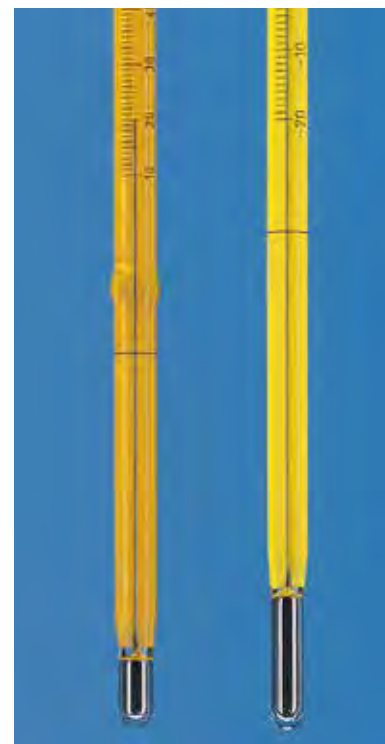
ASTM thermometers

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.



a: Immersion depth
b: Fitting length

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 Laboratory

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 90



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 μ l	natural	4522 01
Capacity of loop: 10 μ l	blue	4522 10
Capacity of loop: 1 + 10 μ l	yellow	4522 15

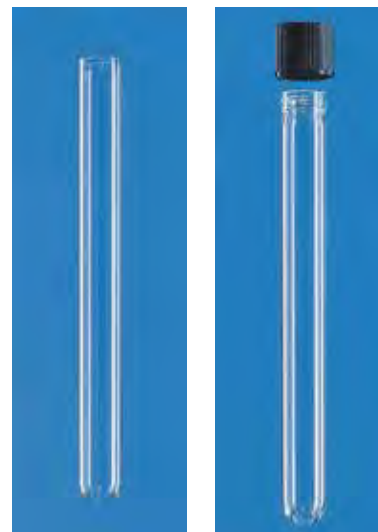
Culture tubes

Rimless or with screw cap (GL thread)

Soda-lime glass. Screw cap, PP, with white TPE elastomer seal. Autoclavable (121 °C). Pack of 100.

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 20000. 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.
13	without base	non-sterile	17	120	750 (5 x 150)	1148 17
13	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





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 (121 °C). 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 (121 °C). 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. Pasteur pipettes can be filled and deep-frozen, or changed into a closed vessel by heat-sealing the tip. The integrated pipetting bulb depresses easily, minimizing fatigue from frequent pipetting. Resistant to gas or gamma radiation sterilization.

Graduation/ Sub-division ml	Withdraw volume ml	Outer-Ø tip mm	Length mm	Drop quantity of ml	Pack of*	Cat. No.
–	3.0	2.8	152	25-27	5000	7477 50
1 / 0.25	3.5	3.4	151	25-30	5000	7477 55
3 / 0.5	3.5	3.2	152	21-28	5000	7477 60
2 / 0.5	2.0	3.3	152	22-26	5000	7477 65
–	4.0	1.0	148	60-75	5000	7477 70
–	1.0	1.0	105	50	3200	7477 75

* Pack quantities: 5000 = 10 cartons of 500, 3200 = 8 cartons of 400.



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

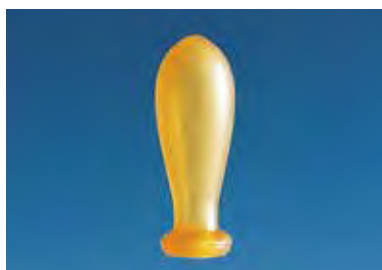




Pasteur pipettes

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
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All products can also be found in our online catalog at: www.brand.de



Disposable micropipettes, intraMARK

BLAUBRAND®, conformity certified, with ring mark

DIN ISO 7550. Volumes greater than 5 µl are conformity certified.

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

* conformity certified for 5 µl mark



Disposable micropipettes, intraEND

BLAUBRAND®, conformity certified, without ring mark

DIN ISO 7550. Volumes greater than 5 µl are conformity certified.

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

* not conformity certified



Disposable Delbrück micropipettes, intraEND

BLAUBRAND®, conformity certified, 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



BRAND counting chamber and haemocytometer 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)

$$\text{Particles per } \mu\text{l volume} = \frac{\text{Counted particles}}{\text{Counted surface (mm}^2\text{)} \cdot \text{Chamber depth (mm)} \cdot \text{Dilution}}$$

Example: Erythrocytes

Chamber: Improved Neubauer

1. Counted particles: 528 erythrocytes

2. Counted surface: 5 group squares, equivalent to 0.2 mm²

3. Chamber depth: 0.1 mm

4. Dilution: 1:200

$$\frac{528 \cdot 200}{0.2 \cdot 0.1 \cdot 1} = 5.28 \cdot 10^6 \text{ ery}/\mu\text{l blood} = \underline{5.28 \text{ Mio ery}/\mu\text{l blood}}$$

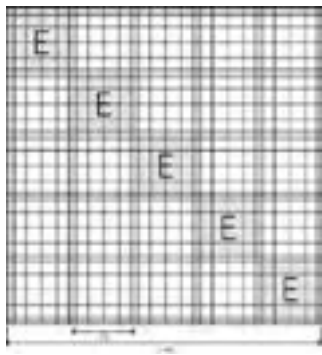
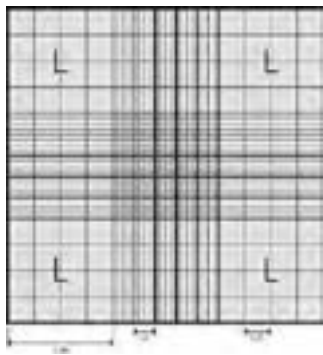
Pack quantities for all counting chambers:

1 Counting chamber, complete with 2 haemocytometer cover glasses, in transparent plastic box.

Cleaning

For cleaning, we recommend the disinfectant cleaner Mucocit®-T (page 313).





Large central square

Description	Chamber depth	Cat. No.
without spring clips	0.1 mm	7178 05
with spring clips	0.1 mm	7178 20

Improved Neubauer

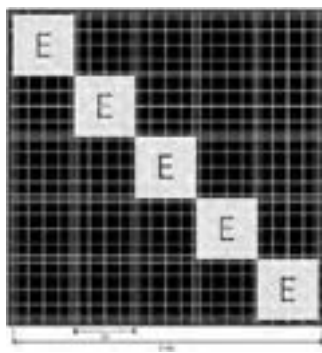
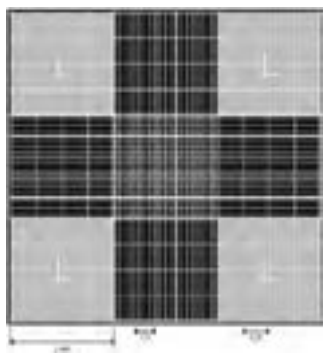
double ruling, with or without spring clips

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.



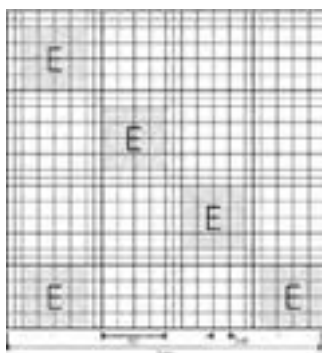
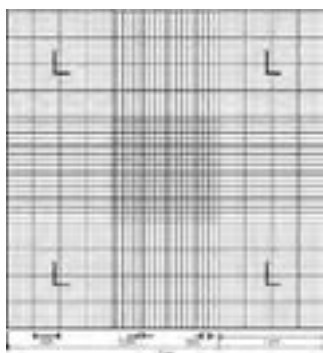
Large central square

Description	Chamber depth	Cat. No.
without spring clips	0.1 mm	7178 10

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.



Large central square

Description	Chamber depth	Cat. No.
without spring clips	0.1 mm	7186 05
with spring clips	0.1 mm	7186 20

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.

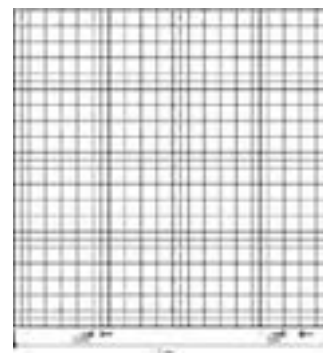
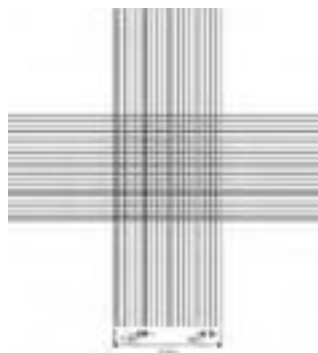
Thoma

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 mm^2 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.

Haemocytometer cover glasses for counting chambers see page 257.

We recommend in mm: 20 x 26 x 0.4 Haemocytometer 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).



Large central square

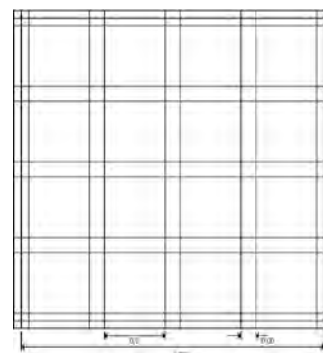
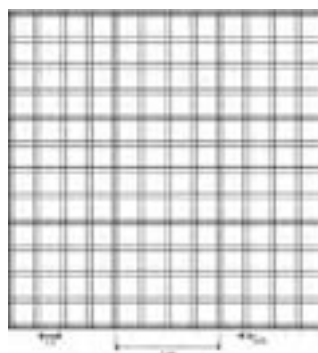
Description	Chamber depth	Cat. No.
without spring clips	0.1 mm	7180 05
with spring clips	0.1 mm	7180 20

Bürker

double ruling, with or without spring clips

The ruling shows 9 large squares of 1 mm^2 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 mm^2 .

CE-marked according to IVD-Directive 98/79 EC.



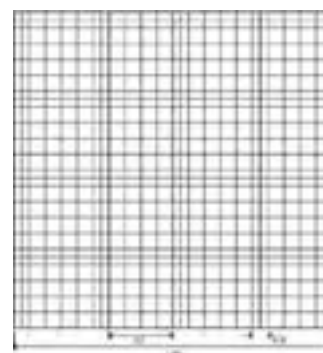
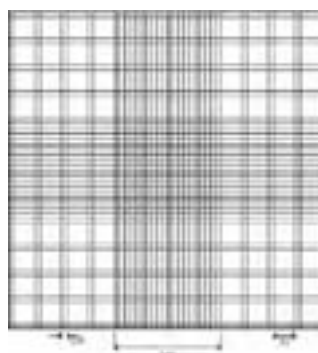
Large central square

Description	Chamber depth	Cat. No.
without spring clips	0.1 mm	7189 05
with spring clips	0.1 mm	7189 20

Bürker-Türk

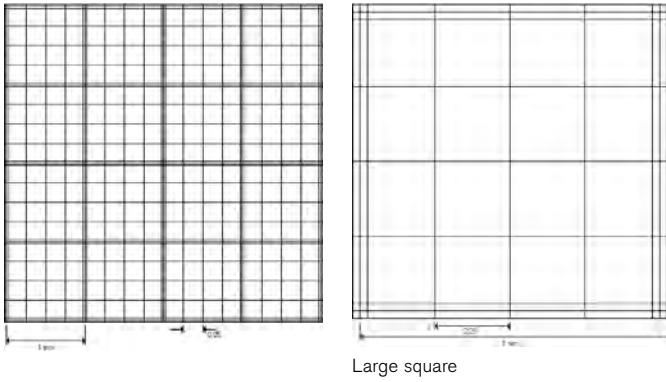
double ruling, with or without spring clips

Combination of the Bürker and Thoma systems. The chamber depth is 0.1 mm. The ruling shows 9 large squares of 1 mm^2 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 ($= 0.0025 \text{ mm}^2$). 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

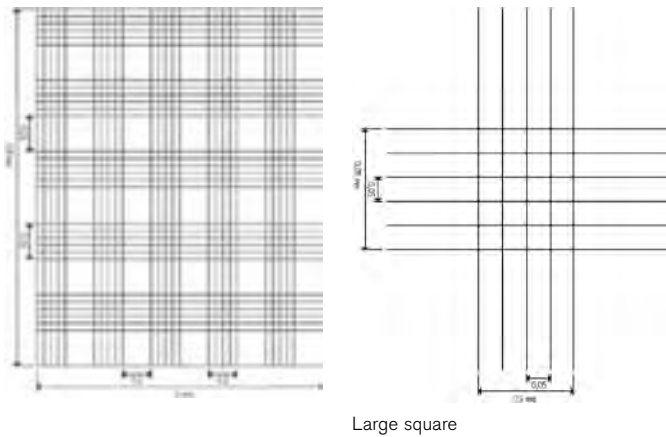


Fuchs-Rosenthal

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

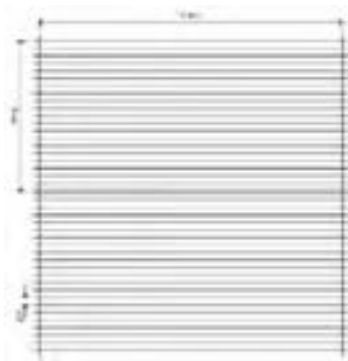


Malassez

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 $n_e = 1.52 \pm 0.01$; Abbe number $v_e = 56.5 \pm 0.5$. Flatness tolerance $\pm 3 \mu\text{m}$. 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 $n_e = 1.52 \pm 0.01$, Abbe number $v_e = 56.5 \pm 0.5$. Fully automated production guarantees "ready-for-use" quality – clean, dust and grease-free, distortion-free, flatness within $\pm 3 \mu\text{m}$.
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

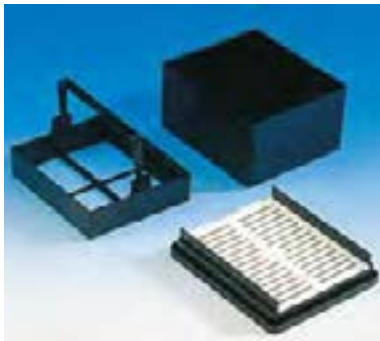




Staining trough with tray

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.

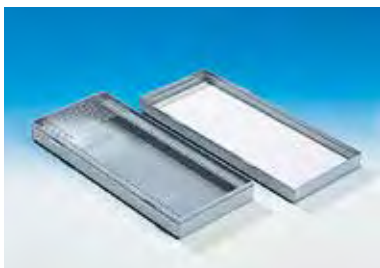
Description	Length mm	Width mm	Height mm	Pack of	Cat. No.
Staining trough, without tray	101	83	70	4	4743 00
Tray (PP) for 20 slides				2	4743 05



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



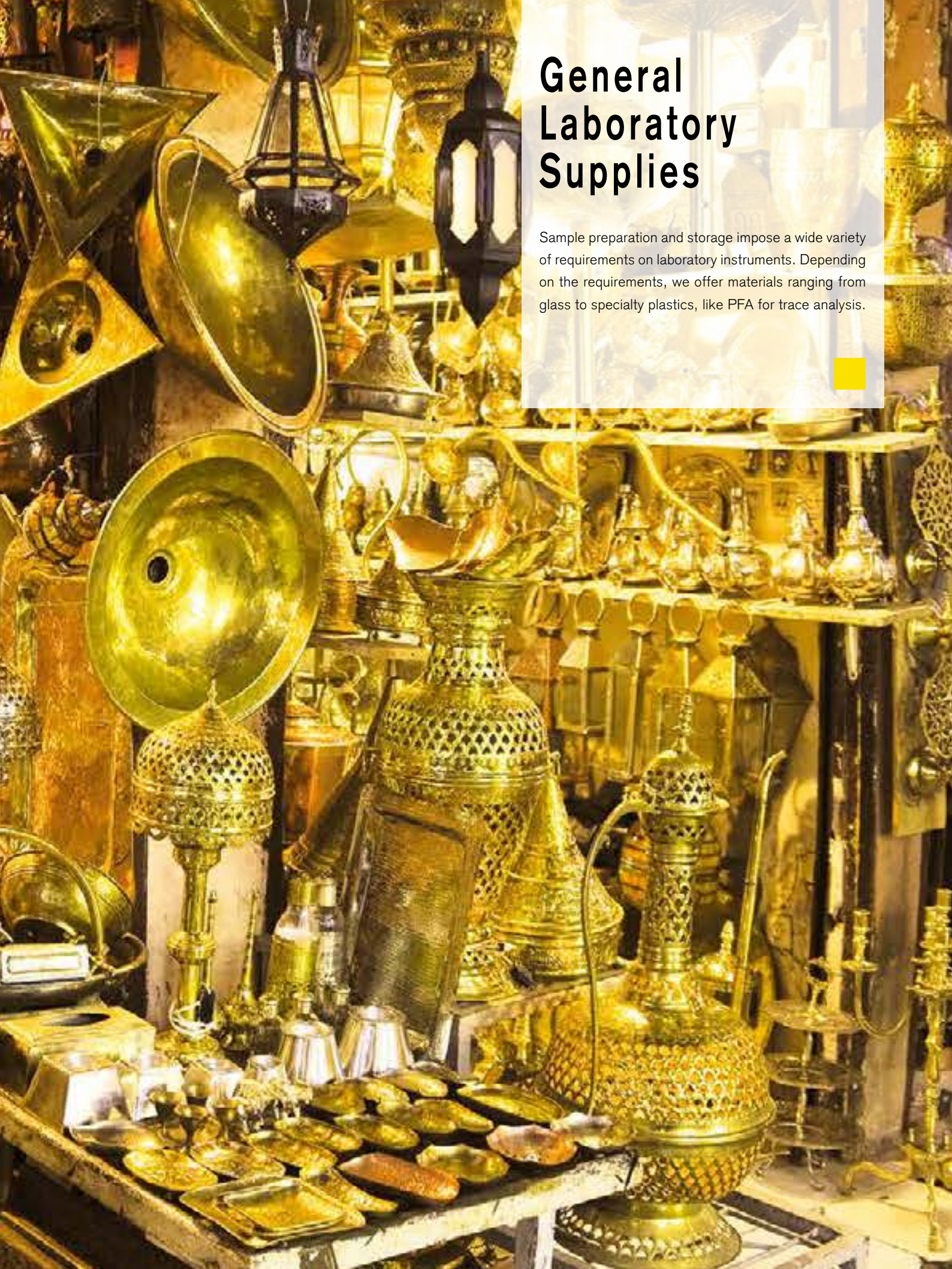
Slide box

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



BRAND



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:
 O₂ (oxygen): ≤ 350 cm³/m²
 N₂ (nitrogen): ≤ 105 cm³/m²
 CO₂ (carbon dioxide):
 ≤ 1100 cm³/m²

Water vapor permeability in 24 hours at 37 °C and 90% relative humidity:
 0.8 g/m²

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

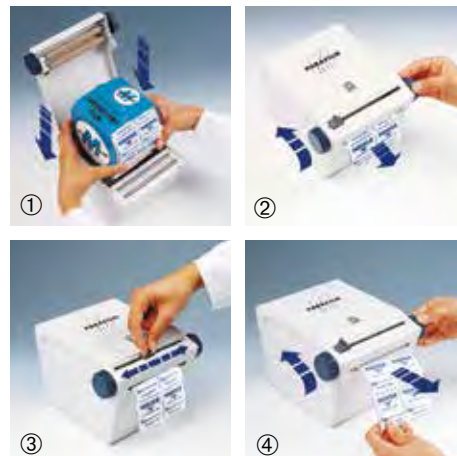
Width mm	Length m	Pack of	Cat. No.
50	75	24	7016 11
100	38	12	7016 05
100	75	12	7016 06
500	15	6	7015 01



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

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.

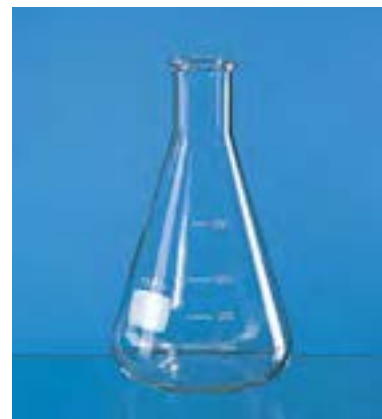
With graduation and spout.

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

Note! The abbreviation Boro 3.3 represents the internationally designated borosilicate glass type 3.3.





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 (size 250 mm: Pack of 1).

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 stem. 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
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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 12 476, 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
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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
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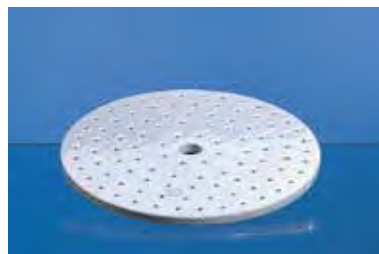


Accessories for desiccators of Boro 3.3 or PC/PP

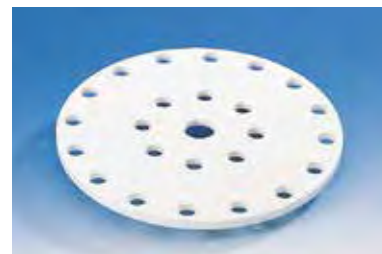
Desiccator plates

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)

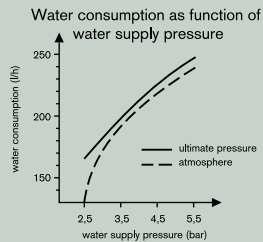
Boro 3.3. DIN 12473-1. With straight bore stopcocks size 3 NS/14 with retention device. One end with capillary tube (inner-diameter 2.7 mm, outer diameter 8 mm), other end with hose nozzle (outer diameter 9 mm). With marking area. Pack of 1.

Capacity ml	Cat. No.
100*	2350 10
250*	2350 20
500	2350 30

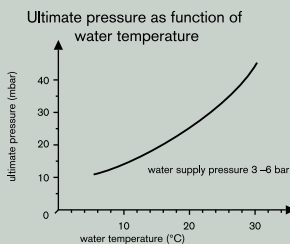
* in addition to the DIN range



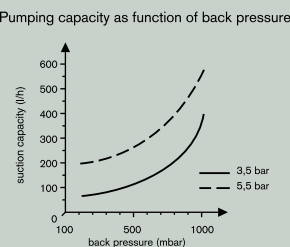
Water jet pump

**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).

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.

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
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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 Mucosal®. 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:

$$Q < 1 \cdot 10^{-4} \text{ mbar} \cdot \text{l} \cdot \text{s}^{-1}$$

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 12 252. 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

Borosilicate glass. DIN 12 252. 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 20000 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.

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. 10000 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

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

Screw caps for narrow-mouth bottle, PE-LD



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

Name of solvent	Color stopper	without venting valve		with venting valve	
		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
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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
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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 $\mu\text{S}/\text{cm}$) is obtained by the special design of the condenser.

Cat. No.	562 20
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MonoDest 3000 N

The low-cost alternative to the MonoDest 3000 E. Recommended for applications where conductivity of 1.5 $\mu\text{S}/\text{cm}$ is sufficient.

Cat. No.	562 15
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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	$\mu\text{S}/\text{cm}$	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 Hygiene (VAH)
 Robert Koch-Institute (RKI)
 German Society for Hygiene 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/m³
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/m³
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 derivatives. 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

Mucocit®-P

Instrument disinfecting detergent

Powerful and gentle to labware. Free of phosphates, aldehydes and phenols. Fresh scent.

Ingredients:

100 g Mucocit®-P contain:
5 g bis(-aminopropyl)-laurylamine,
5 g didecyl-dimethyl-ammonium chloride,
5 - 15% NTA, < 5% non-ionic surfactants,
phosphonates, auxiliary agents

Chemical and physical specifications:

Light-blue powder, fresh smell
Bulk density: approx. 620 kg/m³
pH value (4%): approx. 11

Microbiological efficiency/ concentration for use:

Disinfection of instruments: Bacteria and fungi with high organic burden acc. to DGHM/VAH directives: 3% (30 g/l)/1 hour
Tuberculosis bacteria: 3% (30 g/l)/1 Std.

Limited virucidal efficacy* (incl. HIV, HBV, HCV): 1% (10 g/l)/5 minutes

Inactivation of human rotaviruses:
1% (10 g/l) / 5 minutes

Description	Pack of	Cat. No.
2.5 kg bucket	3	449 20



* 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



- Free of aldehydes
- Effective in only 15 seconds
- DGHM/VAH-tested and RKI-compliant
- 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

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

Notes:





$$C_L = \begin{bmatrix} u_1 & -K \frac{u_1}{u_1} \\ u_1 & u_1 \end{bmatrix}^{-1} \begin{bmatrix} -e \\ -e \end{bmatrix} + K \epsilon_G$$
$$K = 3.5 \epsilon^{3/L} \exp(5.08 \epsilon_G)$$
$$u_t = -17.3 / u_L + [2999 \epsilon^{3/L} - 2 P_L \sqrt{\frac{9}{2\pi}}]$$
$$- A_c d \epsilon \frac{u_1 u_t}{dk} = 0$$



Technical Information

- Quality Management..... p. 318
- Certificates..... p. 320
- Monitoring of Measuring Instruments..... p. 321
- Easy Calibration Technique..... p. 324
- Calibration Service p. 326
- DAkkS Calibration Laboratory..... p. 328
- IVD Directive p. 330
- Laboratory Glass/Plastics p. 331
- Chemical Resistance p. 338
- Cleaning p. 342
- Safety Instructions p. 344



Quality Management

Quality management is briefly described for liquid handling instruments and BLAUBRAND® volumetric instruments

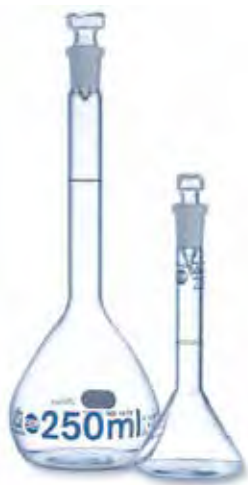
Quality management at BRAND begins at product conception and continues through the design process and production. Routine checks throughout the entire manufacturing process result in volumetric instruments with the smallest possible deviation from the true volume (accuracy) and narrow scatter of individual 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.

As BRAND manufactures conformity certified volumetric instruments, the quality of products is automatically supervised by the "Eichamt", the German State Office of Weights and Measures. The requirements for monitoring of measuring instruments, traceability to national standards, and staff qualification are fully met.




B H Conformity Certification

For volumetric instruments which are kept and used for commercial purposes (e.g., medical and pharmaceutical purposes) the German "Eichordnung" dated 12 August 1988 calls for conformity certification instead of official calibration. This also applies for volumetrically relevant accessories (e.g., pipette tips for piston-operated pipettes).

Conformity means: compliance of an instrument with the "Eichordnung", the German Federal Weights and Measures Regulations, Annex 12. The conformity certification procedure is described in DIN 12600.

The conformity symbol "H" and the manufacturer code designation (for BRAND it is "B") or, on request the "Eichamt" (the German State Office of Weights and Measures, with a separate conformity symbol) certifies the product as complying with the "Eichordnung" for Official Certification and corresponding standards. In general the product itself carries the symbol of conformity or, with disposables, the packaging.

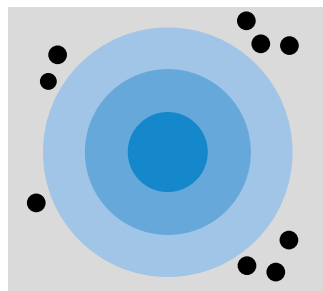
Note!  The conformity certification applies only to volumetric instruments. Therefore, thermometers and density bottles continue to be officially certified.

Precision

What do "Error Limit, Accuracy, Coefficient of Variation and Precision" mean in volumetric measuring?

An illustration of Precision and Accuracy

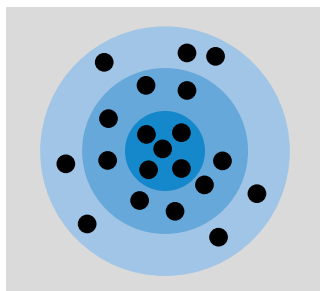
The dart board simulates the volume range around the centered specified value, the black dots simulate the different measured values of a specified volume.



Poor accuracy:
Hits far off center.

Poor reproducibility:
Hits widely scattered.

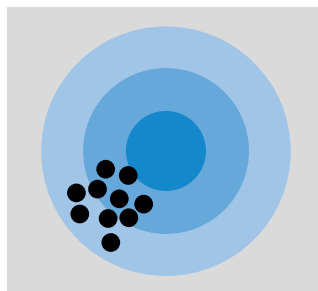
Result:
These volumetric instruments are of inferior quality.



Good accuracy:
On average, hits are evenly distributed around center.

Poor reproducibility:
No gross errors, but hits widely scattered.

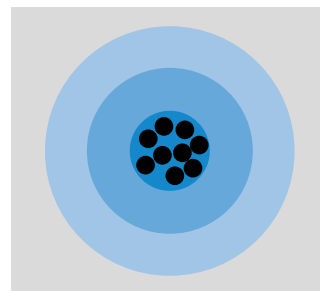
Result:
All deviations are "equally probable". Instruments exceeding the permissible limit should be removed from service.



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.

1 Error limit

The term "Error limit" (EL) in the corresponding standards defines the maximum permissible deviation from the specified value.

2 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 (\bar{V}) and the specified value ($V_{\text{spec.}}$), related to the specified value in percent.

3 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.

4 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 ($V_{\text{part.}}$). In contrast, there is no conversion for partial volumes, if A and CV are stated in volume units (e.g., ml).

5 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.

6 Precision (reproducibility)

It describes the closeness in volume units between the different values in a set of measurements.

$$1 \quad EL \geq |V_{\text{measured}} - V_{\text{spec.}}|$$

$$2 \quad A [\%] = \frac{\bar{V} - V_{\text{spec.}}}{V_{\text{spec.}}} \cdot 100$$

$$3 \quad CV [\%] = \frac{s \cdot 100}{\bar{V}}$$

$$4 \quad A_{\text{part.}} [\%] = \frac{V_{\text{nominal}}}{V_{\text{part.}}} \cdot A_{\text{nominal}} \%$$

$$5 \quad EL \geq \frac{|A\%| + 2CV\%}{100\%} \cdot V_{\text{nominal}}$$

(analog $CV_{\text{part.}} [\%]$)



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

H Conformity certified

All BLAUBRAND® volumetric instruments are conformity certified. With the sign **H**, BRAND confirms that the instruments are manufactured according to "Eichordnung", the German Federal Weights and Measures Regulations. This sign of conformity is printed directly on the instruments, according to DIN 12 600.

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.

13.02

(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.

13.02 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 instruments 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 necessary (see DIN 32937).

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

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.

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

$$\bar{V} = \bar{x} \cdot Z$$

$$\bar{V} = \frac{200.2 + 199.6 + 199.49 + \dots + 199.19}{10} \cdot 1.0032$$

$$\bar{V} = \frac{x_1 + x_2 + x_3 + \dots + x_n}{n} \cdot Z$$

$$\bar{V} = 199.513 \cdot 1.0032$$

$$\bar{V} = 200.1514$$

2. Calculation of accuracy

$$A [\%] = \frac{\bar{V} - V_{\text{spec.}}}{V_{\text{spec.}}} \cdot 100$$

$$A [\%] = \frac{200.1514 - 200}{200} \cdot 100$$

$$A [\%] = 0.076$$

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

$$s = Z \cdot \sqrt{\frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + (x_3 - \bar{x})^2 + \dots + (x_n - \bar{x})^2}{n-1}}$$

$$s = 1.0032 \cdot \sqrt{\frac{(200.2 - 199.51)^2 + (199.6 - 199.51)^2 + (199.49 - 199.51)^2 + \dots + (199.19 - 199.51)^2}{9}}$$

$$s = 1.0032 \cdot \sqrt{\frac{0.8393}{9}}$$

$$s = 0.306$$

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:

$$A_{20 \mu\text{l}} [\%] = \frac{V_{\text{nominal}}}{V_{20 \mu\text{l}}} \cdot A_{\text{nominal}} [\%]$$

$$A_{20 \mu\text{l}} [\%] = \frac{200 \mu\text{l}}{20 \mu\text{l}} \cdot 0.5\%$$

$$A_{20 \mu\text{l}} [\%] = 5\%$$

The calculation of $CV_{20 \mu\text{l}}$ 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

Technical Information

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 recalibration 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:

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".

- **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 cm³ to 100 cm³

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.

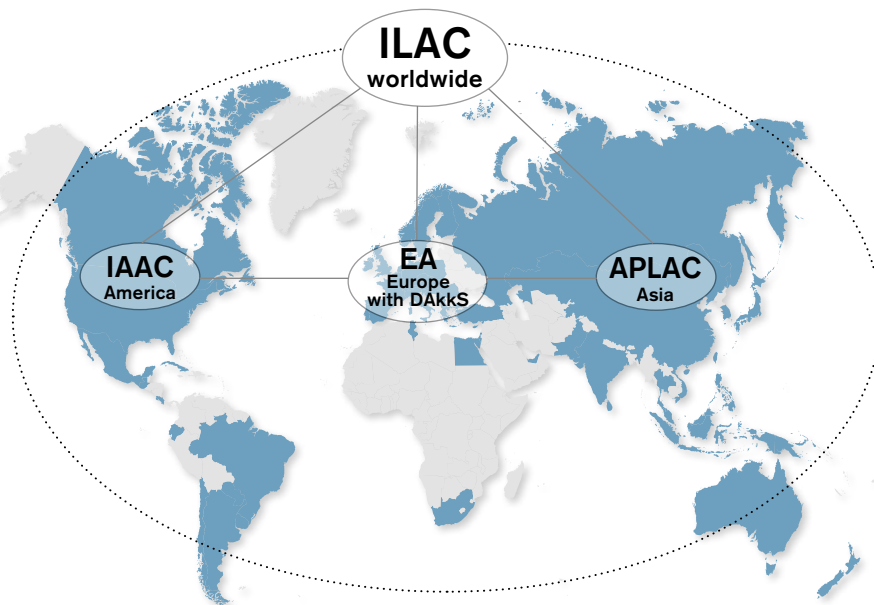
DAkkS – A member in the International Accreditation Network

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).

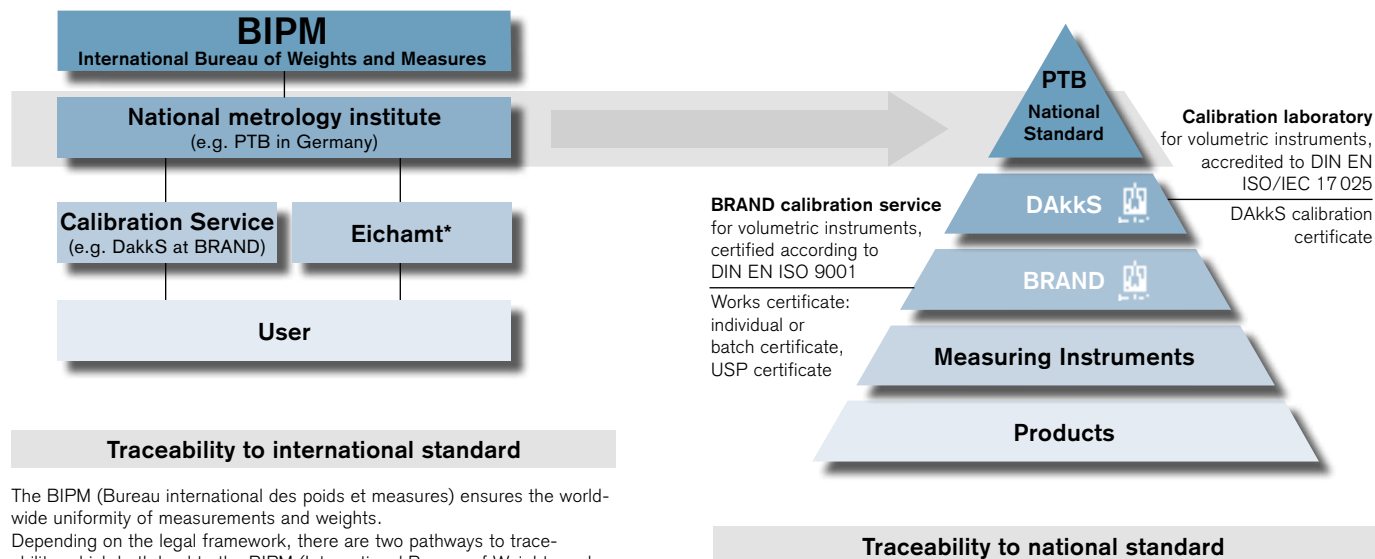
The complete information regarding the ILAC convention, as well as the list of all signatories can be read at www.ilac.org.



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



The BIPM (Bureau international des poids et mesures) ensures the world-wide 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



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
- haemocytometer 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:

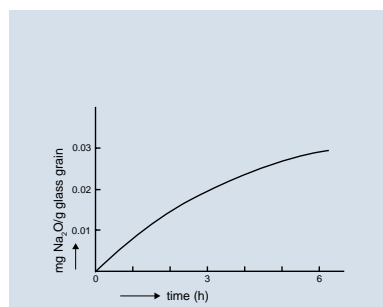
- Do not heat volumetric instruments, measuring cylinders and flasks on hot plates.
- Exothermic reactions such as diluting sulfuric acid or dissolving solid alkaline hydroxides must always be carried out while stirring and cooling the reagents, and in suitable vessels such as Erlenmeyer flasks – never 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.



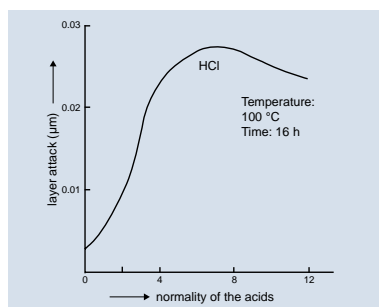
Chemical Resistance

Chemical interaction of glass with water and acids

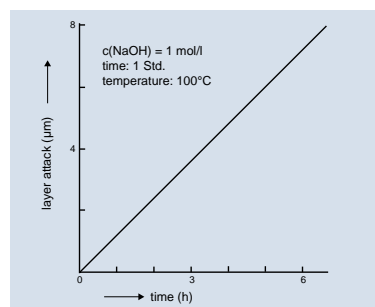
The chemical interaction of water and acids with glass surfaces is negligibly small; only very small amounts, primarily monovalent ions, are dissolved from the glass. This forms a very thin, almost non-porous layer of silica gel on the glass surface, inhibiting further attack. Exceptions are hydrofluoric acid and hot phosphoric acid which prevent the formation of the inert layer.



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 Na₂O 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 Na₂O per gram of glass grain will be removed.

Acid resistance

Borosilicate glass 3.3 meets class 1 of DIN 12 116, 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 cm². Removal of alkali oxide according to DIN ISO 1776 is less than 100 µg Na₂O/100 cm².

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 cm².

Chemical resistance to	Water DIN ISO 719 (HGB Class 1-5)	Acids DIN 12 116 (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.

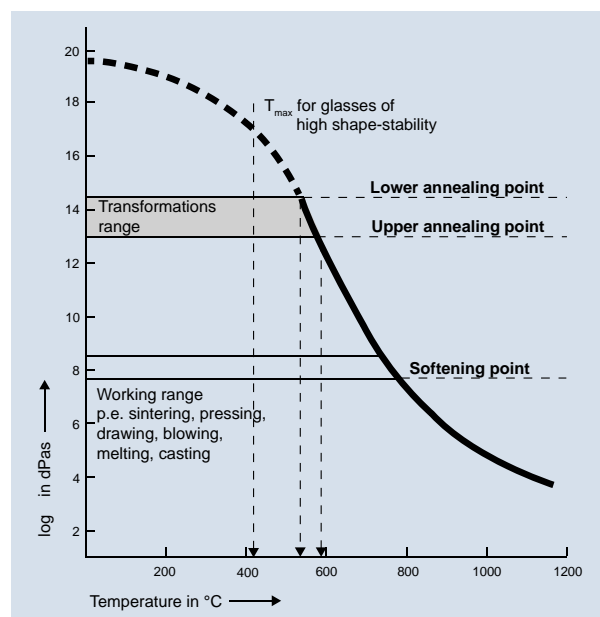
To eliminate inherent stress, glass must be heated up to a temperature between the upper and lower annealing point, be kept at this temperature for approx. 30 minutes and be cooled by observing the prescribed cooling rates.

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/mm². 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 slightly 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

Tetrafluoroethylene-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 performed by the user under actual working conditions.

Physical Properties

	Max. operating temperature (°C)	Brittle temperature (°C)	Micro wave suitability*	Density (g/cm ³)	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	-
<p>Excellent chemical resistance</p> <p>Continuous exposure to the substance does not cause damage within 30 days. The plastic may remain resistant for years.</p>	<p>Good to limited chemical resistance</p> <p>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).</p>	<p>Poor chemical resistance</p> <p>Not suitable for continuous exposure to the substance. Immediate(!) damage may occur (loss of mechanical strength, deformation, discoloration, cracking, dissolution).</p>

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	+	+
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	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	-	+	+
Benzene (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	-	-	-	-	-	-	-	-	-	-	+	+	o	-	o	-
Dibutyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	o	-	o	-
Dichlorbenzene	-	-	-	-	-	-	-	-	-	-	-	-	o	-	o	-
Dichloromethane (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	-
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.

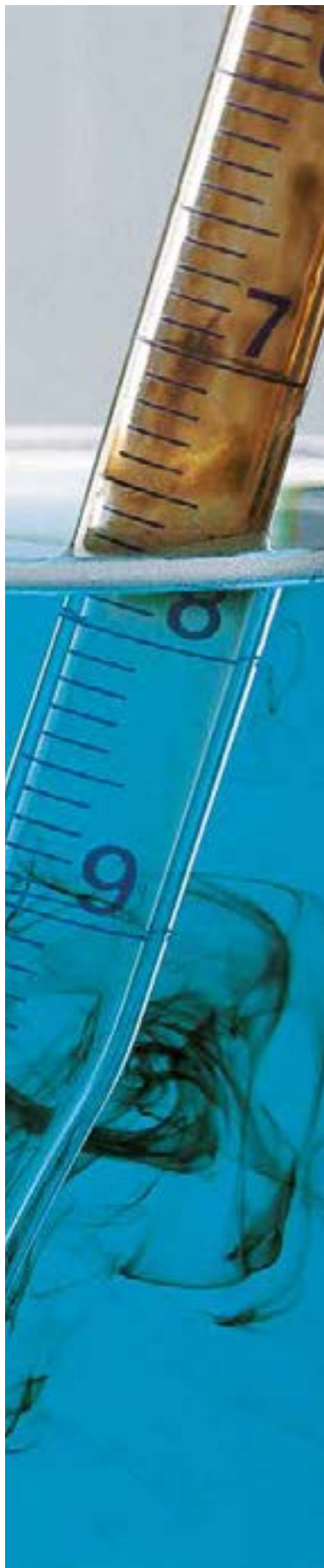
	PP		PMP		ETFE		PTFE		FEP/PFA		FKM	EPDM	NR	SI
	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C	20 °C	20 °C	20 °C	20 °C
Acetaldehyde	+	-	o	-	+	o	+	+	+	+	-	o	-	-
Acetic acid (glacial) 100%	+	o	+	o	+	+	+	+	+	+	-	o	o	o
Acetic acid 50%	+	+	+	+	+	+	+	+	+	+	-	-	-	-
Acetic anhydride	o	o	+	o	+	+	+	+	+	+	-	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	-
n-Butyl chloride (Chloropentane)	-	-	-	-	+	+	+	+	+	+	-	-	-	-
Aniline	+	+	+	o	+	o	+	+	+	+	-	-	-	-
Aqua regia	-	-	-	-	+	+	+	+	+	+	-	-	-	-
Barium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Benzaldehyde	+	+	+	+	+	o	+	+	+	o	-	o	-	-
Benzene	+	o	o	o	+	+	+	+	+	+	o	-	-	-
Benzene (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	-	-	-
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
Dichlorobenzene	o	-	-	-	+	o	+	+	+	+	+	-	-	-
Dichloromethane (Methylene chloride)	o	-	o	-	o	o	+	+	+	+	+	-	-	-
Dichloroacetic acid	o	-	+	+	+	o	+	+	+	+	+	-	-	-
Dichloroethane	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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	+	+	+	+	+	+
Isocetane	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	+	-	+	+	+	+	+	+	+	+
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	0	-	0	-	+	+	+	+	+	+	-	-	-	-
Fluoroacetic acid														
Formaldehyde 40%	+	+	+	+	+	+	+	+	+	+	0	+	0	0
Formamide	+	+	+	+	+	+	+	+	+	+	0	0	+	+
Formic acid 98-100%	+	+	+	0	+	+	+	+	+	+	-	0	0	-
Glycerol	+	+	+	+	+	+	+	+	+	+	0	+	0	+
Glycolic acid 70%	+	+	+	+	+	+	+	+	+	+	0	+	+	+
Heating oil (Diesel oil)	+	0	0	-	+	+	+	+	+	+	+	+	-	-
Heptane	0	0	0	0	+	+	+	+	+	+	+	-	-	0
Hexane	+	0	0	-	+	+	+	+	+	+	+	-	-	0
Hexanoic acid														
Hexanol	+	+	+	+	+	+	+	+	+	+	+	-	0	0
Hydriodic acid	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Hydrobromic acid	+	+	+	+	+	+	+	+	+	+	+	0	0	-
Hydrochloric acid 10%	+	+	+	+	+	+	+	+	+	+	+	+	0	0
Hydrochloric acid 20%	+	+	+	+	+	+	+	+	+	+	+	+	0	0
Hydrochloric acid 37%	+	+	+	+	+	+	+	+	+	+	0	+	0	-
Hydrofluoric acid 40%	+	+	+	+	+	+	+	+	+	+	0	0	-	-
Hydrofluoric acid 70%	+	0	+	0	+	+	+	0	+	+	-	-	-	-
Hydrogen peroxide 35%	+	+	+	+	+	+	+	+	+	+	+	0	-	0
Iodine-potassium iodide solution	+	+	+	0	+	+	+	+	+	+	+	+	+	-
Isoamyl alcohol	+	+	+	+	+	+	+	+	+	+	0	0	0	0
Isobutanol (Isobutyl alcohol)	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Isooctane					+	+	+	+	+	+	+	-	-	-
Isopropanol (2-Propanol)	+	+	+	+	+	+	+	+	+	+	+	+	+	0
Isopropyl ether	-	-	-	-	+	0	+	+	+	+	-	-	-	-
Lactic acid	+	+	+	+	+	+	+	+	+	+	+	0	0	0
Mercury	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mercury chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Methanol	+	+	+	+	+	+	+	+	+	+	-	+	0	+
Methoxybenzene					+	+	+	+	+	+	-	-	-	-
Methyl butyl ether	+	+	+	0	+	0	+	+	+	+	-	-	-	-
Methyl formate (Methyl methanoate)					+	+	+	+	+	+	-	0	-	0
Methyl propyl ketone	+	0	0	0	+	+	+	+	+	+	-	0	-	-
Methylene chloride (Dichloro methane)	0	-	-	-	+	+	+	+	+	+	0	-	-	-
Mineral oil (Engine oil)	+	+	+	+	+	+	+	+	+	+	+	+	-	0
Nitric acid 10%	+	+	+	+	+	+	+	+	+	+	0	0	-	-
Nitric acid 30%	0	-	0	-	+	+	+	+	+	+	0	-	-	-
Nitric acid 70%	-	-	-	-	+	+	+	+	+	+	-	-	-	-
Nitrobenzene	-	-	-	-	+	+	+	+	+	+	-	-	-	-
Oleic acid					+	+	+	+	+	+	0	-	-	-
Oxalic acid	+	+	+	+	+	+	+	+	+	+	+	+	0	0
Ozone	0	-	+	+	+	+	+	+	+	+	+	+	-	+
n-Pentane					+	+	+	+	+	+	+	-	-	-
Peracetic acid					+	+	+	+	+	+				-
Perchloric acid	+	-	0	-	+	+	+	+	+	0	+	0	-	-
Perchloroethylene	-	-	-	-	+	+	+	+	+	+	0	-	-	-
Petroleum	0	-	0	0	+	+	+	+	+	+	+	-	-	0
Petroleum ether					+	+	+	+	+	+	+	-	-	-
Phenol	+	+	0	0	+	+	+	+	+	+	0	-	-	-
Phenylethanol	0				+	+	+	+	+	+				-
Phenylhydrazine	0				+	+	+	+	+	+	0	-	0	-
Phosphoric acid 85%	+	+	+	+	+	+	+	+	+	+	+	0	-	-
Piperidine	+	+	+	+	+	+	+	+	+	+	-	-	-	-
Potassium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Potassium dichromate					+	+	+	+	+	+	0	+	0	0
Potassium hydroxide	+	+	+	+	+	+	+	+	+	+	-	+	0	-
Potassium permanganate	+	+	+	+	+	+	+	+	+	+	+	+	0	-
Propanediol (Propylene glycol)	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Propanol	+	+	+	+	+	+	+	+	+	+	+	+	+	0
Propionic acid	+	0	+	0	+	0	+	+	+	+	+	0	-	-
Pyridine	0	0	+	0	-	-	+	+	+	+	-	-	-	-
Salicylaldehyde	+	+	+	+	+	-	+	+	+	+	+	+	+	+
Salicylic acid	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Silver acetate	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Silver nitrate	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sodium acetate	+	+	+	+	+	+	+	+	+	+	-	+	+	0
Sodium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sodium dichromate	+	+	+	+	+	+	+	+	+	+	+	+	+	0
Sodium fluoride	+	+	+	+	+	+	+	+	+	+	+	+	0	0
Sodium hydroxide	+	+	+	+	+	+	+	+	+	+	0	+	0	0
Sulfuric acid 60%	+	+	+	+	+	+	+	+	+	+	+	-	-	-
Sulfuric acid 98%	-	-	+	+	+	+	+	+	+	+	+	-	-	-
Tartaric acid	+	+	+	+	+	+	+	+	+	+	+	0	+	+
Tetrachloroethylene					0		+	+	+	+	0	-	-	-
Tetrahydrofuran (THF)	0	-	0	-	+	0	+	+	0	0	-	-	-	-
Tetramethylammonium hydroxide					+	+	+	+	+	+	-	+	-	-
Toluene	0	-	0	-	+	+	+	+	+	+	0	-	-	-
Trichloroacetic acid	0	-	+	+	+	0	+	+	+	+	-	0	0	0
Trichlorobenzene	-	-	0	0	+	0	+	+	+	+				-
Trichloroethane	-	-	-	-	+	+	+	+	+	+	+	-	-	-
Trichloroethylene	-	-	-	-	+	+	+	+	+	+	0	-	-	-
Trichlorotrifluoro ethane					0	-	+	+	+	+				-
Triethanolamine							+	+	+	+	-	0	0	-
Triethylene glycol	+	+	+	+	+	+	+	+	+	+	+	+	0	+
Trifluoro ethane							+	+	+	0	+	-	-	-
Trifluoroacetic acid (TFA)							0	+	-	-	-			+
Tripropylene glycol	+	+	+	+	+	+	+	+	+	+			+	+
Turpentine	-	-	0	0	+	+	+	+	+	+	+	-	-	-
Urea	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Xylene	-	-	0	-	+	+	+	+	+	+	0	-	-	-
Zinc chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Zinc sulfate	+	+	+	+	+	+	+	+	+	+	+	+	0	+



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.

Wiping and scrubbing 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.

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.

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 HNO₃ at room temperature for not more than 6 hours. (Glass laboratory equipment is often boiled for 1 hour in 1N HNO₃.)

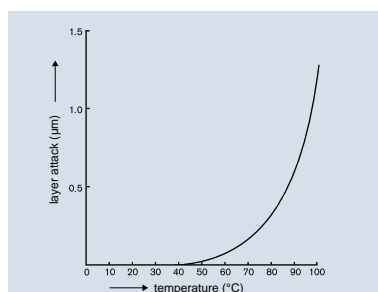
It is then rinsed with distilled water. To minimize organic contamination, laboratory equipment can first be cleaned with alkalis, or a solvent such as alcohol.

Gentle Cleaning

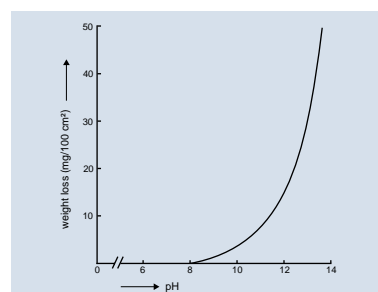
For gentle treatment of labware, clean immediately after use – at low temperatures, with brief soaking times, and at low alkalinity. Glass volumetric instruments should not be exposed to prolonged immersion times in alkaline media above 70 °C, as such treatment might cause volume changes through glass 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 preferable.



Typical curve of alkali attack on Boro 3.3 in relation to temperature, calculated from weight loss. $c(\text{NaOH}) = 1 \text{ mol/l}$. 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.

Therefore 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.
- 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.

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.

Please see page 331 for other **safety information** that apply to glass instruments.

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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 International the 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 ex works 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 their 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 by debit order/direct debit mandate, 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 or 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.



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