


Competence in Labware

Labware range

VITLAB
Competence in Labware

Welcome!

Our extensive range of products provides you with optimal support in your laboratory work, in a wide variety of application ranges. Regardless of whether your work involves volume measurement, sampling or storage: our aim is to develop, manufacture and provide you with products that will facilitate your work whilst continuing to ensure that you achieve perfect results.

This catalog includes all our products, as well as all the relevant, important information. In order to facilitate things for you, we have also divided our products into application ranges.

The different application ranges, such as titration, dosing and pipetting, now include all the VITLAB products that you require for these tasks. Consequently, the chapter on volume measurement includes volumetric flasks, graduated cylinders, graduated pitchers and other plastic products that facilitate your work and help you to achieve precise results.

Our wide range of products includes labware for almost all conceivable areas of application. However, you also have the option to have plastic labware made to measure and manufactured according to your needs. For example, you have the opportunity to determine the geometry and thickness of the various bottles and beakers that you require for special tasks. In addition, you also have the option to choose your own impressions, your own graduation or a special label. Labware that bears your company name and logo is particularly effective for advertising and marketing. Further information is available in the VITLAB Promotional chapter.

On request, VITLAB also offers fluorination, which makes the plastic surfaces even more stable when they come into contact with the many different organic solvents. Our state-of-the-art production facilities also allow us to manufacture and package sterile products in a controlled environment similar to that of a clean room.

Many things are possible – do not hesitate to ask what we can do for you!

VITLAB
your partner fo

Tradition

VITLAB represents 100 years of tradition. VITRI GmbH & Co. KG was founded in Mühltal (Germany) in 1908. In 1989, the laboratory division was established as the independent company, VITLAB. Today, VITLAB is a leading manufacturer of liquid handling instruments and performance plastic products for one-time or long-term use. We develop and manufacture these products at our own production facility.

Quality

Independent inspections and routine internal audits guarantee the effectiveness of VITLAB's quality management system throughout the company, from development to shipment. As a result, the phrase 'Made by VITLAB' has become synonymous with quality. VITLAB has been certified since January 1994 and is currently DIN EN ISO 9001:2000 certified. Environmental protection is also firmly anchored in our corporate philosophy and VITLAB has been DIN EN ISO 14001 certified since May 1999.

r reliability

Service

Thanks to its intensive partnerships with distributors almost everywhere in the world, VITLAB can offer reliable availability of its products, sound advice and seamless logistics. Our qualified product training sessions provide information and tips on using our laboratory products and liquid handling devices. Just in case, our trained repair service is on hand to keep downtimes to an absolute minimum.

Advantages

It is difficult to imagine a laboratory today which does not make use of the wide variety of plastic materials. There are many good reasons for this: High quality plastic materials show a significant level of resistance to chemical substances. Superior break resistance means that the products can be used for a long period of time. Danger of injury in the laboratory is greatly reduced. Light weight materials make handling of the equipment easier. And last, but certainly not least: Laboratory equipment made from plastic materials is less expensive.

Fluoro plastic PFA

Extremely high standards are set for the laboratory products in trace analysis. VITLAB is one of the few manufacturers that uses fluorocarbon PFA in this area of application. Laboratory products that are manufactured using this high-performance plastic guarantee a high level of long-term stability for standard solutions.

For your information

Please understand that technical specifications, catalog numbers and designs may change during the validity period of this catalog. The illustrations that are used are for informative purposes and the details may vary from the description. All measures, with the exception of exact tolerances, are understood as approximate values. Please take into consideration that the actual testing and measuring results may be influenced by a variety of factors that are beyond our control. Therefore, you should carefully check the data prior to transferring it to the particular application in question.

The packaging units (SP) correspond to the minimum order quantities. All the relevant information is also available on the Internet at www.vitlab.de.

If you require any further information, please do not hesitate to call us.

Customer Service page 8

Titration page 9

Dosing page 15

Pipetting page 23

Volume measurement page 33

Saving and storing page 57

Bottling and weighing page 91

Filtering and decanting page 95

Stirring and mixing page 101

Connecting and controlling page 107

Fluoro plastic products page 113

VITLAB Promotional page 129

General and technical information page 132

VITLAB Customer Service

Your personal point of contact

Our Customer Service staff is at your service to provide you with competent answers and advice to all your queries and questions concerning offers, orders and deliveries. Our Product Management and Sales Team are at your disposal at all times – also "on site" – with any technical information or assistance that you might require for your application.

VITLAB GmbH Customer Service
tel: +49 (0) 6026 9 77 99-0
fax: +49 (0) 6026 9 77 99-30
e-mail: info@vitlab.de

Speedy deliveries

VITLAB products can be ordered from distributors of laboratory equipment. A list of our authorized sales partners is available on the Internet at www.vitlab.de. Or simply ask us. Our state-of-the-art logistics at our plant in Grossostheim ensures high levels of availability for all the articles listed in the catalog.

Clear product statements

Our aim is to provide you with a clear and comprehensive presentation of all the product information that is relevant for you. We have used the following symbols in order to allow for quicker orientation:

- product included in the VITLAB catalog for the first time
- Class A volume measurement instrument in accordance with DIN ISO
- KB, conformity attested product according to DIN ISO, with certificate
- product suitable for foodstuffs in accordance with 2002/72/EC
- product suitable for the storage of light sensitive media
- product individually packaged in PE bags, labelled with article number, description and EAN code

Perfect Liquid Handling

HIGH-PRECISION TITRATION

VITLAB
Competence in Labware

Titration with new dosage technology

Bottletop burette VITLAB continuous

Chemical volumetric analysis with minute liquid volumes requires a great deal of concentration. With VITLAB continuous, the bottletop burette, you can carry out continuous titration and comfortably attain secure results – and save a lot of time in the process. The patented[1)] double-piston pump holds the solution to be measured permanently and pulse-free – filling procedures are not necessary. Furthermore, this innovative technology increases security; its compact structure and low center of gravity reduce risk of spillage, especially with smaller bottles. The height and length of the discharge tube can be adjusted, allowing you to work safely with both short and tall bottles. The patented[2)] return dosage system from VITLAB has two advantages: it prevents the loss of valuable reagents and reduces the risk of splashing. The simple-to-use calibration function helps meet all the requirements of testing-apparatus monitoring – with minimal downtime. Margins of error are well within those specified in the German DIN EN ISO 8665-3 standard, even for partial volumes.

[1)] EP 801 982
[2)] EP 542 241

By turning both thumbwheels, the titration liquid is pumped continually by the patented[1)] double-piston pump.

The patented[2)] recirculation valve from VITLAB reduces reagent loss and increases safety.

The angled display clearly shows the titration volume and simplifies operation.

1 Long operating life from two easily-replaced micro-batteries 1.5 V

2 Large, easy-to-read digits

3 Simple, media-specific readjustment via keypad

4 Continual supply of titration medium with patented[1)] double-piston pump

5 Telescopic discharge tube which can be adjusted in both height and length

6 Continuous and precise regulation of titration speed with a large practical thumbwheel

7 Reduced titrant waste with patented[2)] recirculation valve

8 Rotates freely 360° on bottle to align the label of the bottle with the touch panel

9 Adaptable to bottles of different sizes

10 Telescopic, extractable intake tube adapts burette to bottles of varying heights

VITLAB continuous E/RS

With recirculation valve and patented double-piston pump for permanent and pulse-free supply of the solution to be measured. Conformity certified according to DIN 12600.

Margins of error in accordance with DIN EN ISO 8655-3:

	VITLAB continuous E at 25 ml	VITLAB continuous RS at 50 ml
Accuracy:	≤ ±0.2 %	≤ ±0.2 %
Coefficient of variation:	≤ 0.1 %	≤ 0.1 %

Items supplied:
VITLAB continuous E/RS, thread adapters PP GL 32, GL 38 and S*40, telescopic intake tube, telescopic discharge tube, two micro-batteries 1.5 V (LR 03/AAA), instruction manual, quality certificate.

*Buttress thread

Type	Volume/t ml	Thread	SP	Art. No.
E	2.5	GL 45	1	1620506
RS	5.0	GL 45	1	1620507

Recommended application range for the bottletop burette VITLAB continuous:

The VITLAB bottletop burette continuous E/RS can be used for the following titrants up to a concentration of 2 mol/l:

Reagent	Reagent
Acetic acid	Potassium dichromate solution
Alcoholic potassium hydroxide solution	Potassium hydroxide solution
Ammonium iron (II) sulfate solution	Potassium iodate solution
Ammonium thiocyanate solution	Potassium permanganate solution
Barium chloride solution	Potassium thiocyanate solution
Bromide bromate solution	Silver nitrate solution
Cerium (IV) sulfate solution	Sodium arsenite solution
EDTA solution	Sodium carbonate solution
Hydrochloric acid	Sodium chloride solution
Iodine solution	Sodium hydroxide solution
Iron (II) sulfate solution	Sodium nitrite solution
Nitric acid	Sodium thiosulfate solution
Oxalic acid solution	Sulfuric acid
Perchloric acid	Tetra-n-butylammonium hydroxide solution
Potassium bromate solution	Zinc sulfate solution
Potassium bromate bromide solution	

The above table and recommendations have been compiled with the greatest care and reflect testing on the basis of the available information. Always follow the instructions in the operating manual of the instrument, as well as the reagent manufacturer's specifications. Should you require information on chemicals that are not listed, please do not hesitate to contact us. As of: 02/08.

Accessories for bottletop-burettes

For detailed descriptions of spare parts please see the instruction manual of the instrument or our hompage www.vitlab.de.

Description	External thread	Bottle thread	SP	Art. No.
Bottle, amber glass, coated, square, 1000 ml		GL 45	1	1671500
Bottle, amber glass, coated, round, 2500 ml		GL 45	1	1671510
Drying tube, PP, unfilled			1	1671095
NS-adapter, PP	GL 32	NS 19/26	1	1670066
NS-adapter, PP	GL 32	NS 24/29	1	1670067
NS-adapter, PP	GL 32	NS 29/32	1	1670068
Thread adapter, PTFE/ETFE	GL 32	GL 28	1	1670080
Thread adapter, PTFE/ETFE	GL 38	GL 32	1	1670095
Thread adapter, PTFE/ETFE	GL 45	GL 32	1	1670100
Thread adapter, PTFE/ETFE	GL 45	GL 38	1	1670115
Thread adapter, PTFE/ETFE	GL 45	S*40	1	1670125
Thread adapter, PP	GL 32	GL 28	1	1670155
Thread adapter, PP	GL 38	GL 32	1	1670085
Thread adapter, PP	GL 45	GL 32	1	1670180
Thread adapter, PP	GL 45	GL 38	1	1670110
Thread adapter, PP	GL 45	S*40	1	1670120
* Buttress thread				

VITLAB symbiotic, type Dr. Schilling

Plastic-coated burette made of borosilicate glass 3.3. Class B. Conformity with DIN ISO 384. With Schellbach stripes (blue/white) and easily readable black scaling. Calibrated to deliver "Ex". Automatic zeroing. The stopcock of the burette is made of high quality plastic. Its PTFE plug turns easily and allows fine titration.
Special protection against breakage if the symbiotic gets knocked over:
- The temperature-resilient plastic coating helps the entire device to resist breakage and glass fragments are confined within the sheath
- A small bumper has been attached to the upper end of the upright measuring tube. This feature reduces the change of breakage

Material: burette of borosilicate glass 3.3, filling tube PP, burette stopcock PMP/PTFE, reservoir bottle PE-LD

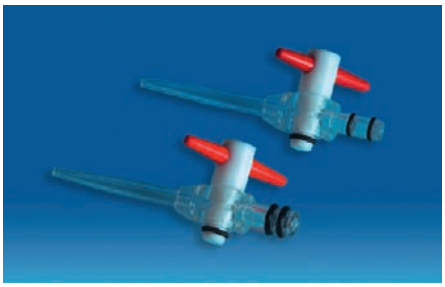
Volume ml	Tolerance ± ml	Graduation ml	Height mm	Bottle ml	SP	Art. No.
25	0.05	0.05	900	1000	1	106599
50	0.10	0.10	900	1000	1	106699

Burettes

Plastic-coated burette made of borosilicate glass 3.3. Class B. Conformity with DIN ISO 384. With Schellbach stripes (blue/white) and easily readable black scaling. Calibrated to deliver "Ex".
The stopcock of the burette is made of high quality plastic. Its PTFE plug turns easily and allows fine titration.
The temperature-resilient plastic coating helps the entire device to resist breakage and glass fragments are confined within the sheath.

Material: burette of borosilicate glass 3.3, burette stopcock PMP/PTFE.

Volume ml	Tolerance ± ml	Graduation ml	Length mm	SP	Art. No.
25	0.05	0.05	800	2	105599
50	0.10	0.10	800	2	105699



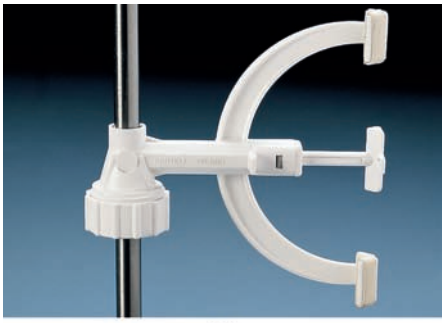
Burette stopcocks

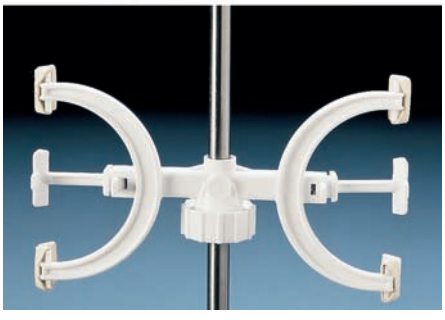
Stopcocks made of PMP. Plugs of PTFE with polished surface turn easily but fit thightly. Insert with two seals.

Art. no. 105799: For burette tubes inner diam. 7.75 ± 0.1 mm.

Art. no. 105899: For burette tubes inner diam. 11.5 ± 0.1 mm.

For Burettes ml	Height	Inner-Ø tip	Immersion depth mm	SP	Art. No.
25	90	1.25	17	5	105799
50	90	1.25	17	5	105899





Burette clamps, PP

Fit rods with diameters of 8 to 14 mm. Clamp arms have rubber-coated tips for secure gripping of burettes.
Graduations and meniscus are visible at all times. Comes supplied with a stainless steel spring.

Type	SP	Art. No.
single	5	80139
double	5	80140

Perfect Liquid Handling

TOTALLY RELIABLE DOSING

VITLAB
Competence in Labware

Lab routines quick, easy and safe

Bottletop-dispensers VITLAB genius and simplex

Extracting measured amounts of liquid from bottles is a routine laboratory task best carried out quickly, accurately, precisely, simply and safely, and without reagent loss.

The VITLAB genius and VITLAB simplex bottletop-dispensers are precision devices that not only accomplish these objectives, but also offer many other advantages. The direct displacement plungers, for example, use a fluoro plastic (PFA) seal that works like a windscreen wiper to prevent build-up of easily crystallizing media on the cylinder wall. The glass cylinder is also coated with a synthetic material that reduces risk of splashes if breakage should occur. The telescopic intake tube can be adjusted easily and smoothly to the height of the bottle. And, since the materials in contact with the media (PTFE, PFA, FEP, borosilicate glass and platinum-iridium) are resistant to acids, solvents and bases, the bottletop-dispensers from VITLAB can be applied almost universally. All VITLAB dispensers are completely autoclavable at 121°C.

VITLAB genius is also equipped with our patented[2)] recirculation valve that reduces reagent loss when ventilated. The simple-to-use calibration function of the genius helps to meet all of the requirements of testing-apparatus monitoring, with the minimum of downtime.

[2)] EP 542 241

1 Media-specific readjustment by turning the adjustment setting (genius only)

2 Smooth handling! Direct displacement plunger with broad PFA seal prevents crystallization build-up

3 Volume settings are quickly and accurately adjusted with a practical screw mechanism

4 Reduced titrant waste with patented[2)] recirculation valve (genius only)

5 Rotates freely 360° on bottle to align the label of the bottle with the touch panel

6 Attached tube-cap reduces the risk of drips

7 Adaptable to bottles of different sizes

8 Telescopic, extractable intake tube adapts dispenser to bottles of varying heights

VITLAB simplex

With variable volume. Conformity certified according to DIN 12600.

Margins of error in accordance with DIN EN ISO 8655-5:

Nominal volumes:	2.5 ml	5.0 to 100.0 ml
Accuracy:	≤ ±0.6 %	≤ ±0.5 %
Coefficient of variation:	≤ 0.1 %	≤ 0.1 %

Items supplied:
VITLAB simplex, three thread adapters of PP (see below), telescopic intake tube (200 to 350 mm), mounting key, instruction manual, quality certificate stating all test values.

Volume ml	Graduation ml	Thread	Adapter	SP	Art. No.
0.25 - 2.5	0.05	GL 32	GL 28, 45, S*40	1	1601503
0.5 - 5.0	0.10	GL 32	GL 28, 45, S*40	1	1601504
1.0 - 10.0	0.20	GL 32	GL 28, 45, S*40	1	1601505
2.5 - 25.0	0.50	GL 45	GL 32, 38, S*40	1	1601506
5.0 - 50.0	1.00	GL 45	GL 32, 38, S*40	1	1601507
10.0 - 100.0	2.00	GL 45	GL 32, 38, S*40	1	1601508

* Buttress thread

VITLAB simplex fix

With fixed volume. Conformity certified according to DIN 12600.

Margins of error in accordance with DIN EN ISO 8655-5:

Nominal volumes:	1.0 ml	5.0 to 10.0 ml
Accuracy:	≤ ±0.6 %	≤ ±0.5 %
Coefficient of variation:	≤ 0.1 %	≤ 0.1 %

Items supplied:
VITLAB simplex fix, three thread adapters of PP (see below), telescopic intake tube (200 to 350 mm), mounting key, instruction manual, quality certificate stating all test values.

Volume ml	Graduation ml	Thread	Adapter GL	SP	Art. No.
1.0	-	GL 32	GL 28, 45, S*40	1	1602502
5.0	-	GL 32	GL 28, 45, S*40	1	1602504
10.0	-	GL 32	GL 28, 45, S*40	1	1602505

* Buttress thread

VITLAB genius

With variable volume, recirculation valve and media-specific recalibration. Conformity certified according to DIN 12600.

Margins of error in accordance with DIN EN ISO 8655-5:

Nominal volumes:	2.5 ml	5.0 to 100.0 ml
Accuracy:	≤ ±0.6 %	≤ ±0.5 %
Coefficient of variation:	≤ 0.1 %	≤ 0.1 %

Items supplied:
VITLAB genius, three thread adapters of PP (see below), telescopic intake tube (200 to 350 mm), mounting key, instruction manual, quality certificate stating all test values.

Volume ml	Graduation ml	Thread	Adapter	SP	Art. No.
0.25 - 2.5	0.05	GL 32	GL 28, 45, S*40	1	1605503
0.5 - 5.0	0.10	GL 32	GL 28, 45, S*40	1	1605504
1.0 - 10.0	0.20	GL 32	GL 28, 45, S*40	1	1605505
2.5 - 25.0	0.50	GL 45	GL 32, 38, S*40	1	1605506
5.0 - 50.0	1.00	GL 45	GL 32, 38, S*40	1	1605507
10.0 - 100.0	2.00	GL 45	GL 32, 38, S*40	1	1605508

* Buttress thread

Dispenser HF

With variable volume, recirculation valve and media-specific recalibration.
For dispensing of hydrofluoric acid (HF). Parts in contact with reagent made of ceramics (cylinder, valve seats and balls) and platinum-iridium. Conformity certified according to DIN 12600.

Margins of error in accordance with DIN EN ISO 8655-5:

Nominal volume:	10.0 ml
Accuracy:	≤ ±0.5 %
Coefficient of variation:	≤ 0.1 %

Items supplied:
Dispenser HF, three thread adapters of PP (see below), telescopic intake tube (125 to 240 mm), mounting key, instruction manual, quality certificate stating all test values.

Volume ml	Gradation ml	Thread	Adapter	SP	Art. No.
1.0 - 10.0	0.20	GL 45	GL 25, 28, 32, 38, S*40	1	1606515

* Buttress thread

Recommended application range for the VITLAB bottletop-dispensers genius und simplex:

Reagent	Reagent	Reagent
Acetaldehyde	Chromosulfuric acid	Methyl butyl ether
Acetic acid	Copper sulfate	Methyl formate
Acetone	Cresol	Methyl propyl ketone
Acetonitrile	Cumene (Isopropyl benzene)	Mineral oil (Engine oil)
Acetylacetone	Cyclohexanone	Monochloroacetic acid, 50 %
Acrylonitrile	Decane	Nitric acid, 30%
Acrylic acid	1-Decanol	Nitrobenzene
Adipic acid	Dibenzylether	Octane
Allyl alcohol	Dichlorobenzene	Oleic acid
Aluminium chloride	Dichloroethane	Oxalic acid
Amino acids	Dichloromethane	Perchloric acid
Ammonium chloride	Diethanolamine	Petroleum
Ammonium fluoride	Diethylamine	Phenol
Ammonium hydroxide	1.2 Diethylbenzene	Phenylethanol
Ammonium sulfate	Diethylene glycol	Phenylhydrazine
n-Amyl acetate	Diethyl ether	Phosphoric acid, 85%
Amyl alcohol (Pentanol)	Dimethylaniline	Phosphoric acid, 85% + Sulfuric acid 98%, 1:1
Amyl chloride (Chloropentane)	Dimethylformamide (DMF)	Piperidine
Aniline	Dimethyl sulfoxide (DMSO)	Potassium chloride
Barium chloride	1.4 Dioxane	Potassium dichromate
Benzaldehyde	Diphenyl ether	Potassium hydroxide
Benzine (Gasoline)	Ethanol	Potassium permanganate
Benzene	Ethanolamine	Propanol
Benzoyl chloride	Ethyl acetate	Propionic acid
Benzyl alcohol	Ethyl methyl ketone	Propylene glycol (Propanediol)
Biuret reagent	Formaldehyde	Propylene oxide
Benzyl amine	Formamide	Pyridine
Benzyl chloride	Formic acid	Pyruvic acid
Boric acid	Glycol (Ethylene glycol)	Salicyl acid
Bromobenzene	Glycolic acid, 50 %	Salicylaldehyde
Bromonaphthalene	Glycerol	Sodium acetate
Butanediol	Heating oil (Diesel oil)	Sodium chloride
1-Butanol	Hexane	Sodium dichromate
Butyric acid	Hexanoic acid	Sodium fluoride
n-Butyl acetate	Hexanol	Sodium hypochlorite
Butyl amine	Hydrochloric acid, 37%	Sodium hydroxide, 30%
Butyl methyl ether	Hydroiodic acid	Sulfuric acid, 98%
Calcium carbonate	Iodine-Potassium iodide solution	Silver acetate
Calcium chloride	Isoamyl alcohol	Silver nitrate
Calcium hydroxide	Isobutanol	Turpentine
Calcium hypochlorite	Isopropanol (2-Propanol)	Tetramethylammonium hydroxide
Chloroacetalaldehyde	Isopropyl ether	Toluene
Chloroacetone	Lactic acid	Tartaric acid
Chlorobenzene	Magnesium chloride	Urea
Chlorbutane	Mercuric chloride	Xylene
Chloroacetic acid	Methanol	Zinc chloride
Chloro naphthalene	Methoxybenzene	Zinc sulfate
Chromic acid	Methyl benzoate	

Hydrofluoric acid (HF): Only the Dispenser HF is specifically designed to dispense hydrofluoric acid (maximum permitted concentration 52%). The VITLAB bottletop dispensers piccolo 1 and piccolo 2 are used mainly in connection with aqueous and highly diluted agents.

The above table and recommendations have been compiled with the greatest care and reflect testing on the basis of the available information. Always follow the instructions in the operating manual of the instrument, as well as the reagent manufacturer's specifications. Should you require information on chemicals that are not listed, please do not hesitate to contact us. As of: 02/08.

VITLAB piccolo

For dosing of tiny quantity of liquids in all areas of biochemistry and medical research.

With the VITLAB piccolo you can dispense the smallest quantities directly from the bottle - a big help, particularly for serial dispensing operations. This approach can even reduce costs since disposable tips are not necessary.

The egonomic design makes dispensing simple and uncomplicated. The VITLAB piccolo can be used with just one hand. Use the thumb (just like pipetting) to depress the volume dispensing button. The spring-loaded piston refills the micro-dispenser automatically after dispensing.

The discharge tube can be rotated 360° so the dispenser can always be used with the label visible for safety.

In order to garantee high levels of resistance to chemicals and a broad range of applications, only high-quality materials, such as PTFE, PFA, ETFE, FEP, borosilicate glass and platinum-iridium, come in contact with the media.

Items supplied:
VITLAB piccolo 1 or 2, mounting key, instruction manual.

Type	Volume µl	Accuracy ≤±	Coefficient of variation ≤	SP	Art. No.
piccolo 1	100	3.0	0.4	1	1610501
piccolo 1	200	2.5	0.4	1	1610502
piccolo 1	250	2.0	0.4	1	1610503
piccolo 1	500	1.5	0.3	1	1610504
piccolo 1	1000	1.0	0.2	1	1610506
piccolo 2	100 / 250	2.0	0.4	1	1611503
piccolo 2	500 / 1000	1.0	0.2	1	1611506
piccolo 2	1000 / 2000	1.0	0.2	1	1611508
Other volumes are available on request.					

Accessories for bottletop-dispensers

For detailed descriptions of spare parts please see the instruction manual of the instrument or our hompage www.vitlab.de.

Description	External thread	Bottle thread	SP	Art. No.
Bottle, amber glass , coated, round, 100 ml		GL 28	1	1671505
Bottle, amber glass , coated, square, 100 ml		GL 32	1	1671506
Bottle, amber glass , coated, square, 250 ml		GL 32	1	1671515
Bottle, amber glass , coated, square, 500 ml		GL 32	1	1671520
Bottle, amber glass , coated, square, 1000 ml		GL 45	1	1671500
Bottle, amber glass , coated, round, 2500 ml		GL 45	1	1671510
Drying Tube, PP, unfilled			1	1671095
NS-adapter, PP	GL 32	NS 19/26	1	1670066
NS-adapter, PP	GL 32	NS 24/29	1	1670067
NS-adapter, PP	GL 32	NS 29/32	1	1670068
Thread adapter,, PP, piccolo	GL 28	GL 32	1	1670145
Thread adapter,, PP	GL 32	GL 25	1	1670150
Thread adapter,, PP	GL 32	GL 28	1	1670155
Thread adapter,, PP	GL 32	GL 38	1	1670165
Thread adapter,, PP	GL 32	GL 45	1	1670175
Thread adapter,, PP	GL 32	S*40	1	1670170
Thread adapter,, PP	GL 38	GL 32	1	1670185
Thread adapter,, PP	GL 45	GL 32	1	1670180
Thread adapter,, PP	GL 45	GL 38	1	1670110
Thread adapter,, PP	GL 45	S*40	1	1670120
Thread adapter,, PTFE	GL 32	GL 25	1	1670072
Thread adapter,, PTFE	GL 32	GL 28	1	1670080
Thread adapter,, PTFE	GL 32	GL 45	1	1670105
Thread adapter,, PTFE	GL 32	S*40	1	1670092
Thread adapter,, PTFE	GL 45	GL 32	1	1670100
Thread adapter,, PTFE	GL 45	GL 38	1	1670115

* Buttress thread

Perfect Liquid Handling

PIPETTING WITH EASE AND COMFORT

VITLAB
Competence in Labware

VITLAB pipeo®

For all pipettes from 0.1 to 100 ml
With the new pipet controller VITLAB pipeo®, pipet handling is simple and comfortable. The ergonomic handle, very light weight - only about 190 grams - and excellent balance all contribute to operating ease. Freely and precisely adjust the speed of the liquid discharge with one hand using the two easily accessible buttons. A 50 ml pipet can be filled, quietly and with minimum vibration, in less than ten seconds. The VITLAB pipeo® can be set to release liquid either in gravity delivery, or in blow out mode using the battery-operated motor.

Items supplied:
VITLAB pipeo®, battery charger, battery, two battery compartment covers, two spare membrane filters 0.2 µm, instruction manual.

Type	SP	Art. No.
pipeo® with battery charger for Europe	1	1631500
pipeo® with battery charger for UK/Ireland	1	1631510
pipeo® with battery charger for Australia	1	1631520
pipeo® with battery charger for Japan	1	1631530

1 Charge-level indicator (LED)
2 Mode selector (gravity delivery / blow-out)
3 Battery compartment cover
4 Ergonomic formed design
5 Single-hand operation
6 Direct discharge of liquid vapors
7 Adapter for a secure attachment of pipets, from 0.1 to 100 ml
8 Pipetting buttons

VITLAB maneus®

For all pipettes from 0.1 to 100 ml. With membrane filter 3 µm and instruction manual.

The new VITLAB maneus® pipet controller allows both left and right-handed people to work easily, tirelessly and safely with all common pipettes from 0.1 to 10 ml. Its easy handling combined with high sensitiveness also lets inexperienced users set the meniscus precisely. The VITLAB maneus® pipet controller is easy to take apart, very simple to clean and completely autoclavable.

Type	SP	Art. No.
maneus®	1	1630500

1 Suction bellows for fast pipette filling (50 ml in less than10 seconds)

2 Button for emptying blow-out pipettes

3 The pipetting knob allows sensitive intake and delivery of fluids

4 The perfectly harmonized valve unit ensures effortless liquid intake

5 A replaceable hydrophobic membrane filter protects the interior from penetrating liquids

6 An especially designed intake cone allows the use of pipettes from 0.1 ml to 100 ml

Pipette filler bulbs, NR

Pipette filler with 3 valves.
Valve A: Release air, Valve S: Filling, Valve E: Delivery

Type	SP	Art. No.
Universal model, for pipets up to 10 ml	1	104099
Universal model, for pipets up to 100 ml	1	104199

Pipette pumps

For pipetting liquids, fit all glass and plastic pipettes. Slowly rotating their actuator-wheels inducts liquid into pipettes. Pressing their relief valves automatically empties pipette pumps without returning their plungers.

For Pipettes ml	Colour	SP	Art. No.
2	blue	1	324594
10	green	1	324694
25	red	1	324794

Accessories for pipette controllers

For detailed descriptions of spare parts please see the instruction manual of the instrument or our hompage www.vitlab.de.

Description	SP	Art. No.
Membrane filter 0.2 µm, sterile, VITLAB pipeo®	1	1670647
Membrane filter 0.2 µm, non-sterile, VITLAB pipeo®	10	1670648
Membrane filter 3 µm, non-sterile, VITLAB pipeo® and VITLAB maneus®	1	1670649
Membrane filter 3 µm, non-sterile, VITLAB pipeo® and VITLAB maneus®	10	1670650

Measuring pipettes, PP

High clarity. Resistant to breakage. Suction tube outer Ø max. 8 mm. Calibrated to deliver ‚Ex'.

Exposure to temperatures above 60 °C may effect accuracy. Recommended cleaning with mild alkaline detergents up to 60 °C.

Volume ml	Tolerance ± ml	Graduation ml	Length mm	SP	Art. No.
1	0.02	0.1	300	12	163094
2	0.02	0.1	300	12	163194
5	0.05	0.1	330	12	163294
10*	0.10	0.1	330	12	163394
10	0.10	0.1	320	12	163594

* Suction tube outer Ø10 mm

Bulb pipettes, PP

High clarity. Resistant to breakage. Calibrated to deliver ‚Ex'.

Exposure to temperatures above 60 °C may affect accuracy. Recommended cleaning with mild alkaline detergents up to 60 °C.

Volume ml	Tolerance ± ml	Length mm	SP	Art. No.
1	0.02	300	12	164094
2	0.02	300	12	164194
5	0.03	300	6	164294
10	0.04	440	6	164394
25	0.05	450	6	164494
50	0.10	460	6	164594

Disposable pipettes, PS, sterile

Translucent, graduated, individual sterile packaging, free of pyrogene.

Volume ml	Graduation ml	Length mm	SP	Art. No.
1	0.01	272	25	160110
2	0.01	272	25	160210
5	0.10	320	25	160510
10	0.10	320	25	161010
25	0.20	345	1	162510

Disposable pipettes, PS, non-sterile

Translucent, graduated, non-sterile.

Volume ml	Graduation ml	Length mm	SP	Art. No.
1	0.01	272	10	160119
2	0.01	272	10	160219
5	0.10	320	10	160519
10	0.10	320	10	161019

Pasteur pipettes, PE-LD

Disposable. Very good reproducibility of the number of drops per millilitre. 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/ Subdivision ml	Withdraw volume max. ml	Outer-Ø tip mm	Length mm	Drop quantitiy D / ml	SP	Art. No.
-	3.0	2.8	152	25-27	5000	148893
1/0.25	3.5	3.4	151	25-30	5000	148993
3/0.5	3.5	3.2	152	21-28	5000	149093
2/0.5	2.0	3.3	152	22-26	5000	149193
-	4.0	1.0	148	52-65	5000	149293
-	1.0	1.0	105	50	3200	149393

Dropping pipettes, PE-LD

With integrated bellows.
For sampling and decanting of infectious or toxic liquids. Graduated.

Volume ml	Length mm	SP	Art. No.
1.5	133	100	149893
5	194	100	149993

Dropping pipettes, PE-LD

With integrated bellows.
For sampling and decanting of infectious or toxic liquids.

Volume ml	Length mm	SP	Art. No.
1.8	98	250	149693

Precision Dispenser Tips, non-sterile, PS

The conformity-certified Precision Dispenser Tips comply with ISO EN ISO 8655 requirements and come with a batch certificate. CE-marked according to IVD-Directive 98/79 EG.
Precision Dispenser Tips can be used also with compartible, third-party dispensing systems.
The automatic size detection option is available in e. g. BRAND HandyStep® electronic
Precision Dispenser Tips can be used with BRAND HandyStep® among others.
Precision Dispenser Tips are made from high-quality materials:
Piston: PE-HD (0.1 ml LCP), cylinder: PP, without plasticizer, lubricant or other additives.
The sizes 25 ml and 50 ml come with the necessary adapter.

Volume ml	SP	Art. No.
0.1	100	146594
0.5	100	146694
1.25	100	146794
2.5	100	146894
5.0	100	146994
12.5	100	147094
25.0*	50	147194
50.0*	25	147294
Adapter, PP, non-sterile, for tips 25 and 50 ml	10	148494

* Adapter inclusive

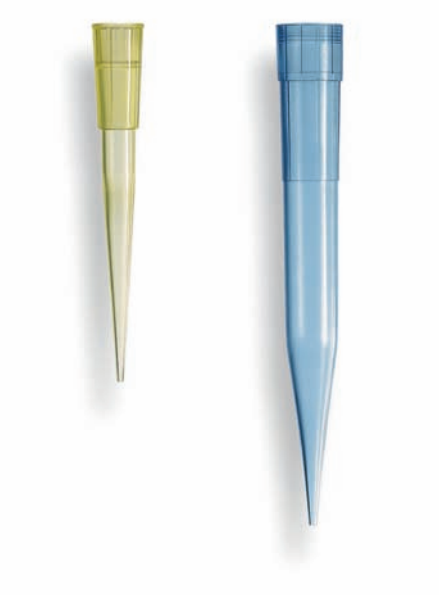
Precision Dispenser Tips, sterile, PS

The conformity-certified Precision Dispenser Tips comply with ISO EN ISO 8655 requirements and come with a batch certificate. CE-marked according to IVD-Directive 98/79 EG. Endotoxine-free, individually wrapped.
Precision Dispenser Tips can be used also with compartible, third-party dispensing systems.
The automatic size detection option is available in e. g. BRAND HandyStep® electronic
Precision Dispenser Tips can be used with BRAND HandyStep® among others.
Precision Dispenser Tips are made from high-quality materials:
Piston: PE-HD (0.1 ml LCP), cylinder: PP, without plasticizer, lubricant or other additives.
The sizes 25 ml and 50 ml come with the necessary adapter.

Volume ml	SP	Art. No.
0.1	100	147594
0.5	100	147694
1.25	100	147794
2.5	100	147894
5.0	100	147994
12.5	100	148094
25.0	25	148194
50.0	25	148294
Adapter, PP, sterile, for tips 25 and 50 ml	5	148594

* Adapter included

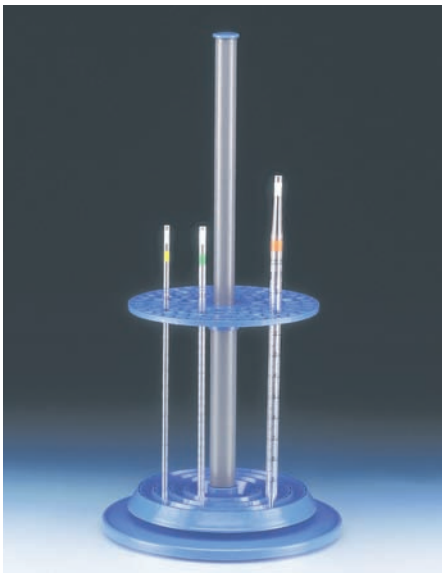
Pipette tips, PP



The pipete tips are conformity-certified. CE-marked according to IVD-Directive 98/79 EG and tested for pipettes made by BRAND. They are suitable for a wide range of pipettes from different manufacturers.

Volume µl	Tip	Package	SP	Art. No.
2 - 200	yellow	1 bag of 1000	1000	145594
2 - 200	yellow	10 bags of 1000	10000	145694
50 - 1000	blue	2 bags of 500	1000	145894
50 - 1000	blue	10 bags of 500	5000	145994

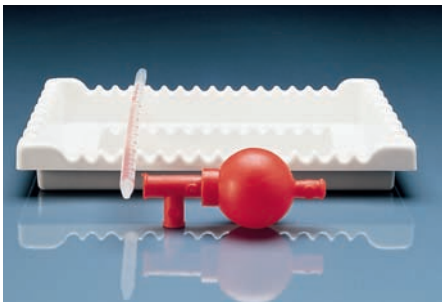
Pipette rack, PP



Rotary rack, consisting of a baseplate and vertical rod accommodating a rotary unit composed of two end-plates and a spacer-tube. The upper end-plate has a total of 94 openings of various diameters, while the lower end-plate has grooves and drainage holes. Supplied flat-packed, readily assembled.

Ø mm	Height mm	SP	Art. No.
230	470	2	79194

Pipette tray, PVC



Holds pipettes from 120 mm length.

L x W x H mm	SP	Art. No.
285 x 215 x 40	1	80996

Pipette tray, PVC

For drawers. Incorporates 4 compartments.

L x W x H mm	SP	Art. No.
420 x 300 x 30	1	80252

Pipette washer, PE-HD

An automatic system ensuring rapid washing and high-quality results. Suitable for the use of pipette baskets (art.-no. 80219 and 80222).

Ø mm	Height mm	Usable length mm	SP	Art. No.
165	740	600	1	80217
165	1000	840	1	80215

Pipette jars, PE-HD

For pre-cleaning pipettes in cleaning agents.

Ø mm	Height mm	SP	Art. No.
125	250	1	80223
165	500	1	80221
165	650	1	80218

Pipette baskets, PE-HD

For dipping pipettes into the pipette jar or pipette-washer and for transferring pipettes. The pipette carrier basket art. 80219 can be prolonged from 650 mm to 870 mm with the help of the extension.

Description	Ø mm	Overall Height mm	Carrier Height mm	SP	Art. No.
Pipette Basket	130	650	300	1	80219
Pipette Basket	130	495	300	1	80222
Extension for the handle (pipette basket art.-no. 80219)				2	81219

Competence in Lab Plastics

MEASUREMENT ACCURACY TO THE HIGHEST DEGREE

VITLAB
Competence in Labware

Highest precisio volume measuri

Volumetric measurement is a routine operation in the laboratory. Therefore, volumetric instruments such as volumetric flasks, graduated cylinders and pipettes are standard equipment in each analytical laboratory.

The importance of the degree of measurement accuracy in your laboratory routines cannot be overstated. VITLAB has decades of experience in the development and production of laboratory products which are used to measure volumes. Based on DIN 12681 – which incidentally was established through the initiation of VITLAB – VITLAB was the first manufacturer to make Class A, conformity-certified measuring cylinders available in PMP plastic.

All Class A PMP volumetric flasks are optionally available in transparent or UV absorbing variations for light-sensitive substances.

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ng devices

Calibration

Type 'TD, Ex': The delivered quantity of liquid corresponds exactly to the capacity indicated on the instrument (pipettes and burettes).

Type 'TC, In': The contained quantity of liquid corresponds exactly to the capacity indicated on the instrument (graduated cylinders and volumetric flasks).

VITLAB adjusts each individual volumetric flask at a room temperature of 20 °C. Due to the hydrophobic characteristics of the materials, VITLAB plastic volumetric instruments can assure that the measured liquid quantity (In) is the same as the removed quantity (Ex) for aqueous solutions.

Accuracy classes

Class A: the tolerances lie within the levels dictated by DIN and ISO.

Class B: the tolerances are twice the margins of error for Class A dictated by DIN and ISO. Detailed explanations on "accuracy in volume measurement" are available in the chapter on "General and Technical Information".

Conformity

VITLAB guarantees that the measuring devices are calibrated in accordance with the German Calibration Regulations. The special manufacturing process, developed by VITLAB, and the proven VITLAB quality management system, ensure that the tightest tolerances for the adherence to measurement standards are maintained.

Volumetric flasks, PFA, class A

High transparency, individually calibrated ring-mark.
Tolerances class A according to DIN EN ISO 1042. With lasered lot.number.
Supplied with PFA screw-caps. Screw-caps provide hermetic seals and high safety from outside contamination. Withstand high temperatures and chemical attack.
Exposure to temperatures up to 121 °C (autoclaving) will not cause permanent exceeding of tolerance limits. Cleaning up to max. 60 °C is recommended to preserve marks and inscriptions.

Volume ml	Tolerance ± ml	Height mm	Thread GL	SP	Art. No.
10	0.04	90	18	1	107097
25	0.04	115	18	1	107197
50	0.06	150	18	1	107297
100	0.10	180	18	1	107397
250	0.15	235	25	1	107497
500	0.25	270	25	1	107597

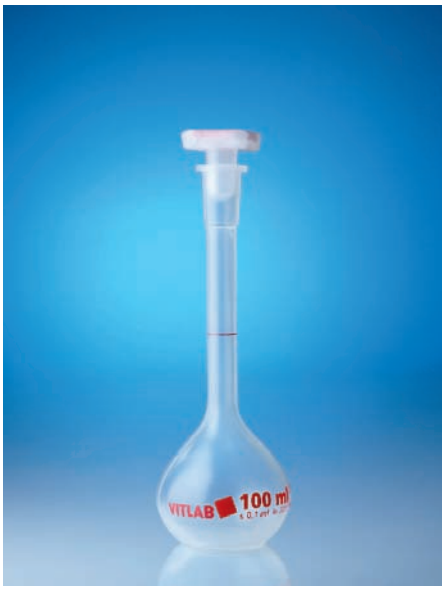
Volumetric flasks VITLAB® opaque, PMP, class A

UV-absorbent for storage of light-sensitive substances.

High transparency, with coloured screw cap made of PP and individually calibrated ring-mark. Tolerances class A according to DIN EN ISO 1042.
With imprinted lot number and certificate.
Exposure to temperatures up to 121 °C (autoclaving) will not cause permanent exceeding of tolerance limits. Cleaning up to max. 60 °C is recommended to preserve marks and inscriptions.

Volume ml	Tolerance ± ml	Height mm	Thread GL	SP	Art. No.
10	0.04	90	18	2	670040
25	0.04	115	18	2	671040
50	0.06	150	18	2	672040
100	0.10	180	18	2	673040
250	0.15	235	25	2	674040
500	0.25	270	25	2	675040
1000	0.40	310	32	1	676040

Volumetric flasks, PMP, class A



Glass-clear, with NS stopper made of PP and individually adjusted ring-mark. Tolerances class A according to DIN EN ISO 1042.
With imprinted lot number and certificate.
Exposure to temperatures up to 121 °C (autoclaving) will not cause permanent exceeding of tolerance limits. Cleaning up to max. 60 °C is recommended to preserve marks and inscriptions.

Volume ml	Tolerance ± ml	Height mm	Neck NS	SP	Art. No.
10	0.04	90	10/19	6	67704
25	0.04	115	10/19	6	67104
50	0.06	150	10/19	6	67204
100	0.10	180	14/23	6	67304
250	0.15	235	19/26	5	67404
500	0.25	270	19/26	4	67504
1000	0.40	310	24/29	3	67604

Volumetric flasks, PMP, class B

Glass-clear, with NS stopper made of PP and individually adjusted ring-mark. Tolerances class B according to DIN EN ISO 1042.
Exposure to temperatures up to 121 °C (autoclaving) will not cause permanent exceeding of tolerance limits. Cleaning up to max. 60 °C is recommended to preserve marks and inscriptions.

Volume ml	Tolerance ± ml	Height mm	Neck NS	SP	Art. No.
10	0.08	90	10/19	6	67795
25	0.08	115	10/19	6	67195
50	0.12	150	10/19	6	67295
100	0.20	180	14/23	6	67395
250	0.30	235	19/26	5	67495
500	0.50	270	19/26	4	67595
1000	0.80	310	24/29	4	67695

Volumetric flasks, PMP, class B

Glass-clear, with screw cap made of PP and individually adjusted ring-mark. Tolerances class B according to DIN EN ISO 1042.
Exposure to temperatures up to 121 °C (autoclaving) will not cause permanent exceeding of tolerance limits. Cleaning up to max. 60 °C is recommended to preserve marks and inscriptions.

Volume ml	Tolerance +- ml	Height mm	Thread GL	SP	Art. No.
10	0.08	90	18	6	677895
25	0.08	115	18	6	671895
50	0.12	150	18	6	672895
100	0.20	180	18	6	673895
250	0.30	235	25	5	674895
500	0.50	270	25	4	675895
1000	0.80	310	32	3	676895

Volumetric flasks, PP, class B

High transparency, with NS stopper made of PP and individually adjusted ring-mark.
Tolerances class B according to DIN EN ISO 1042.
Exposure to temperatures above 60 °C may effect accuracy. Cleaning up to max. 60 °C is recommended to preserve marks and inscriptions.

Volume ml	Tolerance ± ml	Height mm	Neck NS	SP	Art. No.
10	0.08	90	10/19	6	677941
25	0.08	115	10/19	6	671941
50	0.12	150	10/19	6	672941
100	0.20	180	14/23	6	673941
250	0.30	235	19/26	5	674941
500	0.50	270	19/26	4	675941
1000	0.80	310	24/29	3	676941

Volumetric flasks, PP, class B

High transparency, with screw cap made of PP and individually adjusted ring-mark.
Tolerances class B according to DIN EN ISO 1042.
Exposure to temperatures above 60 °C may effect accuracy. Cleaning up to max. 60 °C is recommended to preserve marks and inscriptions.

Volume ml	Tolerance ± ml	Height mm	Thread GL	SP	Art. No.
10	0.08	90	18	6	677891
25	0.08	115	18	6	671891
50	0.12	150	18	6	672891
100	0.20	180	18	6	673891
250	0.30	235	25	5	674891
500	0.50	270	25	4	675891
1000	0.80	310	32	3	676891

Volumetric cylinders, PMP, class A, KB

Tall form, glass-clear, with a raised scale.
Ring marks at the primary scale points, hexagonal base, calibrated to contain ‚In'.
The certificate supplied with these volumetric cylinders attests conformance to standard records. It bears the lot number and the mean value ascertained under the test conditions.
The volumetric cylinder is imprinted with the lot number and the year of manufacture.
Any deviations from the standard value fall well within the allowed tolerances of Class A according to DIN 12681 and ISO 6706.
Exposure to temperatures up to 121 °C (autoclaving) will not cause permanent exceeding of tolerance limits.

Volume ml	Tolerance ± ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
25	0.25	0.50	169	21	2	64704
50	0.50	1.00	199	28	2	64804
100	0.50	1.00	260	34	2	64904
250	1.00	2.00	315	47	2	65004
500	2.50	5.00	350	61	1	65104
1000	5.00	10.00	415	76	1	65204
2000	10.00	20.00	482	97	1	65304

Volumetric cylinders, PMP, class A

Tall form, glass-clear, with a raised scale.
Ring marks at the primary scale points, hexagonal base, calibrated to contain ‚In'.
Tolerances class A according to DIN 12681 / ISO 6706.
Exposure to temperatures up to 121 °C (autoclaving) will not cause permanent exceeding of tolerance limits.

Volume ml	Tolerance ± ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
10	0.10	0.20	140	16	12	64695
25	0.25	0.50	169	21	12	64795
50	0.50	1.00	199	28	12	64895
100	0.50	1.00	260	34	12	64995
250	1.00	2.00	315	47	6	65095
500	2.50	5.00	350	61	6	65195
1000	5.00	10.00	415	76	6	65295
2000	10.00	20.00	482	97	3	65395

Volumetric cylinders, PP, class B

Tall form, highly transparent, with a raised blue scale.
Ring marks at the primary scale points, hexagonal base, calibrated to contain ‚In'.
Tolerances class B according to DIN 12681 / ISO 6706.
Exposure to temperatures above 60 °C may effect accuracy.
Cleaning up to max. 60 °C is recommended to preserve marks and inscriptions.

Volume ml	Tolerance ± ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
10	0.20	0.20	140	16	12	646941
25	0.50	0.50	169	21	12	647941
50	1.00	1.00	199	28	12	648941
100	1.00	1.00	260	34	12	649941
250	2.00	2.00	315	47	6	650941
500	5.00	5.00	350	61	6	651941
1000	10.00	10.00	415	76	6	652941
2000	20.00	20.00	482	97	3	653941

Volumetric cylinders, PP, class B

Tall form, highly transparent, with a raised scale.
Ring marks at the primary scale points, hexagonal base, calibrated to contain ‚In'.
Tolerances class B according to DIN 12681 / ISO 6706.
Exposure to temperatures above 60 °C may effect accuracy.

Volume ml	Tolerance ± ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
10	0.20	0.20	140	16	12	646081
25	0.50	0.50	169	21	12	647081
50	1.00	1.00	199	28	12	648081
100	1.00	1.00	260	34	12	649081
250	2.00	2.00	315	47	6	650081
500	5.00	5.00	350	61	6	651081
1000	10.00	10.00	415	76	6	652081
2000	20.00	20.00	482	97	3	653081

Volumetric cylinders, SAN, class B

Tall form, glass-clear, with a raised scale.
Ring marks at the primary scale points, hexagonal base, calibrated to contain ‚In'.
Tolerances class B according to DIN 12681 / ISO 6706.
Exposure to temperatures above 60 °C may effect accuracy.

Volume ml	Tolerance ± ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
10	0.20	0.20	140	16	12	64691
25	0.50	0.50	169	21	12	64791
50	1.00	1.00	199	28	12	64891
100	1.00	1.00	260	34	12	64991
250	2.00	2.00	315	47	6	65091
500	5.00	5.00	350	61	6	65191
1000	10.00	10.00	415	76	6	65291
2000	20.00	20.00	482	97	3	65391

Volumetric cylinders, short, PP, class B

Short form, highly transparent, with a raised scale.
Ring marks at the primary scale points, hexagonal base, calibrated to contain ‚In'.
Tolerances class B according to DIN 12681 / ISO 6706.
Exposure to temperatures above 60 °C may effect accuracy.

Volume ml	Tolerance ± ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
25	0.50	0.50	122	22	12	640941
50	1.00	1.00	142	27	12	641941
100	2.00	2.00	163	37	12	642941
250	5.00	5.00	192	51	6	643941
500	10.00	10.00	218	67	6	644941
1000	20.00	20.00	285	78	6	645941

Volumetric cylinders, SAN, class B

Short form, glass-clear, with a raised scale.
Ring marks at the primary scale points, hexagonal base, calibrated to contain ‚In'.
Tolerances class B according to DIN 12681 / ISO 6706.
Exposure to temperatures above 60 °C may effect accuracy.

Volume ml	Tolerance ± ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
25	0.50	0.50	122	22	12	64091
50	1.00	1.00	142	27	12	64191
100	2.00	2.00	163	37	12	64291
250	5.00	5.00	192	51	6	64391
500	10.00	10.00	218	67	6	64491
1000	20.00	20.00	285	78	6	64591

Hydrometer cylinder, PP

Highly transparent, with a raised scale. With reservoir beaker and pouring lip. Ring marks at the primary scale points, hexagonal base, calibrated to contain ‚In'.
Tolerances class B according to DIN 12681 / ISO 6706.
Exposure to temperatures above 60 °C may effect accuracy.

Volume ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
500	5.00	351	73	1	760941

Measuring pipettes, PP

High clarity. Resistant to breakage. Suction tube outer Ø max. 8 mm. Calibrated to deliver ‚Ex'.

Exposure to temperatures above 60 °C may effect accuracy. Recommended cleaning with mild alkaline detergents up to 60 °C.

Volume ml	Tolerance ± ml	Graduation ml	Length mm	SP	Art. No.
1	0.02	0.1	300	12	163094
2	0.02	0.1	300	12	163194
5	0.05	0.1	330	12	163294
10*	0.10	0.1	330	12	163394
10	0.10	0.1	320	12	163594

* Suction tube outer Ø10 mm

Bulb pipettes, PP

High clarity. Resistant to breakage. Calibrated to deliver ‚Ex'.

Exposure to temperatures above 60 °C may affect accuracy. Recommended cleaning with mild alkaline detergents up to 60 °C.

Volume ml	Tolerance ± ml	Length mm	SP	Art. No.
1	0.02	300	12	164094
2	0.02	300	12	164194
5	0.03	300	6	164294
10	0.04	440	6	164394
25	0.05	450	6	164494
50	0.10	460	6	164594

Disposable pipettes, PS, sterile

Translucent, graduated, individual sterile packaging, free of pyrogene.

Volume ml	Graduation ml	Length mm	SP	Art. No.
1	0.01	272	25	160110
2	0.01	272	25	160210
5	0.10	320	25	160510
10	0.10	320	25	161010
25	0.20	345	1	162510

Disposable pipettes, PS, non-sterile

Translucent, graduated, non-sterile.

Volume ml	Graduation ml	Length mm	SP	Art. No.
1	0.01	272	10	160119
2	0.01	272	10	160219
5	0.10	320	10	160519
10	0.10	320	10	161019

Pasteur pipettes, PE-LD

Disposable. Very good reproducibility of the number of drops per millilitre. 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/ Subdivision ml	Withdraw volume max. ml	Outer-Ø tip mm	Length mm	Drop quantitiy D / ml	SP	Art. No.
-	3.0	2.8	152	25-27	5000	148893
1/0.25	3.5	3.4	151	25-30	5000	148993
3/0.5	3.5	3.2	152	21-28	5000	149093
2/0.5	2.0	3.3	152	22-26	5000	149193
-	4.0	1.0	148	52-65	5000	149293
-	1.0	1.0	105	50	3200	149393

Dropping pipettes, PE-LD

With integrated bellows.
For sampling and decanting of infectious or toxic liquids. Graduated.

Volume ml	Length mm	SP	Art. No.
1.5	133	100	149893
5	194	100	149993

Dropping pipettes, PE-LD

With integrated bellows.
For sampling and decanting of infectious or toxic liquids.

Volume ml	Length mm	SP	Art. No.
1.8	98	250	149693

Dispenser-tips, non-sterile, PS

The conformity-certified Dispenser Tips comply with ISO EN ISO 8655 requirements and come with a batch certificate. CE-marked according to IVD-Directive 98/79 EG.
Precision Dispenser Tips can be used also with compartible, third-party dispensing systems.
The automatic size detection option is available in e. g. BRAND HandyStep® electronic
Precision Dispenser Tips can be used with BRAND HandyStep® among others.
Precision Dispenser Tips are made from high-quality materials:
Piston: PE-HD (0.1 ml LCP), cylinder: PP, without plasticizer, lubricant or other additives
The sizes 25 ml and 50 ml come with the necessary adapter

Volume ml	SP	Art. No.
0.1	100	146594
0.5	100	146694
1.25	100	146794
2.5	100	146894
5.0	100	146994
12.5	100	147094
25.0*	50	147194
50.0*	25	147294
Adapter, PP, non-sterile, for tips 25 and 50 ml	10	148494

* Adapter inclusive

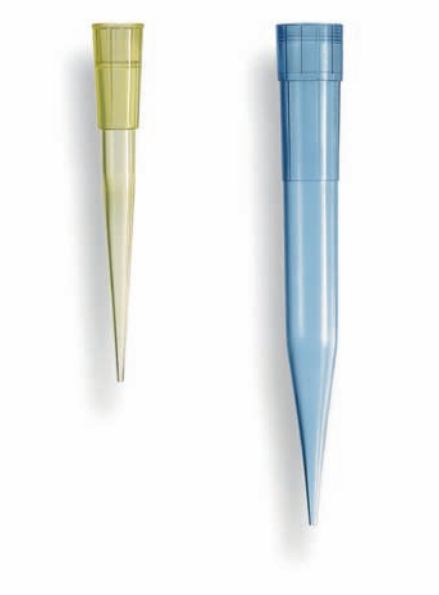
Dispenser-tips, sterile, PS

The conformity-certified Dispenser Tips comply with ISO EN ISO 8655 requirements and come with a batch certificate. CE-marked according to IVD-Directive 98/79 EG. Endotoxine-free, individually wrapped.
Precision Dispenser Tips can be used also with compartible, third-party dispensing systems.
The automatic size detection option is available in e. g. BRAND HandyStep® electronic
Precision Dispenser Tips can be used with BRAND HandyStep® among others.
Precision Dispenser Tips are made from high-quality materials:
Piston: PE-HD (0.1 ml LCP), cylinder: PP, without plasticizer, lubricant or other additives
The sizes 25 ml and 50 ml come with the necessary adapter

Volume ml	SP	Art. No.
0.1	100	147594
0.5	100	147694
1.25	100	147794
2.5	100	147894
5.0	100	147994
12.5	100	148094
25.0	25	148194
50.0	25	148294
Adapter, PP, sterile, for tips 25 and 50 ml	5	148594

* Adapter included

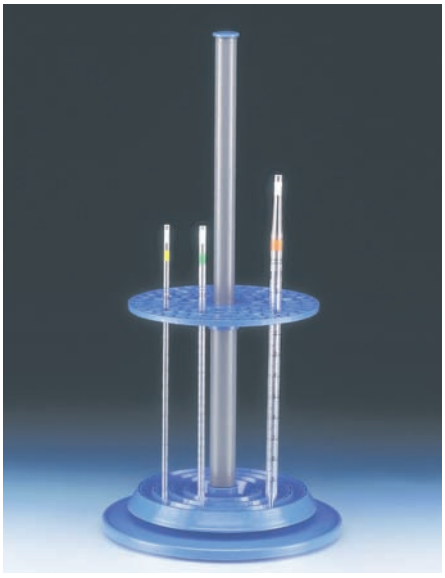
Pipette tips, PP



The pipete tips are conformity-certified. CE-marked according to IVD-Directive 98/79 EG and tested for pipettes made by BRAND. They are suitable for a wide range of pipettes from different manufacturers.

Volume µl	Tip	Package	SP	Art. No.
2 - 200	yellow	1 bag of 1000	1000	145594
2 - 200	yellow	10 bags of 1000	10000	145694
50 - 1000	blue	2 bags of 500	1000	145894
50 - 1000	blue	10 bags of 500	5000	145994

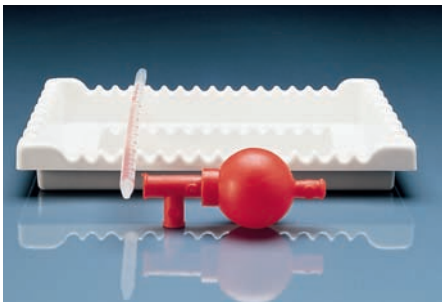
Pipette racks, PP



Rotary rack, consisting of a baseplate and vertical rod accommodating a rotary unit composed of two end-plates and a spacer-tube. The upper end-plate has a total of 94 openings of various diameters, while the lower end-plate has grooves and drainage holes. Supplied flat-packed, readily assembled.

Ø mm	Height mm	SP	Art. No.
230	470	2	79194

Pipette tray, PVC



Holds pipettes from 120 mm length.

L x W x H mm	SP	Art. No.
285 x 215 x 40	1	80996

Pipette tray, PVC

For drawers. Incorporates 4 compartments.

L x W x H mm	SP	Art. No.
420 x 300 x 30	1	80252

Pipette washer, PE-HD

An automatic system ensuring rapid washing and high-quality results. Suitable for the use of pipette baskets (art.-no. 80219 and 80222).

Ø mm	Height mm	Usable length mm	SP	Art. No.
165	740	600	1	80217
165	1000	840	1	80215

Pipette jars, PE-HD

For pre-cleaning pipettes in cleaning agents.

Ø mm	Height mm	SP	Art. No.
125	250	1	80223
165	500	1	80221
165	650	1	80218

Pipette baskets, PE-HD

For dipping pipettes into the pipette jar or pipette-washer and for transferring pipettes. The pipette carrier basket art. 80219 can be prolonged from 650 mm to 870 mm with the help of the extension.

Description	Ø mm	Overall Height mm	Carrier Height mm	SP	Art. No.
Pipette Basket	130	650	300	1	80219
Pipette Basket	130	495	300	1	80222
Extension for the handle (Pipet Basket 80219)				2	81219

VITLAB symbiotic, type Dr. Schilling

Plastic-coated burette made of borosilicate glass 3.3. Class B. Conformity with DIN ISO 384. With Schellbach stripes (blue/white) and easily readable black scaling. Calibrated to deliver "Ex". Automatic zeroing. The stopcock of the burette is made of high quality plastic. Its PTFE plug turns easily and allows fine titration.
Special protection against breakage if the symbiotic gets knocked over:
- The temperature-resilient plastic coating helps the entire device to resist breakage and glass fragments are confined within the sheath.
- A small bumper has been attached to the upper end of the upright measuring tube. This feature reduces the change of breakage.

Material: burette of borosilicate glass 3.3, filling tube PP, burette stopcock PMP/PTFE, reservoir bottle PE-LD.

Volume ml	Tolerance ± ml	Graduation ml	Height mm	Bottle ml	SP	Art. No.
25	0.05	0.05	900	1000	1	106599
50	0.10	0.10	900	1000	1	106699

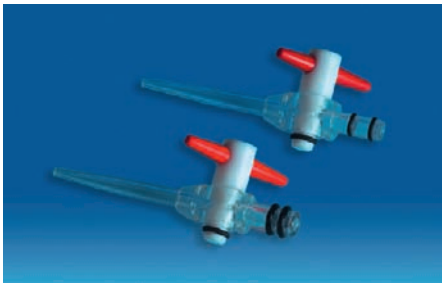
Burettes

Plastic-coated burette made of borosilicate glass 3.3. Class B. Conformity with DIN ISO 384. With Schellbach stripes (blue/white) and easily readable black scaling. Calibrated to deliver "Ex".
The stopcock of the burette is made of high quality plastic. Its PTFE plug turns easily and allows fine titration.
The temperature-resilient plastic coating helps the entire device to resist breakage and glass fragments are confined within the sheath.

Material: burette of borosilicate glass 3.3, burette stopcock PMP/PTFE.

Volume ml	Tolerance ± ml	Graduation ml	Length mm	SP	Art. No.
25	0.05	0.05	800	2	105599
50	0.10	0.10	800	2	105699

Burette stopcocks

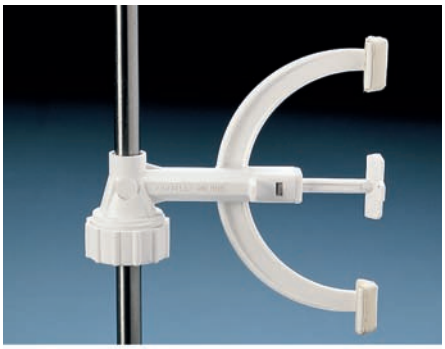


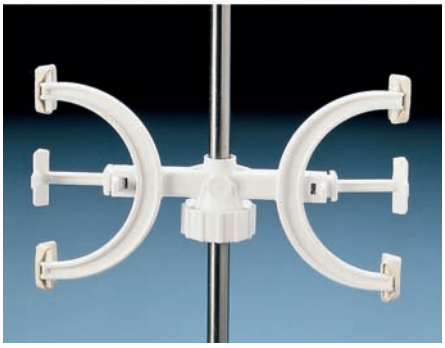
Stopcocks made of PMP. Plugs of PTFE with polished surface turn easily but fit thightly. Insert with two seals.

Art. no. 105799: For burette tubes inner diam. 7.75 ± 0.1 mm.

Art. no. 105899: For burette tubes inner diam. 11.5 ± 0.1 mm.

For Burettes ml	Height	Inner-Ø tip	Immersion depth mm	SP	Art. No.
25	90	1.25	17	5	105799
50	90	1.25	17	5	105899





Burette clamps, PP

Fits rod with diameters of 8 to 14 mm. Clamp arms have rubber-coated tips for secure gripping of burettes.
Graduations and meniscus are visible at all times. Comes supplied with a stainless steel spring.

Type	SP	Art. No.
single	5	80139
double	5	80140

Volume measurement

Graduated pitchers, PP

Highly transparent with raised, blue embossed scale.

Volume ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
50	2	70	40	24	446941
100	2	80	50	24	447941
250	5	120	70	12	440941
500	10	133	91	12	441941
1000	10	170	116	6	442941
2000	20	215	150	6	443941
3000	50	242	170	6	444941
5000	100	270	210	6	445941

Graduated pitchers, PP

Highly transparent with raised scale.

Volume ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
50	2	70	40	24	446081
100	2	80	50	24	447081
250	5	120	70	12	440081
500	10	133	91	12	441081
1000	10	170	116	6	442081
2000	20	215	150	6	443081
3000	50	242	170	6	444081
5000	100	270	210	6	445081

Graduated pitchers, SAN

Glass-clear, with raised scale.

Volume ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
250	5	120	70	12	44091
500	10	133	91	12	44191
1000	10	170	116	6	44291
2000	20	215	150	6	44391
3000	50	242	170	6	44491

Graduated pitchers, nesting, PP

Highly transparent with printed, blue scale.

Volume ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
250	5	115	75	12	480941
500	10	140	100	12	481941
1000	10	167	125	12	482941
2000	20	212	148	12	483941
3000	50	242	170	12	484941

Collectors, PP or SAN

With raised scale, graduation 20 ml, with white lid made of PC.
Volume 2000 ml, Ø 150 mm, height 220 mm.

Description	SP	Art. No.
SAN, raised scale	6	97891
PP, raised scale	6	978941
PP, raised, blue embossed scale	6	978081
Accessories for collectors		
Lid, PC	6	97791

Graduated beakers, PP

Highly transparent, with raised scale, wide round base.

Volume ml	Graduation ml	Height mm	SP	Art. No.
100	2	120	12	80422
250	5	160	18	80423
500	10	180	8	80424
1000	20	270	3	80425

Griffin beakers, PFA

Transparent, with raised scale. High temperature and chemical resistance.

Volume ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
25	5	50	32	1	110205
50	10	59	39	1	110305
100	20	72	50	1	110405
250	50	96	67	1	110605
500	100	122	88	1	110905
1000	100	141	109	1	111005

Griffin beakers, ETFE

Transparent, with printed black scale. High temperature and chemical resistance.

Volume ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
25	5	50	32	1	110204
50	10	59	39	1	110304
100	20	72	50	1	110404
250	50	96	67	1	110604
400	50	109	77	1	110704
500	100	122	88	1	110904
600	100	125	91	1	110804
1000	100	143	105	1	111004

Griffin beakers, PTFE

Opaque, virtually totally chemically inert, withstand high temperatures.

Volume ml	Thickness mm	Height mm	Ø mm	SP	Art. No.
5	2	24	22	1	112197
10	2	39	25	1	112297
25	2	47	32	1	112397
50	2	55	42	1	112497
100	3	68	55	1	112597
250	3	93	62	1	112697
500	4	126	81	1	112797
1000	4	157	102	1	112897

Griffin beakers, PMP

Glass-clear, with printed red scale.

Volume ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
10	2	35	25	12	60503
25	5	47	31	12	60603
50	10	60	40	12	60703
100	20	70	49	12	60803
150	20	80	56	12	60903
250	50	94	68	6	61003
400	50	109	77	6	61103
500	100	122	88	6	61803
600	100	125	91	6	61203
800	100	136	98	6	61303
1000	100	149	102	6	61403
2000	200	183	133	6	61503
3000	200	214	174	4	61603
5000	500	248	185	4	61703

Griffin beakers, PP

Highly transparent with printed blue scale.

Volume ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
10	2	35	25	12	605081
25	5	47	31	12	606081
50	10	60	40	12	607081
100	20	70	49	12	608081
150	20	80	56	12	609081
250	50	94	68	6	610081
400	50	109	77	6	611081
500	100	122	88	6	618081
600	100	125	91	6	612081
800	100	136	98	6	613081
1000	100	149	102	6	614081
2000	200	183	133	6	615081
3000	200	214	174	4	616081
5000	500	248	185	4	617081

Erlenmeyer flasks, PMP

Glass-clear, wide neck, with screw cap made of PP, NS-stoppers can also be used (not included).

Volume ml	Graduation ml	Thread GL	Neck size NS	SP	Art. No.
50	10	40	34/35	6	66695
100	20	40	34/35	6	66795
250	50	52	45/40	6	66895
500	100	52	45/40	6	66995
1000	200	52	45/40	4	67095

Erlenmeyer flasks, PP

Highly transparent, wide neck, with screw cap made of PP, NS-stoppers can also be used (not included).

Volume ml	Graduation ml	Thread GL	Neck size NS	SP	Art. No.
50	10	40	34/35	6	666941
100	20	40	34/35	6	667941
250	50	52	45/40	6	668941
500	100	52	45/40	6	669941
1000	200	52	45/40	4	670941

Erlenmeyer flasks, PC

Glass-clear, wide neck, with screw cap made of PP.
Developed and designed for tissue and sterile culture applications. The screw cap with vent tube can be closed with tissue or filter material.
NS-stoppers 45/40 can also be used (not included).

Volume ml	Graduation ml	Thread GL	Type	SP	Art. No.
250	50	52	closed	6	199099
250	50	52	vent tube Ø 5 mm	6	199095
500	100	52	closed	6	199199
500	100	52	vent tube Ø 5 mm	6	199195

Sedimentation cone, SAN

Glass-clear, raised scale, low break risk, transparent. Produced according to Imhoff. With a threaded tip to allow easy cleaning.

Graduation:

0 - 2 ml : 0.1 ml
2 - 10 ml : 0.5 ml
10 - 40 ml : 1.0 ml
40 - 100 ml : 2.0 ml
100 - 1000 ml : 50.0 ml

Volume ml	SP	Art. No.
1000	3	75991

Sedimentation rack, PMMA

Holds two sedimentation cones.

L x W x H mm	SP	Art. No.
150 x 300 x 290	1	81056

Measuring beaker, PP

Transparent, with raised scale, suitable lid made of PE.

Description	Volume ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
Measuring beaker	30	1	42	37	100	69394
Lid, PE					100	69493

Competence in Lab Plastics

SAVING AND STORING

VITLAB
Competence in Labware

VITsafe™ – the safety wash

Working with chemical substances, which are sometimes dangerous, requires a high level of responsibility and concentration. VITLAB provides laboratory equipment that fulfils safety requirements in the form of the VITsafe™ safety wash-bottles.

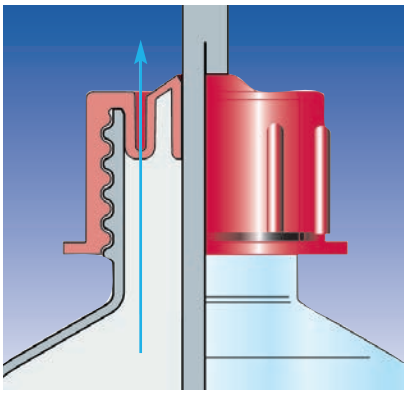
For the first time, VITsafe™ safety wash-bottles are now optionally available made from polyethylene (PE-LD) or polypropylene (PP). PP adds a significantly higher level of resistance toward many organic solvents, and wash-bottles made from PP may also be autoclaved at 121 °C for 20 minutes.

The VENT-CAP virtually prevents leaking, dripping or escaping of liquid from the dispensing tube, which sometimes can occur because of temperature changes in the laboratory.

Permanent imprints for solvent labels, full hazard symbols and other individual information ensure the highest level of safety. You can choose from a variety of 18 laboratory solvents.

- bottle

VENT-CAP

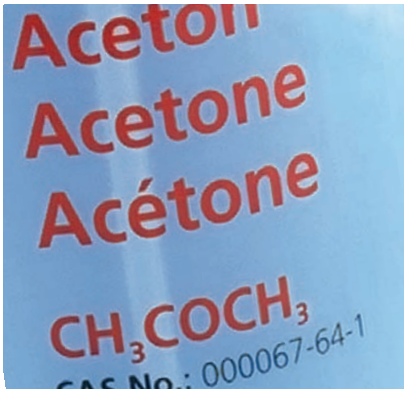


The proprietary design of the metal-free VENT-CAP, red coloured, reduces excess static pressure according to the principle of gas permeability, or respectively steam permeability. Leakage or dripping is almost completely eliminated.

Narrow-mouth or wide-mouth

All VITsafe™ safety wash-bottles are available in two variations. To VITLAB's traditional narrow-mouth wash-bottles we have added a new line of wide-mouth wash-bottles that simplify filling, even without a funnel.

Safety imprint



All VITsafe™ safety wash-bottles have permanent imprints stating the statutory information required in accordance with the Ordinance on Hazardous Substances, as well as other important information: Chemical name in German, English and French, full hazard symbol and labelling, chemical formula, CAS number, risk and safety statements (R- / S- phrases), as well as the NFPA code.

VITsafe™ safety wash-bottles, narrow-mouth

Made of PP or PE-LD with safety imprint in accordance with the Ordinance on Hazardous Substances and VENT-CAP screw cap.
Dispensing tube with pointed end made of PP to optimize the backflow of the medium. The lack of a spray insert and the even molding of the inner-diameter make it possible to avoid almost all turbulence in the liquid.

Permanent imprints stating the statutory information required in accordance with the Ordinance on Hazardous Substances, as well as other important information:
Chemical name in German, English and French, full hazard symbol and labeling, chemical formula, CAS number, risk and safety statements (R-/S-phrases), as well as the NFPA code.

Available in 3 sizes: 250, 500 and 1000 ml

Volume ml	Thread GL	Imprint	Material	SP	Art. No.
250	25	Acetone	PP	12	1431829
500	25	Acetone	PP	12	1432829
1000	32	Acetone	PP	12	1433829
500	25	Acetonitril	PE-LD	6	1332969
250	25	Distilled Water	PE-LD	12	1331819
500	25	Distilled Water	PE-LD	12	1332819
1000	32	Distilled Water	PE-LD	12	1333819
500	25	Acetic acid conc.	PE-LD	6	1332979
250	25	Ethanol	PE-LD	12	1331869
500	25	Ethanol	PE-LD	12	1332869
1000	32	Ethanol	PE-LD	12	1333869
250	25	Ethylacetate	PE-LD	12	1331859
500	25	Ethylacetate	PE-LD	12	1332859
1000	32	Ethylacetate	PE-LD	12	1333859
250	25	Isopropanol	PE-LD	12	1331849
500	25	Isopropanol	PE-LD	12	1332849
1000	32	Isopropanol	PE-LD	12	1333849
250	25	Methanol	PE-LD	12	1331839
500	25	Methanol	PE-LD	12	1332839
1000	32	Methanol	PE-LD	12	1333839
500	25	Methylene dichloride	PE-LD	6	1332879
500	25	Methyl ethyl keton (MEK)	PP	6	1432989
500	25	n-Heptan	PP	6	1432909
500	25	n-Hexan	PP	6	1432899
500	25	N,N-Dimethylformamid	PE-LD	6	1332889
500	25	Petrolether*	PP	6	1432919
500	25	Tetrahydrofurane (THF)	PP	6	1432939
500	25	Toluene	PP	6	1432949
500	25	Xylol	PE-LD	6	1332959

* Petroleum ether (pure benin)

Please see wash bottles PE-LD/PP for height and diameter.

Further imprints on request.

VITsafe™ safety wash-bottles, wide-mouth

Made of PP or PE-LD with safety imprint in accordance with the Ordinance on Hazardous Substances and VENT-CAP screw cap.
Dispensing tube with pointed end made of PP to optimize the backflow of the medium. The lack of a spray insert and the even molding of the inner-diameter make it possible to avoid almost all turbulence in the liquid.

Permanent imprints stating the statutory information required in accordance with the Ordinance on Hazardous Substances, as well as other important information:
Chemical name in German, English and French, full hazard symbol and labeling, chemical formula, CAS number, risk and safety statements (R-/S-phrases), as well as the NFPA code.

Available in 3 sizes: 250, 500 and 1000 ml

Volume ml	Thread GL	Imprint	Material	SP	Art. No.
250	45	Acetone	PP	12	1451829
500	45	Acetone	PP	12	1452829
1000	63	Acetone	PP	12	1453829
500	45	Acetonitrile	PE-LD	6	1352969
250	45	Distilled Water	PE-LD	12	1351819
500	45	Distilled Water	PE-LD	12	1352819
1000	63	Distilled Water	PE-LD	12	1353819
500	45	Acetic acid conc.	PE-LD	6	1352979
250	45	Ethanol	PE-LD	12	1351869
500	45	Ethanol	PE-LD	12	1352869
1000	63	Ethanol	PE-LD	12	1353869
250	45	Ethyl acetate	PE-LD	12	1351859
500	45	Ethyl acetate	PE-LD	12	1352859
1000	63	Ethyl acetate	PE-LD	12	1353859
250	45	Isopropanol	PE-LD	12	1351849
500	45	Isopopanol	PE-LD	12	1352849
1000	63	Isopropanol	PE-LD	12	1353849
250	45	Methanol	PE-LD	12	1351839
500	45	Methanol	PE-LD	12	1352839
1000	63	Methanol	PE-LD	12	1353839
500	45	Methylene dichloride	PE-LD	6	1352879
500	45	Methyl ethyl ketone (MEK)	PP	6	1452989
500	45	n-Heptane	PP	6	1452909
500	45	n-Hexane	PP	6	1452899
500	45	N,N-Dimethyl formamide	PE-LD	6	1352889
500	45	Tetrahydrofurane (THF)	PP	6	1452939
500	45	Toluene	PP	6	1452949
500	45	Petrolium benzine*	PP	6	1452919
500	45	Xylene	PE-LD	6	1352959

* Petroleum ether (pure benzin)

Please see wash bottles PE-LD/PP for height and diameter.

Further imprints on request.

VENT-CAP wash-bottle caps, PP

Screw cap and dispensing tube with pointed end made of PP to optimize the backflow of the medium. The lack of a spray insert and the even molding of the inner-diameter make it possible to avoid almost all turbulence in the liquid.

Thread GL	SP	Art. No.
25	12	833019
32	12	833029
45	12	833039
63	12	833049

Wash-bottles, with imprint

Narrow-/Wide-mouth wash bottles made of PP or PE-LD, transparent.
Dispensing tube with pointed end made of PP to optimize the backflow of the medium. The lack of a spray insert and the even molding of the inner diameter make it possible to avoid almost all tubulence in the liquid.
Imprint upon request, for non-hazardous substances in accordance with the Ordinance on Hazardous Substances.

Volume ml	Thread GL	Imprint	Material	SP	Art. No.
250	25	Dist. Water	PE-LD	12	133181
250	45	Dist. Water	PE-LD	12	135181
500	25	Dist. Water	PE-LD	12	133281
500	45	Dist. Water	PE-LD	12	135281
1000	32	Dist. Water	PE-LD	12	133381
1000	63	Dist. Water	PE-LD	12	135381

Other imprints are available on request.

Please see wash bottles PE-LD/PP for height and diameter.

Wash-bottles, PFA-economy

Narrow-mouth wash bottles, transparent, with ETFE screw-cap and dispensing tube made of FEP. Withstand high temperatures and chemical attack.

Volume ml	Thread GL	Height* mm	Ø mm	SP	Art. No.
250	25	157	61	1	108792
500	25	189	76	1	108892
1000	32	233	96	1	108992

* without wash-bottle cap

Wash-bottles, PP

Narrow-/Wide-mouth bottles made of PP, transparent.
Dispensing tube with pointed end made from PP to optimize the backflow of the medium. The lack of a spray insert and the even molding of the inner-diameter make it possible to avoid almost all turbulence in the liquid.

Volume ml	Thread GL	Height* mm	Ø mm	SP	Art. No.
250	25	135	58	12	94993
250	45	133	58	12	93793
500	25	180	74	12	95093
500	45	151	76	12	93993
1000	32	215	92	12	95193
1000	63	196	91	12	94193

* without wash-bottle cap

Wash-bottles, PE-LD

Narrow-/Wide-mouth bottles made of PE-LD, transparent.
Dispensing tube with pointed end and screw cap made from PP to optimize the backflow of the medium. The lack of a spray insert and the even molding of the inner-diameter make it possible to avoid almost all turbulence in the liquid.

Volume ml	Thread GL	Height* mm	Ø mm	SP	Art. No.
50	18	73	37	24	94588
100	18	95	43	24	94688
250	25	135	58	12	94988
250	45	133	58	12	93788
500	25	180	74	12	95088
500	45	151	76	12	93988
1000	32	215	92	12	95188
1000	63	196	91	12	94188

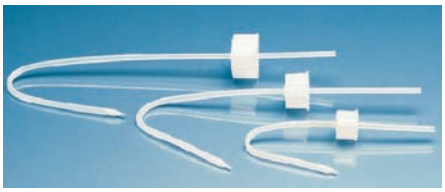
* without wash-bottle cap

Wash-bottles, PE-LD

Narrow-mouth bottles, transparent, with screw cap and dispensing tube made of PE-LD.

Volume ml	Thread GL	Height* mm	Ø mm	SP	Art. No.
100	18	106	45	50	134293
250	25	140	59	50	134393
500	25	180	75	50	134493
1000	28	212	94	25	134593

* without wash-bottle cap



Wash-bottle caps, PP

Screw cap and dispensing tube made of PP with drawn-out tip.

Thread GL	SP	Art. No.
18	24	83300
25	12	83301
32	12	83302
45	12	83303
63	12	83304

Wash-bottles, colour coded, PE-LD

Narrow-mouth bottles made of PE-LD, four colours.

Volume ml	Colour	SP	Art. No.
500	red	5	132703
500	green	5	132705
500	blue	5	132706
500	yellow	5	132708

Integral wash-bottles, PE-LD

Transparent, with integrally moulded tube. No need to take it off when refilling.

Volume ml	Thread GL	Height mm	SP	Art. No.
250	32	143	10	81633
500	32	181	10	81634

Dropping bottles, PE-LD/PE-HD

Narrow-mouth bottles made of PE-LD, transparent, with dropper inserts and mating screw-caps, PE-HD.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
50	18	117	37	24	94587
100	18	142	43	24	94687
250	25	183	58	12	94987
500	25	228	74	12	95087
1000	32	263	92	12	95187

Caps with dropper inserts, PE-HD

Thread GL	SP	Art. No.
18	24	83306
25	12	83307
32	12	83308

Dropping bottles, PE-LD

Narrow-mouth bottles, transparent, with dropper inserts and locking cap made of PE-LD.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
20	14	88	31	100	132193
30	14	96	34	100	132293
50	18	115	39	100	132393
100	18	136	45	50	132493
250	25	170	59	50	132593
500	25	209	75	50	132693
1000	28	240	94	25	132793

Spray bottles, PP

Hand operated pump-spray-bottles. Spray-nozzle adjustable from a fine mist to a narrow jet reaching 3 m to 4 m.

Volume ml	Colour	SP	Art. No.
400	white	5	53510
850	white	5	53610
1000	transparent	5	95286

Narrow-mouth bottles, PFA

Transparent, supplied with screw-cap with buttress thread made of and a moulded-in sealing ring. Ideal as packaging bottle for pure chemicals.
High temperature resistance from -200 °C to +250 °C.

Volume ml	Thread*	Height mm	Ø mm	SP	Art. No.
50	S 28	86	37	1	109297
100	S 28	120	45	1	109397
250	S 28	160	61	1	108297
500	S 28	190	76	1	108397
1000	S 28	240	96	1	108497

* Buttress thread

Narrow-mouth bottles, PFA-economy

Transparent, supplied with hermetically sealing screw-cap made of ETFE and a moulded-in sealing ring. Withstand high temperatures and chemical attack.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
50	18	90	37	1	108092
100	18	114	45	1	108192
250	25	157	61	1	108292
500	25	189	76	1	108392
1000	32	233	96	1	108492

Narrow-mouth bottles, PE-HD

Transparent, with screw-cap with moulded-in sealing ring made of PP, wide shoulder. Heavy duty.

Volume ml	Thread mm	Height mm	Ø mm	SP	Art. No.
4	20	41	16	12	5583170
8	20	44	25	12	5583180
15	20	57	25	12	5583190
30	20	70	31	12	5583100
60	20	84	38	12	5583110
125	24	101	50	12	5583120
250	24	134	61	12	5583130
500	36	185	75	12	5583140
1000	36	206	92	6	5583150

Narrow-mouth bottles, PE-HD, brown

For storage of light-sensitive substances.
With screw-cap with moulded-in sealing ring made of PP, wide shoulder. Heavy duty.

Volume ml	Thread mm	Height mm	Ø mm	SP	Art. No.
4	20	41	16	12	5581170
8	20	44	25	12	5581180
15	20	57	25	12	5581190
30	20	70	32	12	5581200
60	20	84	40	12	5581210
125	24	101	51	12	5581220
250	24	134	62	12	5581230
500	36	185	75	12	5581240
1000	36	206	92	6	5581250

Narrow-mouth bottles, PP

Transparent, with screw-cap with moulded-in sealing ring, wide shoulder. Heavy duty.

Volume ml	Thread mm	Height mm	Ø mm	SP	Art. No.
4	20	41	16	12	5582070
8	20	44	25	12	5582080
15	20	57	25	12	5582090
30	20	70	32	12	5582100
60	20	84	40	12	5582110
125	24	101	51	12	5582120
250	24	134	62	12	5582130
500	36	185	75	12	5582140
1000	36	206	92	6	5582150

Narrow-mouth bottles, PP

Transparent, with screw-cap with moulded-in sealing ring made of PP, high shoulder.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
50	18	73	37	24	94594
100	18	95	43	24	94694
250	25	135	58	12	94994
500	25	180	74	12	95094
1000	32	215	92	12	95194

Narrow-mouth bottles, PE-LD

Transparent, with screw-cap with moulded-in sealing ring made of PP, high shoulder.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
10	11	42	22	24	94389
20	11	59	24	24	94489
50	18	73	37	24	94589
100	18	95	43	24	94689
250	25	135	58	12	94989
500	25	180	74	12	95089
1000	32	215	92	12	95189

Narrow-mouth bottles, PE-LD

Transparent, with screw-cap made of PE-LD, flat shoulder.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
10	14	50	26	100	138093
20	14	58	31	100	138193
30	14	66	34	100	138293
50	18	85	39	100	138393
100	18	106	45	50	138493
250	25	140	59	50	138593
500	25	180	75	50	138693
1000	28	212	94	25	138793
2000	28	264	117	25	138893

Narrow-mouth bottles, PE-LD

Transparent, square, with screw-cap made of PP.

Volume ml	Thread GL	Height mm	Size mm	SP	Art. No.
100	18	82	41 x 41	24	91789
150	18	93	47 x 47	24	91889
250	25	110	55 x 55	24	91989
500	25	133	70 x 70	12	92089
1000	32	166	87 x 87	12	92189

Wide-mouth bottles, PFA

Transparent, supplied with screw-cap with buttress thread made of PFA and a moulded-in sealing ring. Ideal as packaging bottle for pure chemicals. High temperature resistance from -200 °C to +250 °C.

Volume ml	Thread*	Height mm	Ø mm	SP	Art. No.
250	S 40	150	61	1	109497
500	S 40	179	76	1	109597
1000	S 40	217	96	1	109697
2000	S 40	245	130	1	109797
2500	S 40	290	130	1	109897
5000	S 40	320	175	1	109997

* Buttress thread

Wide-mouth bottles, PTFE

Opaque with caps made of PTFE.

Volume ml	Thread mm	Height mm	Ø mm	SP	Art. No.
10	12	50	26	1	122597
25	19	61	33	1	122697
50	25	76	43	1	122797
100	35	88	52	1	122897

Wide-mouth bottles, PE-HD

Transparent, with screw-cap with moulded-in sealing ring made of PP. Heavy duty.

Volume ml	Thread mm	Height mm	Ø mm	SP	Art. No.
30	28	70	32	12	5584200
60	28	84	40	12	5584210
125	38	101	51	12	5584220
250	43	134	62	12	5584230
500	53	185	75	12	5584240
1000	63	206	92	6	5584250

Wide-mouth bottles, PE-HD, brown

For storage of light-sensitive substances.
With screw-cap with moulded-in sealing ring.
Heavy duty.

Volume ml	Thread mm	Height mm	Ø mm	SP	Art. No.
30	28	70	31	12	5581300
60	28	84	38	12	5581310
125	38	98	50	12	5581320
250	43	131	61	12	5581330
500	53	180	75	12	5581340
1000	63	200	92	6	5581350

Wide-mouth bottles, PP

Transparent, with screw-cap with moulded-in sealing ring.
Heavy duty.

Volume	Thread mm	Height mm	Ø mm	SP	Art. No.
30	28	70	31	12	5582200
60	28	84	38	12	5582210
125	38	98	50	12	5582220
250	43	131	61	12	5582230
500	56	180	75	12	5582240
1000	63	200	92	6	5582250

Wide-mouth bottles, PP

Transparent, with screw-cap with moulded-in sealing ring made of PP.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
50	32	87	39	24	93394
100	32	94	47	24	93494
250	45	133	58	12	93794
500	45	151	76	12	93994
1000	63	196	91	12	94194

Wide-mouth bottles, PE-LD

Transparent, with screw-cap with moulded-in sealing ring made of PP.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
50	32	87	39	24	93389
100	32	94	47	24	93489
250	45	133	58	12	93789
500	45	151	76	12	93989
1000	63	196	91	12	94189

Wide-mouth bottles, PE-LD

Transparent, with screw-cap with moulded-in sealing ring made of PE-LD.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
50	32	80	38	100	139393
100	32	94	48	50	139493
250	40	126	62	50	139593
500	50	155	76	50	139693
1000	65	208	93	25	139793
2000	65	246	120	25	139893

Wide-mouth bottles, PE-LD

Transparent, square, with screw-cap made of PP.

Volume ml	Thread GL	Height mm	Size mm	SP	Art. No.
100	32	82	41 x 41	24	92489
250	45	110	55 x 55	24	92689
500	45	133	70 x 70	12	92789
1000	63	166	87 x 87	12	92889

Wide-mouth bottles, PE-LD

Transparent, with leakproof caps with seal. Improved design having eyes for attaching tags or seals.

Volume ml	Thread mm	Height mm	Ø mm	SP	Art. No.
50	24	75	40	25	80408
100	24	90	50	25	80409
250	36	130	60	25	80410
500	36	160	75	10	80411
1000	50	200	95	10	80412
2000	50	250	115	10	80413

Screw caps, PFA

With moulded-in sealing ring.

Thread	SP	Art. No.
GL 18	12	102597
GL 25	12	102397
S*28	12	102697
S*40	12	102897

* buttress thread

Screw caps, PP

With moulded-in sealing ring.

Thread GL	SP	Art. No.
18	24	83310
25	12	83311
32	12	83312
40	12	83315
45	12	83313
52	12	83316
56	12	83317
63	12	83314

Reagent bottles, PP

Narrow-mouth.
Transparent, with screw-cap made of PP.
Size 5000 ml with 1, size 10000 ml with 2 handles.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
100	18	100	52	20	100389
250	25	132	70	20	100489
500	25	165	87	10	100589
1000	32	202	108	10	100689
2000	32	245	131	6	100789
5000	45	315	178	1	100889
10000	63	394	222	1	100989

Reagent bottles, PP

Narrow-mouth.
Transparent, with NS stopper made of PP.
Size 5000 ml with 1 handle.

Volume ml	Neck size NS	Height mm	Ø mm	SP	Art. No.
100	14/23	106	52	20	100394
250	19/26	138	70	20	100494
500	24/29	172	87	10	100594
1000	29/32	213	108	10	100694
2000	29/32	255	131	6	100794
5000	45/40	325	178	1	100894

Reagent bottles, PP

Wide-mouth.
Transparent, with screw-caps made of PP.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
100	32	96	55	20	101589
250	45	132	73	20	101689
500	45	172	87	10	101789
1000	63	204	108	10	101889
2000	63	243	131	6	101989

Reagent bottles, PP

Wide-mouth.
Transparent, with NS stopper made of PP.

Volume ml	Neck size NS	Height mm	Ø mm	SP	Art. No.
100	29/32	111	55	20	101594
250	34/35	144	73	20	101694
500	45/40	183	87	10	101794
1000	60/46	214	108	10	101894
2000	60/46	263	131	6	101994

Standard joint stoppers, PP

NS	SP	Art. No.
7/16	1	90594
10/19	1	90694
12/21	1	90794
14/23	1	90894
19/26	1	90994
24/29	1	91094
29/32	1	91194
34/35	1	91294
45/40	1	91394
60/46	1	91494

Urinals, PP and PC

Bottle made of PP or PC, raised scale, graduation 50 ml. Available with or without attached lid made of PE-LD. Bottles are autoclavable at temperatures up to 121 °C.

Type	Volume ml	SP	Art. No.
Urinal without lid, PP	1000	6	97494
Urinal with lid, PP	1000	6	00394
Urinal without lid, PC	1000	6	97496
Urinal with lid, PC	1000	6	00396
Lid, PE-LD		6	97593

Storage bottles, PE-LD, with tap

Supplied with screw-caps and carrying bails, exchangeable tap with 3/4“ pipe fitting.

Volume l	Thread mm	Height mm	Ø mm	SP	Art. No.
5	45	335	165	1	81660
10	55	415	210	1	81662
25	55	525	280	1	81664
50	55	605	365	1	81666

Storage bottles, PE-LD, without tap

Supplied completely with screw-caps and carrying bails.

Volume l	Thread mm	Height mm	Ø mm	SP	Art. No.
5	90	315	165	1	81640
5	45	335	165	1	81644
10	120	390	210	1	81642
10	55	415	210	1	81646
25	55	525	280	1	81648
50	55	605	365	1	81650

Tap for storage bottles, PP

Description	SP	Art. No.
Tap, PP, for narrow-neck storage bottles, art. no. 81660 to 81666.	1	80375

Container, PP

Save valuable space with this compact container system. Each container is supplied with screw cap and volume scale. The unique stopcock is absolutely water-tight when not in use. By inverting the special spout, any residual dropping after closing is prevented. Supplied without stopcock.
Capacity 6 l
Measurements 65 x 335 x 335 mm
Top Ø 41 mm

Description	SP	Art. No.
Compact container	10	155094
Vented screw-cap	1	155594
Safety support for 2 containers	1	155699
Safety support for 3 containers	1	155799
Stopcock	1	156094

Sample containers, PFA

With screw cap made of PFA.
For sample collection, transport and storage of samples.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
30	40	54	38	1	130297
60	40	90	38	1	130397
90	56	62	54	1	130497
180	56	112	54	1	130597

Sample containers, PE-HD

With screw-cap made of PE-HD
For sample collection, transport and storage of samples.

Volume ml	Thread mm	Height mm	Ø mm	SP	Art. No.
5	23	36	21	10	80910
10	23	58	21	10	80911

Sample containers, PP

With screw-cap made of PP.
For sample collection, transport and storage of samples.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
30	40	54	38	10	130294
60	40	90	38	10	130394
90	56	62	54	10	130494
180	56	112	54	10	130594

Sample vials, PP

Transparent, with snap-on lid made of PE-LD.

Volume ml	Height mm	Ø mm	SP	Art. No.
5	25	20	25	68594
8	37	20	25	68694
12	37	22	25	68794
18	57	22	25	68894
28	52	30	10	68994
35	67	30	10	69094
50	97	30	10	69194
160	110	50	10	69294

Sample vials, PE-LD

Transparent, with attached snap-on lid made of PE-LD.

Volume ml	Height mm	Ø mm	SP	Art. No.
1	32	9	500	80730
2	32	14	100	80731
5	50	15	100	80737
8	56	17	100	80732
10	32	22	100	80733
25	72	24	100	80734
30	52	31	50	80736
50	74	30	50	80735

Sample vials, PFA

With or without individually calibrated ring mark at 10 ml with screw cap GL 25 made of PFA.

Type	Volume ml	Height mm	Ø mm	SP	Art. No.
With ring mark at 10ml	15	110	22	1	103897
Without ring mark	15	110	22	1	1038971

Sample vials, PFA

For sample preparation, centrifugation and for autosampler racks.

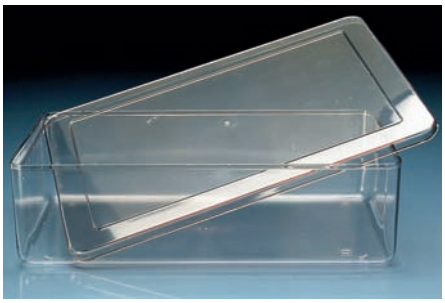
Type	Volume ml	Height mm	Ø mm	SP	Art. No.
With ring mark at 10 ml and stopper, PP	12	110	16	1	1037979
Without ring mark	12	110	16	1	103797

Microcentrifuge tubes, PP

With frosted marking area and raised graduation for volume determination. The lid membrane has a uniform thickness and is easily pierceable by an analyzer. The attached lid seals tightly, yet reopenes easily. The reaction tubes possess a consistent wall thickness and a high clarity.
- Withstands up to 20 000 RCF at 20 °C for up to 20 mins
- Lid membrane Ø 8 mm, approx. 0.35 mm thick
- Outer Ø x H: 11 x 41 mm

Volume ml	Pack size pcs.	SP	Art. No.
1.5	1x500	500	145094
1.5	6x500	3000	145194

Multi-purpose container, SAN



Glass-clear, with lid.

Volume ml	L x W x H mm	SP	Art. No.
4000	340 x 230 x 94	1	36491

Storage boxes, PS

With lid, for 25, 50 or 100 slides of 76 x 26 mm. Handy, stackable, break-proof and easy to clean. The seats are numbered individually. With index card.

Positions	L x W x H mm	SP	Art. No.
25	122 x 96 x 34	4	80276
50	229 x 96 x 34	1	80277
100	229 x 181 x 34	1	80278

Storage boxes, nesting, PS

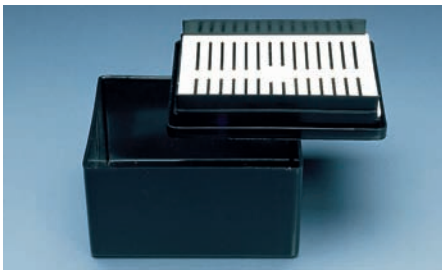
Storage boxes for staining racks. Optional with or without 4 staining racks available.

Description	L x W x H mm	SP	Art. No.
With 4 staining racks	192 x 169 x 39	3	99390
Without staining racks	192 x 169 x 39	3	99490

Staining rack, POM

For simultaneously staining up to 25 slides. Fits in Art. No. 99199 staining jar.

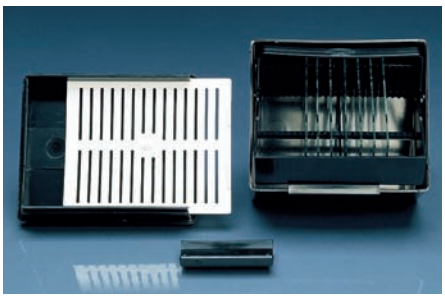
L x W x H mm	SP	Art. No.
91 x 79 x 38	10	99299



Staining jar, POM

Staining jar, handles up to 25 slides. Accommodates a single rack, art. no. 99299.

L x W x H mm	SP	Art. No.
100 x 87 x 51	5	99199



Staining cuvette, POM

Consists of staining jar and rack for 25 standard slides 76 x 26 mm.

L x W x H mm	SP	Art. No.
100 x 87 x 51	5	99099

Staining jar, PMP

Glass-clear, for use with art. no. 80354. Supplied with two lids. One for use when no staining dish is in use, precluding evaporative loss of staining liquids during storage.A second lid witth an opening for the handle of the staining dish.

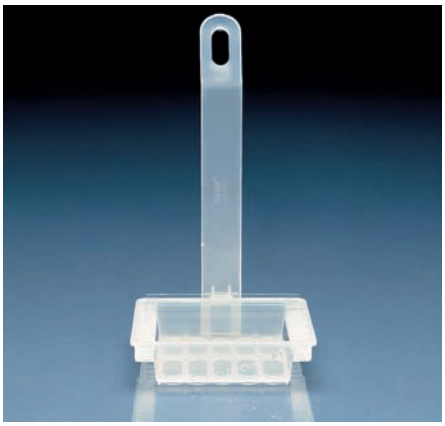
L x W x H mm	SP	Art. No.
103 x 82 x 70	4	80353

Staining cuvette ‘Hellendahl’, PMP

Glass-clear, supplied complete with lid. Holds 8 slides stacked vertically or 16 slides stacked back to back 76 x 26 mm.

L x W x H mm	SP	Art. No.
58 x 53.5 x 86	4	80355

Staining dish, PP



Holds 20 slides of 76 x 26 mm. Removable snap-on handle. For the use with art. no. 80353.

L x W x H mm	SP	Art. No.
86 x 70 x 21	2	80354

Staining cuvette ‘Coplin’, PP

With screw cap, for simultaneously staining 10 slides of 76 x 26 mm.

Height mm	Ø mm	SP	Art. No.
114	59	10	136693

Cuvettes, PS and PMMA

Standardized disposable cuvettes are ideal for kinetic measurements and come in a clearly arranged, resealable package.
- Grouped by mold cavity number
- Flawless optical path
- Recessed windows protect against scratching
- Arrow indicates optical path orientation

Measurements:

Cuvette:	12.5 x 12.5 x 45 mm
Window: Macro Cuvette	10 x 35 mm
Window: Semi-micro cuvette	4.5 x 23 mm
Light path:	10 mm

Polystyrene cuvettes (PS)

Typical range of application	> 340 nm
Standard deviation at 360 nm	0.005 extinction units

Polymethyl methacrylate cuvettes (PMMA)

Typical range of application	> 300 nm
Standard deviation at 320 nm	0.004 extinction units

Description	Filling volume ml	SP	Art. No.
Macro cuvette, PS	2.5 - 4.5	1000	146190
Semi-micro cuvette, PS	1.5 - 3.0	1000	146290
Macro cuvette, PMMA	2.5 - 4.5	1000	146399
Semi-micro cuvette, PMMA	1.5 - 3.0	1000	146499

Desiccators with stopcock, PC

Glass-clear, with stopcock for evacuation. Lower sections can be filled with desiccants. A perforated disk of PP supports materials to be dried. Lids are sealed by a neoprene gasket. Ideal for use in schools, universities, and student laboratories.

Ø mm	Disc Ø mm	SP	Art. No.
171	140	1	326496
230	190	1	326596
273	230	1	326696

Desiccators, PP/PC

Lower section made of PP can be filled with desiccants. A perforated disk of PP supports materials to be dried. Lids made of PC are sealed by a neoprene gasket. Ideal for use in schools, universities, and student laboratories.

Ø mm	Disc Ø mm	SP	Art. No.
171	140	1	326094
230	190	1	326194
273	230	1	326294

Desiccators with stopcock, PP/PC

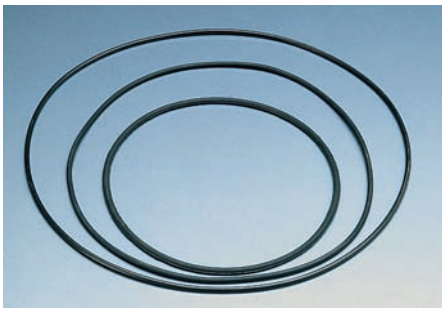
Evacuable desiccators. Base sections in PP. Hot crucibles should be put on a porcelain plate only. Cover of transparent PC. O-ring provides excellent sealing. Vacuum valve of PC with PE stopper allows for gradual admission of air in order to prevent damage to crucibles. A removable pan holds calcium chloride or other choice of desiccant. Supplied without desiccator plates.

Ø mm	SP	Art. No.
150	1	80550
200	1	80230
250	1	80554

Desiccator plates, PP and porcelain

PP-Plate usable up to max. 120 °C.

Material	for Desiccator-Ø mm	Ø mm	SP	Art. No.
PP	150	141	1	80551
PP	200	190	1	80231
PP	250	239	1	80553
Porcelain	150	140	1	65965
Porcelain	200	190	1	65975
Porcelain	250	240	1	65980



Spare parts for desiccators

Spare O-rings and valves for desiccators (art. no. 80550, 80230, 80554).

Description	SP	Art. No.
O-ring for desiccator no. 80550	1	80555
O-ring for desiccator no. 80230	1	80556
O-ring for desiccator no. 80554	1	80557
Valve, PC, for desiccator no. 80550, 80230, 80554	1	80229

Seed germinating kits, PS

Kit for checking seed germination. A strip of filter paper is inserted through the slot in the annular support, a circular sheet of filter paper is placed on the support. Seeds are laid out on this sheet of filter paper. Includes a top bell equipped with an air vent. Conforms to DBGM 1671453.

Description	SP	Art. No.
Seed germinating kit, 250 ml	10	98590
Annular support for seed germinating kit art. no. 98590	10	98690
Top bell for seed germinating kit art. no. 98590	10	98790
Water jar, 250 ml for seed germinating kit art. no. 98590	10	98890

Instrument trays, MF

White. Fitting lid made of PS please order separately.

L x W x H mm	SP	Art. No.
190 x 150 x 40	5	72098
290 x 160 x 35	5	72198
290 x 160 x 60	5	72398
340 x 245 x 100	5	72498
350 x 250 x 40	5	72298

Lids for instrument trays, PS

Glass-clear, with handle.

Size mm	For Container no.	SP	Art. No.
190 x 150	72098	5	79790
290 x 160	72198, 72398	5	79890
340 x 245	72498	5	79990

Instrument trays, flat, MF

White, flat.

L x W x H mm	SP	Art. No.
190 x 150 x 17	5	71598
240 x 180 x 17	5	71698
268 x 208 x 17	5	71798
355 x 240 x 17	5	71898
428 x 288 x 17	5	71998

Laboratory trays, PP

All-purpose trays, robust, high chemical resistance.

Bottom size inner mm	Rim measurement mm	Height mm	SP	Art. No.
130 x 180	180 x 230	42	1	165094
180 x 240	250 x 310	65	1	165194
240 x 300	310 x 370	75	1	165294
300 x 400	420 x 520	120	1	165394
400 x 500	534 x 634	140	1	165494
500 x 700	648 x 846	160	1	165594

Deep trays, PVC

White, universal usable.

Bottom size inner mm	Height mm	SP	Art. No.
200 x 150	50	1	80280
250 x 200	60	1	80281
320 x 260	70	1	80282
350 x 300	85	1	80283
430 x 330	95	1	80284
520 x 420	95	1	80285
675 x 540	100	1	80286
550 x 430	190	1	80288

Compartment tray, PVC

With 9 cavities, for bottles up to Ø 25 mm.

Size mm	Height mm	SP	Art. No.
355 x 300	45	1	80952

Compartment tray, PVC

With 12 cavities, for small parts.

Size mm	Height mm	SP	Art. No.
410 x 300	65	1	80953

Compartment tray, PVC

With 5 cavities of different sizes for pipettes, thermometers, connectors etc.

Size mm	Height mm	SP	Art. No.
410 x 300	70	1	80954

Buckets, PE-HD

White, graduated.
Suitable tight snap-lid, transparent, made of PE-LD. (Please order separately).

Description	Volume l	Height mm	Ø mm	SP	Art. No.
Bucket	5	240	250	1	96093
Bucket	10	300	290	1	96393
Lid	for 5 l			1	96293
Lid	for 10 l			1	96593

Buckets with spout, PP

Transparent, graduated, without lid. Highly resistant to chemicals.

Volume l	Height mm	Ø mm	SP	Art. No.
12	330	310	1	96694
15	370	310	1	96794

Bowls, round, PP

White, round.

Volume l	Height mm	Ø mm	SP	Art. No.
1	70	160	5	42594
2	80	200	5	42694
3	100	240	5	42794
4	120	280	5	42894
7	130	320	3	42994
9	150	360	3	43094
13	180	400	3	43194

Mixing vessel, MF

White, with both spout and handle, non-slip.

Volume ml	Height mm	Ø mm	SP	Art. No.
3000	140	220	1	73298

Bowl, PP

White, for steel sinks.

Volume l	L x W x H mm	SP	Art. No.
14	320 x 340 x 190	5	43510

Carrying trays, PE-HD

Easy stackable.

Volume l	L x W x H mm	SP	Art. No.
20	380 x 280 x 200	1	80602
46	560 x 330 x 250	1	80603
72	660 x 400 x 300	1	80604

Multi-purpose containers, PP

With 2 carrying grips. Volume 30 l, outer-Ø 400 mm, height 450 mm.

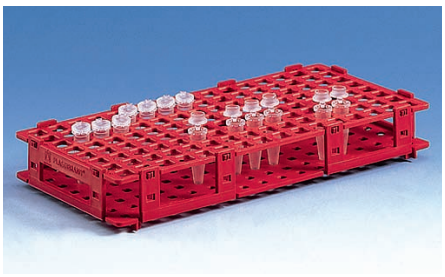
Colour	SP	Art. No.
green	1	47705
yellow	1	47706
orange	1	47707
blue	1	47708
grey	1	47716

Microcentrifuge tube rack, PP

For test tubes 0.5 / 1.5 / 2.0 ml and cryo-tubes.

For Ø up to mm	Positions	Colour	L x W x H mm	SP	Art. No.
10 - 12	8 x 12	white	215 x 131 x 27	1	136894

Microcentrifuge tube racks, coloured, PP



Sturdy construction. Stackable racks with alphanumerical positions. Operating temperature -20 to 90 °C. Autoclavable (121 °C). Density 1.2 g/cm^3. Will not float in waterbath. Racks are supplied in two-pieces (Ø 11 mm, for microcentrifuge tubes) or three-pieces (Ø 13 mm. for cryo tubes) for convenient and permanent assembly.

For Ø up to mm	Positions	Colour	L x W x H mm	SP	Art. No.
11	8 x 16	white	265 x 126 x 38	5	3197940
13	6 x 14	white	265 x 126 x 38	5	3198940
11	8 x 16	blue	265 x 126 x 38	5	3197948
13	6 x 14	blue	265 x 126 x 38	5	3198948
11	8 x 16	red	265 x 126 x 38	5	3197943
13	6 x 14	red	265 x 126 x 38	5	3198943

Test tube racks, coloured, PP

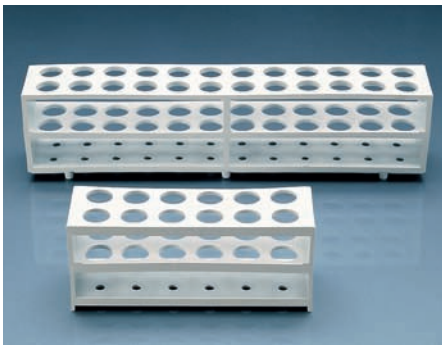
Sturdy construction, stackable, light, colour-coded. Ideal for use in water baths. Alphanumerical positions. For refrigerated storage of samples, and for incubations conducted in climatic chambers. Racks are supplied in two-pieces for convenient and permanent assembly. Operating temperature - 20 to 90 °C. Autoclavable at temperatures up to 121 °C. L x W: 265 x 126 mm.

For Ø up to mm	Positions	Height mm	Colour	SP	Art. No.
13	6 x 14	75	white	5	3190940
16	5 x 11	75	white	5	3191940
18	5 x 11	75	white	5	3192940
20	4 x 10	75	white	5	3193940
25	4 x 8	88	white	5	3194940
30	3 x 7	88	white	5	3195940
13	6 x 14	75	blue	5	3190948
16	5 x 11	75	blue	5	3191948
18	5 x 11	75	blue	5	3192948
20	4 x 10	75	blue	5	3193948
25	4 x 8	88	blue	5	3194948
30	3 x 7	88	blue	5	3195948
13	6 x 14	75	red	5	3190943
16	5 x 11	75	red	5	3191943
18	5 x 11	75	red	5	3192943
20	4 x 10	75	red	5	3193943
25	4 x 8	88	red	5	3194943
30	3 x 7	88	red	5	3195943

Test tube racks, PE

White, allow the control of reagents.

For Ø up to mm	Positions	L x W x H mm	SP	Art. No.
16	10	200 x 55 x 65	4	80130
18	9	200 x 55 x 65	4	80131



Test tube racks, PP

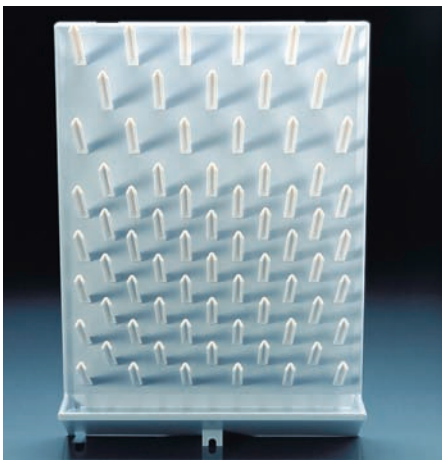
White, for test tubes Ø 21 mm

For Ø up to mm	Positions	L x W x H mm	SP	Art. No.
21	2 x 6	190 x 60 x 80	5	80560
21	2 x 12	375 x 65 x 85	5	80562

Drying rack

Polyethylene-coated steel rack on a PVC backplate and trough.

Size mm	SP	Art. No.
450 x 630	1	76299



Drying rack, PS

With draining trough and draining tubing. Rack with 72 pegs 100 x 15 mm. Pegs can be insert as required.

Description	Size mm	SP	Art. No.
Drying Rack	450 x 630	1	80213
Replacement Pegs	95 x Ø 6	11	81213

Competence in Lab Plastics

BOTTLING AND WEIGHING

VITLAB
Competence in Labware

Measuring scoops, PP

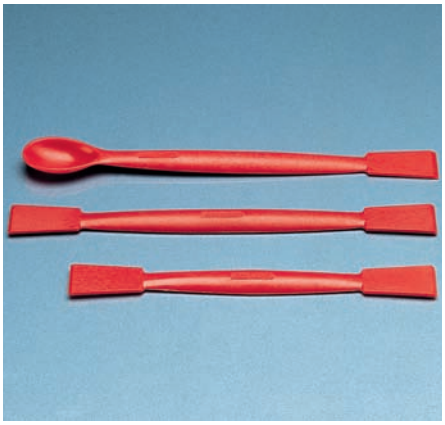
White, flat bottoms and tops, volume-marked.

Volume ml	Length mm	SP	Art. No.
2	60	12	39194
5	82	12	39294
10	100	12	39394
25	135	12	39494
50	160	12	39594
100	200	12	39694
250	260	6	39794
500	315	6	39894
1000	385	6	39994

Measuring scoops, PE-HD

Natural colouring.

Volume ml	Length mm	SP	Art. No.
15	115	12	40093
25	135	12	40193
65	185	12	40293
110	215	12	40393
150	250	12	40493
350	310	6	40593
750	350	6	40693
1250	400	6	40793



Spatula, PA

Glass-fibre reinforced.

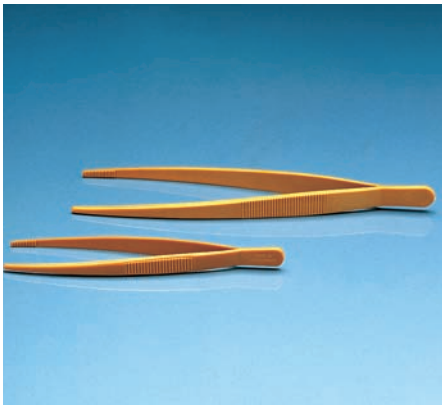
Description	Length mm	SP	Art. No.
Double-spatula	150	10	80594
Double-spatula	180	10	80595
Spatula-spoon	180	10	80596
Spatula-spoon	210	10	80593

Measuring Spoon, PS

Glass-clear, without graduation.

Volume ml	Length mm	SP	Art. No.
2	90	1000	69990

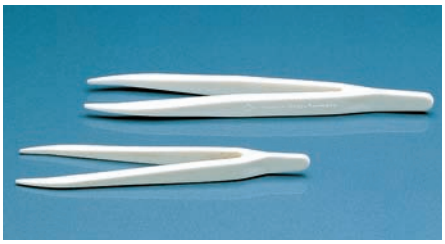
Forceps, POM



Yellow, flat bottoms and tops, self-sprung.

Length mm	SP	Art. No.
115	5	68099
145	5	68199
180	5	68299
250	5	68399

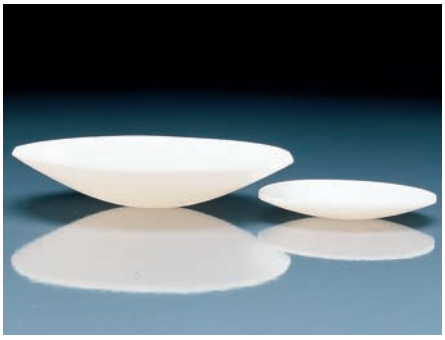
Forceps, PMP



White, pointed, self-sprung.

Length mm	SP	Art. No.
115	10	67895
145	10	67995

Watch glasses, PTFE



Ø mm	SP	Art. No.
50	1	113197
75	1	113297
100	1	113397
125	1	113497

Watch glasses, PP

Transparent, with base.

Ø mm	SP	Art. No.
60	10	80452
80	10	80454
100	10	80455
125	10	80456

Weighing jars, PP

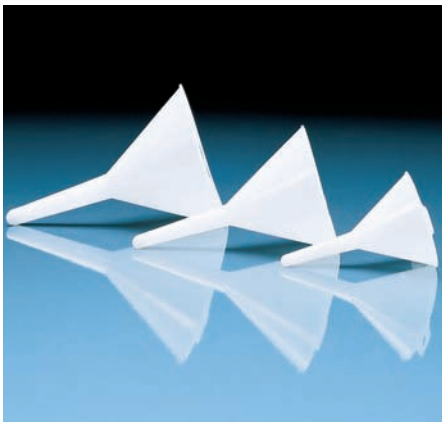
Transparent, with hermetic-seal lids.

Volume ml	Height mm	Ø mm	SP	Art. No.
25	30	40	10	80342
30	50	30	10	80340
50	30	50	10	80345
65	35	60	10	80346
65	60	40	10	80343
200	90	60	10	80347
400	120	70	10	80348

Competence in Lab Plastics

FILTERING AND DECANTING

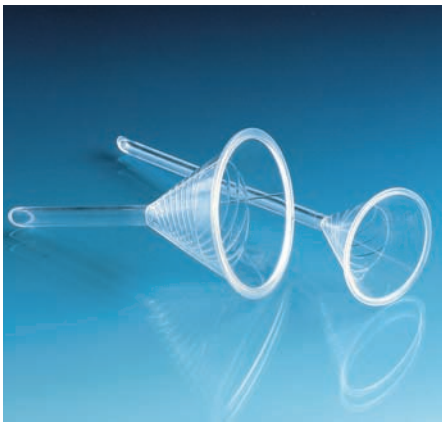
VITLAB
Competence in Labware



Funnels, PP

Transparent.

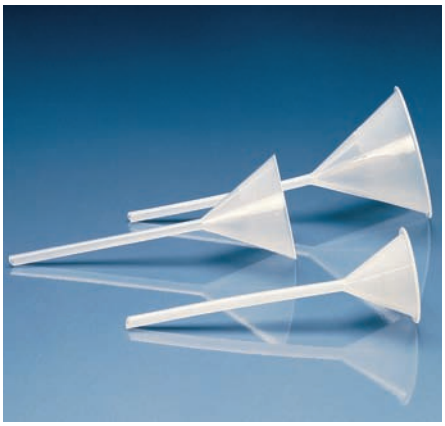
Ø mm	Length mm	Stem Ø mm	Stem length mm	SP	Art. No.
30	45	1.5	25	24	40894
30	47	4	25	24	41094
40	65	4	35	24	41194
50	85	7	43	24	41294
75	110	6	55	12	41394
100	155	8	77	12	41494
120	180	11	90	12	41594
150	220	15	95	12	41694



Urbanti funnels, COC

Glass-clear, spiral ribbing precludes trapping of air between filter paper and funnel, providing more rapid filtration.

Ø mm	Length mm	Stem Ø mm	Stem length mm	SP	Art. No.
51	195	3	150	6	325095
70	210	3	150	6	325195
100	198	7	108	4	325295
140	247	10	132	3	325395
196	315	20	155	2	325495



Analytical funnels, PP

Transparent.

Ø mm	Length mm	Stem Ø mm	Stem length mm	SP	Art. No.
50	194	5	150	10	80162
72	208	5	142	10	80164
91	227	5	142	10	80165

Büchner funnels, PP

Two detachable pieces facilitate cleaning.

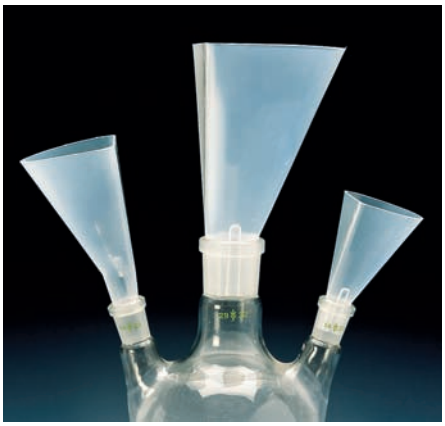
Filter-Ø mm	Length mm	Holes Ø mm	SP	Art. No.
45	95	1.0	1	80437
55	113	1.0	1	80438
70	145	1.5	1	80439
80	165	1.5	1	80440
90	180	1.5	1	80441
110	210	2.0	1	80442
160	280	3.0	1	80443
240	350	3.0	1	80445

Large funnels, PP or PE-HD

Transparent.
Stainless steel/aluminium mesh sieve/filter.

Ø mm	Length mm	Stem Ø mm	Material	SP	Art. No.
200	200	22	PP	6	41794
250	260	30	PP	6	41894
350	440	35	PP	1	41994
400	365	42	PE-HD	1	42294
430	420	37	PE-HD	1	42393
Brass mesh Ø 50 mm for funnels no. 41794, 41894				1	42099

Half-round funnels, PP



Transparent, special ST-funnels for use on multi-neck flasks and labware.

NS	Length mm	Stem width mm	Stem length mm	SP	Art. No.
14/23	75	40	17	10	70494
19/26	95	50	23	10	70594
29/32	135	75	30	5	70694

Powder funnels, PP

Transparent.

Ø mm	Length mm	Stem Ø mm	Stem length mm	SP	Art. No.
65	68	15	25	10	70794
80	75	21	25	10	70894
100	94	22	20	10	70994
120	110	26	20	10	71094
150	138	28	22	5	71194

Funnel holders, PP

Available to hold funnels with diameters from 50-120 mm, to connect to rods with diameters from 8-14 mm.

Positions	SP	Art. No.
1	5	80268
2	5	80269

Support for separatory funnels, PP

For separatory funnels from 125-500 ml, with clamp for rods Ø 8-14 mm.

Positions	SP	Art. No.
1	5	80970

Filter funnel supports

PP-plates with aluminium 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.

Positions	Base plate mm	SP	Art. No.
2	250 x 140	1	78394
4	450 x 140	1	78294

Chemical waste system, PE/PP

For disposal of liquid chemical waste. The funnel of PE-HD contains an automatic valve to avoid overflow. The valve closes the container of PP and minimizes evaporation.

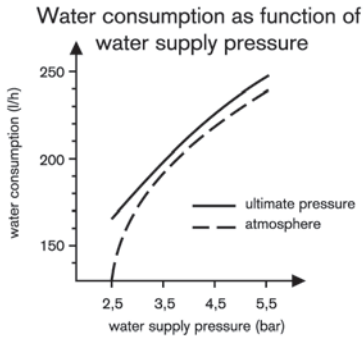
Volume l	Height mm	Ø mm	SP	Art. No.
10	560	222	1	151594

Water-jet vacuum pump, PP

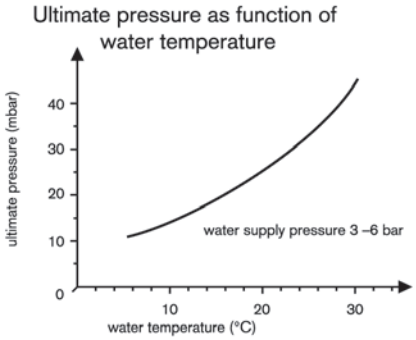
For generation of a vacuum and to siphon off liquids and steam (Suction main or condensation trap may need to be made available.)
Pump fluid: water
Overall length: approx. 210 mm (R 3/4“ connector fitted)
Weight: approx. 33g (R 3/4“ connector fitted)

- 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 vaccuum connection.

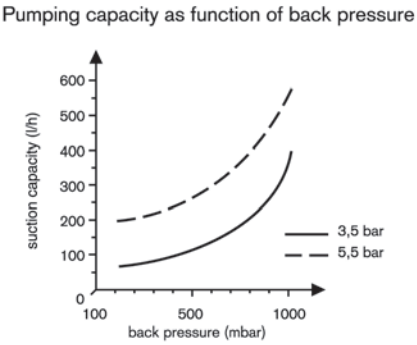
Variety of supplied adapters simplify connections to most water sources. Optional reducing adapters are available.



Very low water consumption:
The flow configuration has been optimized, resulting in a 33% reduction of water consumption (190 liters/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).

Water jet filter pump includes:
- Water connection sleeve nut R 3/4“, reducing adapter R 1/2“, and tubing connector (hose nozzle) of 10 - 12 mm outer-Ø.
- Suction line connection: Detachable hose nozzle of 6-9 mm outer-Ø, with screw cap GL 14.

Description	SP	Art. No.
Water-Jet Pump	1	77094
Adapter R3/4 inch to R3/8 inch	1	159665
Adapter R3/4 inch to M 22x1, faucet thread	1	159670

Competence in Lab Plastics

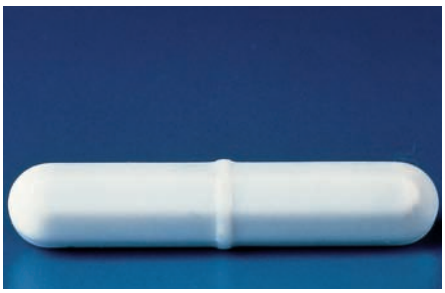
STIRRING AND MIXING

VITLAB
Competence in Labware

Magnetic stirring-bars polygon, PTFE

With permanent-magnet cores.

Ø mm	Length mm	SP	Art. No.
2	5	5	300497
2	7	5	300597
3	8	5	300897
3	10	5	301097
3	13	5	301197
4	12	10	301597
6	10	10	301697
6	15	10	301797
7	20	10	301897
7	25	10	301997
7	30	10	302097
7	40	10	302197
7	50	10	302297
7	60	10	302397
10	70	5	302497
10	80	5	302597
27	57	1	303097
27	108	1	303197
27	159	1	303297



Magnetic stirring-bars octagon, PTFE

With center-rings and permanent-magnet cores.

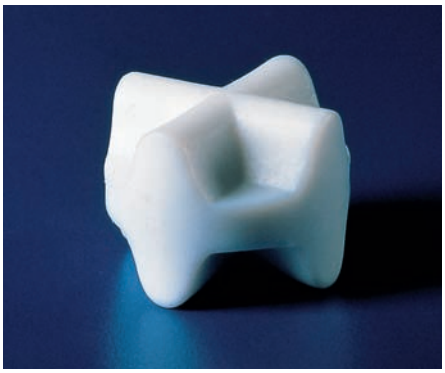
Ø mm	Length mm	SP	Art. No.
8	13	3	307697
8	16	3	307797
8	22	3	307897
8	25	3	307997
8	28	3	308097
8	38	3	308197
8	41	3	308297
8	51	3	308397
8	64	3	308497
10	13	3	308597
10	15	3	308697
10	22	3	308797
10	25	3	308897
10	35	3	308997
10	38	3	309097
10	48	3	309197
10	51	3	309297
10	64	3	309397
13	38	1	309497
13	75	1	309597

Magnetic stirring-bars oval, PTFE

With permanent-magnet cores for use in round bottom flasks.

Ø mm	Length mm	SP	Art. No.
5	10	3	311097
6	15	3	311197
10	20	3	311297
12	25	3	311397
16	30	3	311497
16	35	3	311597
20	40	1	311697
20	50	1	311797
20	64	1	311897
20	70	1	311997

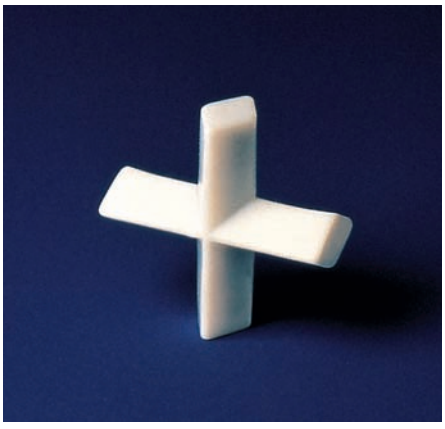
Magnetic stirring-bars double-spinfin, PTFE



With permanent-magnet cores.

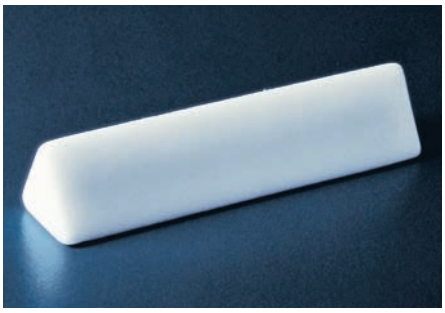
Ø mm	Height mm	SP	Art. No.
14	10	1	314097
17	13	1	314197
22	15	1	314297

Magnetic stirring-bars spinplus, PTFE



With permanent-magnet cores.

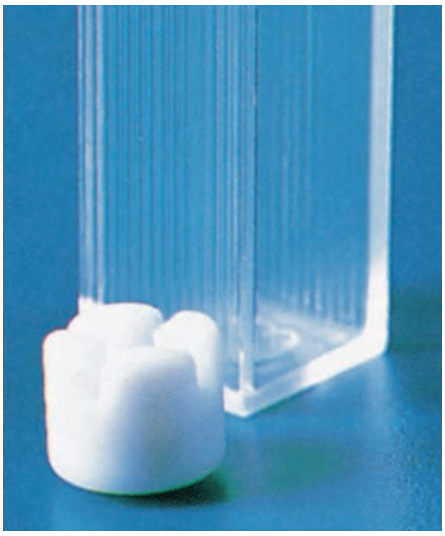
Size mm	SP	Art. No.
10 x 10	1	316097
20 x 20	1	316197
25 x 25	1	316297
30 x 30	1	316397
38 x 38	1	316497



Magnetic stirring-bars triangular, PTFE

With permanent-magnet cores.

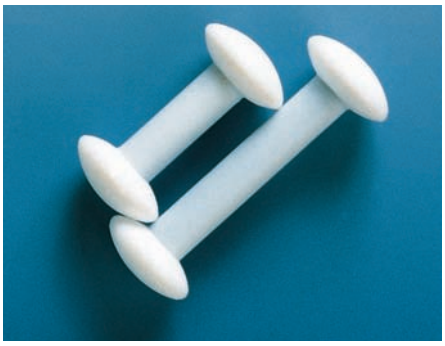
Sides mm	Length mm	SP	Art. No.
6	12	3	310197
8	25	3	310297
14	40	3	310397
12	50	3	310497



Magnetic stirring-bars spin, PTFE

With permanent-magnet cores. For use in sample cells and reagent tubes.

Ø mm	Height mm	SP	Art. No.
9	6	1	317297



Magnetic stirring-bars circulus, PTFE

With permanent-magnet cores. 20-mm circle Ø, 8-mm shaft Ø.

Length mm	SP	Art. No.
32	3	3125970
52	3	3126970

Magnetic stirrer retrievers, PE

With permanent magnet on one end and hang-up ring.

Length mm	SP	Art. No.
300	3	318293
450	3	318393

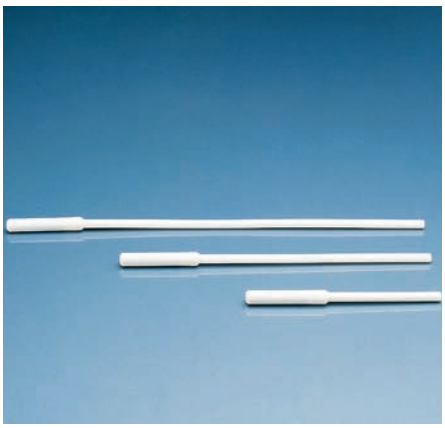
Magnetic stirrer retrievers, flexible, PTFE

With a powerful permanent-magnet at one end. For retrieving stirring bars from beakers, flasks, and similar. Flexible.

Length mm	SP	Art. No.
330	1	318597

Magnetic stirrer retrievers, PTFE

PTFE encapsulated magnetic core.



Length mm	SP	Art. No.
150	1	122097
250	1	122197
350	1	122297

Mortars, MF

White, with spout

Volume ml	Height mm	Ø mm	SP	Art. No.
300	75	125	5	72898
500	90	150	5	72998

Pestles, MF

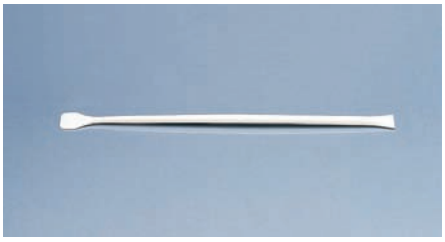
White, heavy, strong.

Length mm	Top Ø mm	Weight g	SP	Art. No.
125	30	55	5	73498
145	35	85	5	73598
160	40	120	5	73698
215	42	175	1	73898

Mixing vessel, MF

White, with both spout and handle, non-slip.

Volume ml	Height mm	Ø mm	SP	Art. No.
3000	140	220	1	73298



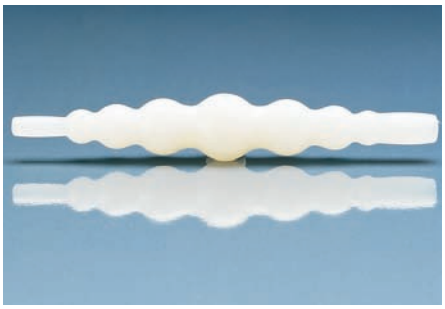
Stirring rod, PP

Length mm	SP	Art. No.
245	10	80828

Competence in Lab Plastics

CONNECTING AND CONTROLLING

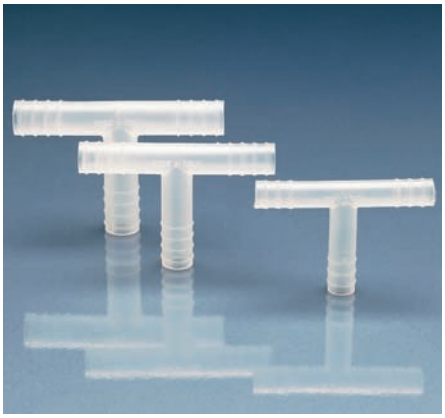
VITLAB
Competence in Labware



Connector universal, PP

Transparent.

For tubing with inner Ø mm	SP	Art. No.
5 - 15	20	78794



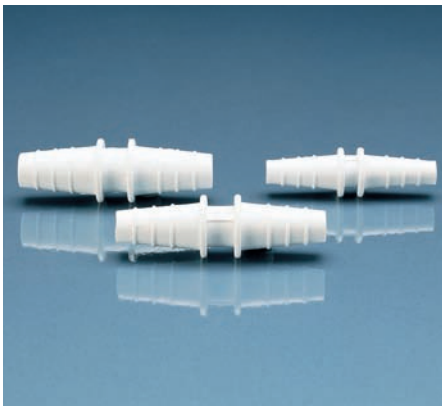
Connectors T-form, PP

For tubing with inner Ø mm	SP	Art. No.
3	20	80459
4 - 5	20	80460
6 - 7	20	80461
8 - 9	20	80462
10 - 11	20	80463
12 - 13	20	80520
14 - 15	20	80521

Connectors Y-form, PP

For tubing with inner Ø mm	SP	Art. No.
3	20	80464
4 - 5	20	80465
6 - 7	20	80466
8 - 9	20	80467
10 - 11	20	80468
12 - 13	20	80525
14 - 15	20	80526

Connectors straight, PP



For tubing with inner Ø mm	SP	Art. No.
3 - 5	20	80510
5 - 7	20	80511
7 - 10	20	80512
9 - 12	20	80513
11 - 14	20	80514
13 - 16	20	80515

Connectors straight, PP

Tube adaptors for various diameters.

For tubing with inner Ø mm	SP	Art. No.
4 - 8 / 8 - 12	20	80877
4 - 8 / 12 - 16	20	80878
8 - 12 / 12 - 16	20	80879

Connectors 90°, PP

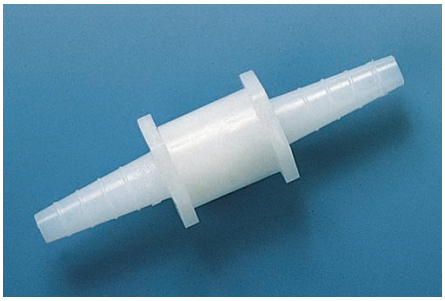
For connecting items of tubing.

For tubing with inner Ø mm	SP	Art. No.
3 - 4	20	81250
4 - 5	20	81251
6 - 7	20	81252
8 - 9	20	81253
10 - 11	20	81254
12 - 13	20	81255
14 - 15	20	81256

Connectors 2-parts, PE-HD

These quick disconnectors are useful for joining tubing of glass, rubber or plastic. Connectors fit tightly together. Replace expensive adaptors. Not suitable for pressure applications.

For tubing with inner Ø mm	SP	Art. No.
3 - 5	20	80434
5 - 7	20	80435
7 - 9	20	80436
9 - 12	20	80535
11 - 14	20	80536
13 - 16	20	80537



Non-return valve, PE-HD

With valve discs of FKM. Max. working pressure 2 bar.

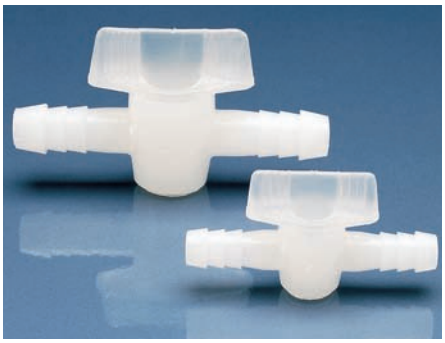
For tubing with inner Ø mm	SP	Art. No.
6 - 9	10	78593

Non-return valves, PP

With valve discs of nitril-rubber (NBR).

For tubing with inner Ø mm	SP	Art. No.
8 - 10	10	80418
10 - 15	10	80419

Stopcocks, PE



With ribbed handles and large tubing fittings. Not suitable for pressure applications.

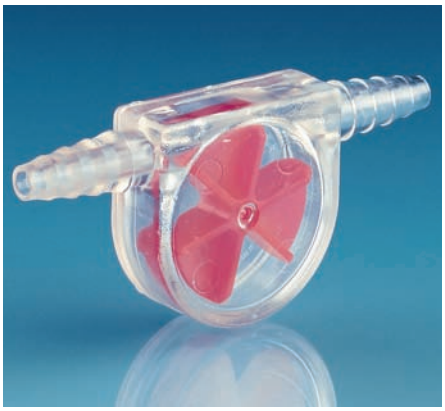
For tubing with inner Ø inch / mm	SP	Art. No.
1/2 / 12	10	75093
3/8 / 9	10	75193

Valves, 2/3-Way, PE/PP

Fittings to connect tubing. Provide flow shutoff and choice of 2-way, or 3-way flow direction. Max. working pressure 1 bar.

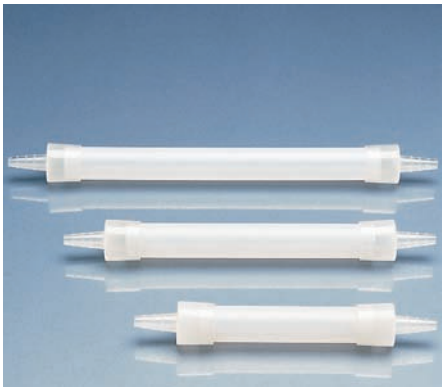
For tubing with inner Ø mm	SP	Art. No.
Valves 2-way		
5	1	137094
7	1	137294
9	1	137494
Valves 3-way		
5	1	137194
7	1	137394
9	1	137594

Flow monitor, SAN



Glass-clear. Provides a visual indication of flow of liquids or gases through tubing. Vane rotates to indicate fluid flow at flow rates as low as 150 ml/min. in either direction. Compact dimensions (just 88 mm overall length, including tubing fittings, and only 40 mm wide and 15 mm deep) allow internal installation in laboratory equipment and other apparatus.

For tubing with inner Ø mm	SP	Art. No.
6.5 - 11	10	138591



Drying tubes, PE-HD

Calcium-chloride drying tubes, ideal for drying gases. Tapered fittings on each end accept tubing having internal diameters of 8 mm to 10 mm.

Ø mm	Length mm	SP	Art. No.
20	100	5	80446
20	150	5	80447
20	200	5	80448

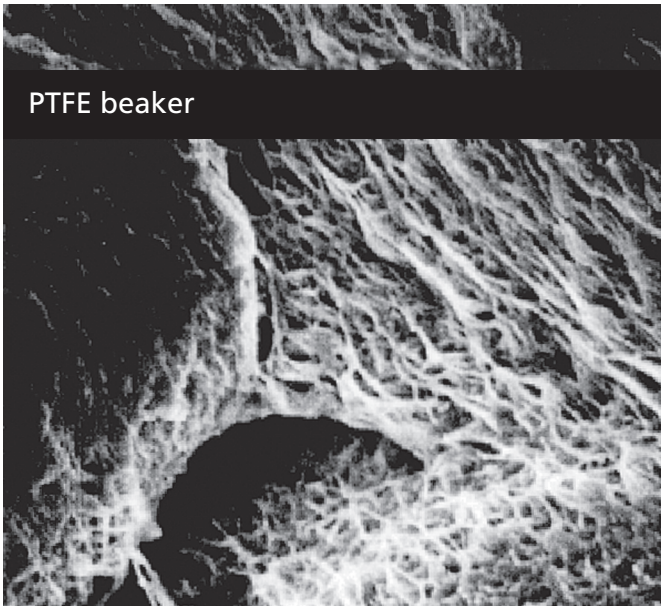
Fluorocarbon PFA

INDISPENSABLE IN TRACE ANALYSIS

VITLAB
Competence in Labware

Fluorocarbon PFA labware

In addition to the polyolefines (e.g. PP, HDPE and LDPE), fluoropolymers, especially PFA and PTFE, have found their firm place in modern laboratories, since they possess an extremely high resistance to chemicals and an unusual temperature resistance of -200 °C to +250 °C (PFA). The use of PFA in combination with injection moulding and extrusion blow moulding makes it possible to manufacture transparent products with extremely smooth and sealed surfaces.



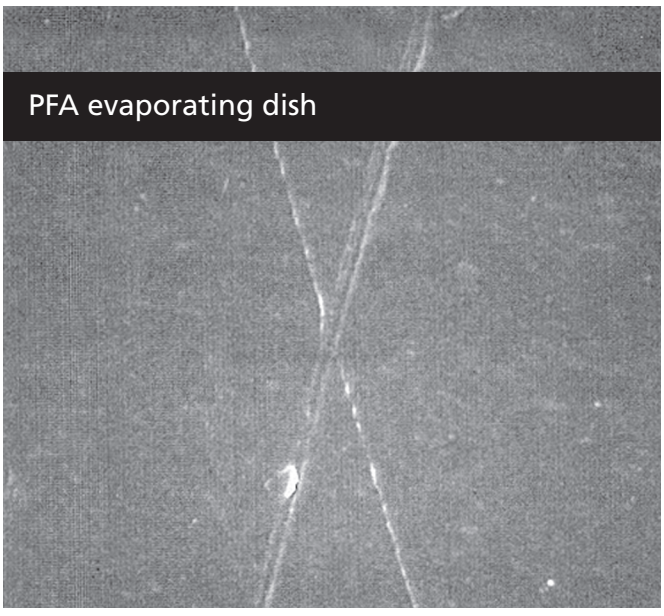
The pictures were taken in a scanning electron microscope, 8000-times magnified.

The ever-increasing need to lower the detection limit of elemental trace analysis necessitates the use of appropriate container materials. Today, trace analysis works with concentrations in the range of ng/g (ppb) and pg/g (ppt). Other materials, which have not been specially pretreated, may cause a change of concentration due to an interaction of the container wall with the sample and thus adulterate the result of the analysis. Studies have shown that a low concentration of element standards can be maintained for a longer time if containers used are made from PFA.

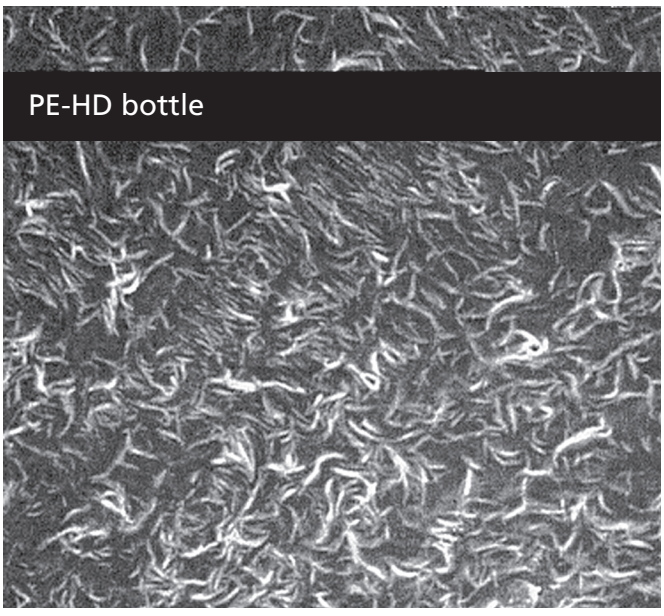
The selection of containers made of high-purity PFA is not only safer regarding the analysis, it is also economical due to the rationalization of laboratory processes.

For all PFA products, VITLAB uses high-purity PFA only, which is particularly well-suited for trace analysis. For less critical uses, e.g. if the main requirement is a high chemical resistance, VITLAB offers bottles of "PFA-economy" grade, which are partly made of recycled PFA. These bottles are very reasonably priced and environmentally sound.

PFA evaporating dish



PE-HD bottle



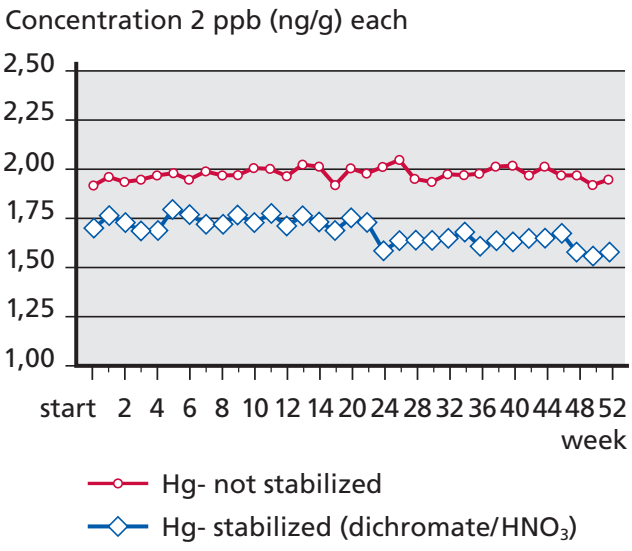
PFA – Fluorocar for secure result

Use within the scope of trace analysis

The easy-to-clean surfaces without any memory effects complement the valuable attributes of PFA laboratory equipment for sampling, preparation and analysis in the field of elemental trace analysis.

Use within trace analysis

Storage of an Hg standard in high-purity PFA containers (concentration 2 ppb (ng/g) each)).



Source: GIT Labor-Fachzeitschrift 1/95

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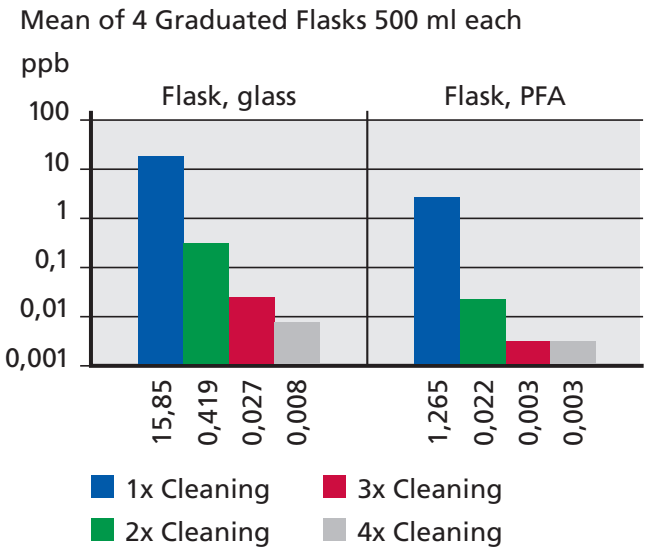
Cleaning after contamination

The cleaning of glass and PFA graduated flasks after contamination, for example with a Pb solution in the concentration of 1000 ppb (ng/g), occurs by rinsing them out with a 65% HNO_3 *Suprapur® (Pb < 0.005 ppm) solution at room temperature. The marginal concentration of 0.003 ppb is already reached after rinsing the PFA graduated flasks three times. Thus, the time-consuming boiling process can be eliminated.



Source: Kali-Forschungsinstitut, K. Mangold

The most important PFA characteristics

- High thermal stability from -200 °C to +250 °C
- Chemical inertness against almost all chemicals
- Extremely hydrophobic and antiadhesive
- Good clarity and form stability, suitable for volume measurement devices
- Long maintenance of reference material with low concentrations in PFA containers
- Extremely smooth surfaces – easy to clean (see graphic)
- No memory effects
- High purity of the basic material
- Very suitable for use within elemental trace analysis

*Suprapur® is a brand name of Merck KGaA.

Volumetric flasks, PFA, class A

High transparency, individually calibrated ring-mark.
Tolerances class A according to DIN EN ISO 1042. With lasered lot.number.
Supplied with PFA screw-caps. Screw-caps provide hermetic seals and high safety from outside contamination. Withstand high temperatures and chemical attack.
Exposure to temperatures up to 121 °C (autoclaving) will not cause permanent exceeding of tolerance limits. Cleaning up to max. 60 °C is recommended to preserve marks and inscriptions.

Volume ml	Tolerance ± ml	Height mm	Thread GL	SP	Art. No.
10	0.04	90	18	1	107097
25	0.04	115	18	1	107197
50	0.06	150	18	1	107297
100	0.10	180	18	1	107397
250	0.15	235	25	1	107497
500	0.25	270	25	1	107597

Griffin beakers, PFA

Transparent, with raised scale. High temperature and chemical resistance.

Volume ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
25	5	50	32	1	110205
50	10	59	39	1	110305
100	20	72	50	1	110405
250	50	96	67	1	110605
500	100	122	88	1	110905
1000	100	141	109	1	111005

Griffin beakers, ETFE

Transparent, with printed black scale. High temperature and chemical resistance.

Volume ml	Graduation ml	Height mm	Ø mm	SP	Art. No.
25	5	50	32	1	110204
50	10	59	39	1	110304
100	20	72	50	1	110404
250	50	96	67	1	110604
400	50	109	77	1	110704
500	100	122	88	1	110904
600	100	125	91	1	110804
1000	100	143	105	1	111004

Griffin beakers, PTFE

Opaque, virtually totally chemically inert, withstand high temperatures.

Volume ml	Thickness mm	Height mm	Ø mm	SP	Art. No.
5	2	24	22	1	112197
10	2	39	25	1	112297
25	2	47	32	1	112397
50	2	55	42	1	112497
100	3	68	55	1	112597
250	3	93	62	1	112697
500	4	126	81	1	112797
1000	4	157	102	1	112897

Wash-bottles, PFA-economy

Narrow-mouth wash bottles, transparent, with ETFE screw-cap and dispensing tube made of FEP. Withstand high temperatures and chemical attack.

Volume ml	Thread GL	Height* mm	Ø mm	SP	Art. No.
250	25	157	61	1	108792
500	25	189	76	1	108892
1000	32	233	96	1	108992

* without wash-bottle cap

Narrow-mouth bottles, PFA

Transparent, supplied with screw-cap with buttress thread made of and a moulded-in sealing ring. Ideal as packaging bottle for pure chemicals.
High temperature resistance from -200 °C to +250 °C.

Volume ml	Thread*	Height mm	Ø mm	SP	Art. No.
50	S 28	86	37	1	109297
100	S 28	120	45	1	109397
250	S 28	160	61	1	108297
500	S 28	190	76	1	108397
1000	S 28	240	96	1	108497

* Buttress thread

Narrow-mouth bottles, PFA-economy

Transparent, supplied with hermetically sealing screw-cap made of ETFE and a moulded-in sealing ring. Withstand high temperatures and chemical attack.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
50	18	90	37	1	108092
100	18	114	45	1	108192
250	25	157	61	1	108292
500	25	189	76	1	108392
1000	32	233	96	1	108492

Wide-mouth bottles, PFA

Transparent, supplied with screw-cap with buttress thread made of PFA and a moulded-in sealing ring. Ideal as packaging bottle for pure chemicals. High temperature resistance from -200 °C to +250 °C.

Volume ml	Thread*	Height mm	Ø mm	SP	Art. No.
250	S 40	150	61	1	109497
500	S 40	179	76	1	109597
1000	S 40	217	96	1	109697
2000	S 40	245	130	1	109797
2500	S 40	290	130	1	109897
5000	S 40	320	175	1	109997

* Buttress thread

Screw caps, PFA

With moulded-in sealing ring.

Thread	SP	Art. No.
GL 18	12	102597
GL 25	12	102397
S*28	12	102697
S*40	12	102897

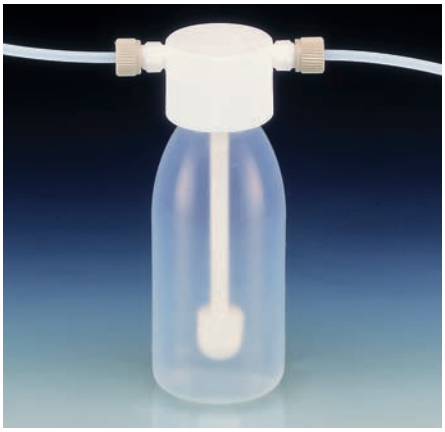
* buttress thread

Wide-mouth bottles, PTFE

Opaque with caps made of PTFE.

Volume ml	Thread mm	Height mm	Ø mm	SP	Art. No.
10	12	50	26	1	122597
25	19	61	33	1	122697
50	25	76	43	1	122797
100	35	88	52	1	122897

Gas-wash bottles, PFA



Provided with a head-piece with buttress thread S 40. Frit, PTFE. The pores of the frit having a size of approx. 50 µm for an excellent gasification into the liquid. A wide field of application is possible thanks to the high quality fluoropolymer employed for these bottles.

Volume ml	Height mm	Ø mm	Tube Connection I-Ø/O-Ø mm	SP	Art. No.
250	160	61	4 / 6	1	159497
500	190	76	4 / 6	1	159597
1000	240	96	5 / 8	1	159697

Sample containers, PFA

With screw cap made of PFA.
For sample collection, transport and storage of samples.

Volume ml	Thread GL	Height mm	Ø mm	SP	Art. No.
30	40	54	38	1	130297
60	40	90	38	1	130397
90	56	62	54	1	130497
180	56	112	54	1	130597

Sample vials, PFA

With or without individually calibrated ring mark at 10 ml with screw cap GL 25 made of PFA.

Type	Volume ml	Height mm	Ø mm	SP	Art. No.
With ring mark at 10ml	15	110	22	1	103897
Without ring mark	15	110	22	1	1038971

Sample vials, PFA

For sample preparation, centrifugation and for autosampler racks.

Type	Volume ml	Height mm	Ø mm	SP	Art. No.
With ring mark at 10 ml and stopper, PP	12	110	16	1	1037979
Without ring mark	12	110	16	1	103797

Evaporating dishes, PFA

With snap-on lid, PE. For contamination free sample preparation and efficient transportation.
Due to a conical depression in the middle of the base very small amounts of a solvent are adequate to absorb the evaporated samples.

Volume ml	Height mm	Ø mm	SP	Art. No.
25	25	50	1	103297
50	54	50	1	103397

Microwave digestion inliner, PFA

'Inliner' for CEM-Microwave Digestion Apparatus.

Volume ml	Height mm	Ø mm	SP	Art. No.
110	110	41	1	103997

Round-bottom flasks, PFA

Transparent, with standard ground socket NS 29/32. For Rotary Evaporators and distillation of high pure chemicals.
Withstand high temperatures and chemical attack.

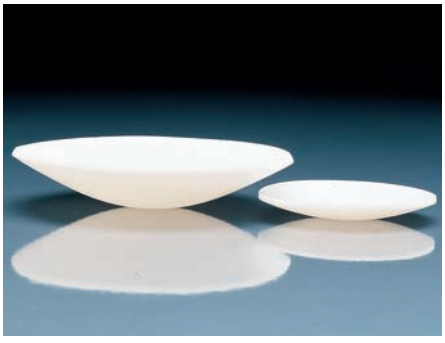
Volume ml	Height mm	Ø mm	SP	Art. No.
100	117	65	1	107797
250	147	88	1	107897
500	177	107	1	107997

Round-bottom flask support, PP

White, for round-bottom flasks, enhancing laboratory safety, durable for temperatures up to 121 °C.

Ø mm	SP	Art. No.
160	5	80271

Watch glasses, PTFE

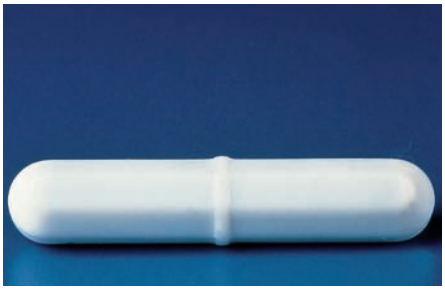


Ø mm	SP	Art. No.
50	1	113197
75	1	113297
100	1	113397
125	1	113497

Magnetic stirring-bars polygon, PTFE

With permanent-magnet cores.

Ø mm	Length mm	SP	Art. No.
2	5	5	300497
2	7	5	300597
3	8	5	300897
3	10	5	301097
3	13	5	301197
4	12	10	301597
6	10	10	301697
6	15	10	301797
7	20	10	301897
7	25	10	301997
7	30	10	302097
7	40	10	302197
7	50	10	302297
7	60	10	302397
10	70	5	302497
10	80	5	302597
27	57	1	303097
27	108	1	303197
27	159	1	303297



Magnetic stirring-bars octagon, PTFE

With center-rings and permanent-magnet cores.

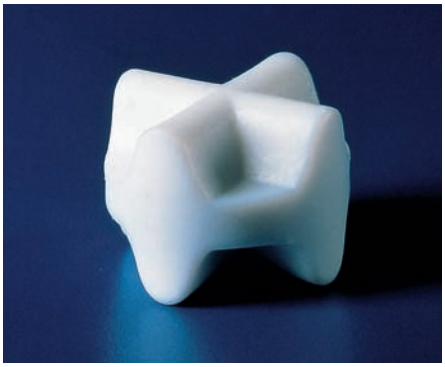
Ø mm	Length mm	SP	Art. No.
8	13	3	307697
8	16	3	307797
8	22	3	307897
8	25	3	307997
8	28	3	308097
8	38	3	308197
8	41	3	308297
8	51	3	308397
8	64	3	308497
10	13	3	308597
10	15	3	308697
10	22	3	308797
10	25	3	308897
10	35	3	308997
10	38	3	309097
10	48	3	309197
10	51	3	309297
10	64	3	309397
13	38	1	309497
13	75	1	309597

Magnetic stirring-bars oval, PTFE

With permanent-magnet cores for use in round bottom flasks.

Ø mm	Length mm	SP	Art. No.
5	10	3	311097
6	15	3	311197
10	20	3	311297
12	25	3	311397
16	30	3	311497
16	35	3	311597
20	40	1	311697
20	50	1	311797
20	64	1	311897
20	70	1	311997

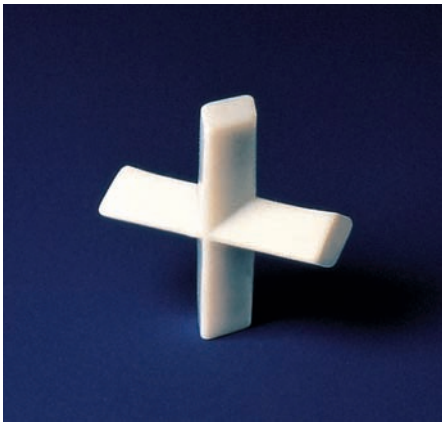
Magnetic stirring-bars double-spinfin, PTFE



With permanent-magnet cores.

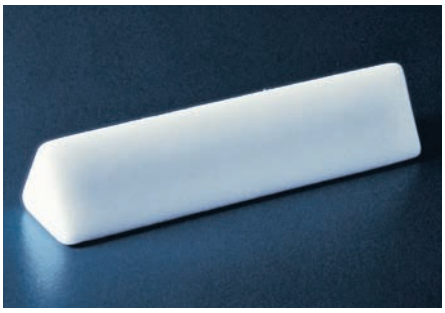
Ø mm	Height mm	SP	Art. No.
14	10	1	314097
17	13	1	314197
22	15	1	314297

Magnetic stirring-bars spinplus, PTFE



With permanent-magnet cores.

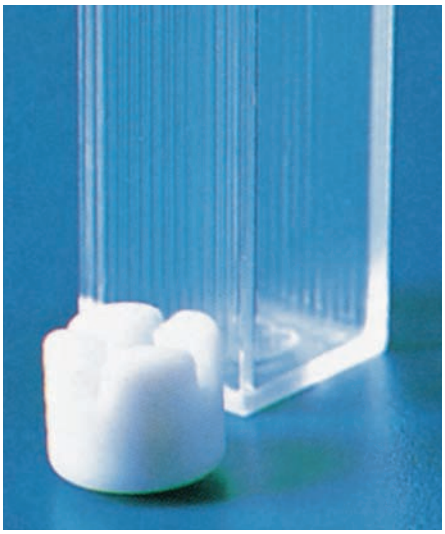
Size mm	SP	Art. No.
10 x 10	1	316097
20 x 20	1	316197
25 x 25	1	316297
30 x 30	1	316397
38 x 38	1	316497



Magnetic stirring-bars triangular, PTFE

With permanent-magnet cores.

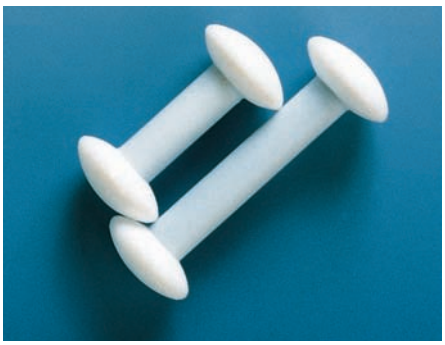
Sides mm	Length mm	SP	Art. No.
6	12	3	310197
8	25	3	310297
14	40	3	310397
12	50	3	310497



Magnetic stirring-bars spin, PTFE

With permanent-magnet cores. For use in sample cells and reagent tubes.

Ø mm	Height mm	SP	Art. No.
9	6	1	317297



Magnetic stirring-bars circulus, PTFE

With permanent-magnet cores. 20-mm circle Ø, 8-mm shaft Ø.

Length mm	SP	Art. No.
32	3	3125970
52	3	3126970

Magnetic stirrer retrievers, PE

With permanent magnet on one end and hang-up ring.

Length mm	SP	Art. No.
300	3	318293
450	3	318393

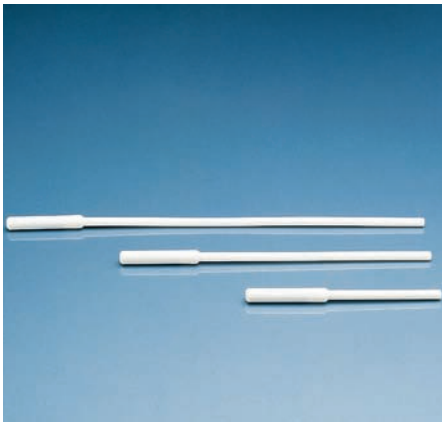
Magnetic stirrer retrievers, flexible, PTFE

With a powerful permanent-magnet at one end. For retrieving stirring bars from beakers, flasks, and similar. Flexible.

Length mm	SP	Art. No.
330	1	318597

Magnetic stirrer retrievers, PTFE

PTFE encapsulated magnetic core.



Length mm	SP	Art. No.
150	1	122097
250	1	122197
350	1	122297

PTFE-tape

Ultra thin (just 0.10 mm thick), flexible, non-adhering tape. Readily conforms to threads and irregularities. Use to improve sealing of threads, or to increase diameters of mating components for better sealing. Withstands temperatures up to 250 °C.

Length m	Width mm	SP	Art. No.
12	12	10	131097

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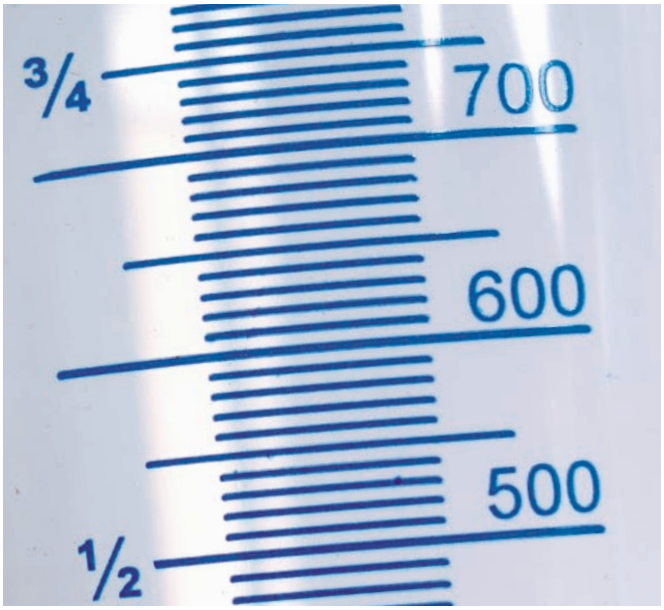


VITLAB offers you a special service with its volumetric containers: the volumetric scale can be individually designed according to your needs. However, it is also possible to print other things on our products, for example logos. So they can be used as sales material articles or as giveaways when your products are purchased. VITLAB provides advertising materials of the very highest quality with round, conical or flat printing, using screen or pad printing systems and with particularly durable and luminescent colours according to the Pantone and HKS colour table. Various marking techniques, such as laser printing and heat embossing, provide you with an unmistakable design.

Please do not hesitate to contact us for further information on the available selection, designs and colours of the plastic labware products. A personal contact will ensure that you receive competent advice from the very first conversation to the delivery of your order.

General and technical information

Plastics and their properties

- Classification and type description
- Physical properties
- Chemical resistance
- Cleaning and sterilisation

Accuracy of volume measuring instruments

Suitability for foodstuffs

Products in sterile packaging

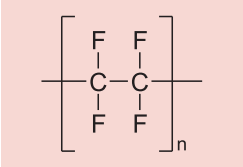
Classification and type description of plastics

In general, plastics can be divided into the three groups. Abbreviations of the described plastics according to DIN 7728.

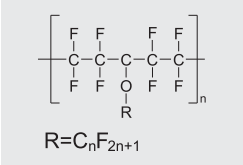
Thermoplastics
Polymers with a linear molecular structure with or without side branches are transformed into objects during molding operations without changing their thermoplastic properties. Thermoplastics are the materials commonly used in plastic labware production. Hence we provide here a brief description of some individual plastics explaining their structural, mechanical, chemical and physical properties. The most popular thermoplastics are polyolefins like polyethylene and polypropylene.

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.

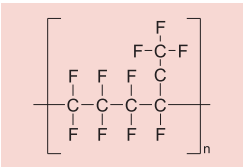
Elastomers
Polymers with loosely cross-linked molecules, exhibiting rubber-like elasticity at room temperature. Heating causes irreversible curing (vulcanization). The most popular Elastomers are natural rubber and silicone rubber.



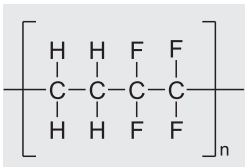
PTFE Polytetrafluoroethylene
PTFE is a fluorinated carbon with a high-molecular, partly crystalline structure. PTFE is resistant to virtually all chemicals. It offers the widest working temperature range, from -200 °C to +260 °C. Its surface is adhesion resistant. The slip properties and electrical insulation 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.



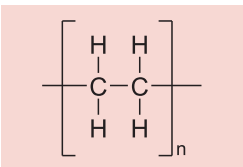
PFA Perfluoroalkoxy copolymer
This is a fluorinated carbon with a high-molecular, partly crystalline structure. Its surface is adhesion-resistant. Mechanical properties and chemical inertness are comparable with those of PTFE. Temperature use is restricted to range -200 °C to +250 °C. PFA is translucent. 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.



FEP Perfluoroethylene-propylene copolymer
This is a fluorinated carbon with a high-molecular, partly crystalline structure. Its surface is adhesion-resistant. Mechanical properties and chemical inertness are comparable with those of PTFE. Temperature use is restricted to range -100 °C to +205 °C. The water absorption of FEP is extremely low. FEP is translucent.

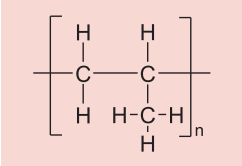


ETFE Ethylene-Tetrafluoroethylene-copolymer
These are ethylene copolymers of chlor-trifluoroethylene and tetrafluoroethylene respectively. Both are plastics of high chemical inertness, but lower temperature resistance than PTFE (max. 150 °C).

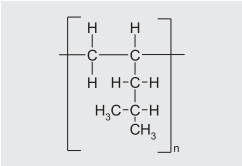


PE-LD Low Density Polyethylene / PE-HD High Density Polyethylene
The polymerization of ethylene under high-pressure results in a certain number of branches in the chain. PE-LD exhibits a less compact molecular structure than PE-HD, with very good flexibility and good chemical resistance, but less chemical resistance to organic solvents than PE-HD. Use is limited to temperatures below 80 °C. If the polymerization of ethylene is controlled by a catalytic process (PE-HD), 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.

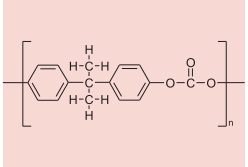
Classification and type description of plastics



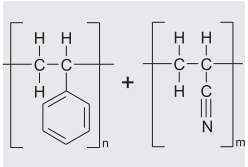
PP Polypropylene
PP has a similar structure to Polyethylene, but with methyl groups at every second carbon atom of the chain. The major advantage, compared with PE, is its higher temperature resistance. It can be repeatedly autoclaved at 121 °C. Like the above mentioned polyolefins, PP has good mechanical properties and good chemical resistance but is sligthly more susceptible to be attacked by strong oxidizing agents than PE-HD.



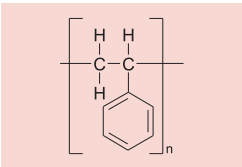
PMP Polymethylpentene
PMP is similar to PP but has isobutyl groups instead of the methyl groups. Chemical resistance is comparable to PP but tends to suffer from tension cracks when exposed to ketones or chlorinated solvents. The most important qualities of PMP are its excellent transparency and good mechanical properties at temperatures up to 150 °C.



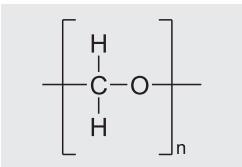
PC Polycarbonate
These are thermoplastic linear carboxylic acid polyesters combining many of the properties of metals, glass and plastics. The materials are transparent and have good thermal properties between -130 °C to +125 °C.
Note: PC may be weakened by autoclaving or exposure to alkaline detergents.



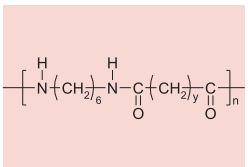
SAN Styrene-acrylonitrile copolymer
This is a glass-clear material with good resistance to stress-cracking. It has slightly better chemical resistance than PS.



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.

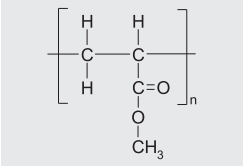


POM Polyoxymethylene
POM has superior properties with regard to hardness, rigidity, strength, durability, chemical resistance and favorable slip and abrasion characteristics. POM can replace metals in many applications.
POM can withstand temperatures up to 130 °C.

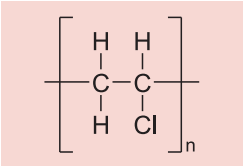


PA Polyamide
Polyamides are linear polymers with repeating amide chain linkages. With their favorable strength characteristics and high durability, polyamides can often be used as structural materials and for surface coating metals. They have good chemical resistance against organic solvents, but are easily attacked by acids and oxidizing agents.

Classification and type description of plastics



PMMA Polymethylmethacrylate
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.



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.

Physical properties of plastics

Plastics	Max. Operating Temperature °C	Brittle-Temperature °C	Micro wave suitability*	Density g/cm³
PS	70	-20	no	1,05
SAN	70	-40	no	1,03
PC	125	-130	yes	1,20
POM	130	-40	no	1,42
PMP	150	0	yes	0,83
PE-LD	80 to 90	-50	yes	0,92
PE-HD	105	-50	yes	0,95
PP	125	0	yes	0,90
ETFE	150	-100	yes	1,70
PFA	250	-200	yes	2,17
PTFE	260	-200	yes	2,17
FEP	205	-100	yes	2,15
PVC	80	-20	no	1,35
NR	80	-40	no	1,20
PMMA	65 to 95	-50	no	1,18
MF	120	-80	yes	1,50

* Observe chemical and temperature resistance

Chemical resistance

With regard to chemical resistance, plastics are classified as follows:

+

Excellent chemical resistance

Continuous exposure to the substance does not cause damage within 30 days. The plastic may remain resistant for years.

O

Good to limited resistance

Continuous exposure to the substance causes minor damages, some of which is reversible, within 7-30 days (e.g. swelling, softening, decrease of mechanical strength, discoloration).

–

Poor chemical resistance

Not suitable for continuous medium exposure to the substance. Immediate damage may occur (loss of mechanical strength, deformation, discolouration, cracking, dissolution).

Chemical resistance

Medium	PS		SAN		PC		POM		PMP		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
Acetaldehyde	-	-	-	-	0	-	+	+	0	-	+	-	+	0
Acetic acid (glacial), 100%	-	-			-	-	-	-	+	0	+	0	+	+
Acetic acid, 96%	0	0	+	0	+	0	0	-	+	+	+	+	+	+
Acetic anhydride	-	-			-	-	-	-	+	0	-	-	0	0
Acetone	-	-	-	-	-	-	+	+	+	+	+	0	+	+
Acetonitrile	-	-	-	-	-	-	+		0	-	+	0	+	0
Acetophenone	-	-	-	-	-	-	+		0	-	-	-	0	0
Acetylacetone	-	-	-	-	-	-	+		+		+		+	
Acetylchloride	-	-	-	-	-	-					+		+	
Acrylic acid	-	-	-	-	-	-	-	-	+		+		+	
Acrylonitrile	-	-	-	-	-	-	-	-	-	-	+	+	+	+
Adipic acid	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Allyl alcohol	+	0	-	-	+	0	+	+	+	0	+	+	+	+
Aluminium chloride	+	+	+	+	-	-	+	0	+	+	+	+	+	+
Aluminium hydroxide	0	0	0	0	0	-	+	+	+	0	+	+	+	+
Amino acids	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ammonium chloride	+	+	+	+	0	0	+	+	+	+	+	+	+	+
Ammonium fluoride	+	+	+	+	0	0	+	+	+	+	+	+	+	+
Ammonium hydroxide, 30% (Ammonia)	0	-	+	0	-	-	0	0	+	+	+	+	+	+
Ammonium sulfate	+	+	+	+	+	+	+	+	+	+	+	+	+	+
n-Amyl acetate	-	-	-	-	-	-	+	+	+	0	0	-	+	0
Amyl alcohol (Pentanol)	0	0	+	+	+	+	+	+	+	+	+	+	+	+
Amyl chloride (Chloropentane)	-	-	-	-	-	-	+	+	-	-	-	-	-	-
Aniline	-	-	-	-	0	-	0	0	+	0	+	0	+	+
Barium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Benzaldehyde	-	-	-	-	0	-	+	+	+	+	+	+	+	+
Benzene (Benzol)	-	-	-	-	-	-	+	0	0	0	0	-	+	+
Benzine (Gasoline)	-	-	-	-	0	-	+	+	0	0	0	-	+	+
Benzoyl chloride	-	-	-	-	-	-	+	0	0	0	0	-	+	+
Benzyl alcohol	-	-	-	-	0	0	+	+	0	-	0	-	0	-

Chemical resistance of plastics to classes of substances

Classes of substances at 20°C	PS	SAN	PC	POM	PMP	PE-LD	PE-HD	PP	ETFE	PFA	PTFE	FEP	PVC	NR	PMMA	MF
Alcohols, aliphatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+
Ether	-	-	-	+	-	o	o	o	+	+	+	+	-	-	-	-
Aldehydes	-	-	o	o	o	o	+	+	+	+	+	+	-	o	o	+
Ester	-	-	-	-	o	o	o	o	+	+	+	+	-	o	o	+
Hydrocarbons, aliphatic	-	-	o	+	o	o	+	+	+	+	+	+	+	-	+	+
Hydrocarbons, aromatic	-	-	-	+	-	o	+	o	+	+	+	+	-	-	-	+
Hydrocarbons, halogenated	-	-	-	+	-	o	o	o	+	+	+	+	-	-	-	+
Ketones	-	-	-	+	o	o	o	o	o	+	+	+	-	-	-	+
Alkalis	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	-
Acids, strong or concentrated	o	-	-	-	+	+	+	+	+	+	+	+	+	-	-	-
Acids, weak or diluted	o	o	o	-	+	+	+	+	+	+	+	+	+	o	-	o
Oxidizing acids, oxidizing agents	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-

The recommendations listed here are based on technical literature and information provided by the manufacturers of raw materials. They were prepared carefully and are intended to inform and advise. However, they cannot replace suitability testing performed by the user under actual working conditions.

Chemical resistance

PP		ECTFE/ETFE		PFA/FEP		PTFE		FKM		PVC		NR		SI		MF
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	20°C
+	-	+	0	+	+	+	+	-	-	-	-	0	0			
+	0	+	+	+	+	+	+	-	-			0		-	-	0
+	+	+	+	+	+	+	+	-	-	+	0	0	0	-	-	+
0	0	+	+	+	+	+	+	-	-	-	-	0		0	-	
+	+	+	0	+	+	+	+	-	-	-	-	0	0	0	0	+
+	0	+	+	+	+	+	+	-		-	-	-	-	-	-	
0	0	+	+	+	+	+	+	-	-	-	-	-	-			+
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-	-	+	+	+	+	+	+	+		-	-	-	-	-	-	
+	+	+	0	+	+	+	+	-	-	-	-	-	-	+	0	
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
+	+	+	0	+	0	+	+	-	-	-	-	-	-	-	-	
+	0	+	+	+	+	+	+	0	-	-	-	-	-	-	-	+
0	0	+	+	+	+	+	+	+	0	0	-	-	-	-	-	+
+	0	+	+			+	+	+		-	-	-	-	-	-	
0	-	+	+	+	+	+	+	+		0	0	+	+	+	+	

Chemical resistance

Medium	PS		SAN		PC		POM		PMP		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
Benzylamine	-	-	-	-	-	-	+		0		0	-	0	
Benzylchloride	-	-					+							
Boric acid, 10%	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bromine	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromobenzene	-	-	-	-	-	-			-	-	-	-	-	-
Bromoform	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromonaphthalene	-	-	-	-										
Butanediol	-	-	-	-			+	+	+	+	+	+	+	+
1-Butanol	0	-	+	0	0	0	+	+	+	0	+	+	+	+
n-Butyl acetate	-	-	-	-	-	-	+	0	+	0	0	0	+	+
Butyl methyl ether	-	-	-	-	-	-	+	+	+	-	0	-	0	-
Butylamine	-	-	-	-			+	+						
Butyric acid	-	-	-	-	0	-					-	-	0	-
Calcium carbonate	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Calcium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Calcium hydroxide	+	0	+	+	-	-	+	+	+	+	+	+	+	+
Calcium hypochlorite	+	+	+	0	0	-	+	+	+	0	+	+	+	+
Calomel	+	0	+	+	+	+	0	0	+	+	+	+	+	+
Carbon disulfide	-	-	-	-	-	-	+	+	-	-	-	-	-	-
Carbon tetrachloride	-	-	-	-	-	-	0	0	-	-	-	-	0	-
Chloro naphthalene							-	-						
Chloroacetalaldehyde, 45%	-	-	-	-										
Chloroacetic acid	-	-	-	-	0	-	-	-	+	+	+	+	+	+
Chloroacetone	-	-	-	-										
Chlorobenzene	-	-	-	-	-	-			-	-	-	-	-	-
Chlorobutane	-	-	-	-			-	-	0	-	0	-	0	-
Chloroform	-	-	-	-	-	-	-	-	0	-	-	-	+	0
Chlorosulfonic acid							-	-						
Chromic acid, 10%	-	-	-	-	+	0	0	0	+	+	+	+	+	+
Chromic acid, 50%	-	-	0	0	0	-	-	-	0	0	+	0	+	0
Chromosulfuric acid	0	0	0	0	-	-	-	-	0	-	-	-	-	-
Copper sulfate	+	+	+	0	+	+	+	+	+	+	+	+	+	+
Cresol	-	-			-	-			-	-	-	-	0	-
Cumene (Isopropyl benzene)	-	-	-	-	-	-	+	-	-	-	0	-	+	0
Cyclohexane	-	-			+	0	+	+	-	-	0	-	0	-
Cyclohexanone	-	-			-	-			0	0	-	-	0	-
Cyclopentane	-	-			-	-			0	-	-	-	0	-
Decane					0		+		0				0	-
1-Decanol	0		0		0		+		+				+	
Dibenzylether	-	-	-	-			+		0				+	
Dibromoethane														
Dibutyl phthalate	-	-	-	-	-	-	+	+	+	0	0	-	0	-
Dichloroacetic acid	0	-			0	-			+	+	0	-	0	0
Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	0	-	0	-
Dichloroethane							-	-	0	-	0	-	0	-
Dichloromethane	-	-			-	-			0	-	0	-	0	-
Diesel oil (Heating oil)	-	-	-	-	-	-	+	+	0	-	0	-	+	0
Diethanolamine	-	-	-	-	-	-							0	
Diethyl ether	-	-	-	-	-	-	+	+	-	-	-	-	0	-
Diethylamine	0	0			-	-			0	0	-	-	0	-
1.2 Diethylbenzene	-	-			0	-			-	-	-	-	0	-
Diethylene glycol	0	-	+	+	0	0	+	+	+	+	+	+	+	+
Dimethyl sulfoxide (DMSO)	-	-	-	-	-	-			+	+	+	+	+	+
Dimethylaniline	-	-	-	-	-	-								

Chemical resistance

PP		ECTFE/ETFE		PFA/FEP		PTFE		FKM		PVC		NR		SI		MF
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	20°C
0		+	+	+	+	+	+	+		-	-	-	-	0		
		+	+			+	+	+				-	-	-	-	
+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	
-	-	+	+	+	+	+	+	0		-	-	-	-	-	-	
-	-	0	-	+	+	+	+	+		-	-	-	-	-	-	
-	-	+	+	+	+	+	+			-	-	-	-	-	-	
		+	+	+	+	+	+									
+	+	+	+	+	+	+	+	-	-			0		-	-	
+	+	+	+	+	+	+	+	+		0	0	+	+	+	+	
0	0	+	+	+	+	+	+	-	-	-	-	0	-	-	-	
+	0	+	0	+	+	+	+	-	-	-	-	-	-	-	-	
		+	+			+	+	-	-			-	-			
-	-	+	+	+	+	+	+	0				-	-			
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
+	+	+	+	+	+	+	+	+		0	-	+	+	0	0	
+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	
+	+	+	+	+	+	+	+	+	+	0	-	+	+	+	0	
+	+	+	+	+	+	+	+	+		-	-	+	+			
-	-	+	0	+	+	+	+	+		-	-	-	-	+	+	
-	-	+	+	+	+	+	+	+		-	-	-	-	-	-	+
		+	+			+	+	+				-	-			
		+	+			+	+									
+	+	+	+	+	+	+	+	0		+	0	-	-	-	-	
		+	+			+	+	-	-			0				
0	-	+	0	+	+	+	+	0	-	-	-	-	-	-	-	
0	-	+	+	+	+	+	+	0	-			-	-	-	-	
-	-	+	0	+	0	+	+	0		-	-	-	-	-	-	+
		0	-	+	+	+	+	-	-			-	-	-	-	
+	+	+	+	+	+	+	+	+		+	0	-	-	0	-	
0	0	+	+	+	+	+	+	+		+	-	-	-	-	-	
-	-	+	+	+	+	+	+	+		+	0	-	-	-	-	
+	+	+	+	+	+	+	+	+		+	0	+	+	+	+	
0	0	+	0	+	+	+	+	+		-	-	-	-			
0	-	+	+	+	+	+	+	+		-	-	-	-	-	-	
0	-	+	0	+	+	+	+	+	-	-	-	-	-	-	-	+
0	-	+	+	+	+	+	+	-	-	-	-	-	-			
0	-	+	+	+	+	+	+	+		-	-	-	-	-	-	
0		+	+	+	+	+	+	+		0		-	-	-	-	
+		+	+	+	+	+	+	+		+		0		0		
+		+	+	+	+	+	+	-	-			-	-			
		0		+		+	+									
+	0	+	+	+	+	+	+	0		-	-	-	-	0	-	
0	-	+	0	+	+	+	+	-	-	0	-	-	-	-	-	
0	-	+	0	+	+	+	+	+		-	-	-	-	-	-	
0	-	+	+	+	+	+	+	0				-	-	-	-	
0	-	0	0	+	+	+	+	0		-	-	-	-	-	-	
+	0	+	+	+	+	+	+	+		0	-	-	-	-	-	
0						+	+									
0	-	+	+	+	+	+	+	-	-	-	-	-	-	-	-	
0	-	+	0	+	+	+	+	-	-	-	-	0		0		
-	-	+	0	+	+	+	+	+		-	-	-	-	-	-	
+	+	+	+	+	+	+	+	+		-	-	+	+	+	+	
+	+	+	+	+	+	+	+			-	-			+	+	
		+	+	+	+	+	+	0				-	-	0		

Chemical resistance

Medium	PS		SAN		PC		POM		PMP		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
Dimethylformamide (DMF)	-	-	-	-	-	-	+	+	+	+	+	+	+	+
1.4 Dioxane	-	-	-	-	0	0	0	0	0	0	+	0	+	+
Diphenyl ether	-	-	-	-			0							
Ethanol	-	-	0	-	+	0	+	+	+	0	+	+	+	+
Ethanolamine														
Ethyl acetate	-	-			-	-			0	-	+	+	+	+
Ethyl methyl ketone	-	-	-	-	-	-	-	-	-	-	0	-	0	-
Ethylbenzene	-	-	-	-	-	-			-	-	-	-	-	-
Ethylene glycol (glycol)	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ethylene oxide	-	-	-	-	0	-	+	+	0	-	0	0	0	0
Fluoroacetic acid	-	-	-	-	-	-	-	-						
Formaldehyde, 40%	-	-	+	+	+	0	+	+	+	+	+	+	+	+
Formamide							-	-	+	+	+	+	+	+
Formic acid, 100%	+	0	0	0	+	0	-	-	+	0	+	+	+	+
Glycerol	+	+	+	+	+	+	0	0	+	+	+	+	+	+
Glycolic acid, 50%									+	+	+	+	+	+
Heating oil (Diesel oil)	-	-	-	-	-	-	+	+	0	-	0	-	+	0
Heptane	-	-			+	0			0	0	0	-	0	0
Hexane	0	-	+	+	-	-	+	+	0	-	0	-	+	0
Hexanoic acid														
Hexanol									+	+	+	+	+	+
Hydriodic acid									+	+	+	+	+	+
Hydrobromic acid	0	-			+	+	-	-	+	+	+	+	+	+
Hydrochloric acid, 10%	+	+	0	-	-	-	-	-	+	+	+	+	+	+
Hydrochloric acid, 20%	+	+	0	-	0	0	-	-	+	+	+	+	+	+
Hydrochloric acid, 20-37 %	0	0	0	-	-	-	-	-	+	+	+	+	+	+
Hydrofluoric acid, 40%	+	+	+	0	-	-	-	-	+	+	+	+	+	+
Hydrofluoric acid, 70%	-	-	-	-	-	-	-	-	+	0	+	-	+	0
Hydrogen peroxide, 35%	+	+	+	+	+	+	+	-	+	+	+	+	+	+
Isoamyl alcohol							+	+	+	+	+	+	+	+
Isobutanol	0	0	0	-	+	+	+	+	+	+	+	+	+	+
Isooctane	0	-	0	-	0									
Isopropanol (2-Propanol)	0	0	+	-	+	+	+	+	+	+	+	+	+	+
Isopropyl ether	-	-			-	-			-	-	-	-	-	-
Lactic acid	+	+	+	+	+	+	+	-	+	+	+	+	+	+
Lugol's solution (iodine-potassium iodide solution)	0	-	0	-	0	-	0	0	+	0	-	-	-	-
Mercury	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Methanol	0	-	0	-	+	0	+	+	+	+	+	0	+	+
Methoxybenzene	-	-	-	-	-	-	0							
Methyl formate	-	-	-	-	-	-	+							
Methyl propyl ketone	-	-	-	-	-	-	+	+	0	0	+	0	+	+
Methylene chloride	-	-	-	-	-	-	-	-	-	-	0	-	0	-
Mineral oil (Engine oil)	+		+		+		+	+	+	+	+	0	+	+
Monochloroacetic acid	-	-	-	-	0	-	-	-	+	+	+	+	+	+
Nitric acid, 10%	-	-	+	0	+	0	-	-	+	+	+	+	+	+
Nitric acid, 30%	-	-	0	-	+	0	-	-	0	-	0	0	0	-
Nitric acid, 70%	-	-	-	-	-	-	-	-	0	-	-	-	-	-
Nitrobenzene	-	-	-	-	-	-	0	-	-	-	-	-	0	-
Nitrohydrochloric acid	0	-	0	-	-	-	-	-	0	0	-	-	-	-
Oleic acid	-	-	-	-										
Oxalic acid	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ozone	0	0	0	0	-	-	-	-	+	+	0	-	0	-
n-Pentane														
Peracetic acid					-	-	-	-						

Chemical resistance

PP		ECTFE/ETFE		PFA/FEP		PTFE		FKM		PVC		NR		SI		MF
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	20°C
+	+	+	+	+	+	+	+	-	-	0	-	-	-	+	+	
+	0	+	0	+	+	+	+			-	-	-	-	-	-	
						+	+	0				-	-	-	-	
+	+	+	+	+	+	+	+	0		+	0	+	+	+	+	+
+		+	+	+	+	+	+									
+	0	+	+	+	+	+	+	-	-	-	-	-	-			+
+	0	0	0	+	+	+	+	-	-	-	-	-	-			
-	-	0	0	+	+	+	+			-	-	-	-	-	-	
+	+	+	+	+	+	+	+	0		+	+	+	+	+	+	+
0	-	+	+	+	+	+	+			0	-	-	-	-	-	
						+		-	-	-	-	-	-	-	-	
+	+	+	+	+	+	+	+	0		0	-	+	+			
+	+	+	+	+	+	+	+	0				+				
+	+	+	+	+	+	+	+	-	-	-	-	0	0	+	+	+
+	+	+	+	+	+	+	+	0		+	+	+	+	+	+	+
+	+	+	+	+	+	+	+	0				+		+		
+	0	+	+	+	+	+	+	+		0	-	-	-	-	-	
0	0	+	+	+	+	+	+	+		-	-	-	-			
+	0	+	+	+	+	+	+	+		0	-	-	-	-	-	
						+	+									
+	+	+	+	+	+	+	+	+				0		0		
+	+	+	+	+	+	+	+	+								
+	+	+	+	+	+	+	+	+				0				
+	+	+	+	+	+	+	+	+	+	+		0		0	-	-
+	+	+	+	+	+	+	+	+	0	0		0		-	-	-
+	+	+	+	+	+	+	+	0	-	0	-	0	-	-	-	-
+	+	+	+	+	+	+	+			0	-	0	0	-	-	-
+	0	+	+	+	+	+	0			-	-	-	-	-	-	-
+	+	+	+	+	+	+	+			+	0	-	-	0	0	0
+	+	+	+	+	+	+	+	+				0		0		
+	+	+	+	+	+	+	+	+		+	0	+	+	+	+	
		+	+	+	+	+	+	+				-	-	-	-	
+	+	+	+	+	+	+	+	+		+	0	+	+	+	+	
-	-	+	0	+	+	+	+	-	-	-	-	-	-			
+	+	+	+	+	+	+	+	+		0	0	0	0	0	0	
+	+	+	+	+	+	+	+	+		-	-	-	-			
+	+	+	+	+	+	+	+	+		+	+	+	+			
+	+	+	+	+	+	+	+	-	-	+	0	+	+	+	+	
		+	+	+	+	+	+	-	-			-	-			
		+	+	+	+	+	+					-	-	0	-	
+	0	+	+	+	+	+	+			-	-	-	-	0	-	
0	-	+	+	+	+	+	+	0		-	-	-	-	-	-	
+	+	+	+	+	+	+	+	+		+	+	-	-	+	0	
+	+	+	+	+	+	+	+	0		+	0	-	-	-	-	
+	+	+	+	+	+	+	+	0	-	+	0	-	-	-	-	-
0	-	+	+	+	+	+	+	0	-	0	-	-	-	-	-	-
-	-	+	+	+	+	+	+	0	-	-	-	-	-	-	-	-
-	-	+	+	+	+	+	+	-	-	-	-	-	-	-	-	
0	-	+	+	+	+	+	+	-	-	0	0	-	-	-	-	-
		+	+	+	+	+	+	0				-	-	-	-	
+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	
0	-	+	+	+	+	+	+	0		+	0	-	-	0	0	
		+	+	+	+	+	+	+				-	-	-	-	
		+	+	+	+	+	+							-	-	

Chemical resistance

Medium	PS		SAN		PC		POM		PMP		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
Perchloric acid	-	-	-	-	-	-	-	-	0	-	+	-	+	-
Perchloroethylene	-	-	0	0	-	-	+	0	-	-	-	-	-	-
Petroleum	-	-			0	0	+	+	0	0	0	-	0	-
Petroleum ether	-	-					+	+			0			
Phenol	-	-	-	-	-	-	-	-	0	0	+	0	+	+
Phenylethanol													0	
Phenylhydrazine													0	
Phosphoric acid, 85%	+	0	+	+	+	+	+	-	+	+	+	+	+	+
Piperidine													+	
Potassium chloride	0	0	0	0	+	+	+	+	+	+	+	+	+	+
Potassium dichromate														
Potassium hydroxide	0	0	0	0	-	-	+	+	+	+	+	+	+	+
Potassium permanganate	+	+	+	0	+	+	0	0	+	+	+	+	+	+
Propanol	0		+	+	0		+	+	+	+	+	+	+	+
Propionic acid	0	-			-	-	-	-	+	0	0	-	+	0
Propylene glycol (Propanediol)	+	+	-	-	+	0	+	+	+	+	+	+	+	+
Pyridine	-	-	-	-	-	-	+	0	+	0	+	0	+	0
Salicylaldehyde	-	-	-	-	0	0			+	+	+	+	+	+
Salicylic acid	+	+	+	+			-	-	+	+	+	+	+	+
Silver acetate	0	0	0	0	+	+	0	0	+	+	+	+	+	+
Silver nitrate	0	0	+	+	+	+	0	0	+	+	+	+	+	+
Sodium acetate	+	+	+	+	+	+	+	0	+	+	+	+	+	+
Sodium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sodium dichromate	+	0	+	0	+	-	+	+	+	+	+	+	+	+
Sodium fluoride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sodium hydroxide, 30%	+	+	+	+	-	-	+	+	+	+	+	+	+	+
Sulfuric acid, 60%	-	-	+	0	0	0	-	-	+	+	+	+	+	+
Sulfuric acid, 98%	-	-	-	-	-	-	-	-	+	+	0	-	0	-
Tartaric acid	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Tetrachloroethylene														
Tetrahydrofuran (THF)	-	-	-	-	-	-	0	0	0	-	0	-	0	-
Tetramethylammonium hydroxide					-	-	-	-						
Toluene	-	-	-	-	-	-	+	+	0	-	0	-	0	0
Trichloroacetic acid	0	-			0	-			+	+	0	-	0	0
Trichlorobenzene	-	-			-	-			0	0	-	-	-	-
Trichloroethane	-	-	-	-	-	-	0	-	-	-	-	-	0	-
Trichloroethylene	-	-	-	-	-	-	-	-	-	-	-	-	0	-
Trichlorotrifluoro ethane	-	-	-	-										
Triethanolamine	-	-	-	-										
Triethylene glycol	+	0	+	+	+	0	+	0	+	+	+	+	+	+
Trifluoro ethane	-	-	-	-										
Trifluoroacetic acid (TFA)	-	-	-	-			-	-						
Tripropylene glycol	+	+	+	+	+	0	+	0	+	+	+	+	+	+
Turpentine	-	-	0	0	-	-	+	+	0	0	0	-	0	-
Urea	+	+	+	+	-	-	+	+	+	+	+	+	+	+
Xylene	-	-	-	-	-	-	+	+	0	-	0	-	0	-
Zinc chloride, 10%	+	+	+	+	+	+	+	0	+	+	+	+	+	+
Zinc sulfate, 10%	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Chemical resistance

PP		ECTFE/ETFE		PFA/FEP		PTFE		FKM		PVC		NR		SI		MF
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	20°C
+	-	+	+	+	0	+	+	+		0	-	0	-	0	-	
-	-	+	+	+	+	+	+	0		-	-	-	-	-	-	
0	-	+	+	+	+	+	+	+		+	-	-	-	0		
		+	+	+	+	+	+	+		0	-	-	-	0		
+	+	+	+	+	+	+	+	0		-	-	-	-	-	-	
0		+	+	+	+	+	+									
0		+	+	+	+	+	+	0				0				
+	+	+	+	+	+	+	+	+		+	0	-	-	0	0	-
+		+	+	+	+	+	+	-	-			-	-			
+	+	+	+	+	+	+	+			+	0	+	+	+	+	
						+	+	0				0				
+	+	+	+	+	+	+	+	-	-	0	0	+	+	-	-	-
+	+	+	+	+	+	+	+	+		+	+	+	0			
+	+	+	+	+	+	+	+	+		+	+	+		0		
+	0	+	0	+	+	+	+	+		0	-	-	-			
+	+	+	+	+	+	+	+	+	+	0	-	+				
0	0	-	-	+	+	+	+	-	-	0	-	-	-	-	-	
+	+	+	-	+	+	+	+			-	-					
+	+	+	+	+	+	+	+	+	+	0	-	+	+	+	+	
+	+	+	+	+	+	+	+	+	+	0	0	+	+	+	+	
+	+	+	+	+	+	+	+	+		0	0	+	+	+	+	
+	+	+	+	+	+	+	+	-	-	0	0	+	+	+	0	
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
+	+	+	+	+	+	+	+	+		+	+	+	+	0		
+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	
+	+	+	+	+	+	+	+	0		+	+	+	+	0	0	-
+	+	+	+	+	+	+	+	+		0	-	-	-	-	-	
-	-	+	+	+	+	+	+	+		-	-	-	-	-	-	
+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	-
		0		+		+	+	0				-	-			
0	-	+	0	0	0	+	+	-		-	-	-	-	-	-	+
		+	+	+	+	+	+	-								
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0	-	+	0	+	+	+	+	-	-	0	-	0				
-	-	+	0	+	+	+	+			-	-					
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-	-	+	+	+	+	+	+	0		-	-	-	-	-	-	
		0	-	+	+	+	+									
				+	+	+	+	-	-			-	-	-	-	
+	+	+	+	+	+	+	+	+	+	0	-	+	+	+	+	
				+	0	+	+	+				-	-	-	-	
				+	-	+	0	-	-							
+	+	+	+	+	+	+	+			0	-	+	+	+	+	
-	-	+	+	+	+	+	+	+		+	+	-	-	-	-	
+	+	+	+	+	+	+	+	+		0	-	+	+	+	+	+
-	-	+	+	+	+	+	+	0		-	-	-	-	-	-	
+	+	+	+	+	+	+	+	+		+	0	+	+	+	+	
+	+	+	+	+	+	+	+	+		0	-	+	+	+	+	

Cleaning and sterilization* of plastics

Plastics	Autoclavable at 121 °C, t_e 20 min per DIN	Hot air at 160 °C (dry)	Gas (Ethylen oxide)	Chemical (Formalin, Ethanol)	β-/γ-radiation 25 kGy
PS	no	no	no	yes	yes
SAN	no	no	yes	yes	no
PC	yes [1)]	no	yes	yes	yes
POM	yes [1)]	no	yes	yes	yes (restricted)
PMP	yes	no	yes	yes	yes
PE-LD	no	no	yes	yes	yes
PE-HD	no	no	yes	yes	yes
PP	yes	no	yes	yes	yes (restricted)
ETFE	yes	no	yes	yes	no
PFA	yes	yes	yes	yes	no
PTFE	yes	yes	yes	yes	no
FEP	yes	yes	yes	yes	no
PVC	no	no	yes	yes	no
NR	no	no	yes	yes	no
PMMA	no	no	no	yes	yes
MF	no	no	yes	no	no

* Before sterilization labware must be carefully cleaned and rinsed with distilled water. Always remove covers from containers!
[1)] Frequent autoclaving may reduce mechanical stability!

Cleaning and sterilization of plastics laboratory equipment
All polyolefines, such as PE-LD, PE-HD, PP and PMP, as well as the fluoropolymers PTFE, PFA, FEP, ETFE and ECTFE have water-repellent surfaces that are very durable and easy to clean. Scrubbing agents or scouring pads should not be used for laboratory equipment made of plastics, but you may use generic alkaline cleaning agents. Equipment made from the materials mentioned above can be cleaned and dried in a lab washer, with other containers. 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 injector nozzles. Due to their low weight we recommend securing them with washing nets to avoid tumbling them in the water jet. Labware is protected against scratching when the wire baskets in the washing machine are plastic coated. Polycarbonate (PC) equipment should not be cleaned with alkaline cleaning agents (> pH 7).

Cleaning in trace analysis
To avoid contamination with cations and anions, you should leave plastics laboratory equipment with a 1N HCl or HNO_3 for a maximum of 6 hours at room temperature, and rinse it afterwards with purified distilled water. If trace analysis is conducted in the range of ng/g (ppb) or pg/g (ppt), containers made of PFA are particularly suitable, because they have a smooth surface, are easy to clean without memory effects and interaction with the container material.

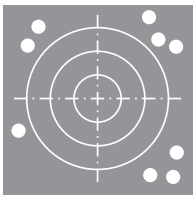
Sterilization of laboratory equipment made of plastics
Autoclaving (steam sterilization) is defined as the destruction or irreversible inactivation of all reproducible microorganisms under exposure to "saturated steam at 120 °C Minimum." (DIN 58946-1, 1987). The following minimum exposure time (destruction time + safety span) is specified by DIN EN 285: Sterilizing temperature 121 °C – exposure time t_e = 20 minutes. For correct sterilization procedure, including biological security (DIN EN 285), please contact your sterilization officer. Prior to sterilization you have to ensure that there are no residual contaminations on the equipment. Otherwise, residue will bake on during sterilization. This could lead to the plastic's destruction during the autoclaving process (121 °C), or microorganisms may not be effectively destroyed if they are protected by the residue. For autoclaving, please note that containers with a screw-on lid or stopper have to be opened to ensure pressure equalization. Autoclaving of closed containers leads to a deformation or destruction of the container. To prevent pressure build-up, containers or vessels must always be open. Not all plastics are resistant to steam sterilization. Polycarbonate, e.g., will lose its strength. Polycarbonate centrifuge tubes cannot be steam sterilized.

Precision

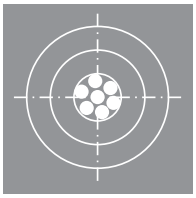
What do "tolerance, accuracy, coefficient of variation and precision" mean in volumetric measuring?

An illustration of precision and accuracy
The dart board simulates the volume range around the centered specified value, the white dots simulate the different measured values of a specified volume.

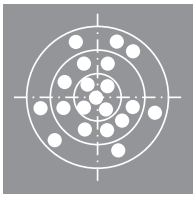
Poor accuracy: Although all hits are close together, the center (true volume) is still missed.
Good reproducibility: All hits are close together.
Result: Improperly controlled production, with systematic variation. Instruments exceeding the permissible limit should be removed from service.



Poor accuracy: Hits far off center.
Poor reproducibility: Hits widely scattered.
Result: These volumetric instruments are of inferior quality.



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.



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.

The precision of glass volumetric instruments is commonly defined by "Tolerance Limits" whereas for liquid handling instruments the statistical terms "Accuracy [%]" and "Coefficient of Variation [%]" have been established.

Tolerance

$$\text{Tol.} \geq | V_{measured} - V_{spec.} |$$

The term "tolerance" (tol.) in the corresponding standards defines the maximum permissible deviation from the specified value.

Accuracy

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

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 ($V_{spec.}$), related to the specified value in percent.

Coefficient of Variation

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

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.

Partial volumes

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

(analog CV_{part} %)

Generally A and CV are related to the nominal volume ($V_{nominal}$). These values are in % and have to be converted for partial volumes ($V_{part.}$). In contrast, there is no conversion for partial volumes, if A and CV are stated in volume units (e.g., ml).

Tolerance of A and CV

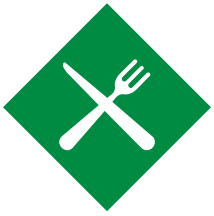
$$\text{Tol.} \geq \frac{| A\% | + 2CV\%}{100\ \%} \cdot V_{nominal}$$

A good estimate for the tolerance at nominal volume ($V_{nominal}$) can be calculated using the values for accuracy and coefficient of variation.

Precision (reproducilibity)

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

Suitability for foodstuffs



Marked PP products are suitable for contact with all foodstuff categories in so far as a contact period of 24 hours and a contact temperature of 40 °C are not exceeded. Marked SAN products are suitable for contact with all aqueous, alcoholic and fatty foods, in so far as a contact period of 24 hours and a contact temperature of 40 °C are not exceeded.

Unfortunately we are unable to provide any information with regard to contact period in excess of 24 hours and contact temperatures in excess of 40 °C, as these did not constitute part of the testing.

Consequently, under the specified testing conditions, the marked products are in accordance with the requirements of Commission Directive 2002/72/EC (up to and including amending Directive 2007/19/EC) and Regulation (EC) No. 1935/2004. The marked products are also in accordance with the requirements of the Commodities Regulation (Bedarfsgegenstände-VO as of: 20.12.2006) and the German Food and Feed Code (Lebensmittel- und Futtermittelgesetzbuches, LFGB).

All source materials used in the manufacturing of the products are listed in the Commodities Regulation (Bedarfsgegenstände-VO as of: 20.12.2006), or respectively, Commission Directive 2002/72/EC (up to and including amending Directive 2007/19/EC), in accordance with the present attestation. Therefore, they represent permissible source materials in accordance with food law and may be used in the production of food commodities in accordance with the specified restrictions concerning migration threshold values and permissible residual content in the end product.

In addition to the testing of the adherence to the threshold values for the global migration (or respectively, the specific migration threshold values), a sensory testing for possible olfactory and flavour-related impairment of test foods was also implemented. All testing and analysis was performed by an independent, accredited institute.

Products in sterile packaging

The use of sterile, individually packaged VITLAB plastic labware, for example volumetric instruments or measuring scoops, means that time-consuming cleaning and autoclaving processes are no longer necessary. As a result you save time and money.

Sterile, individually packaged VITLAB plastic labware reduces the risk of contamination. This makes your processes more secure.

Sterility requirements exist in many industrial sectors, such as the medical, pharmaceuticals or microelectronics sectors. A sterile product must not contain any viable microorganisms that are capable of reproduction. The manufacturing of a product, including its packaging, under the very best hygienic conditions does not automatically result in a sterile condition. The product must be sterilised after its production and packaging.

The packaging is necessary in order to ensure that the sterile condition achieved after the radiation sterilisation remains for a long period. The irradiation inactivates the microorganisms. The inactivation occurs according to an exponential law. Depending on the product requirements, different end conditions can be achieved with regard to the microbial exposure after the irradiation.

Radiation sterilisation has established itself since several decades as an effective method of killing bacteria and germs. As the inactivation of the microorganisms by physical or chemical means occurs according to exponential laws, this absolute condition is not achieved. It remains possible that a microorganism survives. The residual risk is defined as 10^{-6} in the EN 556 for medical products that have been sterilised in their end packaging. This means that of one million parts of a product that have been sterilised in the end packaging, a maximum of one may be found that contains a microorganism capable of reproduction.

At the request of the customer, we also offer a bioburden analysis or certificate of sterility, or respectively pyrogen test, in addition to individual packaging.

All testing and analysis was performed by an independent, accredited institute.

Number index

00394 74
00396 74
36491 79
39194 92
39294 92
39394 92
39494 92
39594 92
39694 92
39794 92
39894 92
39994 92
40093 92
40193 92
40293 92
40393 92
40493 92
40593 92
40693 92
40793 92
40894 96
41094 96
41194 96
41294 96
41394 96
41494 96
41594 96
41694 96
41794 97
41894 97
41994 97
42099 97
42294 97
42393 97
42594 87
42694 87
42794 87
42894 87
42994 87
43094 87
43194 87
43510 88
44091 51
44191 51
44291 51
44391 51
44491 51
47705 88
47706 88
47707 88
47708 88
47716 88
53510 65
53610 65
60503 54
60603 54
60703 54
60803 54
60903 54
61003 54
61103 54
61203 54
61303 54
61403 54
61503 54
61603 54
61703 54
61803 54
64091 42
64191 42
64291 42
64391 42
64491 42
64591 42
64691 41
64695 40
64704 39
64791 41
64795 40
64804 39
64891 41
64895 40
64904 39
64991 41
64995 40
65004 39
65091 41
65095 40
65104 39
65191 41
65195 40
65204 39
65291 41
65295 40
65304 39
65391 41
65395 40
65965 83
65975 83
65980 83
66695 55
66795 55
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66995 55
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67104 37
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67295 37
67304 37
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68299 93
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68594 77
68694 77
68794 77
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69194 77
69294 77
69394 56
69493 56
69990 93
70494 97
70594 97
70694 97
70794 98
70894 98
70994 98
71094 98
71194 98
71598 85
71698 85
71798 85
71898 85
71998 85
72098 84
72198 84
72298 84
72398 84
72498 84
72898 106
72998 106
73298 87, 106
73498 106
73598 106
73698 106
73898 106
75093 111
75193 111
75991 56
76299 90
77094 100
78294 99
78394 99
78593 110
78794 108
79194 31, 47
79790 85
79890 85
79990 85
80130 90
80131 90
80139 14, 50
80140 14, 50
80162 96
80164 96
80165 96
80213 90
80215 32, 48
80217 32, 48
80218 32, 48
80219 32, 48
80221 32, 48
80222 32, 48
80223 32, 48
80229 84
80230 83
80231 83
80252 32, 48
80268 98
80269 98
80271 123
80276 79
80277 79
80278 79
80280 86
80281 86
80282 86
80283 86
80284 86
80285 86
80286 86
80288 86
80340 94
80342 94
80343 94
80345 94
80346 94
80347 94
80348 94
80353 80
80354 81
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80447 112
80448 112
80452 94
80454 94
80455 94
80456 94
80459 108
80460 108
80461 108
80462 108
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80464 108
80465 108
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80467 108
80468 108
80510 109
80511 109
80512 109
80513 109
80514 109
80515 109
80520 108

80521 108
80525 108
80526 108
80535 110
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80550 83
80551 83
80553 83
80554 83
80555 84
80556 84
80557 84
80560 90
80562 90
80593 92
80594 92
80595 92
80596 92
80602 88
80603 88
80604 88
80730 77
80731 77
80732 77
80733 77
80734 77
80735 77
80736 77
80737 77
80828 106
80877 109
80878 109
80879 109
80910 76
80911 76
80952 86
80953 86
80954 86
80970 98
80996 31, 47
81056 56
81213 90
81219 32, 48
81250 109
81251 109
81252 109
81253 109
81254 109
81255 109
81256 109
81633 64
81634 64
81640 75
81642 75
81644 75
81646 75
81648 75
81650 75
81660 75
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81664 75
81666 75
83300 64
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83302 64
83303 64
83304 64
83306 65
83307 65
83308 65
83310 72
83311 72
83312 72
83313 72
83314 72
83315 72
83316 72
83317 72
90594 74
90694 74
90794 74
90894 74
90994 74
91094 74
91194 74
91294 74
91394 74
91494 74
91789 68
91889 68
91989 68
92089 68
92189 68
92489 71
92689 71
92789 71
92889 71
93389 71
93394 70
93489 71
93494 70
93788 63
93789 71
93793 63
93794 70
93988 63
93989 71
93993 63
93994 70
94188 63
94189 71
94193 63
94194 70
94389 68
94489 68
94587 64
94588 63
94589 68
94594 67
94687 64
94688 63
94689 68
94694 67
94987 64
94988 63
94989 68
94993 63
94994 67
95087 64
95088 63
95089 68
95093 63
95094 67
95187 64
95188 63
95189 68
95193 63
95194 67
95286 65
96093 87
96293 87
96393 87
96593 87
96694 87
96794 87
97494 74
97496 74
97593 74
97791 52
97891 52
98590 84
98690 84
98790 84
98890 84
99099 80
99199 80
99299 79
99390 79
99490 79
100389 73
100394 73
100489 73
100494 73
100589 73
100594 73
100689 73
100694 73
100789 73
100794 73
100889 73
100894 73
100989 73
101589 73
101594 74
101689 73
101694 74
101789 73
101794 74
101889 73
101894 74
101989 73
101994 74
102397 72, 120
102597 72, 120
102697 72, 120
102897 72, 120
103297 122
103397 122
103797 78, 122
103897 78, 122
103997 123
104099 26
104199 26
105599 14, 49
105699 14, 49
105799 14, 49
105899 14, 49
106599 13, 49
106699 13, 49
107097 36, 118
107197 36, 118
107297 36, 118
107397 36, 118
107497 36, 118
107597 36, 118
107797 123
107897 123
107997 123
108092 66, 120
108192 66, 120
108292 66, 120
108297 66, 119
108392 66, 120
108397 66, 119
108492 66, 120
108497 66, 119
108792 62, 119
108892 62, 119
108992 62, 119
109297 66, 119
109397 66, 119
109497 69, 120
109597 69, 120
109697 69, 120
109797 69, 120
109897 69, 120
109997 69, 120
110204 53, 118
110205 53, 118
110304 53, 118
110305 53, 118
110404 53, 118
110405 53, 118
110604 53, 118
110605 53, 118
110704 53, 118
110804 53, 118
110904 53, 118
110905 53, 118
111004 53, 118
111005 53, 118
112197 53, 119
112297 53, 119
112397 53, 119
112497 53, 119
112597 53, 119
112697 53, 119
112797 53, 119
112897 53, 119
113197 93, 123
113297 93, 123
113397 93, 123
113497 93, 123
122097 105, 127
122197 105, 127
122297 105, 127
122597 69, 121
122697 69, 121
122797 69, 121
122897 69, 121
130294 77
130297 76, 121
130394 77
130397 76, 121

Number index

130494 77
130497 76, 121
130594 77
130597 76, 121
131097 128
132193 65
132293 65
132393 65
132493 65
132593 65
132693 65
132703 64
132705 64
132706 64
132708 64
132793 65
133181 62
133281 62
133381 62
134293 63
134393 63
134493 63
134593 63
135181 62
135281 62
135381 62
136693 81
136894 88
137094 111
137194 111
137294 111
137394 111
137494 111
137594 111
138093 68
138193 68
138293 68
138393 68
138493 68
138591 111
138593 68
138693 68
138793 68
138893 68
139393 71
139493 71
139593 71
139693 71
139793 71
139893 71
145094 78
145194 78
145594 31, 47
145694 31, 47
145894 31, 47
145994 31, 47
146190 82
146290 82
146399 82
146499 82
146594 30, 46
146694 30, 46
146794 30, 46
146894 30, 46
146994 30, 46
147094 30, 46
147194 30, 46
147294 30, 46
147594 30, 46
147694 30, 46
147794 30, 46
147894 30, 46
147994 30, 46
148094 30, 46
148194 30, 46
148294 30, 46
148494 30, 46
148594 30, 46
148893 28, 44
148993 28, 44
149093 28, 44
149193 28, 44
149293 28, 44
149393 28, 44
149693 29, 45
149893 29, 45
149993 29, 45
151594 99
155094 76
155594 76
155699 76
155799 76
156094 76
159497 121
159597 121
159665 100
159670 100
159697 121
160110 28, 44
160119 28, 44
160210 28, 44
160219 28, 44
160510 28, 44
160519 28, 44
161010 28, 44
161019 28, 44
162510 28, 44
163094 27, 43
163194 27, 43
163294 27, 43
163394 27, 43
163594 27, 43
164094 27, 43
164194 27, 43
164294 27, 43
164394 27, 43
164494 27, 43
164594 27, 43
165094 85
165194 85
165294 85
165394 85
165494 85
165594 85
199095 55
199099 55
199195 55
199199 55
300497 102, 124
300597 102, 124
300897 102, 124
301097 102, 124
301197 102, 124
301597 102, 124
301697 102, 124
301797 102, 124
301897 102, 124
301997 102, 124
302097 102, 124
302197 102, 124
302297 102, 124
302397 102, 124
302497 102, 124
302597 102, 124
303097 102, 124
303197 102, 124
303297 102, 124
307697 102, 124
307797 102, 124
307897 102, 124
307997 102, 124
308097 102, 124
308197 102, 124
308297 102, 124
308397 102, 124
308497 102, 124
308597 102, 124
308697 102, 124
308797 102, 124
308897 102, 124
308997 102, 124
309097 102, 124
309197 102, 124
309297 102, 124
309397 102, 124
309497 102, 124
309597 102, 124
310197 104, 126
310297 104, 126
310397 104, 126
310497 104, 126
311097 103, 125
311197 103, 125
311297 103, 125
311397 103, 125
311497 103, 125
311597 103, 125
311697 103, 125
311797 103, 125
311897 103, 125
311997 103, 125
314097 103, 125
314197 103, 125
314297 103, 125
316097 103, 125
316197 103, 125
316297 103, 125
316397 103, 125
316497 103, 125
317297 104, 126
318293 105, 127
318393 105, 127
318597 105, 127
324594 26
324694 26
324794 26
325095 96
325195 96
325295 96
325395 96
325495 96
326094 83
326194 83
326294 83
326496 82
326596 82
326696 82
440081 51
440941 51
441081 51
441941 51
442081 51
442941 51
443081 51
443941 51
444081 51
444941 51
445081 51
445941 51
446081 51
446941 51
447081 51
447941 51
480941 52
481941 52
482941 52
483941 52
484941 52
605081 54
606081 54
607081 54
608081 54
609081 54
610081 54
611081 54
612081 54
613081 54
614081 54
615081 54
616081 54
617081 54
618081 54
640941 42
641941 42
642941 42
643941 42
644941 42
645941 42
646081 41
646941 40
647081 41
647941 40
648081 41
648941 40
649081 41
649941 40
650081 41
650941 40
651081 41
651941 40
652081 41
652941 40
653081 41
653941 40
666941 55

667941 55
668941 55
669941 55
670040 36
670941 55
671040 36
671891 39
671895 38
671941 38
672040 36
672891 39
672895 38
672941 38
673040 36
673891 39
673895 38
673941 38
674040 36
674891 39
674895 38
674941 38
675040 36
675891 39
675895 38
675941 38
676040 36
676891 39
676895 38
676941 38
677891 39
677895 38
677941 38
760941 42
833019 62
833029 62
833039 62
833049 62
978081 52
978941 52
1037979 78, 122
1038971 78, 122
1331819 60
1331839 60
1331849 60
1331859 60
1331869 60
1332819 60
1332839 60
1332849 60
1332859 60
1332869 60
1332879 60
1332889 60
1332959 60
1332969 60
1332979 60
1333819 60
1333839 60
1333849 60
1333859 60
1333869 60
1351819 61
1351839 61
1351849 61
1351859 61
1351869 61
1352819 61
1352839 61
1352849 61
1352859 61
1352869 61
1352879 61
1352889 61
1352959 61
1352969 61
1352979 61
1353819 61
1353839 61
1353849 61
1353859 61
1353869 61
1431829 60
1432829 60
1432899 60
1432909 60
1432919 60
1432939 60
1432949 60
1432989 60
1433829 60
1451829 61
1452829 61
1452899 61
1452909 61
1452919 61
1452939 61
1452949 61
1452989 61
1453829 61
1601503 18
1601504 18
1601505 18
1601506 18
1601507 18
1601508 18
1602502 18
1602504 18
1602505 18
1605503 19
1605504 19
1605505 19
1605506 19
1605507 19
1605508 19
1606515 19
1610501 21
1610502 21
1610503 21
1610504 21
1610506 21
1611503 21
1611506 21
1611508 21
1620506 12
1620507 12
1630500 25
1631500 24
1631510 24
1631520 24
1631530 24
1670066 13, 22
1670067 13, 22
1670068 13, 22
1670072 22
1670080 13, 22
1670085 13
1670092 22
1670095 13
1670100 13, 22
1670105 22
1670110 13, 22
1670115 13, 22
1670120 13, 22
1670125 13
1670145 22
1670150 22
1670155 13, 22
1670165 22
1670170 22
1670175 22
1670180 13, 22
1670185 22
1670647 26
1670648 26
1670649 26
1670650 26
1671095 13, 22
1671500 13, 22
1671505 22
1671506 22
1671510 13, 22
1671515 22
1671520 22
3125970 104, 126
3126970 104, 126
3190940 89
3190943 89
3190948 89
3191940 89
3191943 89
3191948 89
3192940 89
3192943 89
3192948 89
3193940 89
3193943 89
3193948 89
3194940 89
3194943 89
3194948 89
3195940 89
3195943 89
3195948 89
3197940 89
3197943 89
3197948 89
3198940 89
3198943 89
3198948 89
5581170 67
5581180 67
5581190 67
5581200 67
5581210 67
5581220 67
5581230 67
5581240 67
5581250 67
5581300 70
5581310 70
5581320 70
5581330 70
5581340 70
5581350 70
5582070 67
5582080 67
5582090 67
5582100 67
5582110 67
5582120 67
5582130 67
5582140 67
5582150 67
5582200 70
5582210 70
5582220 70
5582230 70
5582240 70
5582250 70
5583100 66
5583110 66
5583120 66
5583130 66
5583140 66
5583150 66
5583170 66
5583180 66
5583190 66
5584200 69
5584210 69
5584220 69
5584230 69
5584240 69
5584250 69

Alphabetical index

A

Accessories for bottletop-burettes 13
Accessories for bottletop-dispensers 22
Accessories for pipette controllers 26
Analytical funnels, PP 96

B

Bowl, PP 88
Bowls, round, PP 87
Buckets with spout, PP 87
Buckets, PE-HD 87
Büchner funnels, PP 97
Bulb pipettes, PP 27, 43
Burette clamps, PP 14, 50
Burette stopcocks 14, 49
Burettes 14, 49

C

Caps with dropper inserts, PE-HD 65
Carrying trays, PE-HD 88
Chemical waste system, PE/PP 99
Collectors, PP or SAN 52
Compartment tray, PVC 86
Connector universal, PP 108
Connectors 2-parts, PE-HD 110
Connectors 90°, PP 109
Connectors straight, PP 109
Connectors T-form, PP 108
Connectors Y-form, PP 108
Container, PP 76
Cuvettes, PS and PMMA 82

D

Deep trays, PVC 86
Desiccator plates, PP and porcelain 83
Desiccators with stopcock, PC 82
Desiccators with stopcock, PP/PC 83
Desiccators, PP/PC 83
Dispenser HF 19
Disposable pipettes, PS, non-sterile 28, 44
Disposable pipettes, PS, sterile 28, 44
Dropping bottles, PE-LD 65
Dropping bottles, PE-LD/PE-HD 64
Dropping pipettes, PE-LD 29, 45
Drying rack 90
Drying rack, PS 90
Drying tubes, PE-HD 112

E

Erlenmeyer flasks, PC 55
Erlenmeyer flasks, PMP 55
Erlenmeyer flasks, PP 55
Evaporating dishes, PFA 122

F

Filter Funnel Supports 99
Flow monitor, SAN 111
Forceps, PMP 93
Forceps, POM 93
Funnel Holders, PP 98
Funnels, PP 96

G

Gas-wash bottles, PFA 121
Graduated beakers, PP 52
Graduated pitchers, nesting, PP 52
Graduated pitchers, PP 51
Graduated pitchers, SAN 51
Griffin beakers, ETFE 53, 118
Griffin beakers, PFA 53, 118
Griffin beakers, PMP 54
Griffin beakers, PP 54
Griffin beakers, PTFE 53, 119

H

Half-round funnels, PP 97
Hydrometer cylinder, PP 42

I

Instrument trays, flat, MF 85
Instrument trays, MF 84
Integral wash-bottles, PE-LD 64

L

Laboratory trays, PP 85
Large funnels, PP/PE-HD 97
Lids for instrument trays, PS 85

M

Magnetic stirrer retrievers, flexible, PTFE 105, 127
Magnetic stirrer retrievers, PE 105, 127
Magnetic stirrer retrievers, PTFE 105, 127
Magnetic stirring-bars circulus, PTFE 104, 126
Magnetic stirring-bars double-spinfin, PTFE 103, 125
Magnetic stirring-bars octagon, PTFE 102, 124
Magnetic stirring-bars oval, PTFE 103, 125
Magnetic stirring-bars polygon, PTFE 102, 124
Magnetic stirring-bars spin, PTFE 104, 126
Magnetic stirring-bars spinplus, PTFE 103, 125
Magnetic stirring-bars triangular, PTFE 104, 126
Measuring beakers, PP 56
Measuring pipettes, PP 27, 43
Measuring scoops, PE-HD 92
Measuring scoops, PP 92
Measuring Spoon, PS 93
Microcentrifuge tube rack, PP 88
Microcentrifuge tube racks, coloured, PP 89
Microcentrifuge tubes, PP 78
Microwave digestion inliner, PFA 123
Mixing vessel, MF 87, 106
Mortars, MF 106
Multi-purpose container, SAN 79
Multi-purpose containers, PP 88

N

Narrow-mouth bottles, PE-HD 66
Narrow-mouth bottles, PE-HD, brown 67
Narrow-mouth bottles, PE-LD 68
Narrow-mouth bottles, PFA 66, 119
Narrow-mouth bottles, PFA-economy 66, 120
Narrow-mouth bottles, PP 67

Non-return valve, PE-HD 110
Non-return valves, PP 110

P

Pasteur pipettes, PE-LD 28, 44
Pestles, MF 106
Pipette baskets, PE-HD 32, 48
Pipette filler bulbs, NR 26
Pipette jars, PE-HD 32, 48
Pipette pumps 26
Pipette racks, PP 31, 47
Pipette tips, PP 31, 47
Pipette trays, PVC 31, 32, 47, 48
Pipette washer, PE-HD 32, 48
Powder funnels, PP 98
Precision-dispenser-tips, non-sterile, PS 30, 46
Precision-dispenser-tips, sterile, PS 30, 46
PTFE-Tape 128

R

Reagent bottles, PP 73, 74
Round-bottom flask support, PP 123
Round-bottom flasks, PFA 123

S

Sample containers, PE-HD 76
Sample containers, PFA 76, 121
Sample containers, PP 77
Sample vials, PE-LD 77
Sample vials, PFA 78, 122
Sample vials, PP 77
Screw caps, PFA 72, 120
Screw caps, PP 72
Sedimentation cone, SAN 56
Sedimentation rack, PMMA 56
Seed germinating kids, PS 84
Spare parts for desiccators 84
Spatula, PA 92
Spray bottles, PP 65
Staining cuvette ‘Coplin’, PP 81
Staining cuvette ‘Hellendahl’, PMP 80
Staining cuvette, POM 80
Staining dish, PP 81
Staining jar, PMP 80
Staining jar, POM 80
Staining rack, POM 79
Standard joint stoppers, PP 74
Stirring rod, PP 106
Stopcocks, PE 111
Storage bottles, PE-LD, with tap 75
Storage bottles, PE-LD, without tap 75
Storage boxes, nesting, PS 79
Storage boxes, PS 79
Support for separatory funnels, PP 98

T

Tap for storage bottles, PP 75
Test tube racks, coloured, PP 89
Test tube racks, PE 90
Test tube racks, PP 90

U

Urbanti funnels, COC 96
Urinals, PP and PC 74

V

Valves, 2/3-Way, PE/PP 111
VENT-CAP wash-bottle caps, PP 62
VITLAB continuous E/RS 12
VITLAB genius 19
VITLAB maneus® 25
VITLAB piccolo 21
VITLAB pipeo® 24
VITLAB simplex 18
VITLAB simplex fix 18
VITLAB symbiotic, type Dr. Schilling 13, 49
VITsafe™ safety wash-bottles, narrow-mouth 60
VITsafe™ safety wash-bottles, wide-mouth 61
Volumetric cylinders, PMP, class A 40
Volumetric cylinders, PMP, class A, KB 39
Volumetric cylinders, PP, class B 40, 41, 42
Volumetric cylinders, SAN, class B 41, 42
Volumetric flasks opaque, PMP, class A 36
Volumetric flasks, PFA, class A 36, 118
Volumetric flasks, PMP, class A 37
Volumetric flasks, PMP, class B 37, 38
Volumetric flasks, PP, class B 38, 39

W

Wash-bottle caps, PP 64
Wash-bottles, colour coded, PE-LD 64
Wash-bottles, PE-LD 63
Wash-bottles, PE-LD/PP 63
Wash-bottles, PFA-economy 62, 119
Wash-bottles, PP 63
Wash-bottles, with imprint 62
Watch glasses, PP 94
Watch glasses, PTFE 93, 123
Water-jet vacuum pump, PP 100
Weighing jars, PP 94
Wide-mouth bottles, PE-HD 69
Wide-mouth bottles, PE-HD, brown 70
Wide-mouth bottles, PE-LD 71, 72
Wide-mouth bottles, PFA 69, 120
Wide-mouth bottles, PP 70
Wide-mouth bottles, PTFE 69, 121

General Terms and Conditions of VITLAB GmbH

1 General

1.1 (Conflicting business conditions, written form, additional agreements and contract language) These General Terms and Conditions shall apply to all contracts, including all future contracts with the Customer.
Other conditions shall not become a part of the contract even if we do not expressly object to such conditions. The Customer may only claim validity of additional agreements before or upon the conclusion of the contract only if they provide immediate written confirmation. Renunciation of the written form is only possible in writing. The language of the contract shall be German or English.

1.2 (Offers, right to make changes) Our offers are subject to confirmation. We reserve the right to make technical improvements to our products.

1.3 (Recording of data) We may store and process relevant contract data in our EDP systems.

1.4 (Setting off and retention) The setting off or the retention by the Customer is not permitted except in cases of undisputed or indefeasible counter claims.

1.5 (Rush orders/small orders) Orders with a value of the goods of less than 100 euros are subject to a low quantity surcharge of 20 euros. Delivery is normally in packing units according to the valid price list. For deliveries within five working days or for order values up to 500 euros, we reserve the right to ship and invoice immediately without separate order confirmation.

1.6 (Place of jurisdiction) The place of jurisdiction shall be the court responsible for our domicile in Aschaffenburg, Germany. We are also entitled to call upon the court responsible for our customer's domicile. Furthermore, we as Plaintiffs have the right to call the arbitral tribunal at the Chamber of Industry and Commerce in Frankfurt am Main. In this case, the arbitral tribunal conclusively decides the legal dispute in accordance with the ICC Rules of Arbitration excluding the due legal process. The preamble of the legal summary proceeding for order to pay debts from us does not denote the exertion of our voting right. It is in no way admissible.

1.7 German law is applicable, to the exclusion of the 'UN Convention on Contracts for the International Sale of Goods', CISG.

2 Delivery

2.1 Place of performance shall be our factory in Grossostheim, Germany. The risk shall be transferred to the Customer when the delivery leaves the ramp in our factory. This shall apply also to partial deliveries and where we have undertaken additional services such as freight forwarding; costs of transporting, packing or insurance; exportation; and installation. This also applies in the case of delivery to a consignment warehouse.

2.2 Where we have accepted Orders on Call, Standing or Blanket Orders, the Customer must call up the entire order quantity within 6 months.

2.3 If there be any delay in the Customer's acceptance of a shipment, we may, at our own discretion, have the products stored at the Customer's expense or, after providing a warning and setting a deadline, sell the products for account of the customer.

3 Delivery period, Delay

3.1 Indicated delivery periods are ex works. Delivery deadline shall commence upon the Customer's receipt of our order confirmation; however, only after settlement of the technical questions that are still open at the conclusion of the contract and after we have received from the customer all documents, such as diagrams, permits or releases required from the Customer and definitely not before any advance payments that have been agreed upon. The delivery deadline is considered to have been observed if the readiness for shipment has been declared prior it the expiration of this period. Correct and punctual delivery remains a requirement.

3.2 Force Majeure, strikes, lockouts, operating breakdowns, shortages of raw materials or means of production for which we are not responsible, including delayed deliveries or failure to deliver by upstream suppliers, shall extend the delivery deadline accordingly and shall release us from our obligation to deliver if delivery becomes impossible as a result. We are considered not to be responsible for the aforementioned circumstances, even where they occur during an existing delay. The same applies in the case of additional or amended services requested by the customer.

3.3 Our default in delivery shall not exist unless the Customer has provided us with a warning and an indicated reasonable additional period of time has lapsed.

3.4 In the case of delay damages, we shall limit our liability for damage compensation to 10% of the value of our delayed delivery/service. The limitation does not apply in the case of wilful intent, gross negligence and/or damage to life, body or health. The Customer shall be obligated to promptly notify us in writing of any consequences of delay.

4 Prices, Terms of Payment

4.1 Prices quoted shall be ex works and do not include VAT, if applicable. Charges for packaging, freight and insurance shall be at the Customer's expense. The prices are understood to be exclusive of costs for the return and recycling/disposal of old equipment.

4.2 Invoices shall be paid in full, without deductions, and must be credited to our account in EURO (€) immediately or by the due date indicated on the invoice. Receipt of payment is applicable. We shall accept bills of exchange or checks only with a view to performance and at the Customer's expense.

4.3 In the case of customers, with whom we are working for the first time or with whom we do not regularly work, after delays in payment or in the case of reasonable doubt of the creditworthiness of the client, we retain the right to make any individual shipment dependent on payment in advance or a security deposit to the value of the invoice amount.

4.4 If the period between conclusion of the contract and the agreed delivery is longer than four months, we reserve the right to demand an extra charge, which corresponds to our cost increase until delivery, at our own discretion. For deliveries on call our then valid price shall apply.

4.5 In the case of an agreed return of faultless products, the customer will be charged a checking and processing fee to the value of 15% of the invoice amount (10 euros minimum).

4.6 If the Customer is in default of payment, then all of our debt claims against him shall be due immediately and we shall not be obligated to make any further deliveries based on current delivery contracts.

4.7 If default of payment occurs, we shall charge, notwithstanding further damage compensation claims, default interest to the amount legally allowed.

4.8 We may offset amounts payable to the Customer, such as a credit notes, against our claims against the Customer, if necessary.

5 Retention of Title and Assignment of Future Claims

5.1 Goods delivered shall remain our property until the complete and unlimited payment of all of our debt claims against the Customer. If we still have further claims against the customer, we reserve our property rights until the payment of this.

5.2 The Customer may neither use conditional goods nor merge nor combine them with other objects, to which a third party may have rights. If, however, conditional goods become a component of a new object, then we shall be a direct proportional co-owner of this object even if it constitutes a new legal entity. Our proportion of co-ownership shall be based on the relation of the invoice value of the conditional goods to the value of the new object at the time of the connection.

5.3 The Customer may resell the conditional goods in his normal course of business as long as his claims from the resale have not been assigned, pledged or otherwise encumbered.

5.4 The Customer shall assign to us in advance as collateral any claims against his customers from the resale of the conditional goods (see clause 5.3) and/or newly formed objects (see clause 5.2) to the value of our invoice for the conditional goods. If the Customer is not in default of payment for the conditional goods, he may collect the assigned claims in his normal course of business. However, he may only use the proportional proceeds for the payment to us for the conditional goods.

5.5 Upon the customer's request, we shall release collateral at our discretion, if and to the degree that the nominal value of the collateral exceeds 120 % of the nominal value of our open debt claims against the Customer.

5.6 The Customer is required to immediately inform us of any attachments, confiscation or any other right to disposal of a third party with regard to the conditional goods or the goods co-owned by us.

5.7 In the case of failure to pay in exchanges or checks, or if debit requests or direct debit authorizations are not carried out or are retroactively cancelled, or if the Customer or the end user become insolvent or suspend payments, the Customer shall lose all rights as per clause 5.3. The Customer must immediately notify any subsequent purchaser of our extended retention of property rights. He may only use the proportional proceeds, which are based on the assignment, for the payment of the goods delivered.

5.8 If default of payment occurs or in those cases covered in clause 5.7, we shall be authorized to withdraw from the contract, and/or to demand the return of any conditional goods, even without withdrawal, in the possession of the Customer and/or to collect the assigned debt claims directly. In order to determine our rights, we shall have the right to have the Customer's documents and books concerning our reserved rights examined by a person who is subject to the professional duty of confidentiality.

6 Defects and claims for damages

6.1 We shall be liable for insuring that our products, including any agreed installation, are free of defects at the time of the transfer of risk (clause 2.1). The required composition, shelf life and use of our products are based solely on the written agreed specification, product description and/or operating instructions. Any information beyond this and in particular in preliminary discussions, advertisement and/or referenced industrial standards shall only become a part of the contract if they are expressly referenced in writing.

6.2 If the Customer requires the delivered goods for purposes other than those agreed, he must check before use if the products are specially suitable for such purposes – including all aspects pertaining to product safety – and Customer is required to ensure that products comply with all relevant technical, legal and official regulations and requirements. We shall not be responsible for the fulfillment of any application not expressly confirmed by us in writing. We are not liable for material or design guidelines of the Customer, concerning the suitability or permissibility of the desired materials or designs and thus have no particular testing obligation.
The observation of safety-related and occupational health regulations depends on the place and conditions of the use, of which we have no knowledge. Measures of the observation of these regulations are, therefore, the responsibility of the user.

6.3 We shall not be liable for the consequences of improper handling, use, servicing or operation of the products or the consequences of normal wear and tear of wearing parts such as pistons, seals, valves and the breakage of glass, plastic or ceramic parts, for the consequences of chemical, electrochemical or electrical influences or the failure to follow the instructions in the operating instructions.

6.4 In the case of justified deficiency claims we shall only initially be required to provide subsequent performance (i.e. free replacement or repair at our sole discretion). Any additional warranty claims shall only exist due to rejection, impossibility or failure of said subsequent performance. Additional expenses, resulting from the fact that the goods have been relocated from the initial place of delivery, shall be borne by the Customer.

6.5 The Customer shall be obliged to promptly and carefully check incoming products – also for product safety – and to notify us of any apparent deficiencies in writing, any hidden defects as soon as they are found. The Customer must notify the carrier immediately of any transport damage. Non-observation of the obligation to check and give notice of defects will void any and all warranty claims for those deficiencies.

6.6 Our liability for slight negligence is limited to claims owing to injury to life, the body or the health, to claims from product liability as well as claims from the culpable breach of essential contractual duties, through which the contract is endangered. Incidentally, our liability for slightly negligent breach of essential contractual duties is limited to the typically incurring damages which we could have foreseen when the contract was concluded.

6.7 If the customer uses the delivered goods with materials that are harmful to the environment, poisonous, radioactive or dangerous in any other way, he shall be obliged to clean them prior to any return shipment. We can put any necessary costs of decontamination/cleaning and disposal in the client's invoice.

7 Limitation of actions

Claims for defects against us shall be limited to one year from delivery of the goods to the customer. The same shall apply to claims for damages no matter for what legal grounds. The period of limitations of § 438, paragraph 1, no. 1 and 2 of the German Civil Code, and § 479, paragraph 1 and 634a, paragraph 1, no. 2 remain unaffected.
The restriction of the statute of limitations shall not apply to claims owing to malicious non-disclosure of a defect, for claims according to product liability and for damages from injury to life, the body or the health and for other damages, which are due to wilful intent or gross negligence.

8 Software use

8.1 Insofar as software is contained in the delivery, the Purchaser will be granted the non-exclusive right to use the software delivered including its paperwork. It shall also be available for use on the specific delivery item. Use of the software on more than one system is prohibited.

8.2 The Purchaser may only copy, transfer or translate the software in a legally acceptable scope (§§ 69 a ff of Copyright Law (UrhG)) or convert from the object code into the source code. The Purchaser is obliged to not remove manufacturer's instructions, especially copyright entries, or to change them without prior permission from the Supplier.

8.3 All remaining rights to the software and the documentation thereof, including copies, remain with the Supplier and/or Software Supplier. The allocation of sublicenses is not permissible.

9 Installation

9.1 Installation costs can be invoiced monthly. Fixed installation prices shall only apply to the work, which has been agreed upon. In other cases, our price list for installation and service costs shall apply.

9.2 The Customer shall be responsible for providing the following if required at his own expense: lighting, motive power: compressed air, water, electrical power for welding, heating including any required connections, electrical installations for the connection of the products delivered by us, the required devices (e.g., hoisting equipment), a room, which can be closed, for storing material, tools and clothing during the installation.

10 Spare Parts, Maintenance/Repair and Calibration

10.1 For spare parts, maintenance, repair and calibration services the valid repair and replacement price list shall apply.

10.2 If we have an obligation to maintain/deliver spare parts, then this shall be limited to a period of five years from the date of delivery of the original product. If the spare parts are not manufactured by us or are no longer available on the market, e.g. electrical components, or if the raw materials required for their production are no longer available, then our obligation to supply spare parts shall lapse.

10.3 For calibration and servicing, normally disposables from our production lines shall be used.

10.4 Any servicing and/or calibration service may only be performed after the Customer has declared the absence of health hazards with regard to the devices sent.

10.5 For service values of up to 50 euros, we reserve the right to service / repair without providing a separate cost estimate.

11 Legal reservation, industrial proprietary rights, secrecy

11.1 We reserve ownership in any of the moulds, tools or other appliances, samples, diagrams, commercial or technical documents produced or provided by us as well as all copyrights, proprietary and intellectual property rights in any such item. This applies also if the Customer has wholly or partly borne the costs of this. The use of any such item by the Customer is subject to our prior written approval. The Customer is neither entitled to manufacture the subjects of this agreement nor to have them manufactured on his behalf, without our approval in writing.

11.2 If we deliver goods according to designs or other requirements specified by the customer (models, samples etc.), he is liable by default for ensuring that through the production and delivery of these products industrial property rights or other rights of third parties are not infringed. He shall be obligated by default to provide compensation for all damages resulting from such legal infringements.

11.3 All information acquired through the business relationship with us which is not deemed to be public knowledge shall be deemed proprietary and may not be disclosed by the customer to any third party.

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30 99 40 40 0 BLZ 790 800 52
01 05 61 9 BLZ 508 700 05

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