



CATALOG

Vakat



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IBAN: DE89508501500021003409

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SWIFT-BIC: DEUT DE FF 508
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Information

Working together with VITLAB

Quality products and first-class service

VITLAB GmbH is committed to providing quality products with first-class customer service on a global scale. VITLAB was one of the first manufacturers in our industry to be issued the ISO 9001 certification for its development, manufacturing and distribution systems. Apart from producing quality products we provide our customers:

- Support for their technical applications
- A global distribution network
- Rapid delivery of our products
- Our own repair service for all liquid handling products.

Worldwide presence

VITLAB has developed a global customer service network to provide its customers information and service support all over the world. More than 100 distribution partnerships provide our customers readily available product and application support on-site. This ensures that our products fulfill the high demands expected of them.

Product information and user instructions

For additional information about our products, application support or product modifications required for your specific applications please contact us at any time.

Sales support and product demonstrations

VITLAB holds on-site product training schemes or demonstrations. Please contact our sales department for further information.

Service

VITLAB provides an all-inclusive service. For utilizing the repair service for WALU liquid handling products please proceed as follows:

- Carefully clean and disinfect the instrument!
- Complete the Declaration on the Absence of Health Hazards (you can obtain forms from your dealer or from VITLAB).

Please send these together with your instrument to your dealer or to VITLAB.

Ordering possibilities

Our products can be purchased from major supply dealers throughout the world. Should you have difficulties finding a specialist dealer in your vicinity, simply call us or visit our Internet page.

How to contact VITLAB

You can contact us at any time by telephone, fax, e-mail or through the Internet.

Telephone:
+49 6257 8608-0

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info@vitlab.de

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<http://www.vitlab.de>

<http://www.promoline.vitlab.com>

<http://www.walu.de>

Catalog

Our catalog provides you information about our products. The actual test and measuring results may vary due to numerous factors beyond our control. For this reason, the user must carefully check the data when transferring it to the particular application in question.

The **technical specifications**, catalog numbers or appearance are subject to change without notice.

The **figures** serve for illustration purposes. They do not necessarily have to agree with the described article in every detail.

Dimensions given without exact tolerances are approximate figures.

The **packaging units** correspond with the recommended order quantity. The minimum order quantities are indicated in the respective, current price list.

Should you require further information please contact us. We shall be pleased to help you further!

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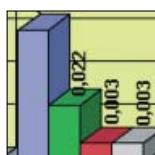
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Quality Philosophy

You can rely on VITLAB

The name VITLAB stands for the highest quality of laboratory instruments made of high-class plastics.

Originating from VITRI GmbH & Co. KG, Mühlthal in 1989, and as a leading producer of liquid handling laboratory products at its location in Seeheim – Jugenheim, VITLAB mainly develops and manufactures volumetric products of ultra-pure, officially approved plastics (PP, PMP, PFA, etc.) using injection molding and extrusion blow molding.

Besides an extensive range of Griffin beakers, graduated beakers, cylinders and flasks, and a unique range of products made of fluoroplastics (PFA for trace analyses), VITLAB has specialized particularly in precision calibration. Whether the calibration is raised, engraved in color or printed on - the quality and precision of the screen or pad printing system are decisive.

In addition to important disposable articles, VITLAB has also been marketing WALU liquid handling products since 2003.

Our high quality standard has been guaranteed for many years by a quality management system structured according to DIN EN ISO9001.

Quality - innovation - reliability. These are the three basic pillars supporting our company philosophy - and to which all the employees at VITLAB feel committed.

The Product Range

State of the art

Vitlab is not self-content with its past achievements. We are continually adapting our product range to meet the needs of the market. Therefore we are expanding our offer of liquid handing products and offering bottle top dispensers, digital burettes and pipetting aids under the WALU brand. We are also pleased to manufacture special customized products. In addition, we have included important disposable articles such as pipette tips and plastic cuvettes in our extended product range.

In the Promoline product line VITLAB produces individually designed, customized calibrations, product names and logos. In addition to offering detailed advice on costs and applications, taking your intended implementation of the products into consideration, VITLAB offers an all-inclusive service including the selection of the appropriate product, the design and the technical details such as calibrations, colors, print and packaging, right through to the logistics at the Point of Sale.

Due to very close co-operation with the dealers world-wide, VITLAB offers reliable, fast availability of the products at an attractive price/performance ratio that fulfills all the demands on the quality required.



Certificates

Certified Quality

The fact that the demands for quality and a sense of responsibility for the environment in no way contradict each other, has been documented by VITLAB in its certified Quality and Environment Management System, in conformity with DIN EN ISO 9001
DIN EN ISO 14001.

DIN EN ISO 9001

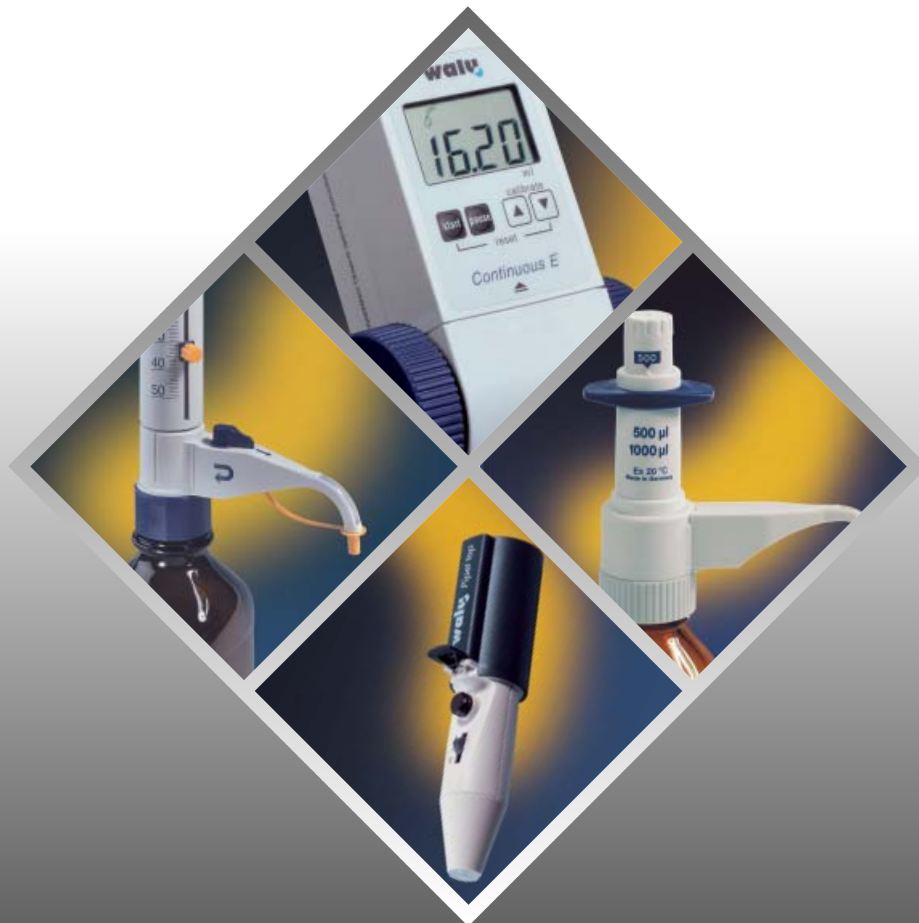
The quality management system at VITLAB has been officially certified since 1995 in accordance with DIN EN ISO 9001. This provides our customers and business partners a guarantee that they are buying products that have been developed and manufactured according to the highest international quality standards. This only proves successful because all the employees and sectors of our company and a large number of customers and suppliers play an active part in our quality management system.

DIN EN ISO 14001

Our business activity focuses on the principle of continuous, future-compatible and future-oriented development of our products whereby forthcoming generations are ensured the possibility of developing and innovating freely. Playing an active role in protecting the environment is therefore a key focus and is firmly anchored in our company philosophy. VITLAB has been certified according to DIN EN ISO 14001 since 1999.



- Bottletop Burette Continuous
- Bottletop Dispenser Genius
- Bottletop Dispenser Simplex
- Micro-Dispenser Piccolo 1 + 2
- Pipetting Aid Pipet top



Liquid Handling

Quality you can count on
from development
to service



Since 1995, the production of WALU Liquid Handling products is supervised by a quality management system, certified according to DIN EN ISO 9001.

For many years, Liquid Handling equipment from WALU has distinguished itself for its many practical solutions and sophisticated designs for everyday work in laboratories.

The employment of cutting-edge CNC machinery guarantees a consistently high quality standard at a competitive price.

The application advisory service and technical support offer assistance with equipment selection and possible repairs. The modular design of the WALU Liquid handling equipment makes all parts easily exchangeable, thus saving the customer's time and money.



Continuous



Pipet Top

Highest precision and minimal fault tolerance ensure optimal measurement results in the laboratory. The certificate of conformity asserts the adherence to the margins of error determined in DIN EN ISO 8655.

The WALU certificate documents each device's

- accuracy R%
- coefficient of variation V%
- device type
- serial number



Genius



Simplex



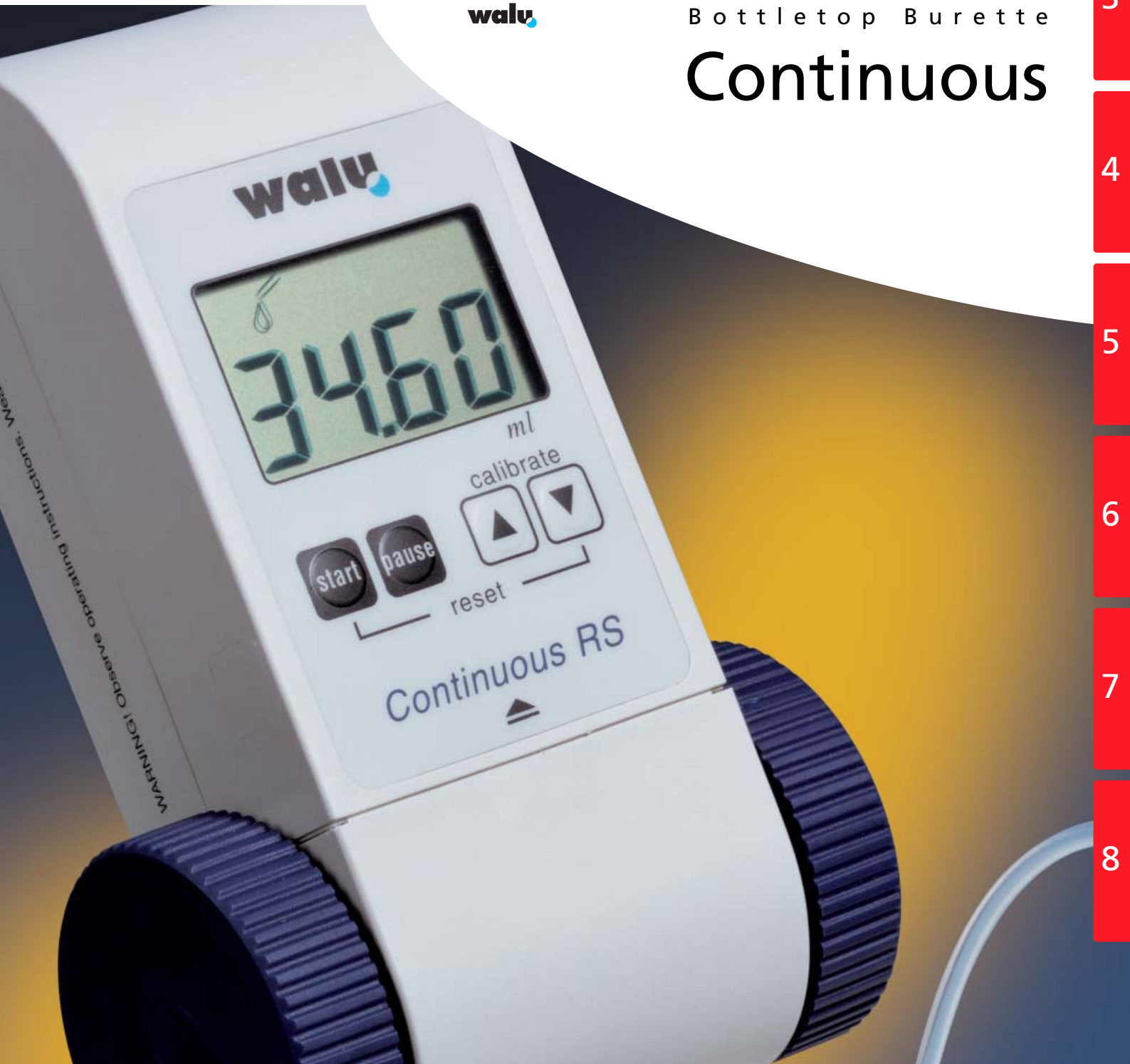
Piccolo



waju

Bottle top Burette

Continuous



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The Burette Continuous: precise titration, perfect handling

The pulse-free dispensing technique of the Burette Continuous makes titration safer at high-level precision.

The Burette Continuous can be used for titration agents up to a concentration of 2 Mol/l. During the titration process, the burette fills automatically, eliminating time-consuming refills.

The Burette Continuous undercuts especially in partial volumes the margins of error defined by DIN EN ISO 8655-3.

All operation controls and the digital display have an ergonomic and functional design and are arranged clearly.

- Pulse-free dispensing technique for continuous and quick titration (5 ml/sec)
- Innovative recirculation valve allows for recirculation within the closed system to avoid reagent waste.
- Timesaving elimination of filling procedures
- Clear and precise display of titrated volume
- Battery-operated, easily replaceable micro-batteries
- Dispensing range from 0,010 ml to 999,9 ml
- Dispensing volume per hand wheel rotation 2,5 ml (Continuous E), 5,0 ml (Continuous RS)
- Can be calibrated
- Service-friendly modular design
- Device can be rotated on the bottle 360°
- Telescoping intake tube extractable from 200 to 350 mm
- Adapters for drying tube and filter
- Certificate of conformity according to DIN 12600



Margin of error according to DIN EN ISO 8655-3:

	Continuous E at 25 ml	Continuous RS at 50 ml
Accuracy	$\leq \pm 0,2 \%$	$\leq \pm 0,2 \%$
Coefficient of variation	$\leq 0,1 \%$	$\leq 0,1 \%$

Items supplied:

Burette Continuous, 3 polypropylene adapters (GL 32, GL 38, S 40), 1 telescoping intake tube, 1 telescoping titrating tube, 2 micro-batteries 1,5 V (LR 03/AAA), operating manual, quality certificate

Burette Continuous



Type	Volume/t	Thread	Adapters	SP	Art.- No.
Continuous E	2,5 ml	GL 45	GL 32, 38, S 40	1	1620006
Continuous RS	5,0 ml	GL 45	GL 32, 38, S 40	1	1620007

You can find details of application ranges on the internet at www.walu.de

1

Batteries

Two micro-batteries 1,5 V (LR 03/AAA), easy to replace

2

Easy Calibration

using only the display keys, e.g. in the context of monitoring or measuring devices (according to ISO and GLP)

3

Pulse-free Titration

continuous flow of titrant. No waste of time by filling the cylinder

4

Recirculation Valve

Innovative recirculation system minimizes loss of reagent during priming

5

Adjustable Titrating Tube

Rotates 360°, adjustable length and height, removable

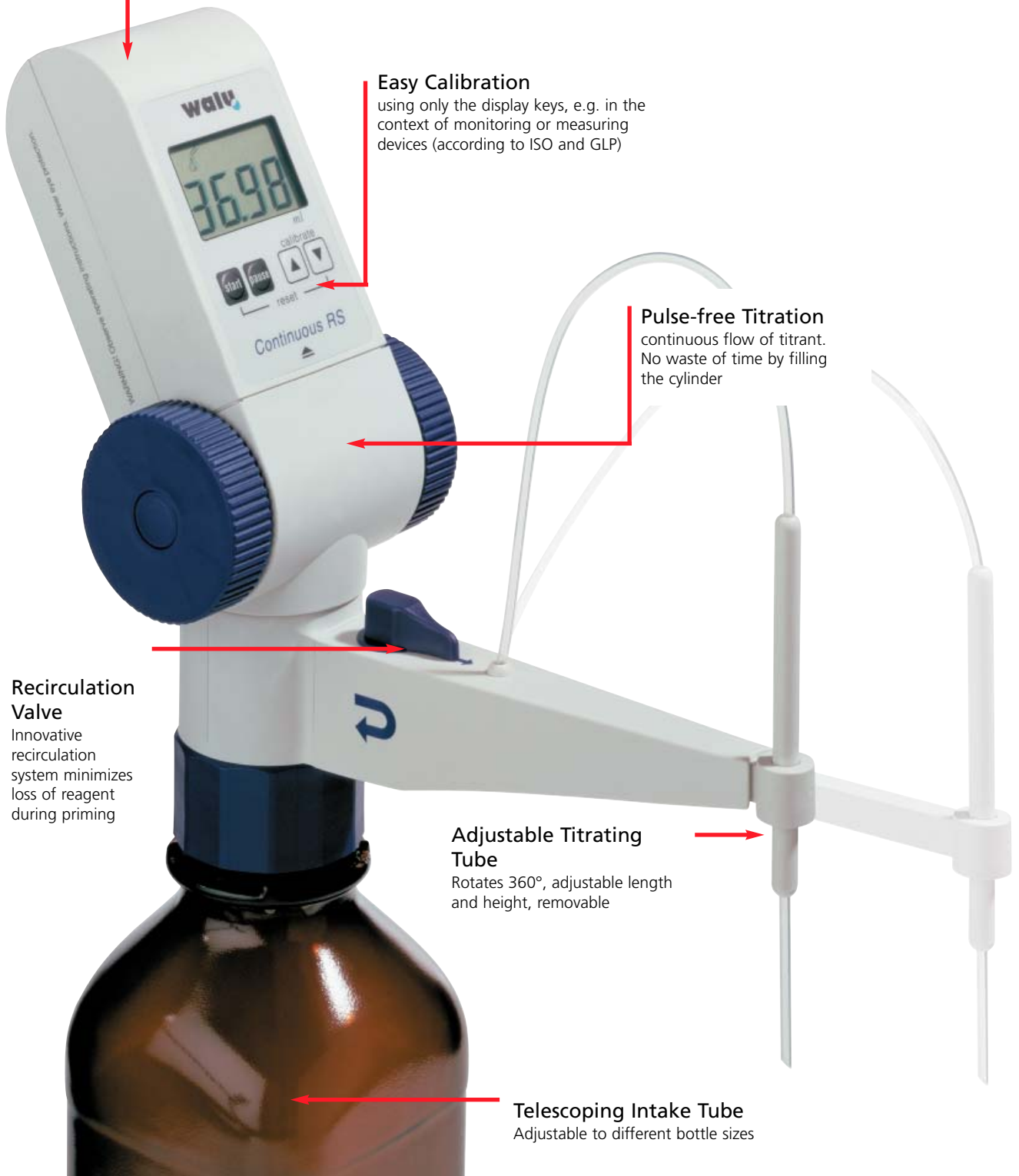
6

Telescoping Intake Tube

Adjustable to different bottle sizes

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Accessories

Thread Adapter, PP

for		SP Art.- No.
External thread	Bottle thread	
GL 45	GL 32	1 1670180
GL 45	GL 38	1 1670110
GL 45	S 40	1 1670120

NS-Adapter, PP

for		SP Art.- No.
External thread	Ground flasks	
GL 32	NS 19/26	1 1670066
GL 32	NS 24/29	1 1670067
GL 32	NS 29/32	1 1670068

Telescoping Intake Tube, FEP

for Continuous E and RS	SP Art.- No.
variable length, 200 mm to 350 mm	1 1671085

Drying Tube

for Continuous E and RS	SP Art.- No.
complete without filling	1 1671095

Bottles, amber glass with synthetic coating

Volume ml	Shape	Thread GL	SP Art.- No.
1000	square	45	1 1671500
2500	round	45	1 1671510

Batteries

for Continuous E and RS	SP Art.- No.
Micro-batteries 1,5 V (LR 03/AAA)	2 1670216

Discharge incl. Recirculation Valve

for Continuous E and RS	SP Art.- No.
complete	1 1655085

Discharge Tube Support

for Continuous E and RS	SP Art.- No.
complete, with locknut	1 1650135

Tube Holder

for Continuous E and RS	SP Art.- No.
variable	1 1650162

Note:

Detailed descriptions of spare parts are part of the device's operation manual



walv

Bottle top Dispenser

Genius & Simplex



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The Bottletop Dispensers Genius and Simplex: Precise dispensing, perfect handling

Their easy and safe handling made the bottletop dispensers Genius and Simplex so popular.

- quick, easy and precise volume adjustment
- innovative recirculation valve allows for recirculation within the closed system to avoid reagent waste (Genius only)
- no drips after tube has been capped
- Easy calibration adjustment (Genius only)
- High-quality materials (PTFE, PFA, FEP, borosilicate glass, platinum-iridium) ensure high chemical resistance against most acids, solvents, and bases
- A positive displacement plunger with a PFA seal minimizes the crystallization of liquids and thus the clogging of the plunger
- Easy to dismount for cleaning, no tools necessary
- Completely autoclavable at 121°C
- Device can be rotated on bottle 360°
- certificate of conformity according to DIN 12600
- Margin of error according to DIN EN ISO 8655-5:
Accuracy < + 0,5%
(Nominal volume 2,5 ml < + 0,6%)
Coefficient of variation < 0,1%

Items Supplied:

Bottletop dispenser Genius or Simplex,
3 polypropylene adapters (see chart),
1 telescoping intake tube (200 –
350 mm), 1 mounting tool, operation
manual, quality certificate stating all
test values



Dispenser Genius

With recirculation valve and media-specific recalibration.

Volume ml	Gradation ml	Thread	Adapter	SP	Art.- No.
0,1 - 2,5	0,05	GL 32	GL 28, 40, 45	1	1605003
0,5 - 5,0	0,10	GL 32	GL 28, 40, 45	1	1605004
1,0 - 10,0	0,20	GL 32	GL 28, 40, 45	1	1605005
2,5 - 25,0	0,50	GL 45	GL 32, 38, S 40	1	1605006
5,0 - 50,0	1,00	GL 45	GL 32, 38, S 40	1	1605007
10,0 - 100,0	2,00	GL 45	GL 32, 38, S 40	1	1605008

Dispenser HF

With 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.

Volume ml	Gradation ml	Thread	Adapter	SP	Art.- No.
1,0 - 10,0	0,20	GL 45	GL 28, 45, S 40	1	1606015

Dispenser Simplex

With variable volume

Volume ml	Gradation ml	Thread	Adapter	SP	Art.- No.
0,1 - 2,5	0,05	GL 32	GL 28, 40, 45	1	1601003
0,5 - 5,0	0,10	GL 32	GL 28, 40, 45	1	1601004
1,0 - 10,0	0,20	GL 32	GL 28, 40, 45	1	1601005
2,5 - 25,0	0,50	GL 45	GL 32, 38, S 40	1	1601006
5,0 - 50,0	1,00	GL 45	GL 32, 38, S 40	1	1601007
10,0 - 100,0	2,00	GL 45	GL 32, 38, S 40	1	1601008

Dispenser Simplex Fix

With fixed volume

Volume ml	Gradation ml	Thread	Adapter	SP	Art.- No.
1,0	-	GL 32	GL 28, 45, S 40	1	1602002
5,0	-	GL 32	GL 28, 45, S 40	1	1602004
10,0	-	GL 32	GL 28, 45, S 40	1	1602005

You can find details of application ranges on the internet at www.walu.de



Easy Calibration

Media-specific recalibration, Genius only (e.g., for different temperatures or viscosities)

The Plunger

Positive-displacement plunger with a PFA seal minimizes the crystallization of liquids and thus the clogging of the plunger

Volume Setting

Easy to operate, clear to read. With clear indication of the selected volume. Quick change of volume by practical setting screw

Recirculation Valve

Innovative recirculation valve minimizes loss of reagent during priming (only Genius)

Discharge Tube

Device can be rotated on the bottle 360°. Closure cap protects against contact with media

Genius

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Accessories

Adapters, PP and PTFE

Material	External Thread	for Bottle Thread	SP Art.- No.
PP	GL 32	GL 25	1 1670150
PP	GL 32	GL 28	1 1670155
PP	GL 32	GL 38	1 1670165
PP	GL 32	S 40	1 1670170
PP	GL 32	GL 45	1 1670175
PP	GL 38	GL 32	1 1670085
PP	GL 45	GL 32	1 1670180
PP	GL 45	GL 38	1 1670110
PP	GL 45	S 40	1 1670120
PTFE	GL 32	GL 25	1 1670072
PTFE	GL 32	GL 28	1 1670085
PTFE	GL 32	GL 38	1 1670090
PTFE	GL 32	S 40	1 1670092
PTFE	GL 32	GL 45	1 1670105
PTFE	GL 38	GL 32	1 1670095
PTFE	GL 45	GL 32	1 1670100
PTFE	GL 45	GL 38	1 1670115
PTFE	GL 45	S 40	1 1670125

NS Adapter, PP

External Thread	For Ground-Neck Bottles	SP Art.-No.
GL 32	NS 19/26	1 1670066
GL 32	NS 24/29	1 1670067
GL 32	NS 29/32	1 1670068

Filling Valve for Genius and Simplex

for Dispenser	SP Art.- No.
2,5 / 5 / 10 ml	1 1655000
25 / 50 / 100 ml	1 1655005

Discharge incl. Recirc. Valve for Genius

for Dispenser	SP Art.- No.
2,5 / 5 / 10 ml	1 1655075
25 / 50 / 100 ml	1 1655080

Discharge Valve For Simplex

for Dispenser	SP Art.- No.
2,5 / 5 / 10 ml	1 1655095
25 / 50 / 100 ml	1 1655100

Intake Tube, FEP

for Dispenser	Length mm	SP Art.- No.
2,5 / 5 / 10 ml	220	1 1650020
2,5 / 5 / 10 ml	335	1 1650025
25 / 50 / 100 ml	250	1 1650030
25 / 50 / 100 ml	335	1 1650035
Telescoping intake tube, variable length 200 mm to 350 mm		1 1671085

Discharge Tube, bent, FEP

for Dispenser	SP Art.- No.
Genius 2,5 / 5 / 10 ml	1 1650085
Simplex 2,5 / 5 / 10 ml	1 1650080
Genius 25 / 50 / 100 ml	1 1650110
Simplex 25 / 50 / 100 ml	1 1650100

Flexible Discharge Tubing, 80cm, PTFE

for Dispenser	SP Art.- No.
Genius and Simplex 2,5 / 5 / 10 ml	1 1650086
Genius and Simplex 25 / 50 / 100 ml	1 1650111

Filter Membrane, 3 µm

for Dispenser	SP Art.- No.
All sizes, bag with 10 p.	1 1670650

Drying Tube

for Dispenser	SP Art.- No.
All sizes (without filling)	1 1671095

Bottles, amber glass with synthetic coating

Volume ml	Shape	Thread GL	SP Art.- No.
100	round	28	1 1671505
100	square	32	1 1671506
250	square	32	1 1671515
500	square	32	1 1671520
1000	square	45	1 1671500
2500	round	45	1 1671510

Note:

Detailed descriptions of spare parts are part of the device's operation manual.



walu Micro-Dispenser

Piccolo 1 & Piccolo 2



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Piccolo 1, Micro Dispenser, fixed

walu

An innovative way of serial dispensing. New methods in the field of biochemical and medical research demand the dispensing of smallest volumes. With the WALU Piccolo 1 these volumes can be dispensed straight from the bottle, which makes it a perfect help for the dispensing of long series. Disposable tips are not necessary.

- Precise dispensing
- One-hand operation
- Low weight
- Discharge tube can be rotated 360°
- Bottle thread GL 28
- Wide range of applications, since all parts in contact with the reagents are made from high-quality materials such as PTFE, FEP, borosilicate glass and platinum-iridium.

You can find details of application ranges on the internet at www.walu.de

Volume µl	Accuracy R% ≤ ±	Coefficient of variation V% ≤	SP	Art.- No.
100	3,0	0,4	1	1610001
250	2,0	0,4	1	1610003
500	1,5	0,3	1	1610004
1000	1,0	0,2	1	1610006

Other volumes on request



Piccolo 2, Micro-Dispenser, switchable

walu

An innovative way of serial dispensing. New methods in the field of biochemical and medical research demand the dispensing of smallest volumes. With the WALU Piccolo 2 these volumes can be dispensed straight from the bottle, which makes it a perfect help for the dispensing of long series. Disposable tips are not necessary.

- Precise dispensing
- One-hand operation
- Low weight
- Discharge tube can be rotated 360°
- Bottle thread GL 28
- Wide range of applications, since all parts in contact with the reagents are made from high-quality materials such as PTFE, FEP, borosilicate glass and platinum-iridium.

You can find details of application ranges on the internet at www.walu.de

Volume µl	Accuracy R% ≤ ±	Coefficient of variation V% ≤	SP	Art.- No.
100 / 250	2,0	0,4	1	1611003
500 / 1000	1,0	0,2	1	1611006
1000 / 2000	1,0	0,2	1	1611008

Other volumes on request



walu Pipetting Aid

Pipet Top



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Creating the vacuum



Filling and dispensing



Blowing out

Pipetting Aid Pipet Top



An elegant and inexpensive alternative.
Perfect handling.

- For glass and plastic pipettes from 0.1 to 100 ml
- Ergonomical design
- One-hand operation
- Sensitive control and meniscus movement
- The hydrophobic membrane filter prevents absorption of liquids into the device
- Filter and body connection autoclavable

Description	SP	Art.- No.
Pipet Top	1	1630000

Accessories for Pipet Top

Description	SP	Art.- No.
Silicone adapter	1	1670200
Intake cone	1	1661280
Replacement membrane filter 3 µm (10 p.)	1	1670650



- Cuvettes
- Pipet Tips
- Centrifuge Tubes
- Precision Dispenser Tips
- Pasteur Pipettes



Disposables

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Macro and semi-micro cuvettes, plastics

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 360 nm 0.004 extinction units

Type of Cuvette	Filling volume ml	Window mm	SP	Art.-No.
Macro cuvette, PS	2,5 - 4,5	10 x 35	1000	146190
Semi-micro cuvette, PS	1,5 - 3,0	4,5 x 23	1000	146290
Macro cuvette, PMMA	2,5 - 4,5	10 x 35	1000	146399
Semi-micro cuvette, PMMA	1,5 - 3,0	4,5 x 23	1000	146499



Centrifuge 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 reopens 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

Description	SP	SP	Art.-No.
Centrifuge tubes 1,5 ml with lid	1x500	500	145094
Centrifuge tubes 1,5 ml with lid	6x500	3000	145194

Relative Centrifugal Force (RCF)

The RCF stated (identical with g-figure) refers to a water filling and 20 mins of centrifugal activity at 20 °C. Since a number of factors, such as placement of the centrifugal tube within the rotor, chemicals, temperature and duration, can influence the RCF limit significantly, all RCF values are just given as a general information (DIN 58970).

Pipette Tips, non-sterile, bulk, with certificate of conformity

The pipette tips have a certificate of conformity, and are tested for pipettes made by BRAND, Gilson®, Labsystems, Eppendorf®. 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



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Precision Dispenser Tips

The dispenser tips are suitable for the Eppendorf Multipipette®, 4780/Repeater®, EDOS® 5221, Brand HandyStep® and other compatible dispensing systems. The BRAND HandyStep® electronic recognizes the tip size automatically. They comply with DIN EN ISO 8655.

Dispenser tips are made from high-quality materials:

Flask: 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	Description	SP	Art.-No.
0,1	non-sterile, bulk	100	146594
0,5	non-sterile, bulk	100	146694
1,25	non-sterile, bulk	100	146794
2,5	non-sterile, bulk	100	146894
5,0	non-sterile, bulk	100	146994
12,5	non-sterile, bulk	100	147094
25,0	non-sterile, bulk, with adapter	50	147194
50,0	non-sterile, bulk, with adapter	25	147294
0,1	sterile, free of endotoxins, individually wrapped	100	147594
0,5	sterile, free of endotoxins, individually wrapped	100	147694
1,25	sterile, free of endotoxins, individually wrapped	100	147794
2,5	sterile, free of endotoxins, individually wrapped	100	147894
5,0	sterile, free of endotoxins, individually wrapped	100	147994
12,5	sterile, free of endotoxins, individually wrapped	100	148094
25,0	sterile, free of endotoxins, individually wrapped	25	148194
50,0	sterile, free of endotoxins, individually wrapped	25	148294
	adapter for 25/50 ml tips, non-sterile	10	148494
	adapter for 25/50 ml tips, sterile	5	148594



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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 qty. (D/ml)	SP*	Art.-No.
-	3,0	2,5	152	25-27	5000	148893
1/0,25	3,0	2,8	151	25-30	5000	148993
3/0,5	3,0	3,3	154	21-28	5000	149093
2/0,5	2,0	3,0	153	22-26	5000	149193
-	3,5	1,0	148	52-65	5000	149293
-	1,0	1,0	105	50	3200	149393

* SP:
5000 = 10 cartons of 500
3200 = 8 cartons of 400



Dropping pipettes with integrated bellows [PE-LD]

For sampling and decanting of infectious or toxic liquids. Graduated.

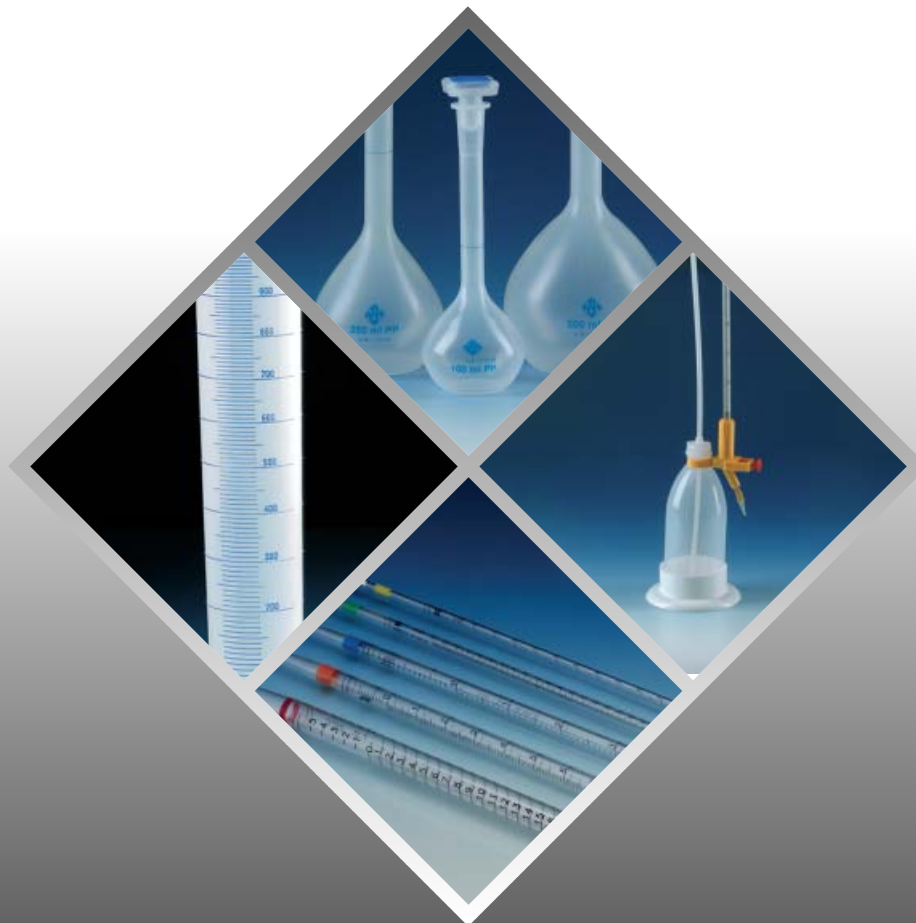
Volume ml	Length mm	SP	Art.-No.
1,5	133	100	149893
5	194	100	149993



Dropping pipette with integrated pipetting bulb [PE-LD]

Volume ml	Length mm	SP	Art.-No.
1,8	98	250	149693

- Graduated Cylinders
- Volumetric Flasks
- Burettes
- Pipettes
- Pipette Aids
- Pipette Racks
- Pipette Washer



Volumetric Instruments

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Graduated Cylinders [PP] tall, moulded scale

class B per DIN 12681/ISO 6706, translucent, ring-moulded graduations, hexagonal base.

Volume ml	Tolerance ± ml	Grad. 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



Graduated Cylinders [PP] tall, blue scale

class B per DIN 12681/ISO 6706, translucent, ring-moulded graduations, overprinted in blue, hexagonal base.

Volume ml	Tolerance ± ml	Grad. 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



Graduated Cylinders [SAN] tall, moulded scale

class B per DIN 12681/ISO 6706, transparent, ring-moulded graduations, hexagonal base.

Volume ml	Tolerance ± ml	Grad. 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

Graduated Cylinders [PMP] tall, moulded scale

class A per DIN 12681, transparent, ring-moulded graduations, hexagonal base.

Volume ml	Tolerance ± ml	Grad. 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



Graduated Cylinders [PMP] tall, Conformity Certified

class A according to DIN 12 681, transparent, with hexagonal base and ring-moulded graduations. Accuracy is individually checked and marked with 'H'. With Test Certificate indicating lot number and year of production, also on the cylinder.

Volume ml	Tolerance ± ml	Grad. ml	Height mm	Ø mm	SP	Art. No.
25	0,20	0,50	169	21	2	64704
50	0,20	1,00	199	28	2	64804
100	0,40	1,00	260	34	2	64904
250	0,40	2,00	315	47	2	65004
500	1,40	5,00	350	61	1	65104
1000	2,50	10,00	415	76	1	65204
2000	5,00	20,00	482	97	1	65304



Graduated Cylinders [SAN] short, moulded scale

transparent, moulded graduations.

Volume ml	Tolerance ± ml	Grad. ml	Height mm	Ø mm	SP	Art. No.
25	0,5	0,50	122	22	12	64091
50	1,0	1,00	142	27	12	64191
100	2,0	2,00	163	37	12	64291
250	5,0	5,00	192	51	6	64391
500	10,0	10,00	218	67	6	64491
1000	20,0	20,00	285	78	6	64591



Graduated Cylinders [PP] short, moulded scale

translucent, moulded graduations.

Volume ml	Tolerance ± ml	Grad. ml	Height mm	Ø mm	SP	Art. No.
25	0,5	0,50	122	22	12	640941
50	1,0	1,00	142	27	12	641941
100	2,0	2,00	163	37	12	642941
250	5,0	5,00	192	51	6	643941
500	10,0	10,00	218	67	6	644941
1000	20,0	20,00	285	78	6	645941



Graduated Beakers [PP]

translucent, moulded graduation, wide round base.

Volume ml	Grad. 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



Hydrometer Cylinders [PP]

translucent, with reservoir beaker and pouring lip, moulded graduations.

Volume ml	Grad. ml	Height mm	Ø mm	SP	Art. No.
500	5	351	73	1	760941



Volumetric Flasks [PP] with screw-cap [PP]

The tolerances are approx. 20 % better than class B according to DIN EN ISO 1042. Translucent, individually ring-marked.

Volume ml	Tolerance ±ml	Height mm	Thread GL	SP	Art. No.
25	0,06	115	18	6	671891
50	0,10	150	18	6	672891
100	0,16	180	18	6	673891
250	0,24	235	25	5	674891
500	0,40	270	25	4	675891
1000	0,60	310	32	3	676891



Volumetric Flasks [PMP] with screw-cap [PP]

The tolerances are approx. 20 % better than class B according to DIN EN ISO 1042. Translucent, individually ring-marked.

Volume ml	Tolerance ±ml	Height mm	Thread GL	SP	Art. No.
25	0,06	115	18	6	671895
50	0,10	150	18	6	672895
100	0,16	180	18	6	673895
250	0,24	235	25	5	674895
500	0,40	270	25	4	675895
1000	0,60	310	32	3	676895

Volumetric Flasks [PFA]

see page 38

Volumetric Flasks [PP] with stoppers [PP]

The tolerances are approx. 20 % better than class B according to DIN EN ISO 1042. Translucent, individually ring-marked.

Volume ml	Tolerance ±ml	Height mm	Stopper NS	SP	Art. No.
25	0,06	115	10/19	6	671941
50	0,10	150	10/19	6	672941
100	0,16	180	14/23	6	673941
250	0,24	235	19/26	5	674941
500	0,40	270	19/26	4	675941
1000	0,60	310	24/29	3	676941



Volumetric Flasks [PMP] with stoppers [PP]

The tolerances are approx. 20 % better than class B according to DIN EN ISO 1042. Translucent, individually ring-marked.

Volume ml	Tolerance ±ml	Height mm	Stopper NS	SP	Art. No.
25	0,06	115	10/19	6	67195
50	0,10	150	10/19	6	67295
100	0,16	180	14/23	6	67395
250	0,24	235	19/26	5	67495
500	0,40	270	19/26	4	67595
1000	0,60	310	24/29	3	67695



Volumetric Flasks [PMP] Class A with stoppers [PP]

Translucent, individually ring-marked, tolerances per DIN EN ISO 1042, class A. Supplied with standard NS PP stoppers, with imprinted Lot No. and Certificate.

Volume ml	Tolerance ± ml	Height mm	Stopper NS	SP	Art. No.
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

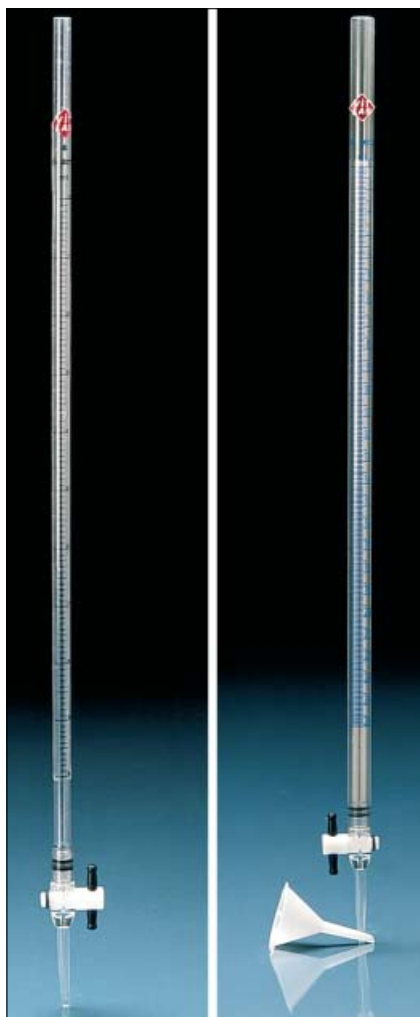


Burettes [PE/PVC/PP] 'Schilling'-Type

All parts are completely manufactured from hard to break plastic material. The burettes are filled with titrating solution and automatically adjusted to zero by squeezing the bottle. By pressing the button pre-titrating is started. Fine titration is possible with the help of the screw-adjustment which enables drop by drop dosing to the equivalent point.

Capacity ml	Tolerance ±ml	Grad. ml	Height mm	Bottle ml	SP	Art. No.
10	0,15	0,10	760	500	2	106299
25	0,40	0,10	820	1000	2	106399
50	0,50	0,10	1180	1000	2	106499

NS-Stoppers
see page 67



Burettes [PVC/PMP/FEP]

These VITLAB plastic burettes are high-precision burettes, resistant to chemical attack, and a cost-effective choice for routine work. VITLAB plastic burettes have been developed in order to eliminate problems of glass breakage in routine laboratory work, thus providing greater safety and protection for laboratory workers. The combination of three different plastic materials - PMP - FEP - PVC - provides high resistance to chemical attack. Our VITLAB stopcock housing is unique in that it is the first such to be moulded as a single unit. The key is of FEP, requires no lubrication. The high-precision graduated burette tube is moulded of PVC and overcoated with "Schellbach". This provides for better legibility, along with high resistance to chemical attack.

Capacity ml	Tolerance ± ml	Grad. ml	Length mm	SP	Art. No.
10	0,15	0,1	550	2	105299
25	0,40	0,1	570	2	105399
50	0,50	0,1	920	2	105199



Burette Stopcocks [PMP/FEP]

The PMP-body is produced from 1 piece. The FEP-key with polished surface is easily turnable and tight. Applicable for plastic tubes having int. diameters of 9.5 mm ± 0.1 mm. Insert with 2 o-rings. Top-inn.-Ø 0,9 mm. Mounting length 70 mm.

Height mm	SP	Art. No.
90	5	105499



Burette Clamps [PP] single

Fits 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



Burette Clamps [PP] double

Fits 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.
double	5	80140

Graduated Pipette [PP]

PP. High clarity. Resistant to breakage. Suction tube outer Ø max. 8 mm. Calibrated to deliver (TD, Ex). Exposure to temperatures above 60°C may effect accuracy! Recommended cleaning with mild alkaline detergents up to 60°C.

Volume ml	Tol. ± ml	Grad. 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 Ø 10 mm



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Bulb Pipette [PP], 1 mark

PP. High clarity. Resistant to breakage. Calibrated to deliver (TD, Ex). Exposure to temperatures above 60 °C may affect accuracy! Recommended cleaning with mild alkaline detergents up to 60 °C.

Volume ml	Tol. ± ml	Length ±10 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	0,06	450	6	164494
50	0,10	460	6	164594

Disposable Pipettes [PS]

translucent, graduated, unsterilised.

Volume ml	Grad. 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



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Disposable Pipettes [PS] sterile

translucent, graduated, individual sterile packaging.

Volume ml	Grad. 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



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Pipette Filler Bulbs [NR]

Pipette filler with 3 valves.

Valve A: Release air, Valve S: Filling, Valve E: Delivery

for Pipettes ml	SP	Art. No.
Standard model up to 10 ml	1	104099
Universal model up to 100 ml	1	104199



QR Pipette Pumps [PP]

For pipetting liquids fit all glass and plastic pipettes. Slowly rotating their actuator-wheels inducts liquid into pipettes. Pressing their relief valves automatically empties QR 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



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



Deep Tray for Pipettes [PVC]

Holds pipettes from 120 mm length.

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



Pipette Trays for Drawer [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. Accepts pipettes and burettes up to 60 cm long.

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



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 extensions.

Model	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
2 Extensions for the handle				2	81219



Pipette Jar [PE-HD]

For pre-cleaning pipettes in cleaning agents.

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

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Beakers: page 60

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Graduated Pitchers: Page 61

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- Evaporating Dishes
- Sample Tubes
- Containers
- Bottles
- Round Bottom Flasks
- Bottles
- Watch Glasses
- Magnetic Stirring-Bars



***Fluorocarbon
Range***



Volumetric Flasks [PFA] „Class A“ with screw caps

High transparency, individually calibrated ring-markings, tolerances class A per DIN EN ISO 1042, supplied with PFA screw-caps. Screw-caps provide hermetic seals and high safety from outside contamination. Withstand high temperatures and chemical attack.

Volume ml	Tolerance ±ml	Height mm	Thread GL	SP	Art. No.
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



Beakers [PFA]

Translucent moulded graduations resistant to high temperatures and chemical attack. Meet ISO 7056.

Volume ml	Grad. 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



Beakers [ETFE] with impression

Translucent black graduation resistant to high temperatures and chemical attack. Meet ISO 7056.

Volume ml	Grad. 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



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

Evaporating Dishes [PFA] with snap on lid [PE]

For contamination free sample preparation.

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



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Microwave Digestion Inliner [PFA]

'Inliner' for CEM-Microwave Digestion Apparatus.

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



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Sample Tubes [PFA]

Art. 103897 with calibrated ring-mark at 10 ml, with screw cap PFA. For sample preparation, centrifugation and for Autosampler racks.

Volume ml	Height mm	Ø mm	Thread GL	SP	Art. No.
12	110	16	-	1	103797
15	110	22	25	1	103897



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Sample Containers [PFA]

With screw cap (PFA) for sample collection, transport and storage of samples.

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



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Volumetric flasks see pages 30 - 31
Griffin beakers see page 60



Bottles Narrow-Neck [PFA] with screw-caps

Supplied with a moulded-in sealing ring in screw-caps (PFA) straight-shouldered thread translucent withstand high temperature from -200°C to +260°C and chemical attack. For storage of pure chemicals without contamination.

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



Bottles Wide-Neck [PFA] with screw-caps

Supplied with a moulded-in sealing ring in screw-caps (PFA) straight-shouldered thread translucent, withstand high temperatures from -200°C to +260°C and chemical attack. For storage of pure chemical without contamination.

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



Bottles Narrow-Neck [PFA] Economy, with screw-cap [ETFE]

Supplied with hermetically sealing screw-caps, translucent, withstand high temperatures and chemical attack. Caps of ETFE have been specially developed, and incorporate a moulded-in sealing ring for hermetic sealing.

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



Reagent Bottles [ECTFE] with screw-caps [ETFE]

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

Volume ml	Height mm	Ø mm	Thread GL	SP	Art. No.
100	100	53	18	1	111397
250	132	70	25	1	111497
500	165	85	25	1	111597
1000	202	105	32	1	111697

Wash Bottles Narrow-Neck [PFA] Economy

Translucent. Screw-cap, ETFE, with tube, FEP. Tips of wash tubes may be cut to increase flow rate. Withstand high temperatures and chemical attack.

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



Bottles [PTFE]

Opaque, medium-wide mouths, tight-fitting caps.

Volume ml	Height mm	Ø mm	SP	Art. No.
10	50	26	1	122597
25	62	33	1	122697
50	71	45	1	122797
100	89	52	1	122897



Sampling System [PFA]

For Samples of ultrapure liquids. All parts in contact with fluids have been manufactured from PFA. Creates a vacuum inside the bottle, to suck in samples. Easy handling by attaching onto S40 thread bottle. Please order bottle separately ! Supplied with PFA tube 1,5 m.

Tubing int. Ø mm	Thread	SP	Art. No.
3,2	S40	1	159897



Gas-Wash-Bottles [PFA]

Provided with a head-piece with thread S40. 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



more Bottles see pages 50 - 53
more Wash-Bottles see pages 46 - 48

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Round Bottom Flasks [PFA]

DIN 12348 (Glass) with Standard ground socket. For Rotary Evaporators and distillation of high pure chemicals.

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



Watch Glasses [PTFE]

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



Magnetic Stirring-Bars [PTFE] POLYGON

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 [PTFE] OCTAGON

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 [PTFE] OVAL

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

more watch-glasses
see page 70



Magnetic Stirring-Bars [PTFE] SPINPLUS

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 [PTFE] TRIANGULAR

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 [PTFE] DOUBLE-SPINFIN

With permanent-magnet cores.

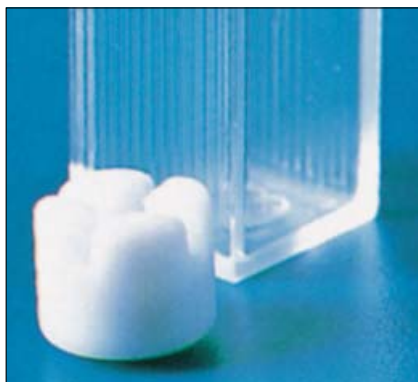
Ø mm	Height mm	SP	Art. No.
14	10	1	314097
17	13	1	314197
22	15	1	314297



Magnetic Stirring-Bars [PTFE] cirulus

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

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



Magnetic Stirring-Bars [PTFE]

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

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



Magnetic Stirrer Retriever [PTFE]

All PTFE, with a powerful magnet at one end. For retrieving stirring bars from beakers, flasks, and similar. Flexible.

Length mm	SP	Art. No.
330	1	318597

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Magnetic Stirrer Retriever [PTFE]

PTFE encapsulated magnetic core.

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



Magnetic Stirrer Retriever [PE]

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

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



Tape [PTFE]

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 260°C.

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

- Wash-Bottles
- Dropping-Bottles
- Erlenmeyer Flasks
- Bottles
- Containers
- Staining Jars
- Urine Jars



Container



VENT-CAP Safety-Wash-Bottles [PE-LD] with impression

with permanent coloured imprint indicating the contents together with the latest hazard symbols and information. The print is in English, German and French language. VITLAB wash-bottles are based on the popular Wash Bottles made of virgin PE-LD featuring leak proof closures made of PP. The newly developed Safety Wash Bottle with VENT- CAP has a unique mechanism (patent no. DBGM 29718714.7) which automatically vents volatile solvent vapour. The screw-cap has a DIN-thread GL 25.

Volume ml	Thread GL	Imprint	SP	Art. No.
250	25	without impression	12	949889
250	25	Dist. Water	12	1331819
250	25	Acetone	12	1331829
250	25	Methanol	12	1331839
250	25	Isopropanol	12	1331849
250	25	Ethylacetate	12	1331859
250	25	Ethanol	12	1331869
500	25	without impression	12	950889
500	25	Dist. Water	12	1332819
500	25	Acetone	12	1332829
500	25	Methanol	12	1332839
500	25	Isopropanol	12	1332849
500	25	Ethylacetate	12	1332859
500	25	Ethanol	12	1332869
500	25	Methylenchlorid	6	1332879
500	25	N,N-Dimethylformamid	6	1332889
500	25	n-Heptan	6	1332899
500	25	n-Hexan	6	1332909
500	25	Petrolether*	6	1332919
500	25	Tetrahydrofurane (THF)	6	1332939
500	25	Toluene	6	1332949
500	25	Xylol	6	1332959
500	25	Acetonitrile	6	1332969
500	25	Acetic acid conc.	6	1332979
500	25	Methylethylketon	6	1332989

* Petroleum ether (pure benzin)



Wash-Bottles [PE-LD]

Promote laboratory-safety, imprinted with German, English and French name and chemical formula of intended contents, together with symbols indicating type of hazard. With GL 32 screw-cap.

Volume ml	Thread GL	Imprint	SP	Art. No.
1000	32	Dist. Water	12	133381
1000	32	Acetone	12	133382
1000	32	Methanol	12	133383
1000	32	Isopropanol	12	133384
1000	32	Ethylacetate	12	133385
1000	32	Ethanol	12	133386

Wash-Bottles [PFA]

see page 41

Wash-Bottles [PE-LD] with impression

Promote laboratory-safety, imprinted with German, English and French name and chemical formula of intended contents, together with symbols indicating type of hazard. Bottle, wash tubes and insert of PE-LD, screw-cap of PP.

Volume ml	Thread GL	Imprint	SP	Art. No.
250	25	Dist. Water	12	133181
250	25	Acetone	12	133182
250	25	Methanol	12	133183
250	25	Isopropanol	12	133184
250	25	Ethylacetate	12	133185
250	25	Ethanol	12	133186
500	25	Dist. Water	12	133281
500	25	Acetone	12	133282
500	25	Methanol	12	133283
500	25	Isopropanol	12	133284
500	25	Ethylacetate	12	133285
500	25	Ethanol	12	133286
500	25	Methylenchloride	6	133287
500	25	N,N-Dimethylformamid	6	133288
500	25	n-Heptan	6	133289
500	25	n-Hexan	6	133290
500	25	Petrolether*	6	133291
500	25	Tetrahydrofurane (THF)	6	133293
500	25	Toluene	6	133294
500	25	Xylol	6	133295
500	25	Acetonitril	6	133296
500	25	Acetic acid conc.	6	133297
500	25	Methylethylketon	6	133298

* Petroleum ether (pure benzin)



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Wash-Bottles [PE-LD] without impression

Round, translucent. Bottle and tube are made from PE-LD, screw-cap from PP.

Volume ml	Thread GL	Ø mm	SP	Art. No.
50	18	37	24	94588
100	18	43	24	94688
250	25	58	12	94988
500	25	74	12	95088
1000	32	92	12	95188



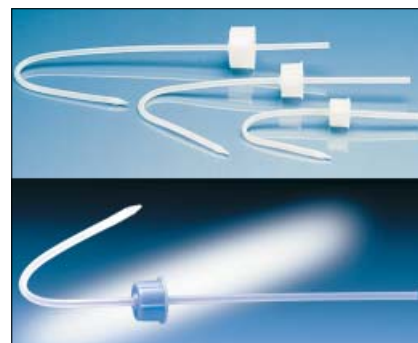
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Screw-caps [PP] for wash-bottles

with GL-thread. Shower and tube from PE-LD

Thread GL	Type	SP	Art. No.
18	-	24	83300
25	-	12	83301
32	-	12	83302
25	VENT-CAP	12	833019



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Dropping-Bottles [PE-LD]

Round, supplied with dropper inserts and mating screw-caps.

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



Screw-caps with dropping inserts [PE-HD]

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



Wash-Bottle [PE-LD] colour coded

Volume ml	Colour-Code	SP	Art. No.
250	red	5	132603
250	green	5	132605
250	yellow	5	132606
250	blue	5	132608
500	red	5	132703
500	green	5	132705
500	yellow	5	132706
500	blue	5	132708



Integral Wash-Bottles [PE-LD]

Easy managable. 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

Wash-Bottles [PFA]
see page 41

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-Code	SP	Art. No.
400	white	5	53510
850	white	5	53610



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Wide-neck Erlenmeyer Flasks [PP]

Translucent, conical flasks, supplied complete with PP screw-caps. NS-stoppers can also be used (not included).

Volume ml	Grad. ml	Thread GL	NS-Stopper	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



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Wide-neck Erlenmeyer Flasks [PMP]

Transparent, conical flasks, supplied complete with PP screw-caps. NS-stoppers can also be used (not included).

Volume ml	Grad. ml	Thread GL	NS-Stopper	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



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Erlenmeyer Flasks [PC]

Erlenmeyer Flasks, glass clear, with screw cap (PP), developed and designed for tissue and sterile culture applications. The screw cap with vent tube can be closed with tissue or filter material.

Volume ml	Grad. 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



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Presentation-Kit

for a professional and effective presentation of VITLAB products. The kit contains a cross-section of VIT-LAB articles as well as our latest catalogue with price-list and CD-ROM.

Model	SP	Art. No.
Presentation-Kit	1	19999



Narrow-neck Bottles [PE-LD] round

Translucent, supplied with mating screw-caps, PP.

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



Wide-neck Bottles [PE-LD] round

translucent, with screw-caps.

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-neck Jars [PE-LD] with screw connections

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

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

Bottles [PFA] and [ECTFE]
see page 40

Narrow-neck Bottles [PE-LD] square

Translucent, supplied with mating screw-caps.

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



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Wide-neck Bottles [PE-LD] square

Translucent, with screw-caps.

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



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Narrow-neck Bottles [PP] round, with conical shoulders

translucent, supplied with mating screw-caps, PE-LD.
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



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Wide-neck Bottles [PP] round, with conical shoulders

translucent, with screw-caps 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



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Bottles [PFA] and [ECTFE]
see page 40



Screw-caps [PP] for bottles

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



Narrow-neck Bottles [PP] with conical shoulders

transparent, with NS-Stopper.
Size 5000 ml with 1 handle.

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



Wide-neck Bottles [PP] with conical shoulders

transparent, with NS-Stopper.

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



Storage Bottles [PE-LD]

Supplied completely with screw-caps and carrying bails.

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

Narrow-neck Storage Bottles [PE-LD] with tap

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

Volume l	Neck Ø mm	Ø mm	Height mm	SP	Art. No.
5	45	165	335	1	81660
10	55	210	415	1	81662
25	55	280	525	1	81664
50	55	365	605	1	81666
Tap for Narrow-neck Storage Bottles, PP				1	80375



Compact containers [PP]

Save valuable space with this compact container system. Each container (PP) 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

Type	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 Vials [PP]

with tight fitting caps of PE-LD, transparent.

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



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Sample Containers [PE-LD]

General-purpose containers, flush-fitting hinged lids.

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 Containers [PE-HD]

with screw-caps, heavy duty

Volume ml	Height mm	Ø mm	SP	Art. No.
5	30	21	10	80910
10	52	21	10	80911



Sample Containers [PP]

with screw-caps of PP, for taking samples, transport and storage.

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



Weighing Jars [PP]

Hermetic-seal lids, transparent.

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

Multi-Purpose Containers [PP] square

translucent, square, hermetic-sealing lids made of white PE. Suitable for freezing.

Volume ml	Size mm	Height mm	SP	Art. No.
250	110 x 110	47	10	235494
500	135 x 135	57	10	235594
1000	175 x 175	63	10	235694
500	110 x 110	86	10	235994
1000	135 x 135	108	10	236094
2000	175 x 175	120	10	236194



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Multi-Purpose Containers [PP] rectangular

translucent, rectangular, hermetic-sealing lids made of white PE. Suitable for freezing.

Volume ml	Size mm	Height mm	SP	Art. No.
1000	240 x 140	47	10	236594
1500	240 x 140	76	10	236694



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Multi-Purpose Containers [SAN]

Transparent, rectangular container and lid, suitable for general use.

Volume ml	Size mm	Height mm	SP	Art. No.
4000	340 x 230	94	1	36491



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Staining Cuvette - 'Coplín-type' [PP]

Supplied with screw-cap for simultaneously staining 10 slides of 26 x 76 mm.

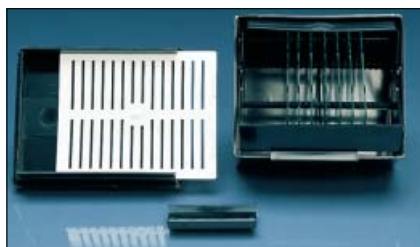
Height mm	Ø mm	SP	Art. No.
114	59	10	136693



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Universal Slide Staining Kit [POM]

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

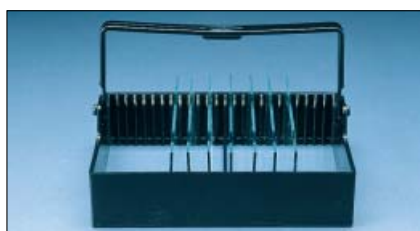
Size mm	Height mm	SP	Art. No.
100 x 87	51	5	99099



Staining Jar [POM]

Staining jar, handles up to 25 slides. Accommodates a single Art.- No. 99299 rack.

Size mm	Height mm	SP	Art. No.
100 x 87	51	5	99199



Staining Rack [POM]

For simultaneously staining up to 25 slides. Fits in Art.-No. 991-99 staining jar.

Size mm	Height mm	SP	Art. No.
91 x 79	38	10	99299



Storage Boxes [PS]

for slides. Optional with or without 4 staining racks available.

Size mm	Height mm	Description	SP	Art. No.
192 x 169	39	with 4 staining racks	3	99390
192 x 169	39	without staining racks	3	99490



Microscope Slide Boxes [PS] nesting

Durable, non-warping slide boxes having retaining grooves for storing 26 x 76 mm slides, reducing risks of breakage. Inside its lid is a numbered index card.

Size mm	Height mm	Slides No.	SP	Art. No.
122 x 96	34	25	4	80276
229 x 96	34	50	1	80277
229 x 181	34	100	1	80278

Staining Cuvette - 'Hellendahl-type' [PMP]

Supplied complete with lid. Holds 8 slides stacked vertically, or 16 slides stacked back to back.

Size mm	Height mm	SP	Art. No.
58 x 53,5	86	4	80355



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Staining Jar [PMP]

Moulded in PMP, for use with Art.No 803-54, below. Supplied with two lids, one for use when no staining dish is in use, precluding evaporative loss of staining liquids during storage, plus a second lid having an opening for the handle of the staining dish.

Size mm	Height mm	SP	Art. No.
101 x 81	86	4	80353



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Staining Dish [PP]

Staining dish of PP with horizontal tray. Holds 20 slides of 26 x 76 mm. Slide tray has 20 locating grooves and a removable snap-on handle.

Size mm	Height mm	SP	Art. No.
86 x 70	21	2	80354



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Measuring Spoon [PS]

Transparent, without graduation.

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



6

Measuring Beaker [PP]

transparent, moulded scale. Suitable lid made of PE.

Volume ml	Grad. ml	Height mm	Ø mm	SP	Art. No.
30	1	42	37	100	69394
Lid	-	-	-	100	69493



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Collectors [SAN] or [PP]

moulded scale, graduation 20 ml, with white lid, PC.

Type	Volume ml	Height mm	Ø mm	SP	Art. No.
Urine Collector, SAN	2000	220	150	6	97891
Urine Collector, PP	2000	220	150	6	978941
Lid, PC	-	-	-	6	97791

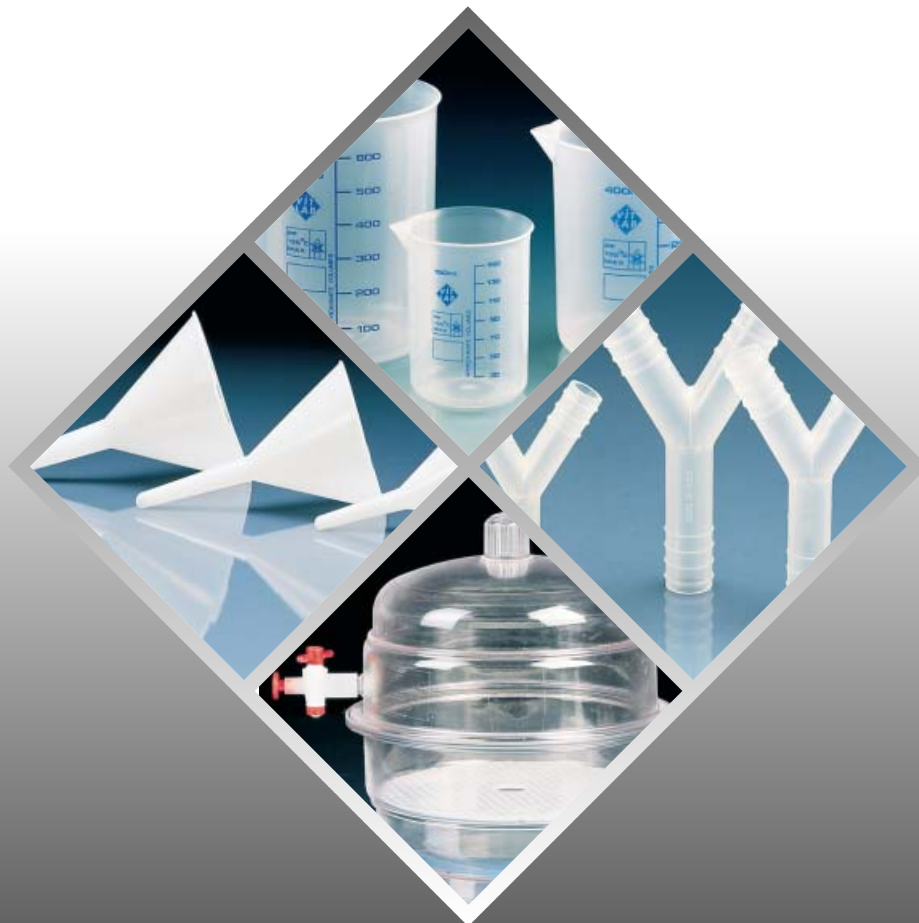


Urinals [PP] or [PC]

Raised graduations available with or without attached PE lid. Bottles are autoclavable at temperatures up to 121°C.

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

- Beakers
- Sedimentation Cones
- Funnels
- Water-Jet Pumps
- Connectors
- Valves
- Stoppers
- Racks
- Scoops
- Forceps
- Spatulas
- Mortars
- Trays
- Buckets
- Desiccators



General Laboratory Articles

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Beakers [PP] blue scale

Translucent, per ISO 7056.

Volume ml	Grad. 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



Beakers [PMP] red scale

Transparent, per ISO 7056.

Volume ml	Grad. 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	200	248	185	4	61703

Beakers [PFA] , [ETFE] and [PTFE]

see page 38



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Promotion made to Measure

Graduated Pitchers [PP] moulded graduation

Translucent.

Volume ml	Grad. 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



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Graduated Pitchers [PP] moulded blue scale

Translucent.

Volume ml	Grad. 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



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Graduated Pitchers [SAN] moulded scale

Transparent.

Volume ml	Grad. 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



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Graduated Pitchers [PP] nesting, blue scale

Translucent.

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



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Sedimentation Cone [SAN]

low break risk, transparent, Imhoff-type sedimentation cone, moulded graduations screw-cap at tip for ease of cleaning.

0-2 ml= 0,1 ml
 2-10 ml= 0,5 ml
 10-40 ml= 1 ml
 40-100 ml= 2 ml
 100-1000 ml= 50 ml.

Volume ml	SP	Art. No.
1000	3	75991

Rack for cones [PMMA]

holds two sedimentation cones.

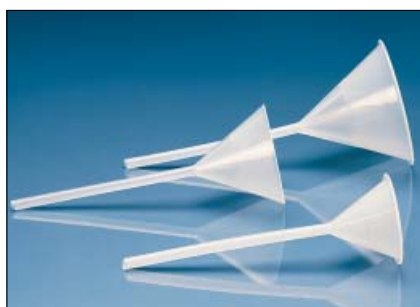
Size mm	SP	Art. No.
150 x 300 x 290	1	81056



Funnels [PP]

transparent.

Ø mm	Length mm	Stem Ø mm	SP	Art. No.
30	47	2	24	40894
30	47	5	24	41094
40	65	5	24	41194
50	85	9	24	41294
75	110	10	12	41394
100	155	13	12	41494
120	180	14	12	41594
150	220	17	12	41694



Long-stemmed Funnels [PP]

Translucent.

Ø mm	Stem length mm	Stem Ø mm	SP	Art. No.
60	150	8	10	80162
80	150	8	10	80164
100	150	8	10	80165



Urbanti Funnels [PMP]

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

Ø mm	Length mm	Stem Ø mm	SP	Art. No.
51	150	3	6	325095
70	150	3	6	325195
100	108	7	4	325295
140	132	10	3	325395
196	160	20	2	325495

Powder Funnels [PP]

Wide-stem funnels for powders. Translucent.

Ø mm	Length mm	Stem Ø mm	SP	Art. No.
65	68	16	10	70794
80	75	22	10	70894
100	94	23	10	70994
120	110	27	10	71094
150	138	29	5	71194



Half-round Funnels [PP]

Special ST-funnels for use on multi-neck flasks and labware.

NS	Length mm	SP	Art. No.
14/23	80	10	70494
19/26	100	10	70594
29/32	140	5	70694



Large Funnels [PP]

industrial version, translucent. Large funnels Ø 430 mm made of PE-HD. Brass mesh sieve/filter mates to rims of large funnels Ø 200 and 250 mm.

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



Chemical Waste System [PE/PP] without lid

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

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



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Funnels, Buchner [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



Funnel Holders [PP]

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

Type	SP	Art. No.
single	5	80268
double	5	80269



Support [PP] for Separatory Funnels

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

Type	SP	Art. No.
single	5	80970



Filter Funnel Support

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.

for no. of funnels	Base plate mm	SP	Art. No.
4	450 x 140	1	78294
2	250 x 140	1	78394

Water-Jet Vacuum Pump [PP]

Good chemical resistance, fluid path consists of polypropylene, FKM (e.g., Viton®) and PTFE. The flow configuration has been optimized, resulting in a 33% reduction of water consumption (190 liters/h at 305 bar water supply pressure).

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.

Overall length: approx. 210 mm (R 3/4" connector fitted)

Weight: approx. 33g (R 3/4" connector fitted)

Pack of 1.



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

Non-return Valve [PE-HD]

with valve discs of FKM (e.g. Viton®).

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



Non-return Valve [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



Connectors [PP] universal

transparent.

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



Connectors [PP] straight

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



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Connectors [PE-HD] 2-parts

These quick disconnectors are useful for joining tubing of glass, rubber or plastic. Connectors fit tightly together. Replace expensive adaptors.

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 - 6	20	80537



Connectors [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 [PP] 90°

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 [PP] T-Form

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 [PP] Y-Form

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

Flow Monitors [SAN]

Transparent. 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



Stopcocks [PE]

with ribbed handles and large tubing fittings. NOT FOR USE IN PRESSURIZED LINES.

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



Valves [PE/PP] 2/3-Way

For laboratory use and chemical engineering applications. Fittings for connecting to tubing provide flow shutoff, plus choice of 2-way, or 3-way flow direction.

for tubing with inner Ø mm	Ways	SP	Art. No.
5	2	1	137094
5	3	1	137194
7	2	1	137294
7	3	1	137394
9	2	1	137494
9	3	1	137594



Standard Joint Stoppers [PP]

Autoclavable at 121°C, size according to DIN

NS-Stopper	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



Bottles see page 52
Graduated Pitchers see
page 31

Conical joint clip [POM], adjustable

Operating temperature up to 150 °C.

for NS	SP	Art. No.
10/19	1	1670790
12/21	1	1670805
14/23	1	1670820
19/26	1	1670835
24/29	1	1670850
29/32	1	1670860
34/36	1	1670870
40/38	1	1670880
45/40	1	1670890





Test Tube Racks [PP] colour-coded, nesting

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.

for Ø up to mm	Positions	Rows	Height mm	Colour	SP	Art. No.
13	84	6 x 14	75	white	5	3190940
16	55	5 x 11	75	white	5	3191940
18	55	5 x 11	75	white	5	3192940
20	40	4 x 10	75	white	5	3193940
25	32	4 x 8	88	white	5	3194940
30	21	3 x 7	88	white	5	3195940
13	84	6 x 14	75	blue	5	3190948
16	55	5 x 11	75	blue	5	3191948
18	55	5 x 11	75	blue	5	3192948
20	40	4 x 10	75	blue	5	3193948
25	32	4 x 8	88	blue	5	3194948
30	21	3 x 7	88	blue	5	3195948
13	84	6 x 14	75	red	5	3190943
16	55	5 x 11	75	red	5	3191943
18	55	5 x 11	75	red	5	3192943
20	40	4 x 10	75	red	5	3193943
25	32	4 x 8	88	red	5	3194943
30	21	3 x 7	88	red	5	3195943



Microcentrifuge Tube Racks [PP] colour-coded

Sturdy construction. Stackable racks with alphanumerical positions. Operating temperature -20 to 90°C. Autoclavable (121°C). Density 1,2 g/cm³. Will not float in waterbath. Racks are supplied in two-pieces (Ø 11 mm, for microcentrifuge tubes) or three-pieces (Ø 13 mm, for cryo tubes) for convenient and permanent assembly. L x W x H in mm:265 x 126 x 38.

for Ø up to mm	Positions	Rows	Colour	SP	Art. No.
11	128	8 x 16	white	5	3197940
13	84	6 x 14	white	5	3198940
11	128	8 x 16	blue	5	3197948
13	84	6 x 14	blue	5	3198948
11	128	8 x 16	red	5	3197943
13	84	6 x 14	red	5	3198943

Centrifuge tubes
see page 24



Test Tube Racks [PP]

for test tubes 0,5, 1,5, 2 ml Ø 10 - 12 mm and for cryo-tubes. Dimensions: L x W x H: 215 x 131 x 27 mm.

for Ø up to mm	Positions	Rows	Colour	SP	Art. No.
10-12	96	8 x 12	white	1	136894



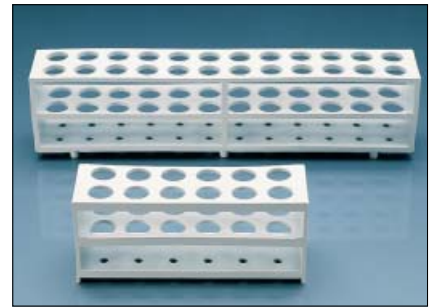
Test Tube Racks [PE]

Allow the control of reagents. L x W x H: 200 x 55 x 65 mm.

for Ø up to mm	Positions	SP	Art. No.
16	10	4	80130
18	9	4	80131

Test Tube Racks [PP]

for Ø up to mm	Positions	Rows	Size mm	Height mm	SP	Art. No.
21	24	2 x 12	375 x 65	85	5	80562
21	12	2 x 6	190 x 60	80	5	80560



Drying Rack [PS]

Backplate and pegs moulded in PS, complete with suitable expansion hanging hooks, draining groove and instruction.

Model	Pegs	Size mm	SP	Art. No.
Drying Rack	72	450 x 630	1	80213
Replacem. pegs	11	95 x Ø 6	1	81213



Drying Rack (wall)

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

Pegs	Size mm	SP	Art. No.
75	450 x 630	1	76299



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



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Measuring Scoops [PE-HD]

natural colouring, industrial version.

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
500	350	6	40693
1000	400	6	40793



Forceps [PMP] white

Flat bottoms and tops, self-sprung.

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



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



Stirring Rods [PP] with Spatula

Length mm	SP	Art. No.
245	10	80828



Laboratory Spatula [PA]

glass-fibre reinforced.

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



Watch Glasses [PP]

with base, translucent.

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

Flask Support [PP]

white, for round-bottom flasks, enhancing laboratory safety, durable for temperatures up to 120 °C.

Ø mm	SP	Art. No.
160	5	80271



Mortars [MF]

white with lip.

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.

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



Instrument Trays [MF]

white, fitting lid made of PS please order separately.

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



Lid [PS] for Instrument Trays

transparent, with handle.

Size mm	SP	Art. No.
190 x 150	5	79790
290 x 160	5	79890
340 x 245	5	79990



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Compartment Trays [PVC] 9 cavities

for bottles up to Ø 25 mm.

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



Compartment Trays [PVC] 12 cavities

for small parts.

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



Compartment Trays [PVC] 5 cavities

5 different sizes for pipettes, thermometers, connectors etc.

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



Instrument Trays [MF]

white, flat.

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



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

Laboratory Trays [PP]

all-purpose trays, robust. High chemical resistance.

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



Bowls [PP] round

white, round.

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



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 and Storage 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



Buckets [PP] with pouring lips

Translucent, pivoted bail. Graduated. Highly resistant to chemicals.

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



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Buckets [PE-HD]

White, pivoted bails, graduated, the fitting lids: translucent, tight snap-lid.

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



Multi-Purpose Containers [PE-HD]

With 2 carrying grips

Colour	Volume l	Ø mm	Height mm	SP	Art. No.
green	30	400	450	1	47705
yellow	30	400	450	1	47706
orange	30	400	450	1	47707
blue	30	400	450	1	47708
grey	30	400	450	1	47716



Desiccators [PP/PC]

evacuatable desiccators. Base sections in polypropylene. Hot crucibles should be put on a porcelain plate only. Covers of transparent polycarbonate. O-ring provides excellent sealing. Vacuum valves of polycarbonate 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



Optional 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).

Bezeichnung	SP	Art. No.
O-ring for desiccator-Ø 100 mm	1	80555
O-ring for desiccator-Ø 200 mm	1	80556
O-ring for desiccator-Ø 250 mm	1	80557
Valve, PC, for all desiccator-Ø	1	80229

Desiccators [PP/PC]

Lower section (of PP) can be filled with desiccants. A perforated disk of PP supports materials to be dried. Lids (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 [PC]

Transparent lower sections and lids. Lower sections (of PC) can be filled with desiccants. A perforated disk of PP supports materials to be dried. Lids (of PC) are sealed by a neoprene gasket. Ideal for use in schools, universities, and student laboratories. Supplied complete with stopcock for evacuation.

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



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



Seed Germinating Kit [PS]

Complete 3-piece 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, and seeds are laid out on this sheet of filter paper. Includes a top bell equipped with an air vent. Conforms to DBGM 1671453.

Description	Height mm	Volume ml	Ø mm	SP	Art. No.
Seed Germinating Kit	175	250	75	10	98590
Annular Support	-	-	70	10	98690
Top Bell	-	-	70	10	98790
Water Jar	-	250	75	10	98890



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☐ Liquid Handling



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Advertising with PROMOLINE - made to measure



VITLAB PROMOLINE products advertise their quality and functionality - all the PROMOLINE products are manufactured according to our Quality Management System in conformity with DIN ISO EN 9001.

Whether graduated beakers, cylinders, scoops, bottles or buckets, we produce and print our quality products with your good name on.

You are able to present your customer directly with a customized scale calibration including your logo and product name. Our customer service offers you advice on the choice of product, its appearance and technical details such as the calibration, colour, print and packaging, right through to the logistics and Point of Sale.

VITLAB manufactures high-quality, plastic volumetric instruments using injection moulding or blow moulding with colour-printed, or raised calibration and marking. We shall be pleased to advise you on the best choice of plastic for a low-cost, optimally customized solution.





Our Customer Service gives you detailed advice on the range of applications for the different kinds of plastic.

VITLAB employs a specially perfected printing technique for round, conical and flat surfaces. Only quality inks in the PANTONE range are used. The combination of hot-foil stamping and cliché printing give your advertising articles a highly exclusive flair.

We can produce your customized product starting at 1,000 pieces. Your individual contact person guarantees a reliable advisory service right from the very first contact and assists you in your "made-to-measure advertising project" up to the delivery to you or your customer.

For more information see www.promoline.vitlab.com

We look forward to working together with you.



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walu OEM

Use our practical know-how to make your ideas become reality!



Our qualitatively high WALU OEM products (Original Equipment Manufacturing) have been a symbol for innovation and reliability for many years.

With our technical know-how and special manufacturing system we are able to implement your ideas as an OEM customer at low-cost to suit the market.

We convert your ideas into reality - from the development stage to serial production. Our Quality Management System has been certified to DIN EN ISO 9001.

Your ideas can thus be developed to create a low-cost product thanks to our efficient implementation.

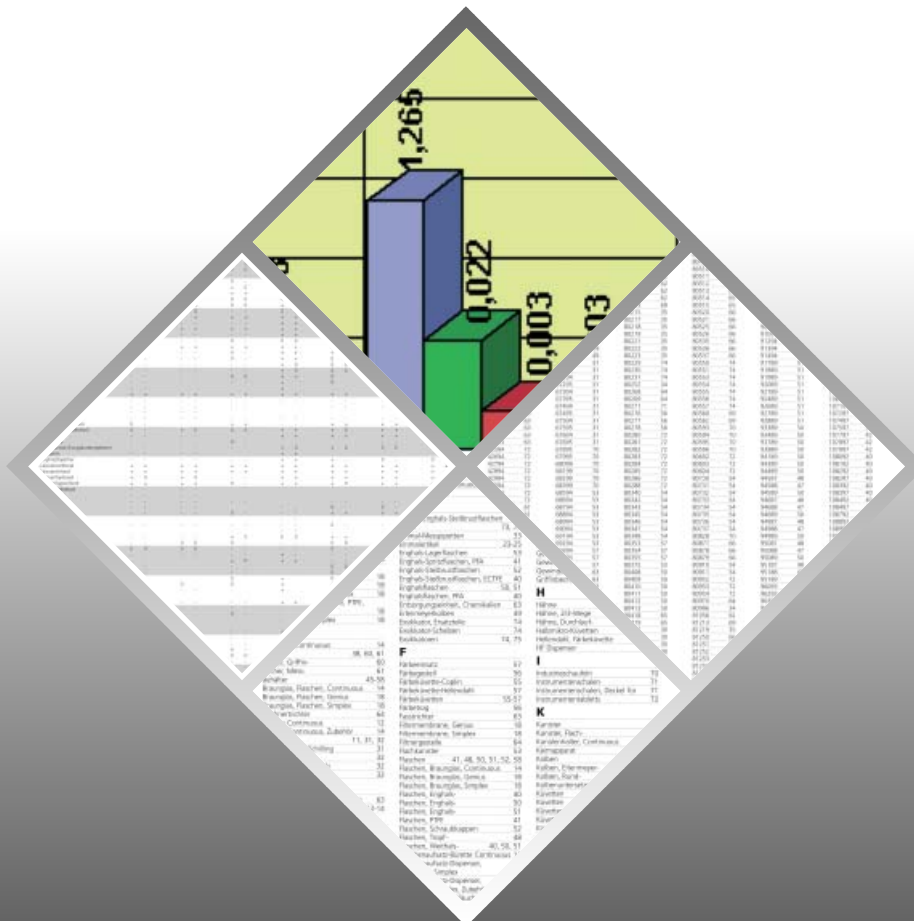
When it comes to reliability and high performance VITLAB is your partner in the following sectors:

- Market-tested WALU OEM products
- Injection moulding and mould designing
- Precision machining of components using CNC control
- Screen printing

We look forward to working together with you.



- Laboratory Instruments of PFA
- Volumetric Instruments of Plastics
- Cleansing and Sterilization
- Sterilization of Plastics
- Physical Properties
- Chemical Properties
- Alphabetical Index
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- Sales Terms and Conditions

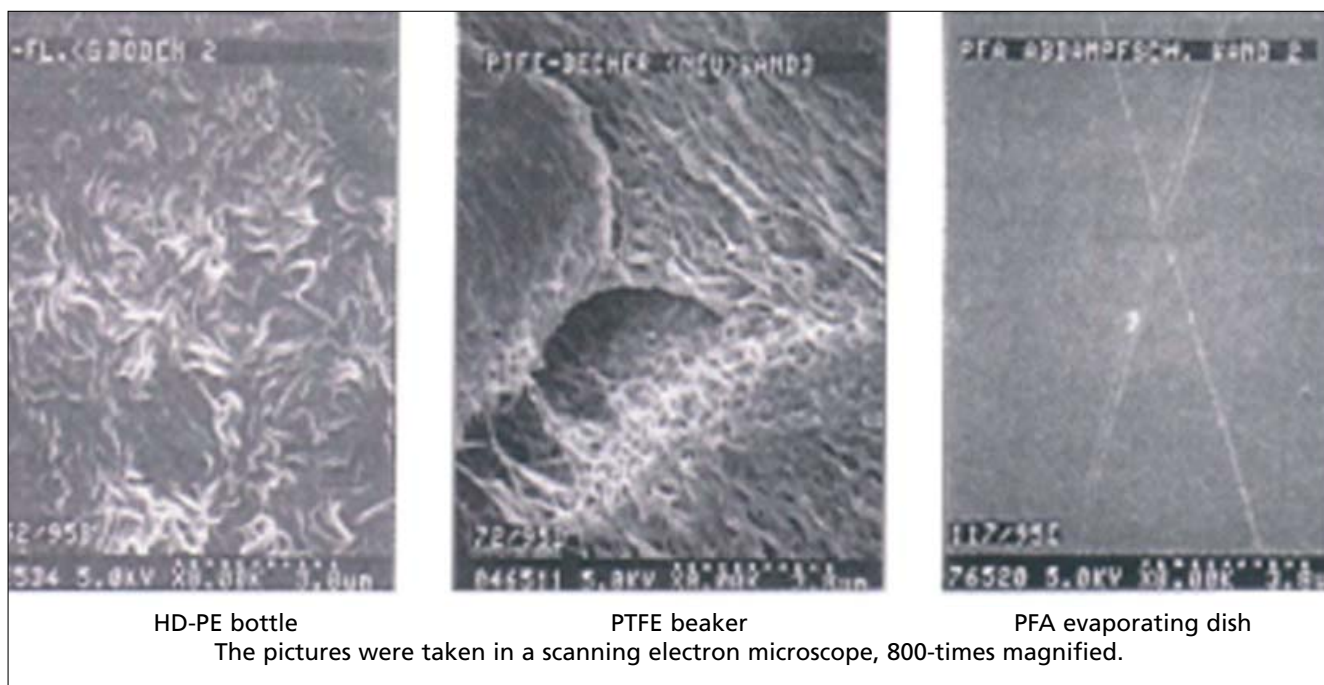


PFA laboratory equipment

In addition to the polyolefines (e.g. PP, HDPE and LDPE), fluorine plastics, 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 +260 °C (PTFE, PFA). For a long time, only PTFE was available with its relatively rough micro-porous surface, which is common for sintered materials. Since 1971, PFA, an advancement of PTFE, has become available. With PFA it is possible to manufacture transparent products with an extremely smooth, closed or dense surface, using injection moulding or extrusion blow moulding techniques.

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, if not specially pre-treated, can cause a change of concentration due to an interaction of the container wall with the sample or reference solution or with chemicals, and can 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 only high-purity PFA, 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.



indispensable for trace analysis

Cleaning

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.

Example:

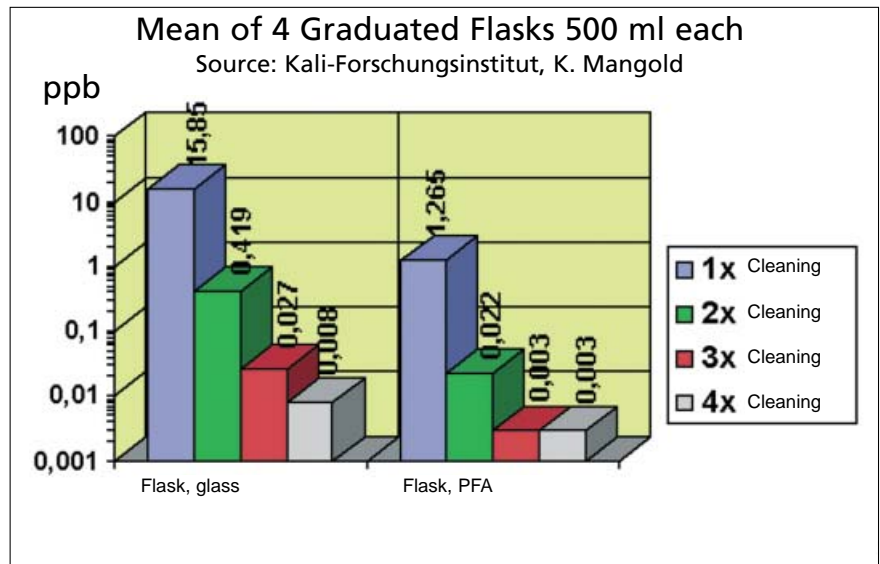
Cleaning procedure of glass and PFA graduated flasks after contamination with a Pb solution in the concentration of 100 ppb ($\mu\text{g/g}$). The containers were cleaned by rinsing them out with a 65% HNO_3 Suprapur[®] solution at room temperature.

Result:

After rinsing the containers three times, the marginal concentration of 0,003 ppb was reached. Thus, the time-consuming boiling process can be eliminated.

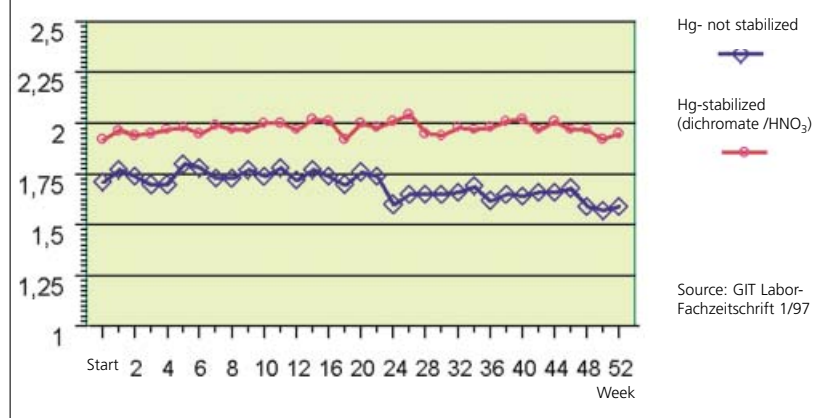
Summary of the most important PFA characteristics

- High thermal stability from $-200\text{ }^\circ\text{C}$ to $+260\text{ }^\circ\text{C}$
- Chemical inertness against almost all chemicals
- Extremely hydrophobic and anti-adhesive
- 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



Use within trace analysis

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



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Plastic Volume Measuring Devices With Tolerance Class A

Volume measuring tools made from plastics are an important addition to the range of articles for modern laboratories. Their advantages such as stability, low weight and favourable price are well known. But since the accuracy of graduated flasks and cylinders made from plastics can be compared to the accuracy of glass tools these days, the spectrum for the application of plastic volume measuring devices widens considerably. Laboratories working according to GLP or GMP, being certified according to DIN EN ISO 9001 or accredited to ISO/EC 17025 should use certified measuring tools whenever possible and subject these to controls at regular intervals.

Following an initiative by VITLAB, in 1996 the standards committee for laboratory apparatus and equipment adopted the first DIN standard for graduated cylinders made of plastics

(DIN 12 681) which is analogous to DIN 12 680 (graduated cylinders made of glass). Based on this new DIN 12 681, VITLAB was the first manufacturer to produce class A graduated cylinders from PMP, which are certified for conformity (Symbol H) and have a raised scale.

With our quality management system, certified according to DIN EN ISO 9001, and the periodical controls of production and products by the calibration authorities in charge, we can ensure our adherence to the requirements for the reception of the certificate of conformity according to DIN 12 600 pertinent to the calibration regulations of August 12th, 1988.

Due to their slight conicity, VITLAB can manufacture graduated cylinders with a sturdy wall thickness. For this reason, our quality graduated cylinders do not need any additional reinforcement of

the brim. The liquid column remains stable, even when the cylinder is lifted. The cylinders have a hexagonal base, allowing them to stand steady on six levels instead of just three points! All of the attributes mentioned are the characteristics of a true quality product.

Furthermore, since 2000 VITLAB has been the first manufacturer to produce graduated flasks from PMP and PFA, which adhere to the class A tolerances of DIN EN ISO 1042 (glass).

VITLAB developed production methods for plastic laboratory equipment and employs a reliable system of quality assurance with the goal of keeping the standard volume tolerances given for volume measurement devices made from glass. Every class A graduated cylinder or flask receives a certificate of quality with a charge number and date of production, which are also indicated on the product itself.



Cleaning and sterilization of plastics laboratory equipment

All polyolefines, such as PE-LD, PE-HD, PP and PMP, as well as the fluorine synthetics PTFE, PFA, FEP, ETFE and ECTFE have water-repellent surfaces that are very durable and easy to clean. Scrubbing agents or brillo 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. Due to their low weight we recommend securing them with washing nets to avoid tumbling them in the water jet. (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 HNO₃ 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

Prior to sterilization you have to ensure that there are no residual contaminations on the equipment, since these could lead to the plastic's destruction during the autoclaving process (121°). 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.



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Physical Properties of Plastics

Plastics	Max. Operating Temperature °C	Brittle-Temperature °C	Micro wave suitability*	Density g/cm ³
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 ... 90	-50	yes	0,92
PE-HD	105	-50	yes	0,95
PP	125	0	yes	0,90
ECTFE/ETFE	150	-100	yes	1,70
PFA/FEP	250/205	-270	yes	2,15
PTFE	300	-200	yes	2,17
FKM	220	-30	-	-
PVC	80	-20	no	1,35
NR	80	-40	no	1,2
SI	180	-60	no	1,1
MF	120	-80	yes	1,5

* Observe chemical and temperature resistance

Sterilization* of Plastics

	Autoclavable at 121 °C, t _e 20 min per DIN	Hot air at 160 °C (dry)	Gas (Ethylen oxide)	Chemical (Formalin, Ethanol)	Gamma-rad. 25 kGy
PS	no	no	no	yes	yes
SAN	no	no	yes	yes	no
PC	no	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)
ECTFE/ETFE	yes	no	yes	yes	no
PFA/FEP	yes	yes	yes	yes	no
PTFE	yes	yes	yes	yes	no
FKM	yes	yes	yes	yes	-
PVC	no	no	yes	yes	no
NR	no	no	yes	yes	no
SI	yes	yes	yes	yes	no
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!

Chemical Properties of Plastics

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

+	o	-
Excellent chemical resistance	Good to limited resistance	Poor chemical resistance
Continuous exposure to the substance does not cause damage within 30 days. The plastic may remain resistant for years.	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).	Not suitable for continuous medium exposure to the substance. Immediate damage may occur (loss of mechanical strength, deformation, discoloration, cracking, dissolution).

Chemical resistance of plastics to classes of substances

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

Abbreviations of the described plastics to DIN 7728

PS:	Polystyrene	ECTFE:	Ethylene-chlorotrifluoroethylene copolymer
SAN:	Styrene-Acrylonitrile Copolymer	ETFE:	Ethylene-tetrafluoroethylene copolymer
PMMA:	Polymethylmethacrylate	PTFE:	Polytetrafluoroethylene
PC:	Polycarbonate	FEP:	Perfluoroethylene-propylene copolymer
PVC:	Polyvinylchloride	PFA:	Perfluoroalkoxy copolymer
POM:	Polyoxymethylene	FKM:	Fluoro elastomer (e.g. Viton®)
PE-LD:	Polyethylen low density	NR:	Natural rubber
PE-HD:	Polyethylen high density	SI:	Silicone rubber
PP:	Polypropylene	MF:	Melamin-formaldehyde
PMP:	Polymethylpentene		

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

Medium	PS		SAN		PC		POM		PMP		LDPE		HDPE	
	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
Acetone	-	-	-	-	-	-	+	+	+	+	+	0	+	+
Acetonitrile	-	-	-	-	-	-	+	-	0	-	+	0	+	0
Acetophenone	-	-	-	-	-	-	+	-	0	-	-	-	0	0
Acetylacetone	-	-	-	-	-	-	+	-	+	-	+	-	+	-
Acetylchloride	-	-	-	-	-	-	-	-	-	-	+	-	+	-
Acrylonitrile	-	-	-	-	-	-	-	-	-	-	+	+	+	+
Acrylic acid	-	-	-	-	-	-	-	-	+	-	+	-	+	-
Adipic acid	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Allyl alcohol	+	0	-	-	+	0	+	+	+	0	+	+	+	+
Aluminium chloride	+	+	+	+	-	-	+	0	+	+	+	+	+	+
Aluminium hydroxide	0	0	0	0	0	-	+	+	+	0	+	+	+	+
Formic acid 98 - 100 %	+	0	0	0	+	0	-	-	+	0	+	+	+	+
Amino acids	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ammonium chloride	+	+	+	+	0	0	+	+	+	+	+	+	+	+
Ammonium fluoride	+	+	+	+	0	0	+	+	+	+	+	+	+	+
Ammonium hydroxide 30 %	0	-	+	0	-	-	0	0	+	+	+	+	+	+
Ammonium sulphate	+	+	+	+	+	+	+	+	+	+	+	+	+	+
n-Amyl acetate	-	-	-	-	-	-	+	+	+	0	0	-	+	0
n-Amyl alcohol (Pentanol)	0	0	+	+	+	+	+	+	+	+	+	+	+	+
Amyl chloride	-	-	-	-	-	-	+	+	-	-	-	-	-	-
Aniline	-	-	-	-	0	-	0	0	+	0	+	0	+	+
Barium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Benzaldehyde	-	-	-	-	0	-	+	+	+	+	+	+	+	+
Benzene (gasoline)	-	-	-	-	0	-	+	+	0	0	0	-	+	+
Benzene (Benzol)	-	-	-	-	-	-	+	0	0	0	0	-	+	+
Benzoyl chloride	-	-	-	-	-	-	+	0	0	0	0	-	+	+
Benzyl alcohol	-	-	-	-	0	0	+	+	0	-	0	-	0	-
Benzylamine	-	-	-	-	-	-	+	-	0	-	0	-	0	-
Benzyl chloride	-	-	-	-	-	-	+	-	-	-	-	-	-	-
Boric acid, 10%	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bromine	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromonaphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrobromic acid	0	-	-	-	+	+	-	-	+	+	+	+	+	+
1-Butanol (Butyl alcohol)	0	-	+	0	0	0	+	+	+	0	+	+	+	+
Butanediol	-	-	-	-	-	-	+	+	+	+	+	+	+	+
Butyric acid	-	-	-	-	0	-	-	-	-	-	-	-	0	-
n-Butyl acetate	-	-	-	-	-	-	+	0	+	0	0	0	+	+
Butylamine	-	-	-	-	-	-	+	+	-	-	0	-	0	-
Butyl methyl ether	-	-	-	-	-	-	+	+	+	-	0	-	0	-
Calcium carbonate	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Calcium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Calcium hydroxid	+	0	+	0	-	-	+	+	+	+	+	+	+	+
Calcium hypochlorite	+	+	+	+	0	-	+	+	+	0	+	+	+	+
Chloroacetaldehyde	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroacetone	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroabenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobutane	-	-	-	-	-	-	-	-	0	-	0	-	0	-
Chloroacetic acid	-	-	-	-	0	-	-	-	+	+	+	+	+	+
Chloro naphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	-	-	-	-	-	-	-	-	0	-	-	-	+	0
Chlorosulfonic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromic acid 10%	-	-	-	-	+	0	0	0	+	+	+	+	+	+
Chromic acid 50%	-	-	0	0	0	-	-	-	0	0	+	0	+	0
Chromosulphuric acid	0	0	0	0	-	-	-	-	0	-	+	-	+	-
Cumene (Isopropyl benzene)	-	-	-	-	-	-	+	-	-	-	0	-	+	0
Cyclohexane	-	-	-	-	+	0	+	+	-	-	0	-	0	-
Cyclohexanone	-	-	-	-	-	-	-	-	0	0	-	-	0	-
Cyclopentane	-	-	-	-	-	-	-	-	0	-	-	-	0	-
Decane	-	-	-	-	0	-	+	-	0	-	-	-	0	-
Decanol	0	-	0	-	0	-	+	-	+	-	+	-	+	-
Deibenzyl ether	-	-	-	-	-	-	+	-	0	-	-	-	+	-
Dibromoethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibutyl phthalate	-	-	-	-	-	-	+	+	+	0	0	-	0	-
Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	0	-	0	-
Dichloroacetic acid	0	-	-	-	0	-	-	-	+	+	0	-	0	0
Dichloroethane	-	-	-	-	-	-	-	-	0	-	0	-	0	-
Dichloromethane (Methylene chloride)	-	-	-	-	-	-	-	-	0	-	0	-	0	-
Diesel oil	-	-	-	-	-	-	+	+	0	-	0	-	+	0
Diethanolamine	-	-	-	-	-	-	-	-	-	-	-	-	0	-
Diethylamine	0	0	-	-	-	-	-	-	0	0	-	-	0	-
Diethylbenzene	-	-	-	-	0	-	-	-	-	-	-	-	0	-
Diethylene glycol	0	-	+	+	0	0	+	+	+	+	+	+	+	+
Diethyl ether	-	-	-	-	-	-	+	+	-	-	-	-	0	-
Dimethylaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethylformamide (DMF)	-	-	-	-	-	-	+	+	+	+	+	+	+	+
Dimethyl sulfoxide (DMSO)	-	-	-	-	-	-	-	-	+	+	+	+	+	+
1.4 Dioxane	-	-	-	-	0	0	0	0	0	0	+	0	+	+
Diphenyl ether	-	-	-	-	-	-	0	-	-	-	-	-	-	-
Acetic acid (glacial) 100%	-	-	-	-	-	-	-	-	+	0	+	0	+	+
Acetic acid 50%	0	0	+	0	+	0	0	-	+	+	+	+	+	+
Acetic anhydride	-	-	-	-	-	-	-	-	+	0	-	-	0	0
Ethanol (Ethyl alcohol)	-	-	0	-	+	0	+	+	+	0	+	+	+	+
Ethanolamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl acetate	-	-	-	-	-	-	-	-	0	-	+	+	+	+
Ethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene glycol (Glycol)	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ethylene oxide	-	-	-	-	0	-	+	+	0	-	0	0	0	0
Ethyl methyl ketone	-	-	-	-	-	-	-	-	-	-	0	-	0	-
Fluoroacetic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrofluoric acid 40 %	+	+	+	0	-	-	-	-	+	+	+	+	+	+
Hydrofluoric acid 70 %	-	-	-	-	-	-	-	-	+	0	+	-	+	0

Chemical resistance (continued)

Medium	PS 20°C 50°C		SAN 20°C 50°C		PC 20°C 50°C		POM 20°C 50°C		PMP 20°C 50°C		LDPE 20°C 50°C		HDPE 20°C 50°C	
Formaldehyde 40%	-	-	+	+	+	0	+	+	+	+	+	+	+	
Formamide	-	-	-	-	-	-	-	-	+	+	+	+	+	
Glycolic acid 70 %	-	-	-	-	-	-	-	-	+	+	+	+	+	
Glycerol	+	+	+	+	+	+	0	0	+	+	+	+	+	
Urea	+	+	+	+	-	-	+	+	+	+	+	+	+	
Heating oil	-	-	-	-	-	-	+	+	0	-	0	-	0	
Heptane	-	-	-	-	+	0	-	-	0	0	0	-	0	
Hexane	0	-	+	+	-	-	+	+	0	-	0	-	0	
Hexanol	-	-	-	-	-	-	-	-	+	+	+	+	+	
Hexanoic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	
Iodine/potassium iodide solution	0	-	0	-	0	-	0	0	+	0	-	-	-	
Hydriodic acid	-	-	-	-	-	-	-	-	+	+	+	+	+	
Isoamyl alcohol	-	-	-	-	-	-	-	-	+	+	+	+	+	
Isobutanol (Isobutyl alcohol)	0	0	0	-	+	+	+	+	+	+	+	+	+	
Iso Octane Isooctan	0	-	0	-	0	-	-	-	+	+	+	+	+	
Isopropanol (2-Propanol)	0	0	+	-	+	+	+	+	+	+	+	+	+	
Isopropyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	
Potassium chloride	0	0	0	0	+	+	+	+	+	+	+	+	+	
Potassium dichromate solution	-	-	-	-	-	-	-	-	+	+	+	+	+	
Potassium hydroxide	0	0	0	0	-	-	+	+	+	+	+	+	+	
Potassium permanganate	+	+	+	0	+	+	0	0	+	+	+	+	+	
Aqua regia	0	-	0	-	-	-	-	-	0	0	-	-	-	
Cresol	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cupric sulphate	+	+	+	0	+	+	+	+	+	+	+	+	+	
Methanol	0	-	0	-	+	0	+	+	+	+	+	0	+	
Methoxybenzene	-	-	-	-	-	-	0	-	-	-	-	-	-	
Methylene chloride (Dichloro methane)	-	-	-	-	-	-	-	-	-	-	0	-	0	
Methyl formate	-	-	-	-	-	-	+	-	-	-	-	-	-	
Methyl propyl ketone	-	-	-	-	-	-	+	+	0	0	+	0	+	
Lactic acid	+	+	+	+	+	+	+	-	+	+	+	+	+	
Mineral oil (Engine oil)	+	-	+	-	+	-	+	+	+	+	+	0	+	
Monochloroacetic acid	-	-	-	-	0	-	-	-	+	+	+	+	+	
Sodium acetate	+	+	+	+	+	+	+	0	+	+	+	+	+	
Sodium chloride	+	+	+	+	+	+	+	+	+	+	+	+	+	
Sodium dichromate	+	0	+	0	+	+	+	+	+	+	+	+	+	
Sodium fluoride	+	+	+	+	+	+	+	+	+	+	+	+	+	
Sodium hydroxide	+	+	+	+	-	-	+	+	+	+	+	+	+	
Nitrobenzene	-	-	-	-	-	-	0	-	-	-	-	-	0	
Oleic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	
Oxalic acid	+	+	+	+	+	+	+	+	+	+	+	+	+	
Ozone	0	0	+	+	+	+	-	-	+	+	+	+	+	
n-Pentane	-	-	-	-	-	-	-	-	-	-	-	-	-	
Perchloroethylene	-	-	0	0	-	-	+	0	-	-	-	-	-	
Perchloric acid	-	-	-	-	-	-	-	-	0	-	+	-	+	
Peracetic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	
Petroleum ether	-	-	-	-	-	-	+	+	-	-	0	-	-	
Petroleum	-	-	-	-	0	0	+	+	0	0	0	-	0	
Phenol	-	-	-	-	-	-	-	-	0	0	+	0	+	
Phenylethanol	-	-	-	-	-	-	-	-	-	-	-	-	0	
Phenylhydrazine	-	-	-	-	-	-	-	-	-	-	-	-	0	
Phosphoric acid 85%	+	0	+	+	+	+	+	-	+	+	+	+	+	
Piperidine	-	-	-	-	-	-	-	-	-	-	-	-	-	
Propanediol (Propylene glycol)	+	+	-	-	+	0	+	+	+	+	+	+	+	
Propanol	0	-	+	+	0	-	+	+	+	+	+	+	+	
Propionic acid	0	-	-	-	-	-	-	-	+	0	0	-	+	
Pyridine	-	-	-	-	-	-	+	0	+	0	+	0	+	
Mercury	+	+	+	+	+	+	+	+	+	+	+	+	+	
Mercury chloride	+	0	+	+	+	+	0	0	+	+	+	+	+	
Salicylaldehyde	-	-	+	-	0	0	-	-	+	+	+	+	+	
Salicyl acid	+	+	+	+	-	-	-	-	+	+	+	+	+	
Nitric acid 10%	-	-	+	0	+	0	-	-	+	+	+	+	+	
Nitric acid 30%	-	-	0	-	+	0	-	-	0	-	0	0	0	
Nitric acid 70%	-	-	-	-	-	-	-	-	0	-	-	-	-	
Hydrochloric acid 10%	+	+	0	-	-	-	-	-	+	+	+	+	+	
Hydrochloric acid 20%	+	+	0	-	0	0	-	-	+	+	+	+	+	
Hydrochloric acid 37 %	0	0	0	-	-	-	-	-	+	+	+	+	+	
Carbon disulphide	-	-	-	-	-	-	+	+	-	-	-	-	-	
Sulphuric acid 60 %	-	-	+	0	0	0	-	-	+	+	+	+	+	
Sulphuric acid 98%	-	-	-	-	-	-	-	-	+	+	0	-	0	
Silver acetate	0	0	0	0	+	+	0	0	+	+	+	+	+	
Silver nitrate	0	0	+	+	+	+	0	0	+	+	+	+	+	
Turpentine	-	-	0	0	-	-	+	+	0	0	0	-	0	
Tetrachloroethylene	-	-	-	-	-	-	-	-	-	-	-	-	-	
Carbon tetrachloride	-	-	-	-	-	-	0	0	-	-	-	-	0	
Tetrahydrofuran	-	-	-	-	-	-	0	0	0	-	0	-	0	
Tetramethylammonium hydroxide	-	-	-	-	-	-	-	-	-	-	-	-	-	
Toluene	-	-	-	-	-	-	+	+	0	-	0	-	0	
Trichlorobenzene	-	-	-	-	-	-	-	-	0	0	-	-	-	
Trichloroacetic acid	0	-	-	-	0	-	-	-	+	+	0	-	0	
Trichloroethane	-	-	-	-	-	-	0	-	-	-	-	-	0	
Trichloroethylene	-	-	-	-	-	-	-	-	-	-	-	-	0	
Trichlorotrifluoro ethane	-	-	-	-	-	-	-	-	-	-	-	-	-	
Triethanolamine	-	-	-	-	-	-	-	-	-	-	-	-	-	
Triethylene glycol	+	0	+	+	+	0	+	0	+	+	+	+	+	
Trifluoroacetic acid (TFA)	-	-	-	-	-	-	-	-	-	-	-	-	-	
Trifluoro ethane	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tripropylene glycol	+	+	+	+	+	0	+	0	+	+	+	+	+	
Hydrogen peroxide 35%	+	+	+	+	+	+	+	-	+	+	+	+	+	
Tartaric acid	+	+	+	+	+	+	+	+	+	+	+	+	+	
Xylene	-	-	-	-	-	-	+	+	0	-	0	-	0	
Zinc chloride	+	+	+	+	+	+	+	0	+	+	+	+	+	
Zinc sulphate	+	+	+	+	+	+	+	+	+	+	+	+	+	

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HandyStep®	
BRAND GMBH + CO KG, Germany	
EDOS®	
Eppendorf AG, Germany	
Eppendorf®	
Eppendorf AG, Germany	
Multipette®	
Eppendorf AG, Germany	
Gilson®	
Gilson Inc., USA	
Viton®	
E.I. du Pont de Nemours, USA	

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00394	58	64895	29	76299	69	80455	70	83300	47	100694	52
00396	58	64904	29	77094	65	80456	70	83301	47	100789	51
19999	50	64901	28	78294	64	80459	66	83302	47	100794	52
30803	60	64995	29	78394	64	80460	66	83306	48	100889	51
36491	55	65004	29	78593	65	80461	66	83307	48	100894	52
39194	69	65091	28	78794	65	80462	66	83308	48	100984	52
39294	69	65095	29	79194	34	80463	66	83310	52	100989	51
39394	69	65104	29	79790	71	80465	66	83311	52	101589	51
39494	69	65191	28	79890	71	80466	66	83312	52	101594	52
39594	69	65195	29	79990	71	80467	66	83313	52	101689	51
39694	69	65204	29	80130	68	80468	66	83314	52	101694	52
39794	69	65291	28	80131	68	80510	65	83315	52	101789	51
39894	69	65295	29	80140	32	80511	65	83316	52	101794	52
39994	69	65304	29	80162	62	80512	65	83317	52	101889	51
40093	70	65391	28	80164	62	80513	65	90464	66	101894	52
40193	70	65395	29	80165	62	80514	65	90594	67	101989	51
40293	70	65965	74	80213	69	80515	65	90694	67	101994	52
40393	70	65975	74	80215	35	80520	66	90794	67	103297	39
40493	70	65980	74	80217	35	80521	66	90894	67	103397	39
40593	70	66695	49	80218	35	80525	66	90994	67	103797	39
40693	70	66795	49	80219	35	80526	66	91094	67	103897	39
40793	70	66895	49	80221	35	80535	66	91294	67	103997	39
40894	62	66995	49	80222	35	80536	66	91394	67	104099	34
41094	62	67095	49	80223	35	80537	66	91494	67	104199	34
41194	62	67104	31	80229	74	80550	74	91789	51	105199	32
41294	62	67195	31	80230	74	80551	74	91889	51	105299	32
41394	62	67204	31	80231	74	80553	74	91989	51	105399	32
41494	62	67295	31	80252	34	80554	74	92089	51	106299	31
41594	62	67304	31	80268	64	80555	74	92189	51	106399	31
41694	62	67395	31	80269	64	80556	74	92489	51	106499	31
41794	63	67404	31	80271	71	80557	74	92689	51	107197	38
41894	63	67495	31	80276	56	80560	69	92789	51	107297	38
41994	63	67504	31	80277	56	80562	69	92889	51	107497	38
42099	63	67595	31	80278	56	80593	70	93389	50	107597	38
42294	63	67604	31	80280	72	80594	70	93489	50	107797	42
42393	63	67695	31	80281	72	80595	70	93789	50	107897	42
42594	72	67895	70	80282	72	80596	70	93989	50	107997	42
42694	72	67995	70	80283	72	80602	72	94189	50	108092	40
42794	72	68099	70	80284	72	80603	72	94389	50	108192	40
42894	72	68199	70	80285	72	80604	72	94489	50	108292	40
42994	72	68299	70	80286	72	80730	54	94587	48	108297	40
43094	72	68399	70	80288	72	80731	54	94588	47	108392	40
43194	72	68594	53	80340	54	80732	54	94589	50	108397	40
43510	72	68694	53	80342	54	80733	54	94687	48	108492	40
44091	61	68794	53	80343	54	80734	54	94688	47	108497	40
44191	61	68894	53	80345	54	80735	54	94689	50	108792	41
44291	61	68994	53	80346	54	80736	54	94987	48	108892	41
44391	61	69094	53	80347	54	80737	54	94988	47	108992	41
47705	74	69194	53	80348	54	80828	70	94989	50	109297	40
47706	74	69294	53	80353	57	80877	66	95087	48	109397	38
47707	74	69394	57	80354	57	80878	66	95088	47	109397	40
47708	74	69493	57	80355	57	80879	66	95089	50	109497	40
47716	74	69990	57	80375	53	80910	54	95187	48	109597	40
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60503	60	70694	63	80410	50	80953	72	96093	74	109897	40
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60903	60	70994	63	80413	50	80996	34	96593	74	110205	38
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61103	60	71598	72	80419	65	81213	69	96794	72	110305	38
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61503	60	71998	72	80425	30	81252	66	97791	58	110605	38
61603	60	72098	71	80434	66	81253	66	97891	58	110704	38
61703	60	72198	71	80435	66	81254	66	98590	75	110804	38
61803	60	72398	71	80436	66	81255	66	98690	75	110904	38
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64191	29	72598	71	80438	64	81633	48	98890	75	111004	38
64291	29	72898	71	80439	64	81634	48	99099	56	111005	38
64391	29	72998	71	80440	64	81640	52	99199	56	111397	40
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64591	29	73498	71	80442	64	81644	52	99390	56	111597	40
64691	28	73598	71	80443	64	81646	52	99490	56	111697	40
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64891	28	75991	62	80454	70	81666	53	100689	51	112697	38

112797	38	146894	25	301697	42	444081	61	1331869	46	1670120	14
112897	38	146994	25	301797	42	444941	61	1332819	46	1670120	18
113197	42	147094	25	301897	42	445081	61	1332829	46	1670125	18
113297	42	147194	25	301997	42	445941	61	1332839	46	1670150	18
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130397	39	148993	26	307997	42	609081	60	1332979	46	1670820	67
130494	54	149093	26	308097	42	610081	60	1332989	46	1670835	67
130497	39	149193	26	308197	42	611081	60	1601003	16	1670850	67
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132603	48	149893	26	308597	42	615081	60	1601007	16	1670890	67
132605	48	149993	26	308697	42	616081	60	1601008	16	1671085	14
132606	48	151594	63	308797	42	617081	60	1602002	16	1671085	18
132608	48	155094	53	308897	42	618081	60	1602004	16	1671095	14
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132706	48	155799	53	309197	42	642941	29	1605004	16	1671500	18
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133181	47	159497	41	309397	42	644941	29	1605006	16	1671506	18
133182	47	159597	41	309497	42	645941	29	1605007	16	1671510	14
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133184	47	159670	65	310197	43	646941	28	1605008	16	1671515	18
133185	47	159697	41	310297	43	647081	28	1606015	16	1671520	18
133186	47	159897	41	310397	43	647941	28	1610001	20	1671520	18
133281	47	160110	33	310497	43	647941	28	1610003	20	3125970	43
133282	47	160119	33	310997	42	648081	28	1610004	20	3126970	43
133283	47	160210	33	311097	42	648941	28	1610006	20	3190940	68
133284	47	160219	33	311197	42	649081	28	1610006	20	3190943	68
133285	47	160510	33	311297	42	649941	28	1611006	20	3190948	68
133286	47	160519	33	311397	42	650081	28	1611008	20	3191940	68
133287	47	160519	33	311497	42	650941	28	1620006	12	3191943	68
133288	47	161010	33	311597	42	651081	28	1620007	12	3191948	68
133288	47	161019	33	311697	42	651941	28	1630000	22	3192940	68
133289	47	162510	33	311797	42	652081	28	1650020	18	3192943	68
133290	47	163094	33	311897	42	652941	28	1650025	18	3192948	68
133291	47	163194	33	311997	42	653081	28	1650030	18	3192948	68
133293	47	163294	33	314097	43	653941	28	1650035	18	3193943	68
133294	47	163394	33	314197	43	666941	49	1650080	18	3193948	68
133295	47	163594	33	314297	43	667941	49	1650085	18	3194940	68
133296	47	164094	33	316097	43	668941	49	1650086	18	3194943	68
133297	47	164194	33	316197	43	669941	49	1650100	18	3194948	68
133298	47	164294	33	316297	43	670941	49	1650110	18	3195940	68
133381	46	164394	33	316397	43	671891	30	1650111	18	3195943	68
133382	46	164494	33	316497	43	671895	30	1650135	14	3195948	68
133383	46	164594	33	317297	43	671941	31	1650162	14	3197940	68
133384	46	165094	72	318293	44	672891	30	1650162	14	3197943	68
133385	46	165194	72	318393	44	672895	30	1655000	18	3197948	68
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136693	55	165394	72	324594	34	673891	30	1655075	18	3198940	68
136894	68	165494	72	324694	34	673895	30	1655080	18	3198943	68
137094	67	165594	72	324794	34	673941	31	1655085	14	3198948	68
137194	67	182941	61	325095	62	674891	30	1655095	18		
137294	67	199095	49	325195	62	674895	30	1655100	18		
137394	67	199099	49	325295	62	674895	30	1661280	22		
137494	67	199195	49	325395	62	674941	31	1670066	14		
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145694	25	235994	55	326496	75	676941	31	1670072	18		
145894	25	236094	55	326596	75	760941	30	1670085	18		
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146290	24	300497	42	440941	61	950889	46	1670092	18		
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146694	25	301197	42	442941	61	1331839	46	1670110	14		
146794	25	301597	42	443081	61	1331849	46	1670110	18		
				443941	61	1331859	46	1670115	18		

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1 General conditions

1.1 (Conflicting business conditions, confirmation in writing) The only terms and conditions for contracts between VITLAB GmbH (hereinafter "VITLAB") and her customers shall be those terms and conditions of VITLAB as last made known to the respective customer. VITLAB will not accept any conflicting general business terms, whether or not expressly rejected by VITLAB. Deviations or additional terms shall not be binding unless expressly agreed to in writing by VITLAB's authorized representative.

1.2 (Offers, right to make modifications, Electronic data storage) All bids and offers are subject to modification at VITLAB's discretion. VITLAB reserves the right to make technical improvements and modifications of products without prior notification. VITLAB may store contract information in data processing systems.

1.3 (Offsetting, withholding) Unless a customer has undisputed counterclaims, he shall neither be entitled to offset nor to withhold payments for deliveries received.

1.4 (Rush orders/small orders) For orders requested to be delivered within 5 business days and/or for order values up to 500 € VITLAB reserves the right to ship and invoice immediately without separate order confirmation.

1.5 (Minimum Order Value) Orders of amounts less than 100 € are subject to a 20 € surcharge. Deliveries normally are carried out in the packing units as indicated in the actual price list.

1.6 (Court of jurisdiction, governing law) For disputes arising out of contracts with German customers solely the court of jurisdiction in Darmstadt, Germany shall be competent. Disputes with foreign customers shall be finally settled according to the Arbitration Rules of the German Institution of Arbitration e.V. (DIS), the Chamber of Commerce in Darmstadt, Germany being solely competent without recourse to the ordinary courts of law. All contracts with German customers shall be construed and interpreted in accordance with the laws of the Federal Republic of Germany, contracts with foreign customers exclusively in accordance with the "UN Convention on the International Sale of Goods", CISG. In cases where the arbitral tribunal cannot be installed or should prove to be incompetent, the ordinary courts of jurisdiction in Darmstadt shall be solely competent, German law being solely applicable.

1.7 (Liability) On any claims based on negligence of her managers or employees, VITLAB's liability shall only accrue from gross negligence and be limited to the net purchase price of the respective contract.

2 Delivery

2.1 Place of performance shall be VITLAB's factory in Seeheim-Jugenheim, Germany. The risk shall be transferred to the customer when the shipment leaves VITLAB's factory. This shall apply also to partial deliveries, deliveries to a consignment location and all deliveries where VITLAB has agreed to provide additional services such as freight forwarding, packing, exportation and installation. The customer shall be responsible for all packing, transport and insurance costs to the place of delivery.

2.2 Where VITLAB has 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, after providing a warning and setting a deadline, VITLAB may, at her own discretion, have the products stored at the customer's expense or sell the products. The foregoing shall not in any way affect the obligations under the contract nor the rights of VITLAB with respect to fulfillment under the contract.

3 Delivery period, Delay

3.1 Indicated delivery periods are approximate and shall commence upon customer's receipt of VITLAB's order confirmation; however, only after settlement of technical questions and after VITLAB has received all documents, permits or releases required from the customer and any agreed to advance payments. Any estimated shipping date shall be deemed met if the consignment has left the VITLAB facility within the indicated delivery period or if the customer has been provided with information that the products are ready for dispatch. Liability for delay damages see 1.7.

3.2 Acts of God, strikes, lockouts, operating breakdowns, shortages of raw materials or means of production for which VITLAB is not responsible, including delayed deliveries or failure to deliver by the suppliers of VITLAB, and modified services or products

requested by the customer, shall extend the delivery period accordingly and/or shall release VITLAB from her obligation to deliver if delivery becomes impossible as a result. The same applies in cases where a shipment had already been delayed prior to any such circumstances.

4 Conditions of payment, price alterations, compensation for returned products

4.1 Prices quoted shall be EXW (ex-works). Charges for packaging, freight and insurance shall be at the customer's expense. Invoices shall be paid in full, without deductions, all transaction-related banking fees at the customer's expense, and must be credited to VITLAB's account in the Federal Republic of Germany, in EURO (€) by the due date indicated on the invoice. VITLAB shall accept bills of exchange or checks only with a view to performance at the customer's expense. VITLAB retains, at her sole discretion, the right at any time to deny any extension of credit to either new or existing customers. VITLAB retains the right to request payment in full in advance of any shipment.

4.2 If the period between conclusion of the contract and delivery is longer than 3 months, VITLAB reserves the right to invoice the prices effective on the date of delivery. The customer has the right to claim a corresponding price reduction if he can prove that the external costs of VITLAB have decreased since conclusion of the contract. In case these price changes exceed 15% of the purchase price of the respective contract, either party may, at its sole discretion, withdraw from the contract. For Deliveries on Call as well as for deliveries based on Standing or Blanket Orders, the prices effective on the date of delivery shall apply.

4.3 No products shall be returned without prior written authorization. All returned goods must be the current model, complete in their original packaging, and in new saleable condition. All returns are subject to a 15% restocking fee (€ 10 minimum), notwithstanding further indemnity claims. In case of delay in payment and notwithstanding further indemnity claims the customer shall pay interest on all amounts in arrears as per §288 German Civil Code (BGB), unless he can prove the loss caused by delay in payment to be less.

4.4 In case of any delays in payment of any invoices, the total amount of the customer's liabilities to VITLAB shall be payable immediately and VITLAB shall be released from any obligations to effect any further deliveries resulting from any contract.

5 Reservation of proprietary rights

5.1 (Reservation of Proprietary Rights) The delivered products shall remain the property of VITLAB and title shall be withheld until all open liabilities of the customer have been fully and unconditionally paid for.

5.2 (Prolonged reservation) The customer may neither consume products delivered conditionally nor combine them with other items to which third parties have rights. Customer may process or resell the products in the normal course of business only if claims arising from the resale have not been assigned, pledged, attached or otherwise encumbered or are liable to be offset against counterclaims. Customer shall assign to VITLAB in advance, any accounts receivable arising from the sale of products delivered conditionally and of newly constituted products to the amount of the invoice for the products delivered conditionally.

5.3 The customer may have the accounts receivable for products delivered conditionally or under joint ownership as per clause 5.2 factored only if the Factor is aware of the advance assignment of claims to VITLAB and if the Factor transfers payments received directly to VITLAB.

5.4 The customer is required to immediately inform VITLAB of any attachments, confiscation or any other disposition of a third party with regard to products delivered.

5.5 In case of customer's insolvency or if any monetary instrument should be returned to VITLAB for insufficient funds, customer shall lose all rights as per clauses 5.2 and 5.3 above. Customer must immediately inform any subsequent purchasers of VITLAB's reservation of proprietary rights. Any and all revenue received by the customer relating to the sale of products shall be used exclusively for paying any amounts due to VITLAB. VITLAB retain the right to reclaim any products which are still in the customer's possession.

6 Warranty, damages, supply of spare parts

6.1 Only qualities, properties, performance, or other features which VITLAB has expressly warranted in writing to the customer shall be binding. Details in advertisements and instructions for use, or reference to industrial standards shall not constitute warranted qualities or the taking-on of particular obligations. If the customer requires the products for special purposes which exceed the normal range of use, 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. VITLAB shall not be liable for any damages caused to the customer or any subsequent user if proper written authorization was not obtained from VITLAB. If the customer has expressed special requirements regarding materials of construction or design modifications, VITLAB is not liable for testing the suitability or approving the requested material or design and is therefore not responsible for any examination as to suitability, worthiness or appropriateness for any particular application.

6.2 VITLAB warrants the products to be free from defects in materials and workmanship at the time of delivery. All wearing, glass and ceramic parts (e.g. pistons, seals and valves) are excluded from any warranty. Any and all warranties are null and void if the products have been processed or consumed in any way, shape or fashion, if the defects are caused by improper handling, maintenance, use or processing by the customer or by third parties, or caused by normal wear and tear or damage caused during transport.

6.3 In case a product should prove to be defective as per the a.m. warranty within one year from date of shipment to the original purchaser, the exclusive remedy of the customer is to the replacement or repair (at VITLAB's sole discretion) of the defective product.

6.4 If the products delivered are destined for the customer's business, he shall be obliged to check incoming products as to quantity delivered and defects and report claims to VITLAB within one week from delivery. Failure to do so will void any and all potential claims for warranty for these defects.

6.5 Prior to any return shipment, customer shall be obliged to clean and decontaminate the products.

6.6 The warranty period for any replacement parts provided by VITLAB under warranty shall lapse at the end of the warranty period for the original product.

6.7 VITLAB is generally able to supply spare parts for a period of 5 years from the date of delivery of the original product. If the spare parts are not manufactured by VITLAB and are no longer available on the market or if the required raw materials are no longer available, VITLAB's obligation to supply spare parts shall lapse.

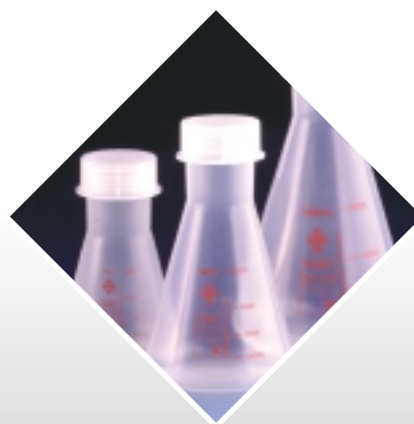
7 Industrial proprietary rights, tools, secrecy

7.1 VITLAB reserves ownership in any tools, moulds, samples, diagrams, commercial or technical documents provided by VITLAB as well as all copyrights, proprietary and intellectual property rights in any such item. This applies also if the customer has partly or wholly borne their costs. The customer may use all such items only in formats approved by VITLAB in writing, he is neither entitled to manufacture these items nor to have them manufactured on his behalf.

7.2 The customer is responsible that the use of drawings, models, samples, or instructions as provided to VITLAB by the customer shall not infringe industrial property rights or other rights of third parties. The customer shall be liable for payment of all expenses, awards, damages, and other compensation to outside parties and all cash and non-cash expenses in defending any allegation of such infringement.

7.3 All information acquired through the business relationship which is not deemed to be public knowledge shall be deemed proprietary and may not be disclosed to any third parties.

Status: March 2003



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