b.safe SYSTEM

Individual System Solutions for Safe Liquid Waste Disposal

A product brand of Bohlender

b.safe SYSTEM

INDEX

Dear HPLC Experts,

The product brand b.safe SYSTEM stands for high-quality safety solutions for waste disposal in HPLC. For many years, we have developed and produced high-professional systems for the assembly into laboratories for well-known providers - although not under our own tradename b.safe SYSTEM.

As BOHLENDER with the tradename BOLA we have successfully constructed and produced top products for the lab at economic prices for more than 60 years.

Corresponding to our engagement to offer best performance for your lab, time has come for the next step: **With b.safe SYSTEM, we present sophisticated and reliable safety solutions for the assembly into laboratories. And this directly from the manufacturer.**

As manufacturers, we are able to meet special requirements and modifications - of course in top quality made in Germany and even cheaper than you may expect.

Check this out! We look forward to your special challenges and your feedback on b.safe SYSTEM.

Your

Volker Bohlender
Managing Director

Easy. Better. Quicker. Directly from the manufacturer.

If you need good quality and safety, we leave nothing to chance. We develop, construct and produce HPLC solutions by ourselves. Even customizations if you need. That allows many features that make HPLC as economic and efficient as possible.

In case of questions, ask experts!

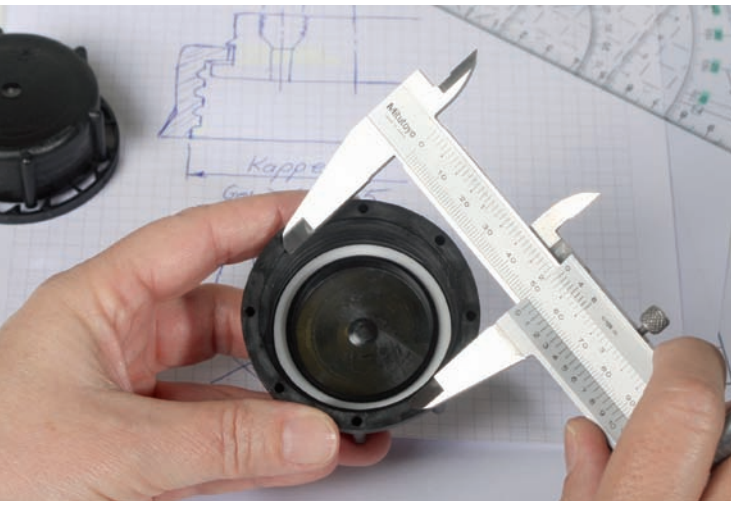
We know our customers´ challenges and thus develop and produce HPLC solutions at our premises in Grünsfeld, South Germany. Everything is repeatedly tested, reworked and optimized for current HPLC requirements. If you have any questions or wishes, our experts will be pleased to give you advice.

High-performance plastics? Trust us.

We are aware of many characteristics of PTFE, PPS etc. Depending on the component and requirements, we choose the best one. For best chemical resistance, easy cleaning, sterilization, grip, …

We look forward to your special requirements.

If you require either an existing product modified or a completely new product, a simple sketch is sufficient and our construction department starts with work. Even cheaper than you might think. Get your free quotation.



Short-term delivery? You´ll get it the next day.

Some wishes cannot wait. We are well prepared for that and have all HPLC solutions in stock. Because of quick processes, our sets and products are delivered within one day within Germany and within three to five days within the EU. Place your order easily by fax, phone, letter, e-mail or in our online shop on bsafe.de.

What about quality? It´s our top priority.

Best raw materials, high-qualified personnel and modern machinery guarantee full reliability. Should you not be satisfied against all expectations, we provide quick replacement or rework your part. We probably ask for return of the product for evaluation.

One word on discounts.

Thank you for asking: In case of bulk quantities, we offer special prices and discounts. Ask us.

Where can I get more information?

bsafe.de
+49 (0) 9346 9286-0

b.safe Sinks

Whether you empty, rinse or dry any vessels, b.safe Sinks facilitate your work. They are almost evenly integrated in the work top and additionaly sealed all-round. The PE-surface can easily be cleaned, is non-adhesive and reduces even though the risk of breakage of glass vessels.

The bottom has been designed in a special way so that liquids can drain safely but prevents set up vessels from tilting. Furthermore, the vessel is ventilated for faster drying. A sieve collects e. g. magnetic stirring bars or gross contamination. It can be removed for cleaning.

When not used, the sink can be closed with the perfectly fitting lid. Also the lid has a sophisticated design: With a sunk handle, the lid provides a plain surface. This way, lab professionals gain additional working space.

Accessories **for simple and safe connections**

Connector G 1 1/2“
as adaptor for sanitary connections **page 38**

Elbow Fitting GL25
for narrow spaces
page 37

A lid with **sunk handle** provides additional space.

The **removable sieve** restrains solid materials.

The **sink** is almost evenly **integrated** in the work top.

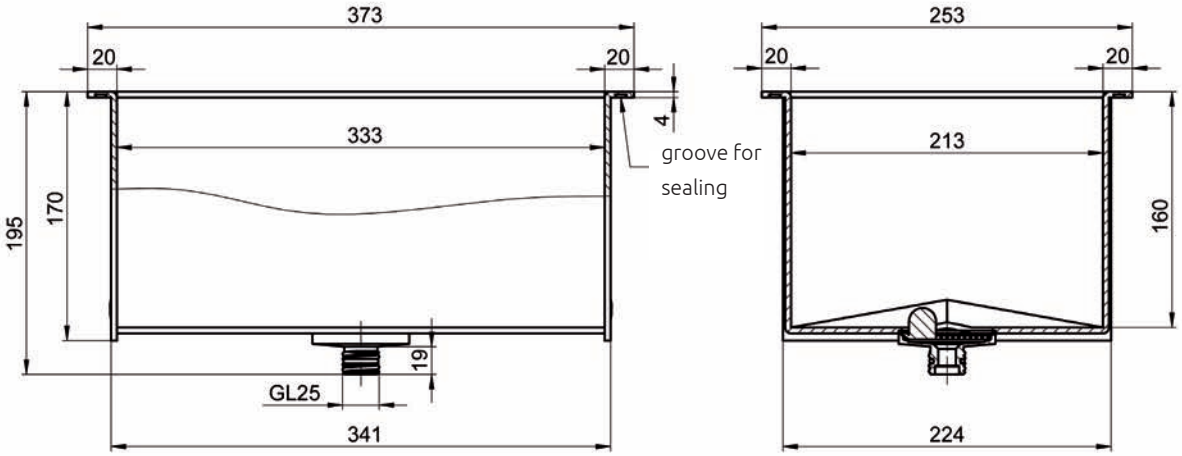
Static dissipative for safe collection of inflammable liquids.

b.safe Sink S

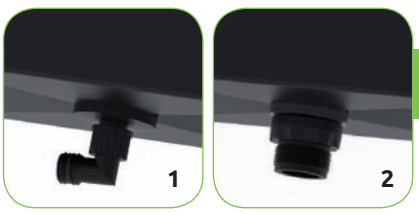
Material: **PE-EX** I Temperature resistance: **-50 °C to +80 °C** I
Chemical resistance: **++ very good** I Conductibility: **10^6 Ohm**

Made of static dissipative PE-EX, with sloped bottom for complete emptying, drain dia. 60 mm with removable sieve, bottom drain with male thread GL25 for direct connection to flexible b.safe Waste Tubes, grounding connection at the side with mounted grounding cable (length 1,5 m).

Don't forget to order:
b.safe Lid for Sink S, made of static dissipative PE-EX, circular nut for safe closure, sunk handle for maximum use of work space.



	Description		Cat. No.
A	**b.safe Sink S**, Inside dimensions: L 333 x W 213 x H 160 mm Volume approx. 10 l		R 1250-20
B	**b.safe Lid** for Sink S, Dimensions: L 383 x W 270 x H 8 mm		R 1255-20



b.safe APPROPRIATE

1: Elbow Fitting GL25 page 37
for narrow spaces

2: Connector G 1 1/2" page 38
adaptor for sanitary connections

b.safe Sink XL

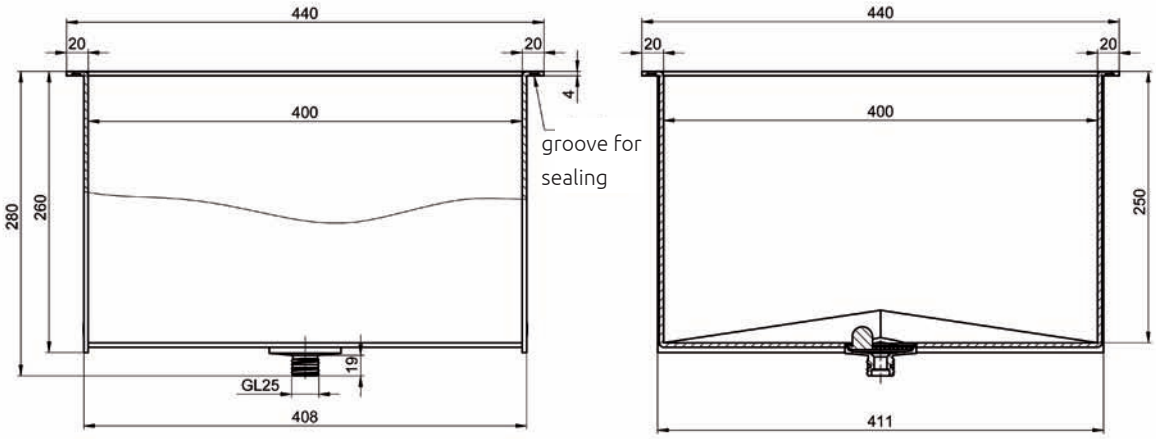
Material: **PE-EX** I Temperature resistance: **-50 °C to +80 °C** I
Chemical resistance: **++ very good** I Conductibility: **10^6 Ohm**

Made of static dissipative PE-EX, with sloped bottom for complete emptying, drain dia. 60 mm with removable sieve, bottom drain with male thread GL25 for direct connection to flexible b.safe Waste Tubes, grounding connection at the side with mounted grounding cable (length 1,5 m).

Don't forget to order:
b.safe Lid for Sink XL, made of static dissipative PE-EX, circular nut for safe closure, sunk handle for maximum use of work space.

B

A



	Description		Cat. No.
A	**b.safe Sink XL**, Inside dimensions: L 400 x W 400 x H 250 mm Volume approx. 38 l		R 1250-40
B	**b.safe Lid** for Sink XL, Dimensions: L 457 x W 457 x H 8 mm		R 1255-40

b.safe System Caps

Using desktop or wall mounted b.safe System Caps, you can connect your HPLC units and directly dispose any liquid solvent waste.

Diverse connectors like fittings, couplings or hose connectors are used to join tightly capillaries and tubing. This provides maximum flexibility as the number and versions of connectors complies with the individual conditions of your lab. If, however, our huge assortment does not include a perfect match, we also offer customized b.safe System Caps on request.

All components are made of high-performance plastics and thus thermally and chemically stable. Furthermore, all caps have a good grip for easy assembly, safe working and improved processes.

Lateral connectors to prevent tubing from bending and to avoid any backflow.

Flexible Waste Tubes
for a safe outlet of liquids
Page 34

Various hose connectors for a safe connection of different tubing diameters. **Page 112**

Corrugated Tubing Coupling made for connecting corrugated tubing without any leakage. **Page 110**

PFA-fittings with internal cone for comfortable inlet of different capillary diameters. **Page 106**

Distributor body with numerous connectors to join tubing without twisting.

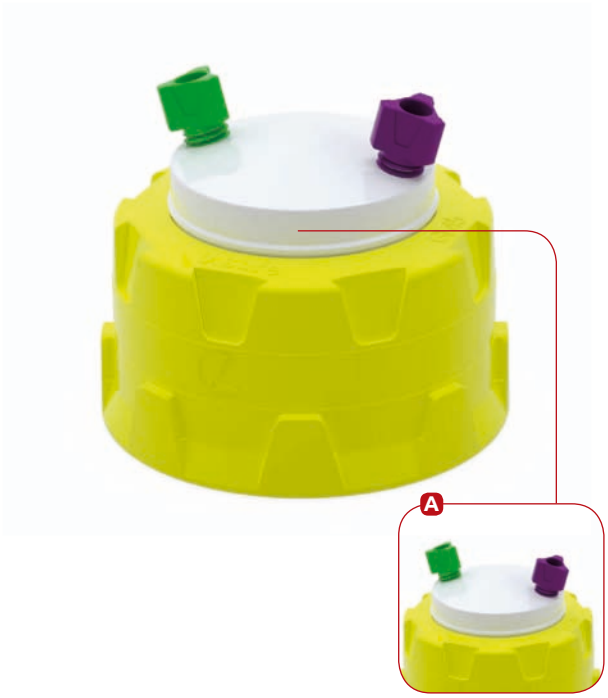
Non-slip surface for easy assembly.

Perfect Desktop Mount for a tight connection to the b.safe Tube System. **Page 16**

b.safe System Caps GL45

Material: **PTFE, PPS** I Temperature resistance: **-50 °C to +80 °C** I Chemical resistance: **++ very good**

Screw cap made of PPS for GL45 thread, rotary insert made of PTFE. With PFA fittings for capillaries with O.D. 1,6/2,2/3,2 mm (thread UNF 1/4"), hose connector for hose I.D. 6,5-8 mm (thread NPT 1/8"). Adapted to the installation on b.safe Desktop Mounts GL45 or b.safe Multiports GL45. Capillaries are inserted from the top, hose connectors are connected at the sides in order to connect all tubes without bending and to prevent any backlog. Design and scope of delivery according to table.

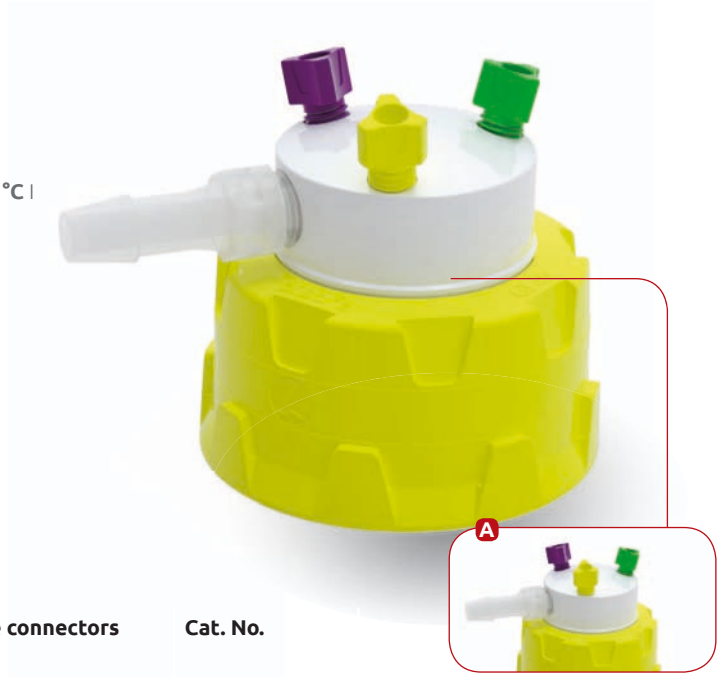


	No. of capillary connections	No. of fittings mm	Hose connectors mm	Cat. No.
A	2	2x Ø 1,6 (green) 2x Ø 2,2 (purple) 2x Ø 3,2 (yellow)	0	R 1145-02
B	3	3x Ø 1,6 (green) 3x Ø 2,2 (purple) 3x Ø 3,2 (yellow)	0	R 1145-03
C	4	4x Ø 1,6 (green) 4x Ø 2,2 (purple) 4x Ø 3,2 (yellow)	0	R 1145-04
D	5	5x Ø 1,6 (green) 5x Ø 2,2 (purple) 5x Ø 3,2 (yellow)	0	R 1145-05
E	7	7x Ø 1,6 (green) 7x Ø 2,2 (purple) 7x Ø 3,2 (yellow)	0	R 1145-07

Application:
Combination of capillaries and hoses of HPLC systems in one desktop mount. Connections that are not needed can easily be closed with b.safe Blind Fittings, see page 116. As an option you can use b.safe Corrugated Tubing Coupling Cat. No. M 514-.. on page 110 to connect corrugated tubes with I.D. 6,5 or 8,5 mm.

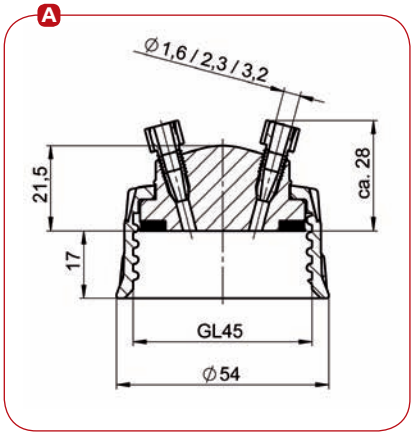
b.safe System Caps GL45

Material: **PTFE, PPS** I Temperature resistance: **-50 °C to +80 °C** I
Chemical resistance: **++ very good**

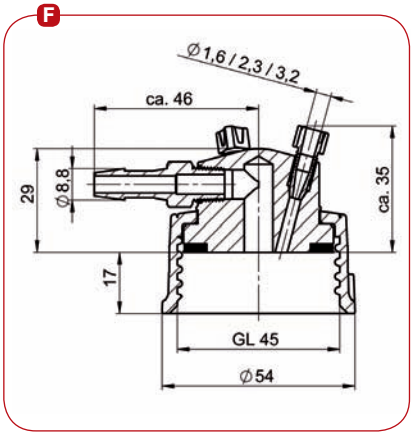


	No. of capillary connections	No. of fittings mm	Hose connectors mm	Cat. No.
F	3	3x Ø 1,6 (green) 3x Ø 2,2 (purple) 3x Ø 3,2 (yellow)	1x Ø 6,5 - 8	R 1145-14
G	4	4x Ø 1,6 (green) 4x Ø 2,2 (purple) 4x Ø 3,2 (yellow)	2x Ø 6,5 - 8	R 1145-16

A



F



b.safe APPROPRIATE

Blind Fittings page 106
For easy closure of unused connectors.

Sophisticated Safety Solutions – custom made!

You are looking for a solution exactly adapted to your application?

As a manufacturing company, we can make products to your specifications. This is easier, quicker and often more economic than you may expect.
Contact our experts – we give advice and support already starting with the construction and production as per your requirements and in compliance with the chosen raw materials – already from 1 piece.

We only need a drawing (a sketch is sufficient) and some further information.

You have a special request?

www.bsafe.de or **+49 (0) 93 46-92 86-0**

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b.safe Desktop Mounts and Wall Mounts

The link between filling devices like e. g. b.safe System Caps or b.safe Funnels and the waste disposal lines to your collecting vessels are b.safe Desktop Mounts and b.safe Wall Mounts.

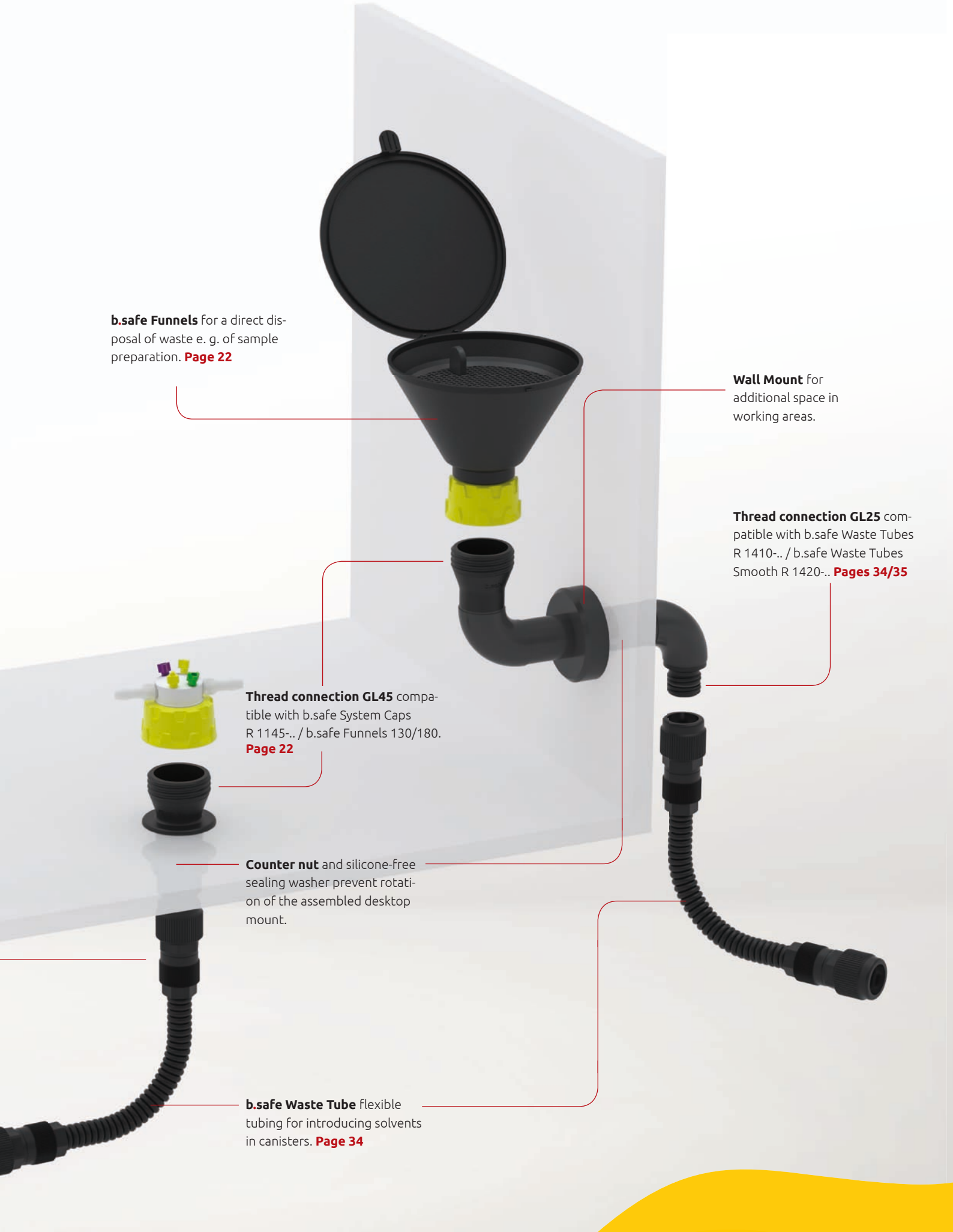
No matter whether you have a b.safe Desktop Mount or a b.safe Wall Mount, the connection to the working area is always a thread GL45 for direct assembly of a b.safe System Cap, a b.safe Funnel or a b.safe Multi-collector for a central junction of the disposal tubing from several HPLC units.

The connection to the waste disposal line is made on the bottom side with male thread GL25 and thus compatible with b.safe Waste Tubes and b.safe Waste Tubes Smooth. Optionally available adapters provide an easy transition to screw joint systems of other manufacturers so that you are always on the safe side.

All components that get in touch with the product are made of static dissipative plastics. Professionally connect the system to earth for reliable prevention of static charging and sparking.

b.safe System Caps for connection of tubes and tubing from HPLC units.
Page 12

Thread connection GL25 compatible with b.safe Waste Tubes R 1410-.. / b.safe Waste Tubes Smooth R 1420-..
Pages 34/35



b.safe Funnels for a direct disposal of waste e. g. of sample preparation. **Page 22**

Wall Mount for additional space in working areas.

Thread connection GL25 compatible with b.safe Waste Tubes R 1410-.. / b.safe Waste Tubes Smooth R 1420-.. **Pages 34/35**

Thread connection GL45 compatible with b.safe System Caps R 1145-.. / b.safe Funnels 130/180. **Page 22**

Counter nut and silicone-free sealing washer prevent rotation of the assembled desktop mount.

b.safe Waste Tube flexible tubing for introducing solvents in canisters. **Page 34**

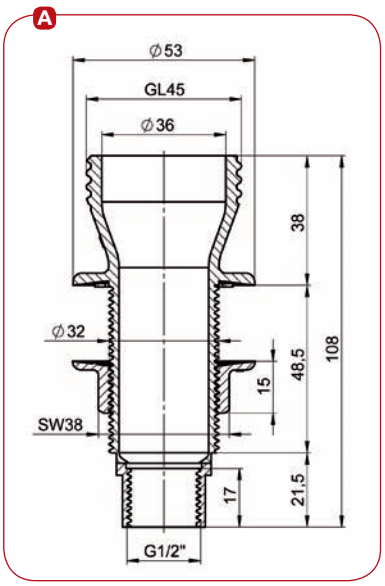
b.safe Desktop Mount GL45

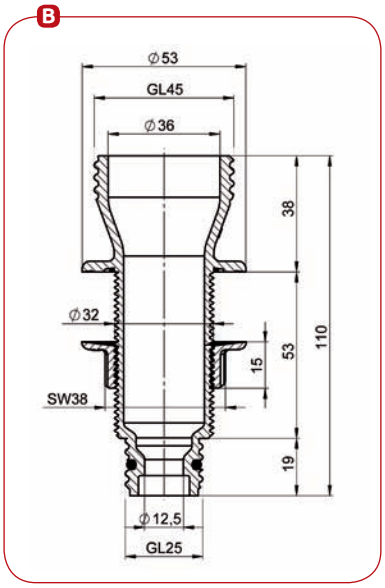
Material: **PE-EX** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductibility: 10^6 Ohm

Made of static dissipative PE-EX, suitable for tabletops with a thickness of 10 to 35 mm, easy fixing by counter nut. Connection top side: male thread GL45 to install a b.safe Funnel with screw cap GL45 or b.safe System Cap GL 45. Connection bottom: male thread GL25 for direct connection with flexible b.safe Waste Tubes.

	Thread top side	Thread bottom	Total length mm	Cat. No.
A	GL45 male	G 1/2“ female	110	R 1100-12
B	GL45 male	GL25 male	110	R 1100-45

Application:
Integration of b.safe System Caps and b.safe Funnels in laboratory hoods or working tables. Liquid solvent waste can be led directly into canisters via b.safe Waste Tubes, for example, with screw connection GL25.





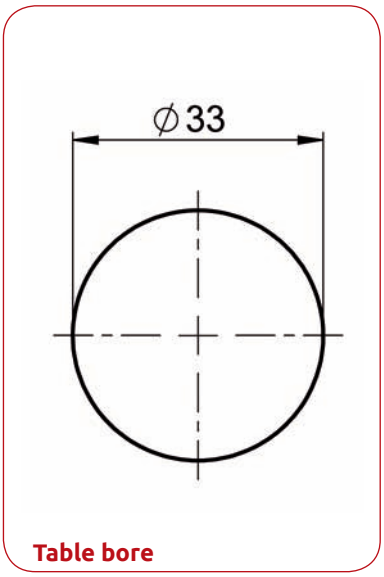


Table bore

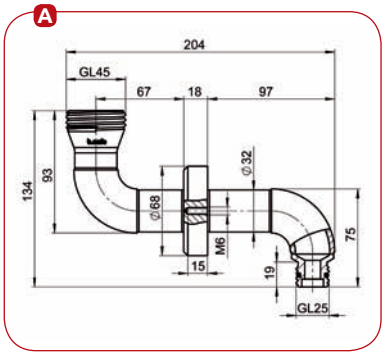
b.safe Wall Mount GL45

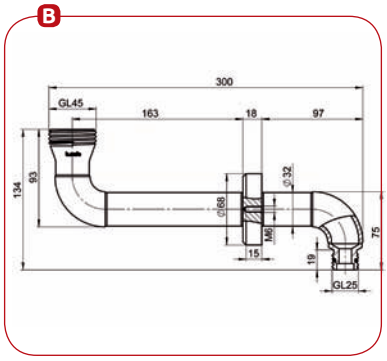
Material: **PE-EX** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductibility: 10^6 Ohm

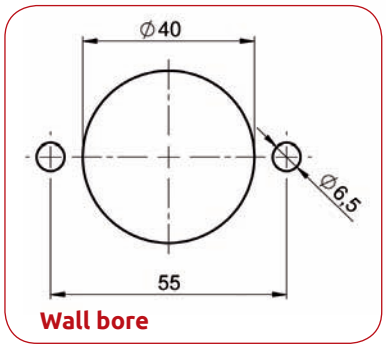
Made of static dissipative PE-EX, 2 welded 90° pipe bends, mounting at the wall by means of integrated mounting plate. Connection at upper side: male thread GL45 for mounting a b.safe Funnel with screw cap GL45. Connection at bottom: male thread GL25 for direct connection with flexible b.safe Waste Tubes.

	Thread connection top side	Thread connection bottom	Suitable for Funnel 130	Suitable for Funnel 180	Cat. No.
A	GL45 male	GL25 male	•		R 1150-13
B	GL45 male	GL25 male	•	•	R 1150-18

Application:
Integration of b.safe Funnels in side walls of laboratory hoods, for example, for more space at the working tables. Direct connection of b.safe Waste Tubes to lead liquid solvent waste directly into connected canisters.







b.safe APPROPRIATE

b.safe Waste Tubes page 34
Flexible tube for introducing solvents into canisters.

b.safe Multicollector

With a b.safe Multicollector you simply multiply the number of connectors of a b.safe Desktop Mount. Assemble on the thread sockets GL45 suitable b.safe System Caps and collect centrally the liquid solvent waste of several HPLCs in a connected waste canister.

This extension can be done without any modification of the existing installation.

Like all b.safe SYSTEM products, also the materials used for the b.safe Multicollector are chemically inert and static dissipative to prevent static charging.

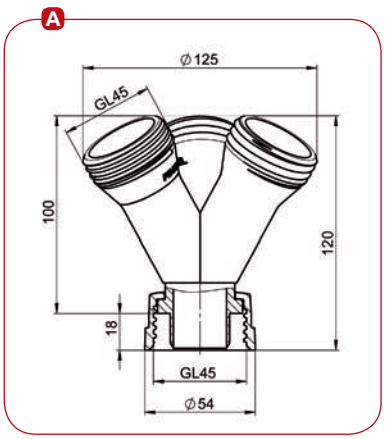
b.safe Multicollector

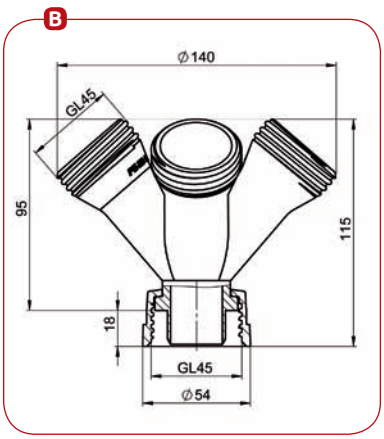
Material: **PE-EX, PPS** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductibility: **10^6 Ohm**

Made of static dissipative PE-EX, screw cap made of PPS with GL45 thread, rotary insert of static dissipative PE-EX and 3x GL45 male thread. To connect up to 4 b.safe System Caps GL45 to one desktop mount GL45 (not included in scope of delivery).

	Female thread	Male thread		Cat. No.
A	GL45	3x GL45		R 1140-03
B	GL45	4x GL45		R 1140-04

Application:
Combination of capillaries and tubes of several HPLC systems in one desktop mount.





Also compatible with **b.safe Corrugated Tubing Coupling** for connecting corrugated tubing without any leakage. **Page 110**

Use **b.safe System Caps** to connect tubes and capillaries. **Page 12**

Freely **rotatable insert** for assembly of fully equipped System Caps.

Desktop Mount with thread connection GL25
for Waste Tubes or **female thread G 1/2“** for stainless steel sanitary components. **Page 18**

GL25

G1/2“

b.safe APPROPRIATE

b.safe Desktop Mount page 18
For connecting filling devices with Waste Tubes.

b.safe Funnels

The best helper for a disposal of high volumes of liquid waste, like e. g. caused during the preparation of samples, are b.safe Funnels.

The firmly attached but freely rotatable screw cap GL45 is compatible with b.safe Desktop Mounts and b.safe Wall Mounts and allows an easy integration of the Funnel in your system for waste disposal.

At b.safe SYSTEMS we offer several funnel models: Depending on the available space and the volumes that you regular dispose, you can choose funnels with diameter 130 or 180 mm, with either a hinged lid or a ball valve. Both, lid and ball valve, retain solvent vapours occurring in the connected collection vessels.

Give us a call! We will be pleased to assist you in choosing the b.safe Funnel that will fit best in your b.safe SYSTEM!

b.safe Funnels

Material : **PE-EX, PPS** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

Funnels made of static dissipative PE-EX for liquid waste disposal. Freely turnable GL 45 screw cap made of PPS for direct connection to a b.safe Wall- or Desktop Mount. Scope of delivery as per below chart.

	Funnel O.D. mm	Version	Cat. No.
A	130	Funnel 130 with with hinged lid, removable sieve, grounding cable (length 1,5 m)	R 800-20
B	180	Funnel 180 with splash guard, removable sieve, ball valve, grounding cable (length 1,5 m)	R 800-02
C	180	Funnel 180 with hinged lid, removable sieve, grounding cable (length 1,5 m)	R 800-10

Application:
For a safe and clean liquid waste disposal together with a b.safe Desktop Mount and connected b.safe Waste Tubes for the transfer to collecting trays.

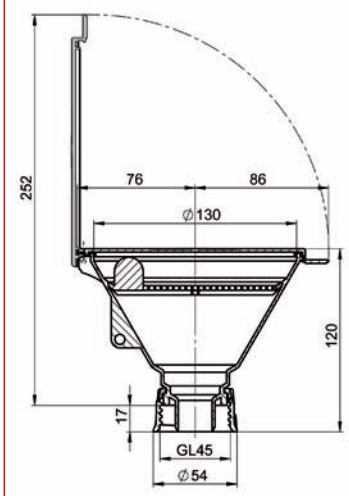
Static dissipative for more safety

The **removable sieve** restrains solid materials.

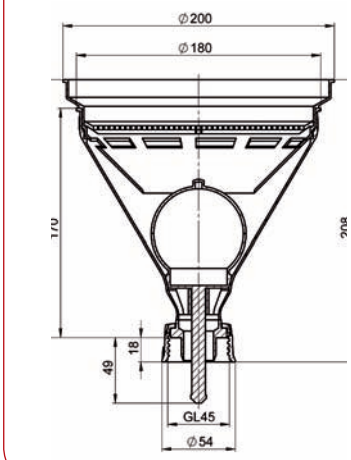
Model with **hinged lid** as protection from harmful vapours.

Model with **ball valve**: the hollow ball floats up during filling and falls down again to hold back harmful vapours.

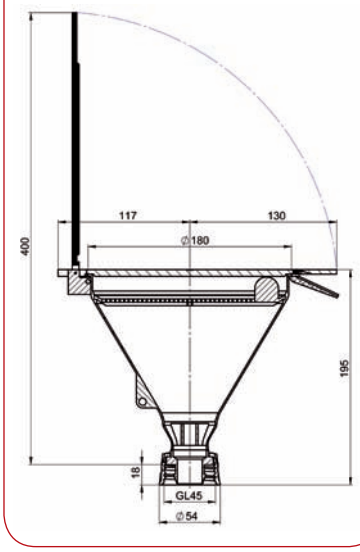
A



B



C



b.safe APPROPRIATE

b.safe Waste Tube Smooth page 34
Flexible tube with smooth inner surface for a drain without residues.

b.safe Desktop Mount Multiport

The b.safe Desktop Mount Multiport is a compact collective connector to combine the outlets of two respectively up to four HPLC units.

All connectors are placed sideways to join tubing and tubes with suitable Fittings and Hose connectors without bending. Furthermore, the threads are all inclined. This additional slope improves the flow and prevents any backflow.

b.safe Desktop Mounts Multiport are available either without any accessories for a flexible configuration or as Starter Sets that include fittings for capillary O.D. 1,6/2,2/3,2 mm, hose connectors for tubing I. D. 6,5-8 mm and blind fittings for all connectors.

A disposal line like e. g. a b.safe Waste Tube is connected via the GL25 connector. For a transition to sanitary threads, we offer optionally available adapters.

Various hose connectors for a safe connection of different tubing diameters. **Page 112**

Compact design for a low installation height.

Compatible with **b.safe Corrugated Tubing Coupling** for connecting corrugated tubing without any leakage. **Page 110**

Lateral connectors to prevent tubing from bending.

Connector GL25 for transition to disposal lines like e. g. b.safe Waste Tubes.

Inclined threads for additional slope and prevention of backflow.

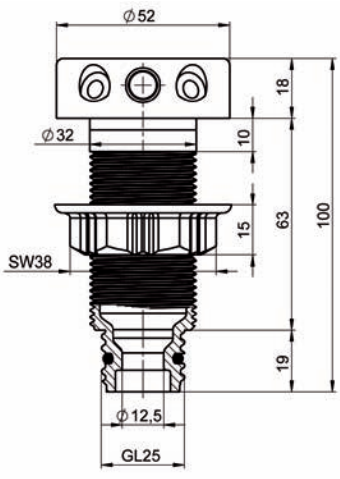
b.safe Desktop Mount Multiport II

Material: **PE-EX** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductibility: **10^6 Ohm**

Made of static dissipative PE-EX, suitable for tabletops with a thickness of 10 to 35 mm, easy fixing by counter nut. Low installation height due to connections at the sides, all threads are inclined to provide additional sloping and connection of tubes without bending. Connections at upper side: 2x2 capillary connections (female thread UNF 1/4“) to connect capillaries with b.safe Fittings, 2x1 tube connection (female thread NPT 1/8“) for hose connectors. Fittings and hose connectors are not included in the scope of delivery.Connection at bottom: male thread GL25 for direct connection with flexible b.safe Waste Tubes.

	No. of capillary connections	No. of tube connections	Connection bottom	Total length mm	Cat. No.
	4x UNF 1/4“	2x NPT 1/8“	GL25 male	100	R 1125-02

Application:
One connection for up to 2 HPLC systems that can be integrated directly in laboratory hoods or working tables. b.safe Waste Tubes lead liquid solvent waste directly into connected canisters.



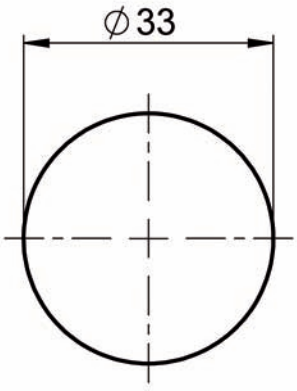


Table bore

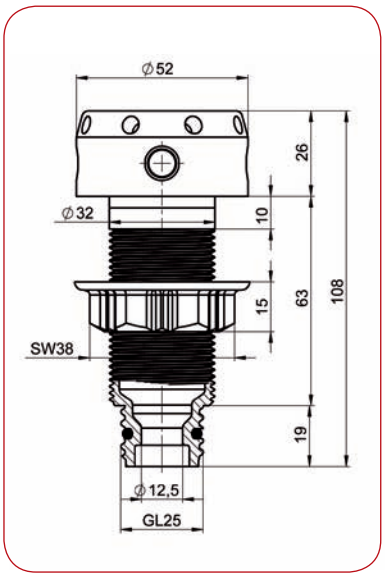
b.safe Desktop Mount Multiport IV

Material: **PE-EX** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductibility: **10^6 Ohm**

Made of static dissipative PE-EX, suitable for tabletops with a thickness of 10 to 35 mm, easy fixing by counter nut. Low installation height due to connections at the sides, all threads are inclined to provide additional sloping and connection of tubes without bending. Connections at upper side: 4x2 capillary connections (female thread UNF 1/4“) to connect capillaries with b.safe Fittings, 4x1 tube connection (female thread NPT 1/8“) for hose connectors. Fittings and hose connectors are not included in the scope of delivery. Connection at bottom: male thread GL25 for direct connection with flexible b.safe Waste Tubes.

	No. of capillary connections	No. of tube connections	Connection bottom	Total length mm	Cat. No.
	8x UNF 1/4“	4x NPT 1/8“	GL25 male	100	R 1125-04

Application:
One connection for up to 4 HPLC systems that can be integrated directly in laboratory hoods or working tables. b.safe Waste Tubes lead liquid solvent waste directly into connected canisters.



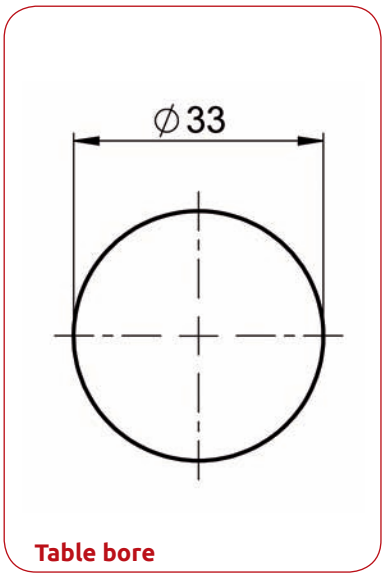


Table bore

b.safe APPROPRIATE

b.safe Waste Tubes page 34
Flexible tube for introducing solvents into canisters.

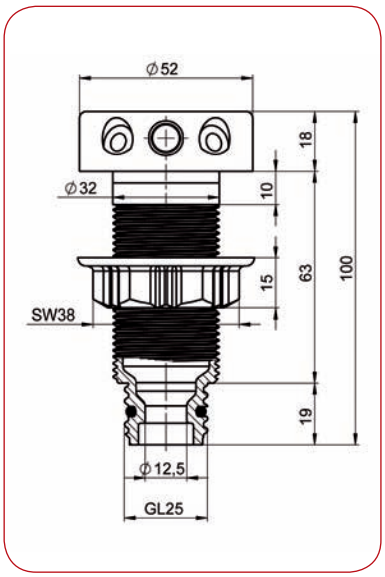
b.safe Starter Set Multiport II

Material: **PE-EX** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductibility: **10^6 Ohm**

Made of static dissipative PE-EX, suitable for tabletops with a thickness of 10 to 35 mm, easy fixing with counter nut. Low installation height due to connections at the sides, all threads are inclined to provide additional sloping and connection of tubes without bending.
Connections at upper side: 2x2 capillary connections (female thread UNF 1/4“) incl. b.safe Fittings to connect capillaries with O.D. 1,6/2,2/3,2 mm , 2x1 tube connection (female thread NPT 1/8“) incl. b.safe Hose Connector for tubing with I.D. 6,5-8 mm.
Connection at bottom: male thread GL25 for direct connection with flexible b.safe Waste Tubes.

	Description	Scope of delivery	Cat. No.
	Starter Box Multiport II	1x b.safe Desktop Mount Multiport II 12x b.safe Fittings 4x Ø 1,6 mm (green), 4x Ø 2,2 mm (purple), 4x Ø 3,2 mm (yellow) 4x b.safe Blind Fittings for capillary connection (UNF 1/4“) 2x b.safe Hose Connectors for I.D. 6,5-8 mm 2x b.safe Blind Fittings for tube connection (NPT 1/8“)	R 9125-02

Application:
One connection for up to 2 HPLC systems that can be integrated directly in laboratory hoods or working tables. b.safe Waste Tubes lead liquid solvent waste directly into connected canisters.



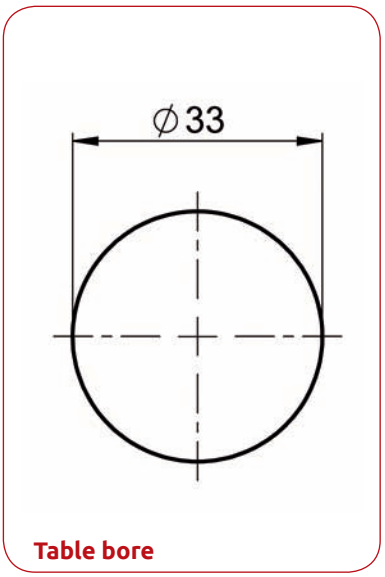


Table bore

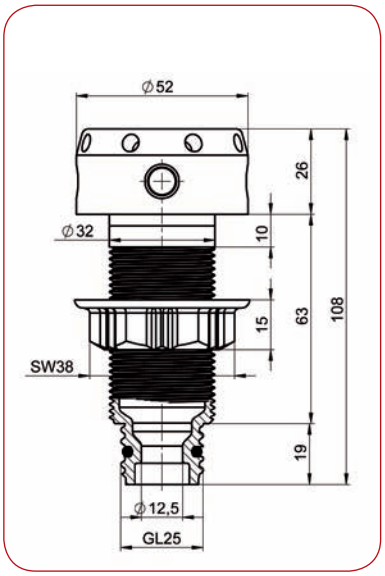
b.safe Starter Set Multiport IV

Material: **PE-EX** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductibility: **10^6 Ohm**

Made of static dissipative PE-EX, suitable for tabletops with a thickness of 10 to 35 mm, easy fixing with counter nut. Low installation height due to connections at the sides, all threads are inclined to provide additional sloping and connection of tubes without bending.
Connections at upper side: 4x2 capillary connections (female thread UNF 1/4“) incl. b.safe Fittings to connect capillaries with O.D. 1,6/2,2/3,2 mm , 4x1 tube connection (female thread NPT 1/8“) incl. b.safe Hose Connector for tubing with I.D. 6,5-8 mm. Connection at bottom: male thread GL25 for direct connection with flexible b.safe Waste Tubes.

	Description	Scope of delivery	Cat. No.
	Starter Set Multiport IV	1x b.safe Dsktop Mount Multiport IV 24x b.safe Fittings 8x Ø 1,6 mm (green), 8x Ø 2,2 mm (purple), 8x Ø 3,2 mm (yellow) 8x b.safe Blind Fittings for capillary connection (UNF 1/4“) 4x b.safe Hose Connectors for I.D. 6,5-8 mm 4x b.safe Blind Fittings for tube connection (NPT 1/8“)	R 9125-04

Application:
One connection for up to 4 HPLC systems that can be integrated directly in laboratory hoods or working tables. b.safe Waste Tubes lead liquid solvent waste directly into connected canisters.



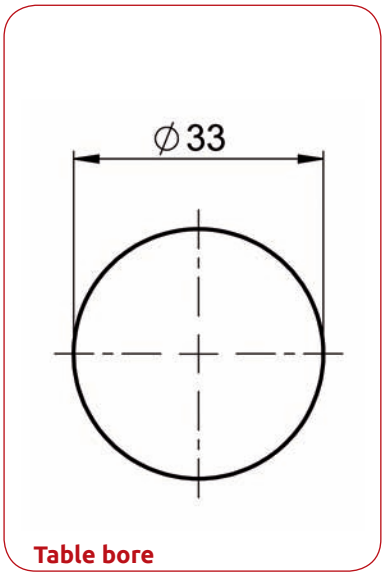


Table bore

b.safe APPROPRIATE

b.safe Waste Tube Smooth page 34
Flexible tube with smooth inner surface for a drain without residues.

b.safe Bore Adapter

Material: **PE** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good**

Made of PE, to reduce the bore diameter in table- or countertops from approx. 54 to 30mm to ensure a safe installation of e.g. b.safe Desktop Mounts or b.safe Multiports in corresponding bores. Consisting of top part, lock washer and gasket to avoid rotating and slipping during installation.

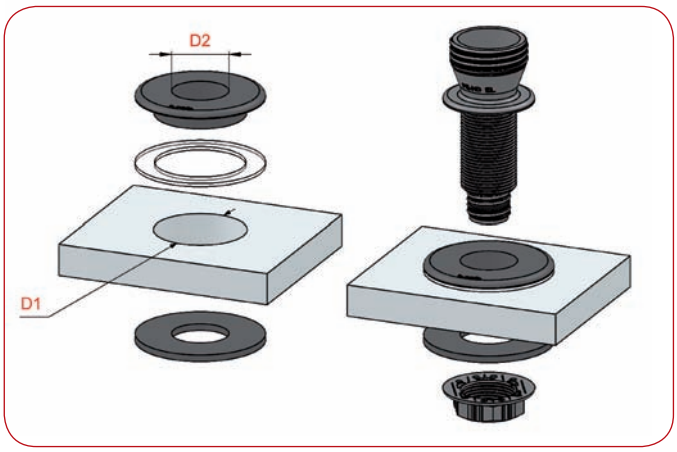
	Bore in tabletop, mm	O.D., mm	I.D., mm	Cat.No.
	max. Ø ca. 54	75	33	R 1169-54

Application:
Diameter of existing bores (min. Ø 30 mm) can be reduced to connect b.safe Desktop Mounts or b.safe Multiports. Easy installation: put the top part of the bore adapter and the gasket on the existing bore. Insert e.g. a b.safe Desktop Mount (Cat. No. R 1100-45 on page 18) through the reduced bore of the top part. Use the lock washer and counter nut of the desktop mount to fix it together with the bore adapter.

b.safe SYSTEMS customized:

We will be pleased to customize a b.safe Bore Adapter for your existing bores.
To prepare an offer we only need the dimensions according to below sketch.
Just add the missing details in the table and send a copy to
info@bohlender.de or fax it to +49 9346 9286-51

	Quantity:	
D1	Ø of existing bore:	mm
D2	Please choose: Desktop Mount with GL 25 connector Desktop Mount for Waste Pipes	☐ ☐



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Contact our experts – we give advice and support already starting with the construction and production as per your requirements and in compliance with the chosen raw materials – already from 1 piece.

We only need a drawing (a sketch is sufficient) and some further information.

You have a special request?
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b.safe Tubing and Connectors

For the safe transfer of solvent waste from a b.safe Sink or a b.safe Desktop Mount combined with a b.safe Funnel into a collection canister we recommend b.safe Waste Tubes.

These corrugated tubes in static dissipative PTFE-EX are highly flexible for integration also in tight installation conditions. At the same time, the material provides a high chemical resistance and static charging can be avoided by grounding the components.

At b.safe, we offer disposal lines in two qualities: b.safe Waste Tubes with spiral-shaped inside and outside for highest flexibility and b.safe Waste Tubes Smooth with spiral-shaped outside and smooth inside for a fast flow without any residues.

Both versions are supplied including appropriate screw joints with connecting thread GL25. These can be removed easily in order to cut the tube and to adapt it to the needed installation length.

The uniform thread connection GL25 allows to join b.safe Waste Tubes fast and tightly to different components of the b.safe SYSTEM range. By means of adapters and fittings, also a transition to sanitary connections like e. g. G1/2" is possible.

b.safe Elbow Stopcock
for exchange of canisters without dripping tubes.
R 1201-05 **Page 57**

b.safe Adapter for Exhaust Filter
for installation of exhaust filters in tight installation conditions.
Page 55

b.safe Elbow Fitting GL25
to compensate tight installation space **Page 37**

Uniform thread connection
GL25 male

b.safe Waste Tube Smooth,
with smooth inside for a fast flow without any residues
R 1420-.. , **Page 35**

b.safe Y-Connector
to combine 2 lines on one outlet R 1220-03
Page 37

Removable screw joints
for cutting and adapting the corrugated tubing during installation.

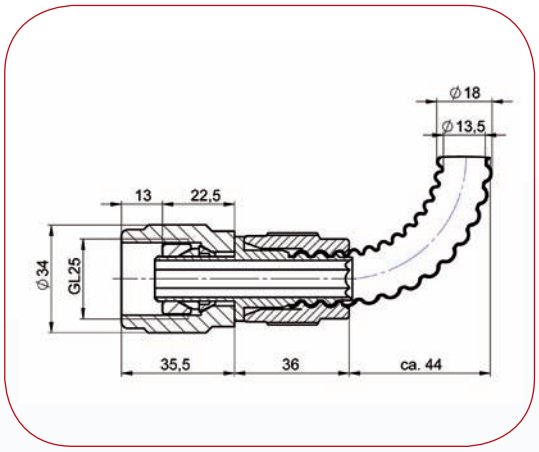
b.safe Waste Tube

Material: **PTFE-EX** | Temperature resistance: **-200 °C to +250 °C** |
Chemical resistance: **++ very good** | Conductibility: **10^6 Ohm**

Cut from flexible corrugated tubing made of static dissipative PTFE-EX, spiral-shaped inside and outside. Including two b.safe Screw Connections for Waste Tube fitting connection thread GL25 of e.g. b.safe Desktop Mounts or b.safe Waste Caps, 1 hexagon key SW10 and 1 tubing holder for wall mounting. To be able to cut the tubing to the required length, the screw connections are not mounted. Using the hexagon key, they can be screwed in the tubing.

	Length mm	I.D. mm	O.D. mm	Connection thread	Cat. No.
	600	approx. 13,5	approx. 18	GL25 female	R 1410-06
	1000	approx. 13,5	approx. 18	GL25 female	R 1410-10
	1500	approx. 13,5	approx. 18	GL25 female	R 1410-15
	2500	approx. 13,5	approx. 18	GL25 female	R 1410-25

Application:
Flexible corrugated tubing to lead liquid solvent waste e. g. from a b.safe Desktop Mount into a canister with Waste Cap and connection GL25. If you need a longer tubing than mentioned in above table, b.safe Corrugated Tubing Cat. No. R 773-18 on page 103 and b.safe Screw Connection for Waste Tube Cat. No. R 1405-08 on page 36 can be combined individually.



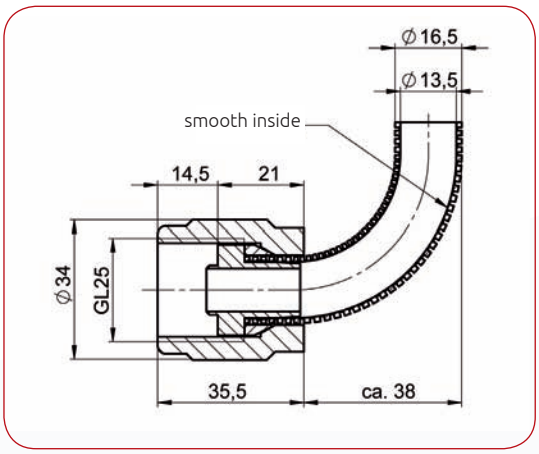
b.safe Waste Tube Smooth

Material: **PTFE-EX** | Temperature resistance: **-200 °C to +250 °C** |
Chemical resistance: **++ very good** | Conductibility: **10^6 Ohm**

Cut from flexible corrugated tubing made of static dissipative PTFE-EX, spiral-shaped outside and smooth inside. Including two b.safe Screw Connections for Waste Tube fitting connection thread GL25 of e.g. b.safe Desktop Mounts or b.safe Waste Caps and 1 tubing holder for wall mounting. To be able to cut the tubing to the required length, the screw connections are not mounted.

	Length mm	I.D. mm	O.D. mm	Connection thread	Cat. No.
	600	approx. 13,5	approx. 16,5	GL25 female	R 1420-06
	1000	approx. 13,5	approx. 16,5	GL25 female	R 1420-10
	1500	approx. 13,5	approx. 16,5	GL25 female	R 1420-15
	2500	approx. 13,5	approx. 16,5	GL25 female	R 1420-25

Application:
Flexible corrugated tubing to lead liquid solvent waste e.g. from a b.safe Desktop Mount into a canister with b.safe Waste Cap and connection GL25. If you need a longer tubing than mentioned in above table, b.safe Corrugated Tubing Cat. No. R 773-16 on page 103 and b.safe Screw Connection for Waste Tube Cat. No. R 1405-06 on page 36 can be combined individually.



b.safe APPROPRIATE

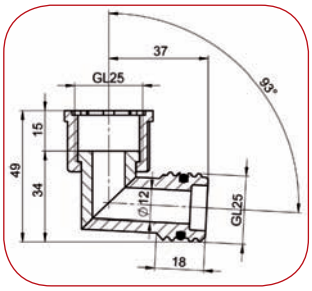
b.safe Y-Connectors page 37
Combine two Waste Tubes to one outlet.

Accessories and spare parts for b.safe Waste Tube / Waste Tube Smooth

Components that can be ordered additionally for b.safe Waste Tube and b.safe Waste Tube Smooth:

Description		Material	Waste Tube	Waste Tube Smooth	Cat.No.
b.safe Screw Connection for Waste Tube, with screw cap GL25 and spiral-shaped connection to screw in b.safe Corrugated Tubing R 773-18 with spiral wall. Including 1 hexagon key for an easy mounting. Packing unit 2 pcs.	A	PTFE-EX/PE-EX	•		R 1405-18
b.safe Screw Connection for Waste Tube Smooth, with screw cap GL25, sealing wedge and conical connection to plug in b.safe Corrugated Tubing R 773-16 with smooth inside. Packing unit 2 pcs.	B	PTFE-EX		•	R 1405-16
b.safe Wall Mount for Waste Tube, hinged pipe clamp for b.safe Waste Tube with O.D. 18 mm. Including fixing material. Packing unit 1 pc	C	PA	•		R 1400-18
b.safe Wall Mount for Waste Tube Smooth, hinged pipe clamp for b.safe Waste Tube Smooth with O.D. 16 mm. Including fixing material. Packing unit 1 pc.	D	PA		•	R 1400-16
b.safe Antistatic Corrugated Tubing for Waste Tube, flexible corrugated tubing made of antistatic PTFE-EX with spiral-shaped inside and outside. I.D. approx. 13.3 mm x O.D. approx. 18 mm. Ordered quantities are supplied in rolls by the meter.	E	PTFE-EX	•		R 773-18
b.safe Antistatic Corrugated Tubing for Waste Tube Smooth, flexible corrugated tubing made of antistatic PTFE-EX with smooth inside and spiral-shaped outside. I.D. approx. 13.6 mm x O.D. approx. 16.2 mm. Ordered quantities are supplied in rolls by the meter.	F	PTFE-EX		•	R 773-16

b.safe Elbow Fitting



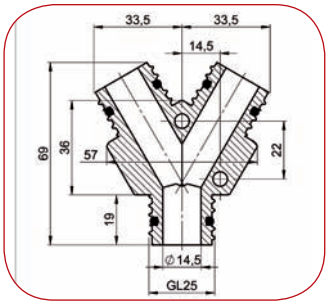
Material: **PE-EX** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductibility: 10^6 Ohm

Made of static dissipative PE-EX, screw cap for thread GL25 made of PPS with rotary elbow fitting with male thread GL25.

	Female thread	Male thread		Cat. No.
	GL25	GL25		R 1224-01

Application:
An angle of approx. 93° allows a connection of b.safe Waste Tubes to b.safe Desktop Mounts or b.safe Drain Basin in a space-saving way and without sagging. The position of the tube connection is freely selectable due to the rotary elbow fitting

b.safe Y-Distributor



Material: **PE-EX** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductibility: 10^6 Ohm

Made of static dissipative PE-EX, 3 connections male thread GL25. with 2 bores dia. 5,5 mm for wall mounting.

	Male thread	Bore dia. mm		Cat.No
	3x GL25	14,5		R 1220-03

Application:
Combine two b.safe Waste Tubes to one outlet.

b.safe APPROPRIATE

b.safe Waste Tubes page 35
Flexible tube for introducing solvents into canisters..

b.safe Connectors

Material: **PE-EX** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductibility: **10^6 Ohm**

Made of static dissipative PE-EX

	Male thread	Male thread		Cat. No.
A	GL25	G1/2“		R 1222-03
B	GL25	GL25		R 1222-05

	Male thread	Female thread		Cat. No.
C	GL25	G1/2“		R 1225-12
D	GL25	G1 1/2“		R 1225-30
E	G1 1/2“	GL25		R 1225-25
F	NPT 1/8“	GL14		M 630-14

	Female thread	Female thread		Cat. No.
G	GL25	GL25		R 1221-01
H	GL25	NPT 1/8“		R 1223-04

	Female thread	Hose connector O.D. mm	Hose connector I.D. mm	Cat. No.
I	GL25	15	10	R 1223-07

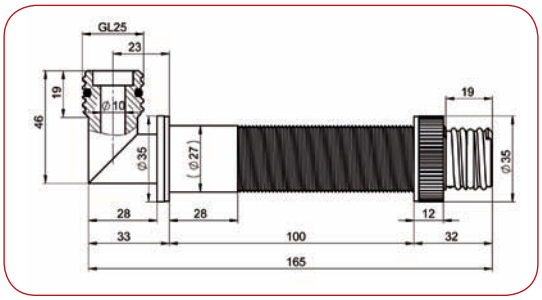
b.safe Cabinet Mount GL25

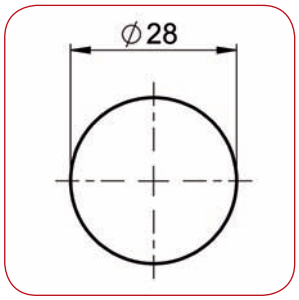
Material: **PE-EX** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductivity: 10^6 Ohm

Made of static dissipative PE-EX, mount for safety cabinets with a wall thickness of max. 100 mm and bore dia. 28 mm, lock nut with silicone gaskets for clamp fastening, 2 connections GL 25 male for connection to b.safe Waste Tubes. A suitable attachment for fire protection is available separately (Cat. No. R 580-05).

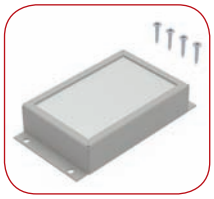
	Thread connection	Outer dimensions, approx. L x Ø mm	Useful length mm	For bore dia. mm	Cat. No.
	2x GL25 male	165 x 35	110	28 mm	R 1105-25

Application:
For safe connection of canisters in safety cabinets to a waste disposal system with b.safe Waste Tubes.





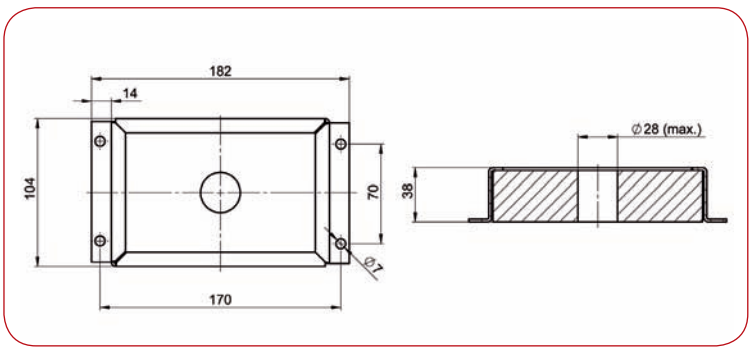
b.safe Attachment for Fire Protection



Sheet metal case with gypsum insert for fire protection of cabinet or tube mounts in safety cabinets. Including 8 fastening screws.

	For tube connection	Outer dimensions, approx. L x W x H mm		Cat. No.
	2x GL25 male	182 x 104 x 38		R 580-05

Application:
For fire protection of b.safe Cabinet Mounts GL 25 (Cat. No. R 1102-25) in safety cabinets.



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We only need a drawing (a sketch is sufficient) and some further information.

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Protect your employees appropriately

b.safe

Easy health protection

Solvents in storage and waste containers often bear potential for serious health danger and chronic diseases. During hectic working days in laboratories, it often happens that contaminant sources are accepted or patently overlooked. Nowadays, the protection of our health, the environment and all resources has highest priority.

b.safe offers all necessary products to change your laboratory to a contemporarily safe workplace!

Sophisticated Safety Solutions for HPLC.

b.safe System Waste Caps

At b.safe SYSTEM we offer Waste Caps in different versions to suit best the planned use.
Especially for the integration in permanently installed disposal systems are b.safe System Waste Caps. This Waste Cap model has just 1 connection GL25 to join directly e. g. a b.safe Waste Tube. An intermediate integration of an elbow stopcock allows to interrupt the line during exchange of the canister and to prevent dripping of solvents. All sensors for the filling level control including necessary signal cables are built-in into the cap.

The acoustic and also optical alarm of the b.safe Display or b.safe Mini-Display indicates which canister has to be exchanged.

As a standard, all System Waste Caps have a connector GL14 for connection of either a b.safe Exhaust Filter or a b.safe Venting Hose. Both solutions ensure that no harmful solvent vapours are emitted to the ambient air during filling.

b.safe System Waste Caps DLC (Dual Level Control) are supplied with a special feature: The built-in sensor reports a pre-alarm at 50 % of the nominal volume of the connected canister and a main alarm for the full canister. Thus an on-time canister exchange before your shift end or the weekend can be planned.

Easy connection with the exhaust system via a special **plug connector** with ribs to snap in a bore with dia. 14 mm

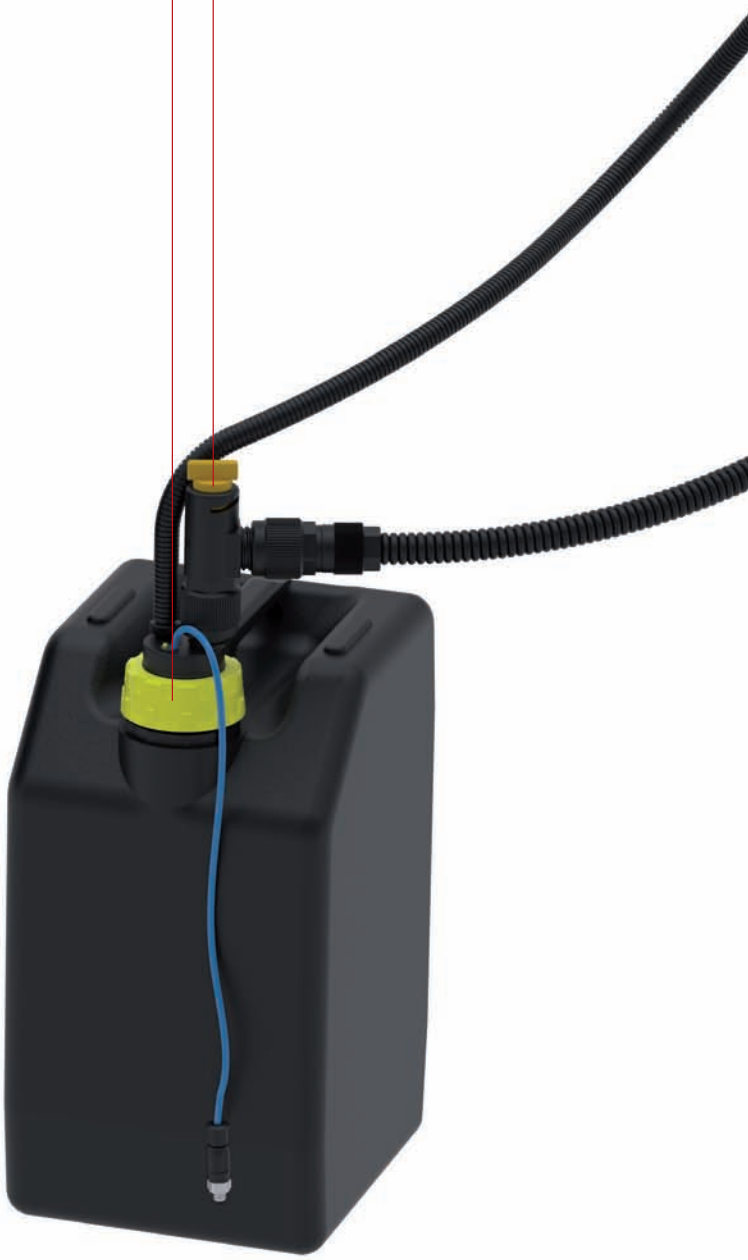
Good grip for a for each hand size

Filling tube for **filling below surface level** made of static disspative PE-EX.

b.safe System Waste Cap DLC
with pre- and main alarm
Page 48

b.safe System Waste Cap
with sensor for capacitive level control **Page 50**

b.safe Stopcock,
prevents dripping
Page 57



No twisting of connected parts during canister change due to 360° free rotation

b.safe Canisters available in different versions and sizes **Page 58**

Permanently fixed signal cable extendable with
b.safe Signal Cables R 645-..
Page 83

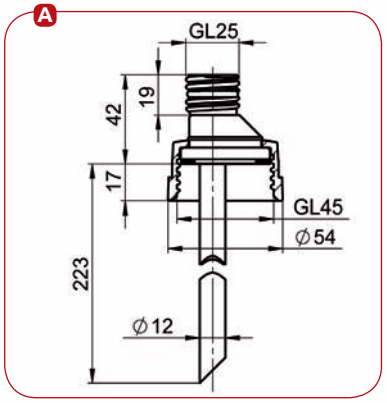
b.safe System Waste Caps

Material: **PE-EX,PPS** I Temperature resistance: **-50 °C to +80 °C** I
Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

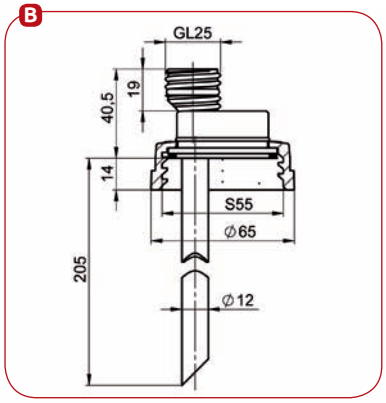
Screw cap made of PPS, free movable insert made of conductible PE-EX with 1 connector GL25 suitable for b.safe Waste Tubes and 1 connector GL14 for fixing the b.safe Venting Hose or a b.safe Exhaust Filter. Design and scope of delivery according to table.

	For canister thread	Hose connector	Connector for aeration	Filling below surface level	Cat. No.
A	GL45	1x GL25 (m)	1x GL14 (f)	yes	R 1320-45
B	S55	1x GL25 (m)	1x GL14 (f)	yes	R 1321-55
C	S60	1x GL25 (m)	1x GL14 (f)	no/drip tube	R 1322-60

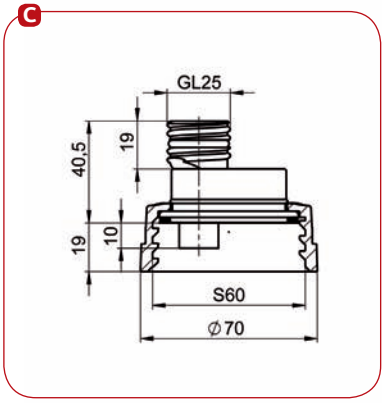
Application:
b.safe Waste Tubes can be connected to the canister by means of these b.safe System Waste Caps and solvents can be collected safely. Solvent vapours are held back by the exhaust filter with activated carbon or can be led to the hood by means of a venting hose.

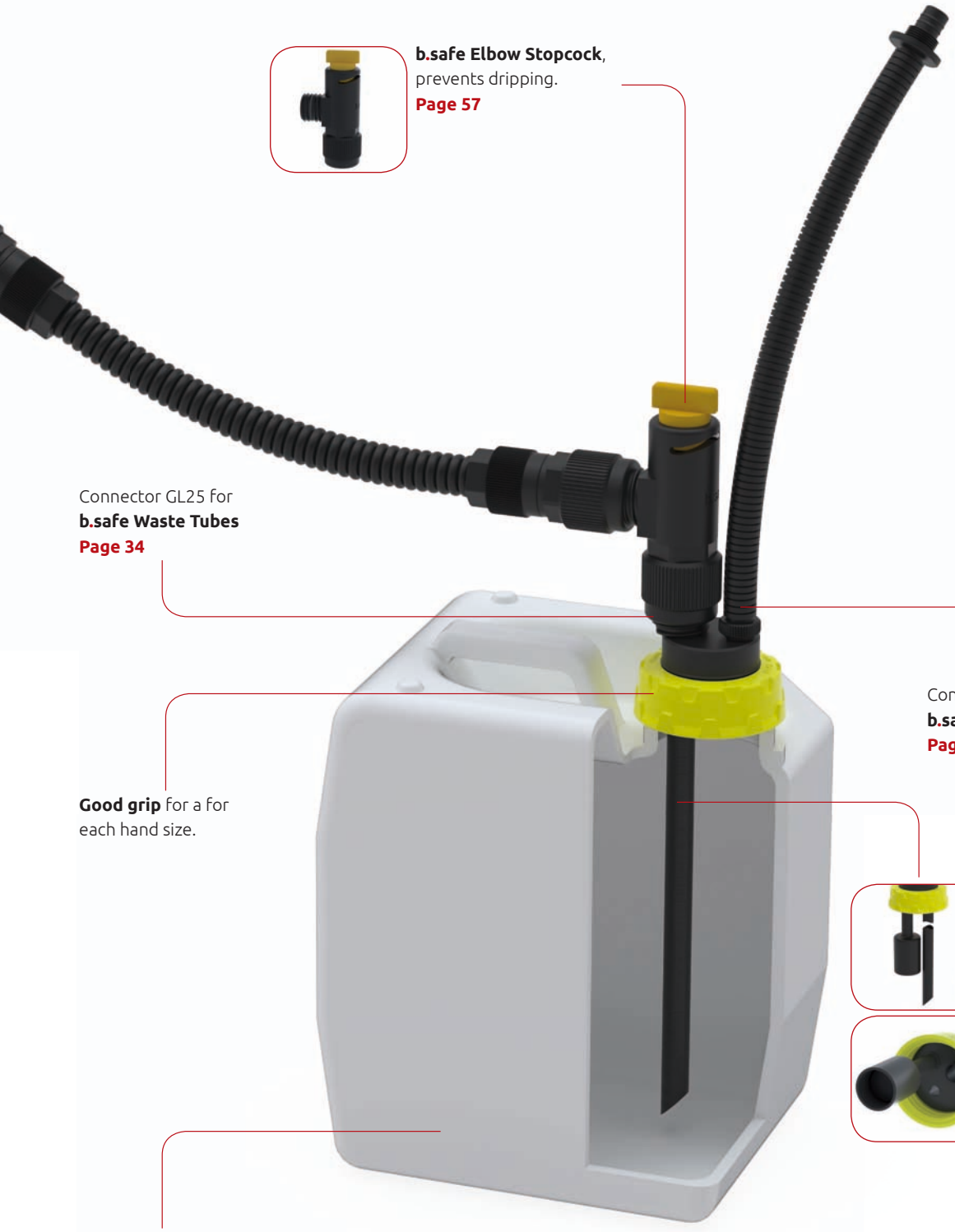


Suitable for Canister R 205-05



Suitable for Canister R 225-05





b.safe Elbow Stopcock, prevents dripping.
Page 57

Connector GL25 for
b.safe Waste Tubes
Page 34

Connector GL14 for
b.safe Venting Hose
Page 56

Good grip for a for each hand size.

b.safe System Waste Caps GL45 and S55:
Outlet with tube for under **level filling.**

b.safe System Waste Caps S60 and S90:
Outlet with drip tube to lead liquids away from the fill level sensor.

See **page 58** for suitable **b.safe Canisters**.

b.safe APPROPRIATE

b.safe Elbow Stopcock Page 57
Prevents dripping during exchange of canisters.

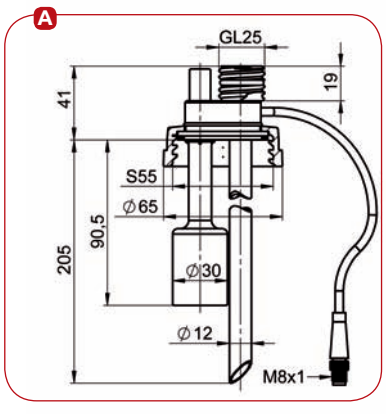
b.safe System Waste Caps LC

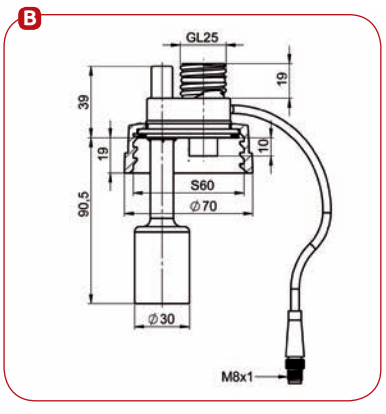
Material: **PE-EX,PP** I Temperature resistance: **-50 °C to +80 °C** I
Chemical resistance : **++ very good** | Conductivity: **10^6 Ohm**

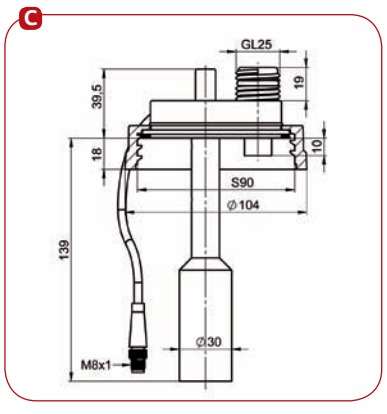
Screw cap made of PPS or PP (only canister thread S90), free movable insert made of conductible PE-EX with permanently fixed cable (length approx. 0,5 m) for the connection to a b.safe Mini-Display/ b.safe Display (see page 66-75) as well as sight glass and visual pin for additional optic control of the filling level. With 1 hose connector GL 25 suitable for b.safe Waste Tubes and 1 connector GL14 for fixing the b.safe Venting Hose or a b.safe Exhaust Filter. Design and scope of delivery according to table.

	For canister thread	Hose connector	Connector for aeration	Filling below surface level	Cat. No.
A	S55	1x GL25 (m)	1x GL14 (f)	yes	R 1305-01
B	S60	1x GL25 (m)	1x GL14 (f)	no/drip tube	R 1306-01
C	S90	1x GL25 (m)	1x GL14 (f)	no/drip tube	R 1309-01

Application:
b.safe Waste Tubes can be connected to the canister by means of these b.safe System Waste Caps and solvents can be collected safely. To avoid spill over of canisters through the connection of a Waste Cap to a b.safe Mini-Display/ b.safe Display (see page 66-75) for electronic level control. The filling levels of waste containers in laboratory cupboards and workbenches can be reliably monitored. With the use of b.safe Waste Tubes, solvent waste is led directly into the canister, solvent vapours are held back by the exhaust filter with activated carbon or can be led to the hood by means of a venting hose.







Suitable for Canister R 225-05

b.safe System Waste Caps GL45 and S55: Outlet with tube **for under level filling.**

b.safe System Waste Caps S60 and S90: Outlet with drip tube to lead liquids away from the fill level sensor.

b.safe Elbow Stopcock, prevents dripping. **Page 57**

Connector GL14 for **b.safe Venting Hose** **Page 56**

Sight glass for easy identification of a full canister.

Permanently fixed signal cable for connection with a **b.safe Display** **Page 72-75** Easily extendable with **b.safe Signal Cables** R 645-.. **Page 83**

Good grip for each hand size.

See **Page 58** for suitable **b.safe Canisters.**

b.safe APPROPRIATE

b.safe Collecting Trays Page 62
Simple helper to prevent contamination of working areas with solvent waste.

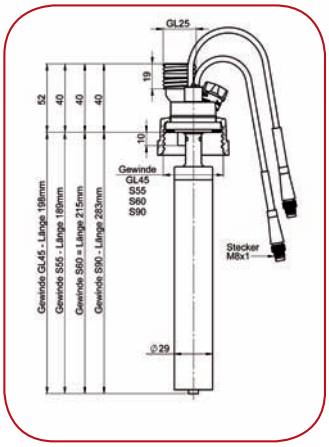
b.safe System Waste Caps DLC

Material: **PE-EX,PPS/PP** I Temperature resistance: **-50 °C bis +80 °C** I
Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

Screw cap made of PPS or PP (only canister thread S90), free movable insert made of conductible PE-EX with 2 permanently fixed cables (length approx. 0,5 m each) for the connection to a b.safe Mini-Display/ b.safe Display (see page 66-75) which signals a pre-alert when approx. 50% of the nominal volume are reached and a main alert for canister change as soon as 100% of the nominal volume are reached. With 1 additional red LED flashing light for easy identification of a full canister. With 1 hose connector GL 25 suitable for b.safe Waste Tubes and 1 connector GL 14 for fixing the b.safe Venting Hose or a b.safe Exhaust Filter. Design and scope of delivery according to table.

	For canister thread	Hose connector	Connector for aeration	Cat. No.
A	GL45	1x GL25(m)	1x GL14(f)	R 1350-21
B	S55	1x GL25(m)	1x GL14(f)	R 1355-20
C	S60	1x GL25(m)	1x GL14(f)	R 1356-20
D	S90	1x GL25(m)	1x GL14(f)	R 1359-20

Application:
b.safe Waste Tubes can be connected to the canister by means of these b.safe System Waste Caps and solvents can be collected safely. To avoid spill over of canisters through the connection of a Waste Cap to a b.safe Mini-Display/ b.safe Display (see page 66-75) for electronic level control. The additional pre-alert enables the user to provide exchange containers for big volumes of waste e.g. before the end of work or the weekend. Reliable monitoring of the filling levels of waste canisters in laboratory cupboards and work-benches. With the use of b.safe Waste Tubes, solvent waste is led directly into the canister, solvent vapours are held back by the exhaust filter with activated carbon or can be led to the hood by means of a venting hose.



Accessories and spare parts for b.safe System Waste Caps DLC

Spare part	Version	Cat. No.
Adaptor for Exhaust Filter	Adaptor for space-saving assembly of the b.safe Exhaust Filter (thread GL 14) on the b.safe Waste Cap (Cat. No. R 1350-21) with NPT 1/8" thread.	M 630-14

Flexible **b.safe Waste Tubes** Page 34

Optional
b.safe Elbow Stopcock,
prevents dripping.
Page 57

Visual alarm

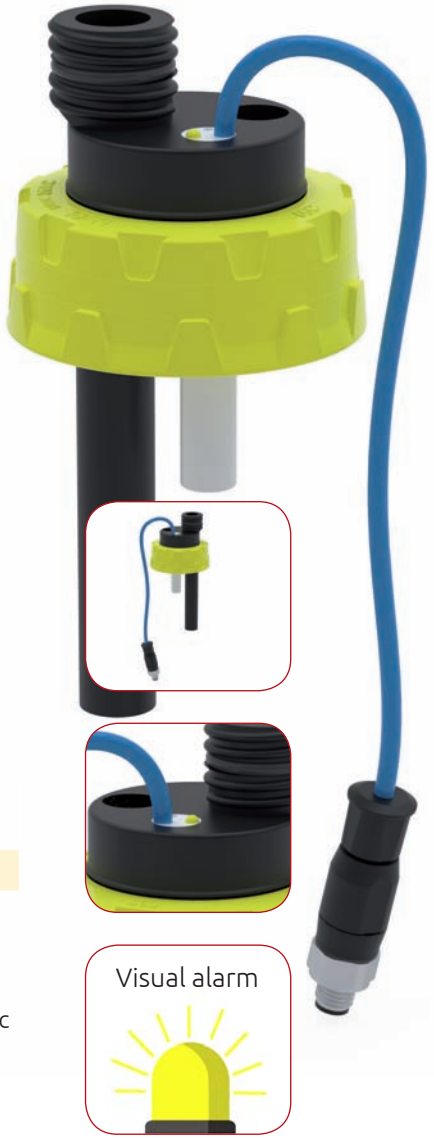
Red LED light
for easy identification of a full canister

Permanently fixed signal cable for connection with a
b.safe Mini Display
Page 68
Easily extendable with
b.safe Signal Cables
R 645-.. Page 83

See Page 58 for suitable **b.safe** Canisters.

b.safe APPROPRIATE

b.safe Venting Hose Page 56
Harmful solvent vapours that can escape during filling are directly led into the exhaust system.



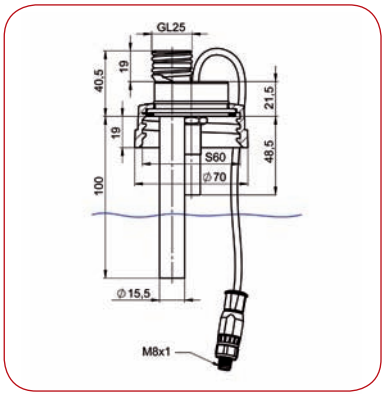
b.safe System Waste Caps Capacitive

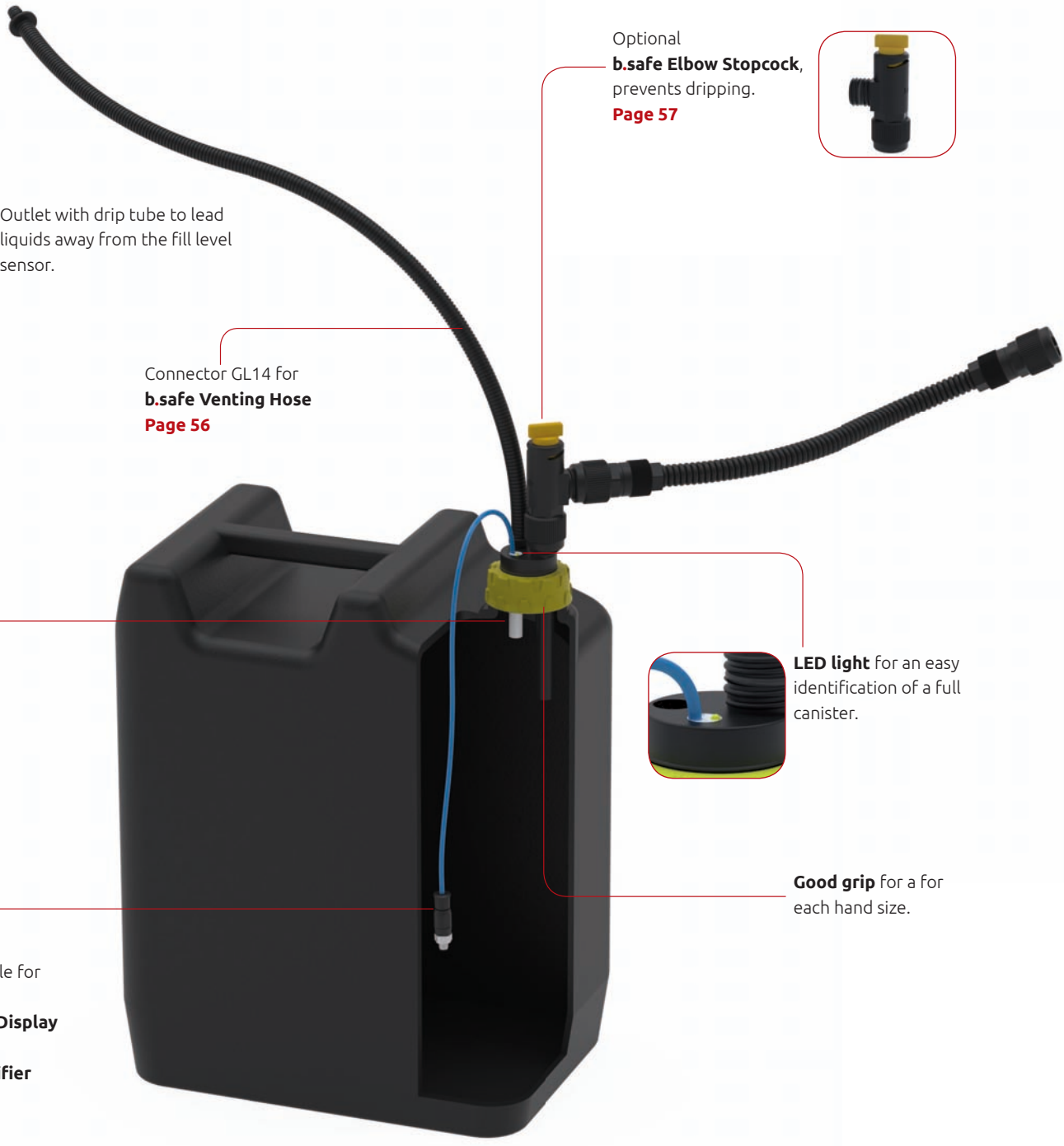
Material: **PE-EX,PPS, PP** I Temperature resistance: **-50 °C to +80 °C** I
Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

Screw cap made of PPS, free movable insert made of conductive PE-EX, permanently fixed sensor for capacitive level control with cable (length 0,5 m). With 1 hose connector GL 25 suitable for b.safe Waste Tubes and 1 connector GL14 for fixing the b.safe Venting Hose or a b.safe Exhaust Filter. Design and scope of delivery according to table.

	For canister thread	Hose connector	Connector for aeration	Cat. No.
	S60	1x GL25 (m)	1x GL14	R 1325-60

Application:
To avoid spill over of canisters through the connection of a Waste Cap Capacitive to a b.safe Mini-Display (see page 66-68) or a b.safe-Display (see page 72-74) for electronic level control. A b.safe Isolated Amplifier is mandatory for its operation. For a reliable control of the fill levels in your waste canisters installed in laboratory cabinets and workbenches simply order a b.safe Signal Cable Cat. No. R 645-.. as extension, see page 83 for available lengths.





Optional
b.safe Elbow Stopcock,
prevents dripping.
Page 57

Outlet with drip tube to lead liquids away from the fill level sensor.

Connector GL14 for
b.safe Venting Hose
Page 56

LED light for an easy identification of a full canister.

Good grip for a for each hand size.

Permanently fixed cable for connection with a
b.safe Display /Mini-Display
via a
b.safe Isolated Amplifier
Page 80

b.safe APPROPRIATE

b.safe Isolated Amplifier Page 80
For a safe signal transmission between explosion-proof areas and not-explosion-proof areas.

b.safe Connection to Canisters and ventilation

Upon insertion of solvents, the waste container has to be reliably ventilated and at the same time harmful solvent vapours shall not escape to the ambience.

Depending on the individual installation, there are two possible solutions for this task:

For firmly installed disposal systems, we recommend to use b.safe Venting Hoses. This highly flexible tube can be adapted to every mounting position. The connecting thread GL14 is compatible with all b.safe Waste Caps and b.safe System Waste Caps. The other end of the tube is equipped with a special plug connector for a direct connection to the exhaust system. Its ribs hold the connector firmly in bores with dia. 14 mm.

b.safe Exhaust Filters are the best solution for waste canisters which are directly connected to a HPLC or for laboratories without exhaust system. The activated carbon filling absorbs solvent vapours that escape from the collected solvent waste. Only filtered air is emitted to the ambience. b.safe Exhaust Filters have a service life of up to 12 months.

Also avoid possible contamination during the exchange of canisters: Just install a b.safe Elbow Stopcock between waste tube and waste cap. Close the passage before removing the waste cap so that there will be no dripping tube.

Integrated service life indicator: just push the button and/or mark the exchange date by hand.

Easy connection with the exhaust system via a special **plug connector** with ribs to snap in a bore with dia. 14 mm

b.safe Elbow Stopcock prevents dripping during exchange of canisters. **Page 57**

Flexible **b.safe Venting Hose,** harmful solvent vapours that can escape during filling are directly led into the exhaust system. **Page 56**

b.safe Exhaust Filters absorb harmful solvent vapours. **Page 54**

b.safe Exhaust Filters

Material: **PP** | Temperature resistance: **0 °C to +110 °C** |
Chemical resistance: **++ very good**

Filter body made of PP with connector (thread GL14) for b.safe Waste Caps. Cap with aeration openings and service life indicator having a title block to monitor service life. Filling made of activated carbon for adsorption of solvents.

	Size	Service life	Packing unit	Cat. No.
A	Small	3 months	2 pcs.	M 506-01
B	Medium	6 months	2 pcs.	M 506-02
C	Large	12 months	2 pcs.	M 506-03

Application:
Safe disposal of solvents without leakage of harmful solvent vapours. The activated carbon in the b.safe Exhaust Filter restrains solvent vapours from the escaping air during filling. The service life of the filter can be easily monitored through either activating the display on the cap and exchanging the filter in case of completely red colouring or documentation of the exchange date by hand.
We recommend the following filter sizes: Size Small for up to 5 litres, size Medium for 5-10 litres, and size Large for more than 10 litres.

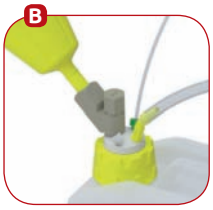
b.safe Adaptors for Exhaust Filter

Material: **PP** | Temperature resistance: **-0 °C to +110 °C** |
Chemical resistance: **++ very good**

Adaptor for space saving installation of the b.safe Exhaust Filter on b.safe Waste Caps.

	Version	Suitable for	Cat. No.
A	Straight	Exhaust filter connection (GL 14 thread)	M 502-01
B	1x angle 45°	Exhaust filter connection (GL 14 thread)	M 502-02
C	1x angle 90°	Exhaust filter connection (GL 14 thread)	M 502-03
D	2x angle 90°	Exhaust filter connection (GL 14 thread)	M 502-04

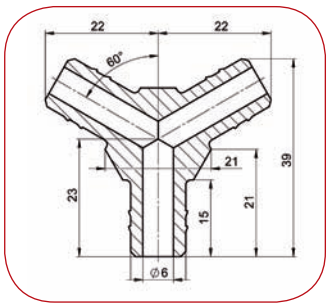
Application:
Enlarge the space on b.safe Waste Caps with b.safe Adaptors for Exhaust Filters and facilitate the installation of capillaries and tubing. With an adapter 1x 90°, Cat. No. M 502-03, you reduce the installation height of the Waste Cap with mounted Exhaust Filter on your canister.



b.safe Y-Hose Connectors for Venting Hose

Material: **PE-EX** | temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | conductivity: 10^6 Ohn

Made of static dissipative PE-EX, 3 connections for b.safe Corrugated Tubing with I.D. 11 mm (Cat. No. R 774-14).



	Hose Conenctor O.D. mm			Cat. No.
	3x 10,8			R 1220-01

Application:
Two Venting hoses can be combined to one outlet. Suitable corrugated tubing see Cat. No. R 774-14 on page 103.

b.safe Venting Hose

Material: **PE-EX** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductibility: 10^6 Ohn

Corrugated tubing made of static dissipative PE-EX, 1x thread connection GL14 to screw in the exhaust filter connection of b.safe Waste Cap, 1x adapter to connect the exhaust system in the lab.

	Length mm	I.D. mm	O.D. mm	Cat. No.
	2500	approx. 11	approx. 14	R 1432-20

Application:
Controlled extraction of solvent-contaminated exhaust air in the waste pipe. The adapter clicks into a bore with dia. 14 mm. If a longer line is required, the suitable antistatic corrugated tubing can be ordered in the desired length
(see Cat. No. R 774-14 on page 103).

b.safe Stopcocks

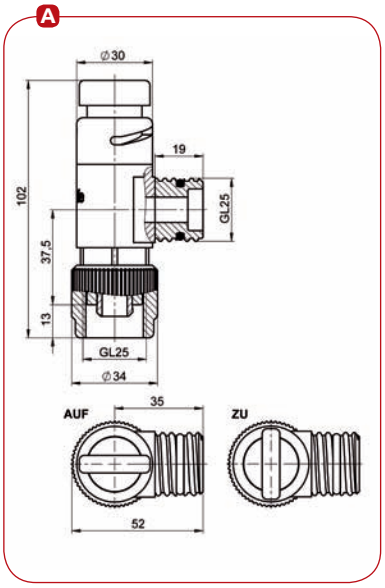
Material: **PE-EX** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very gppd** | Conductivity: **10^6 Ohm**

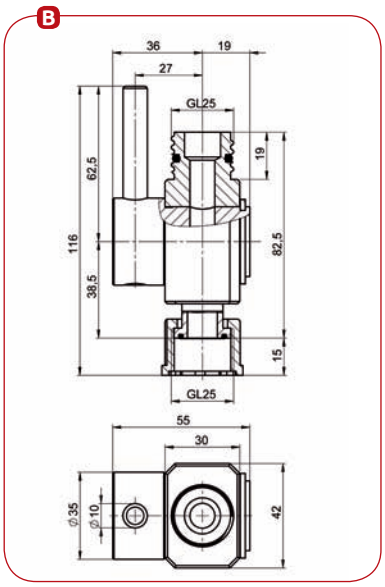
A Model Elbow: 90° elbow fitting made of static dissipative PE-EX with male GL 25 thread, permanently fixed union nut made of PPS-EX with female GL 25 thread and integrated stopcock to interrupt flow when canisters are to be exchanged or emptied. The innovative stopcock can be opened without effort, the locking function in the end positions helps to define opening or closing the passage.

B Model Straight: Connecting piece made of static dissipative PE-EX with male GL 25 thread, permanently fixed union nut made of PPS-EX with female GL 25 thread and integrated stopcock to interrupt flow. The grip position indicates if the passage is open or closed

	Model	Bore dia. mm	Outer dimensions L x D x H approx. mm	Cat. No.
A	Elbow	10	34 x 52 x 102	R 1201-05
B	Straight	10	42 x 55 x 116	R 1203-01

Application:
To connect b.safe Waste Tubes to b.safe Waste Caps GL25 without bending. No dripping from b.safe Waste Tubes during exchange of collection canisters.





b.safe APPROPRIATE

b.safe Waste Tubes Page 35
Flexible tube for introducing solvents into canisters.

b.safe Canisters

b.safe offers also suitable containers like flasks and canisters in addition to the wide range of Caps for the extraction of solvents and Waste Caps or Funnels for the collection of liquid waste. Unless otherwise indicated, all b.safe Canisters are supplied with UN-approval and can be used for the transport of hazardous goods.

In addition, we offer also accessories such as collecting trays, spouts and grounding cables, for dissipative canisters.

Just contact us for comprehensive advice: +49 9346 9286-0.

A selection of our range:

b.safe Information

All canisters with this marking are with UN-approval

b.safe Canister GL45,
see **Page 59**

b.safe Canister S55,
see **Page 59**

b.safe Canister S90,
see **Page 60**

b.safe Canister S60,
see **Page 60, 61**

b.safe Collecting Tray,
see **Page 62**

b.safe Canisters GL45 UN

Canister with GL45 thread (DIN45) for the collection of liquid waste. Version as per below chart.

	Volume liters	Dimensions Length x Width x Height mm	Material	Cat. No.
	2,5	150 x 110 x 210	PE-HD	R 205-02
	5,0	195 x 150 x 270	PE-HD	R 205-05
	10,0	225 x 190 x 300	PE-HD	R 205-10

b.safe Canisters S55 UN

Canister with S55 thread (DIN51) for the collection of liquid waste. Version as per below chart.

	Volume liters	Dimensions Length x Width x Height mm	Material	Cat. No.
	5	190 x 150 x 235	PE-HD	R 225-05
	10	230 x 195 x 235	PE-HD	R 225-10

b.safe Canisters S60 UN

Canister with S60/61 thread (DIN60/61) for the collection of liquid waste. Version as per below chart.

	Volume liters	Neck	Dimensions Length x Width x Height mm	Material	Cat. No.
A	5	straight	190 x 150 x 255	PE-HD	R 230-05
A	10	straight	220 x 190 x 340	PE-HD	R 230-10
A	20	straight	300 x 230 x 450	PE-HD	R 230-20
B	10	straight	220 x 190 x 340	PE-HD-EX	R 231-10
B	30	straight	360 x 235 x 450	PE-HD-EX	R 231-30
C	10	inclined	295 x 200 x 255	PE-HD-EX	R 236-10
C	20	inclined	295 x 200 x 495	PE-HD-EX	R 236-20

b.safe Canister S90 UN

Canister with thread S90 (DIN90) for the collection of liquid waste. Version as per below chart, canister S90 in PE-EX (handle not dissipative) with transparent stripe for observing the fill level.

	Volume l	Dimensions Length x Width x Height mm	Material	Cat. No.
A	10	195 x 195 x 370	PE-HD	R 265-10
B	10	195 x 195 x 370	PE-HD-EX	R 268-10

	Accessories	Description	Cat. No.
C	Grounding Strap for canister R 268-10	Stainless steel strap with tension lock for circumference 195 x 195 mm, grounding-cable 1,5 m and clamp.	R 265-10

UN

b.safe Information

All canisters with this marking are with UN-approval

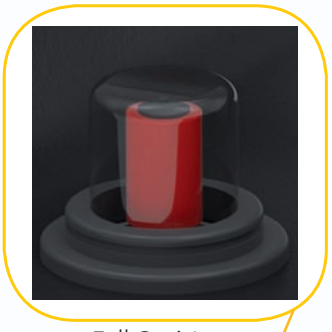
b.safe Canister with Level Indicator S60

Canister with S60/61 thread (DIN 60/61) for the collection of liquid waste with integrated indicator to monitor the level. The red visual pin goes up with increasing filling level. As soon as the visual pin fills the inspection glass completely, the canister is full and has to be exchanged. Version as per below chart.

	Volume liters	Neck	Dimensions Length x Width x Height mm	Material	Cat. No.
	10	inclined	295 x 200 x 255	PE-EX	R 237-10
	20	inclined	295 x 200 x 495	PE-EX	R 237-20

	Accessories	Version	Cat. No.
	Protection Cage for sight glass	Attachable break protection for the sight glass on the canister with integrated Level Indicator R 237-.., Packing Unit: 1 piece	R 247-10

Empty Canister



Full Canister

b.safe Collecting Trays

Collecting trays help to put aside e. g. Waste Caps or Funnels during container exchange without contaminating floor or working area through dripping liquids. In a worst-case scenario they collect escaping liquids from a damaged or spilling waste container and thus increase your own safety.
Corresponding to their installation site, you get b.safe Collecting Trays in PE or static dissipative PE-HD-EX.

Depending of the displacement volume of the canister, we recommend the following maximum number of b.safe Canisters per b.safe Collecting Tray:

Recommended maximum number of canisters for Collecting Tray R 540-01:
- 2x Canister 2,5 l / R 205-02
- 2x Canister 5 l / R 205-05, R 210-05, R 225-05, R 230-05
- 1x Canister 10 l / R 205-10, R 225-10, R 230-10, R 265-10

Recommended maximum number of canisters for Collecting Tray R 540-02:
- 5x Canister 2,5 l / R 205-02
- 3x Canister 5 l / R 210-05
- 2x Canister 5 l / R 205-05, R 225-05, R 230-05
- 2x Canister 10 l / R 205-10, R 225-10, R 230-10, R 265-10
- 1x Canister 20 l / R 230-20

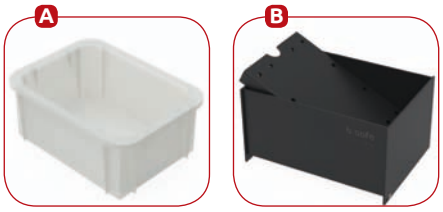
Recommended maximum number of canisters for Collecting Tray R 548-05:
- 1x Canister 10 l / R 231-10, R 236-10, R 268-10(as leakage tray)
- 1x Canister 20 l / R 236-20 (as splash guard tray)

Recommended maximum number of canisters for Collecting Tray R 548-10:
- 2x Canister 10 l / R 231-10, R 236-10, R 268-10
- 2x Canister 20 l / R 236-20 (as splash guard tray)
- 1x Canister 20 l / R 236-20 (as leakage tray)
- 1x Canister 30 l / R 231-30 (as splash guard tray)

b.safe Collecting Trays

Material: **PE, PE-EX** | Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good**

Practical collecting tray made of PE or static dissipative PE-EX. Place your waste canister in a collecting tray. Escaping liquids are collected in case of container exchange or leakages. Version and scope of delivery as per below chart.



	Dimensions L x W x H, mm inside	outside	Volume Litres	Material	With drip tray and grounding connection	Cat. No.
A	335 x 235 x 160	390 x 290 x 165	12	PE-HD	No	R 540-01
A	385 x 290 x 200	460 x 340 x 220	25	PE-HD	No	R 540-02
B	315 x 215 x 156	323 x 233 x 175	10	PE-HD-EX	Yes	R 548-05
B	435 x 315 x 156	443 x 333 x 175	20	PE-HD-EX	Yes	R 548-10

b.safe Professional Equiment for Fill Level Control

Equipping your canisters with b.safe SYSTEM Waste Caps is only the first step to a reliable fill level control. Only by connecting the waste caps to an alarm box you will receive an optic and acoustic alarm for an on-time exchange of the canister.

At b.safe System you have the choice between two alarm box models, either b.safe Display or b.safe Mini-Display.

The state-of-the-art b.safe Display is compatible with any version of b.safe SYSTEM Waste Caps (no matter if with or without pre-alarm) and allows to control centrally several HPLC units. With the version with 6 channels you are prepared also for future extensions. Additional comfort provides the possibility to snooze the alarm tone during the canister exchange.

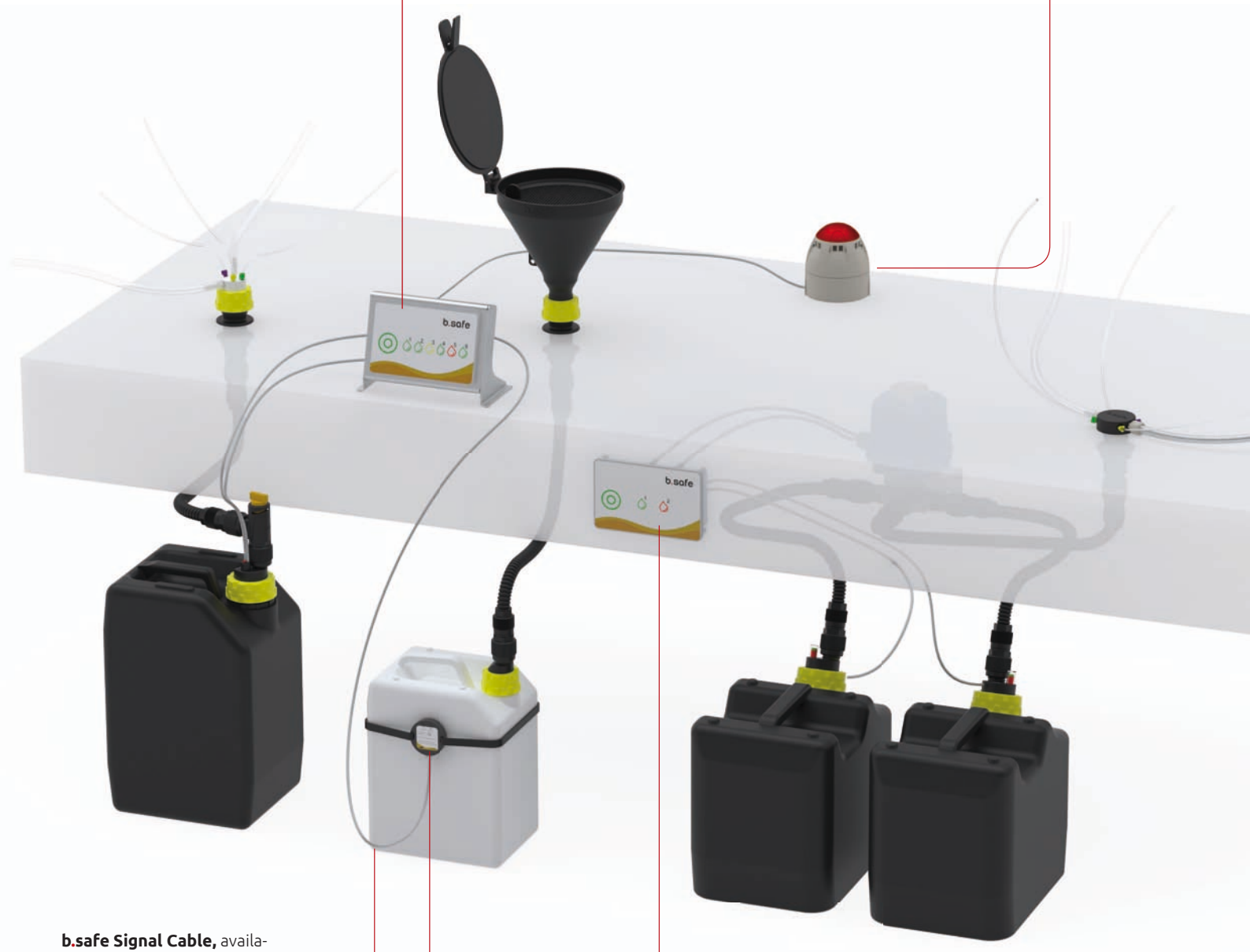
On the other hand, the b.safe Mini-Display is in terms of price the optimal basic solution for the local control of single HPLC units. Upon choosing the suitable version, you have to take into account which Waste Caps are used (either with or without pre-alarm) and that the Mini-Display is suitable for the control of max. 2 canisters.

Both models of the b.safe Alarm Boxes are available as version “Wall” for a fixed installation the front side of laboratory furniture or version “Table” for the use as desktop device.

The version “Splitter” is an exemption. As model b.safe Display as well as b.safe Mini-Display, it can solely be used for the control of a b.safe Splitter and to monitor 2 containers for automatic switching from a full to an empty container.

b.safe Display Table, safe stand on tables and worktops. **Page 72**
Alternative:
b.safe Mini-Display Table, Page 66

Combined Signal Device for additional optical and/or acoustic alarm in e. g. a remote room. **Page 77**



b.safe Signal Cable, available in different lengths for the connection of the b.safe Display
Page 83

b.safe Display Wall, for integration in the front side of laboratory furniture. **Page 74**

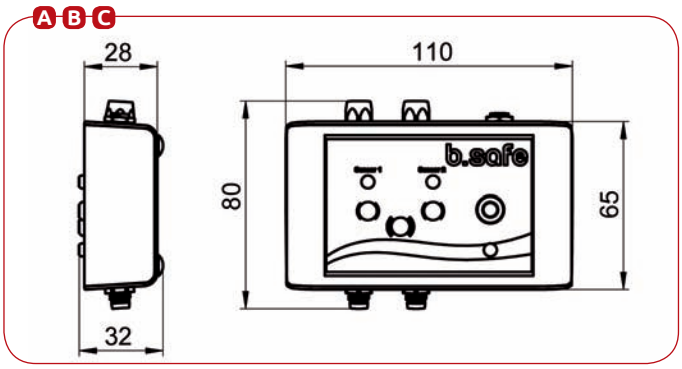
b.safe Disc Sensor, to be fixed on the outside of the canister in height of the max. fill level. **Page 82**

b.safe Mini-Display Table

Alarm box in plastic case. Front side with touch buttons and LED indicators to monitor the operation and the fill level of the connected sensors. Optical and acoustic main alarm starting when containers are full and stopping as soon as an empty container is confirmed. Available as 1 channel and 2 channel version, suitable for b.safe Waste Caps LC / System Waste Caps LC with main alarm, DLC version for b.safe Waste Caps DLC / System Waste Caps DLC with pre and main alarm. Including power supply (input: AC 100-240 V/50-60 Hz, 0,5 A, output: 24 V DC, 0,5 A) with plugs for EU, Australia, USA, Japan and UK.

	Version	No. of containers to be monitored	Outer dimensions of case, length x width x height, mm	Cat. No.
A	1-channel	1	110 x 65 x 30	R 659-01
B	2-channel	2	110 x 65 x 30	R 659-02
C	DLC	1	110 x 65 x 30	R 659-03

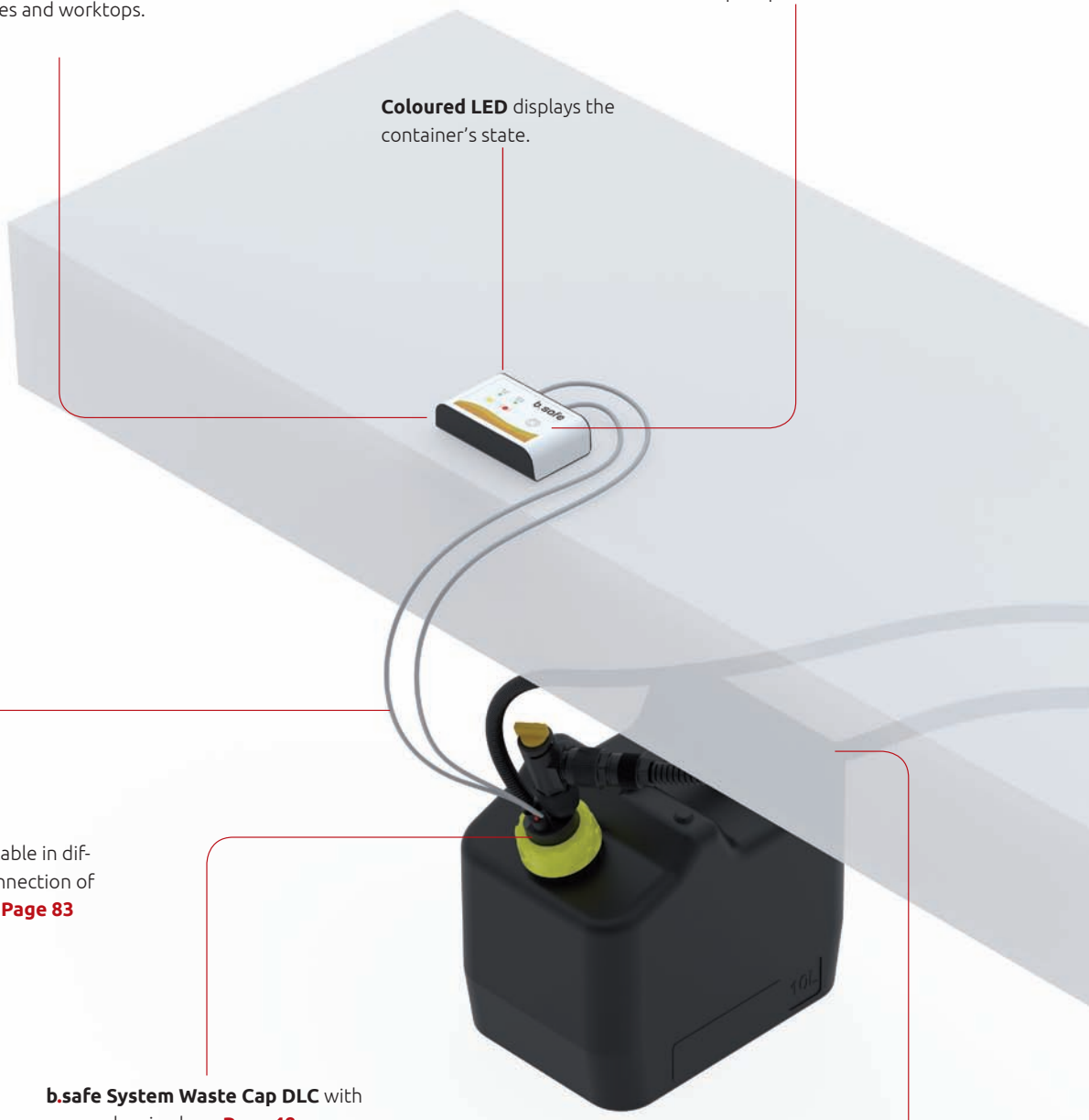
Application:
Display unit to monitor connected fill-level sensors in b.safe Waste Caps and b.safe System Waste Caps. Tight plastic case to place it in the work area. Easy operation via touch surface.



Compact plastic housing for the use on tables and worktops.

Touch surface for simple operation.

Coloured LED displays the container's state.



b.safe Signal Cable available in different lengths for the connection of the **b.safe Mini-Display**. **Page 83**

b.safe System Waste Cap DLC with pre- and main alarm **Page 48**

Flexible b.safe Waste Tubes can be adapted to any installation position **Page 34**

b.safe APPROPRIATE

b.safe Isolated Amplifier Page 80
For a safe signal transmission between explosion-proof areas and not-explosion-proof areas.

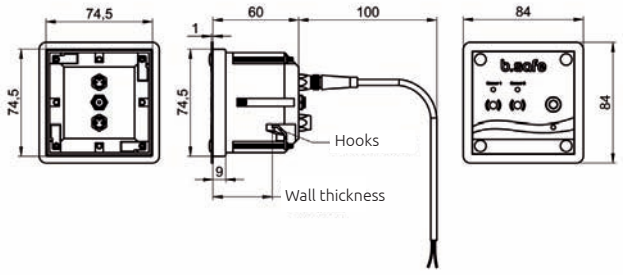
b.safe Mini-Display Wall

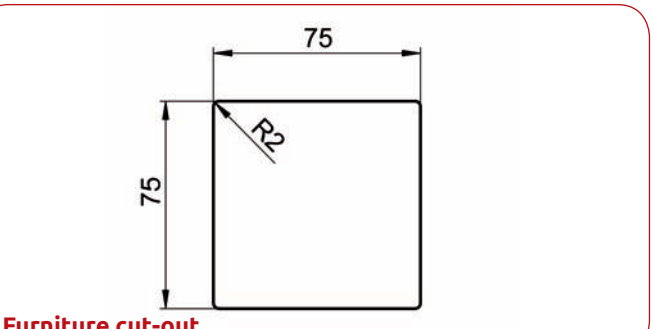
Alarm box with halogen-free plastic case for an installation in front plates of lab furniture. Front side with touch buttons and LED indicators to monitor the operation and the fill level of the connected sensors. Optical and acoustic main alarm starting when containers are full and stopping as soon as an empty container is confirmed. Available as 1 channel and 2 channel version, suitable for b.safe Waste Caps LC / System Waste Caps LC with main alarm, DLC version for b.safe Waste Caps DLC / System Waste Caps DLC with pre and main alarm. Including power supply (input: AC 100-240 V/50-60 Hz, 0,5 A, output: 24 V DC, 0,5 A) with plugs for EU, Australia, USA, Japan and UK.

	Version	No. of containers to be monitored	Outer dimensions of case, length x width x height, mm	Cat. No.
A	1-channel	1	84 x 84 x 70	R 658-01
B	2-channel	2	84 x 84 x 70	R 658-02
C	DLC	1	84 x 84 x 70	R 658-03

Application:
Display unit to monitor connected fill-level sensors in b.safe Waste Caps and b.safe System Waste Caps. Plastic case for an installation in front plates of lab furniture. Easy operation via touch surface.

A B C





Furniture cut-out

A


A


B


B

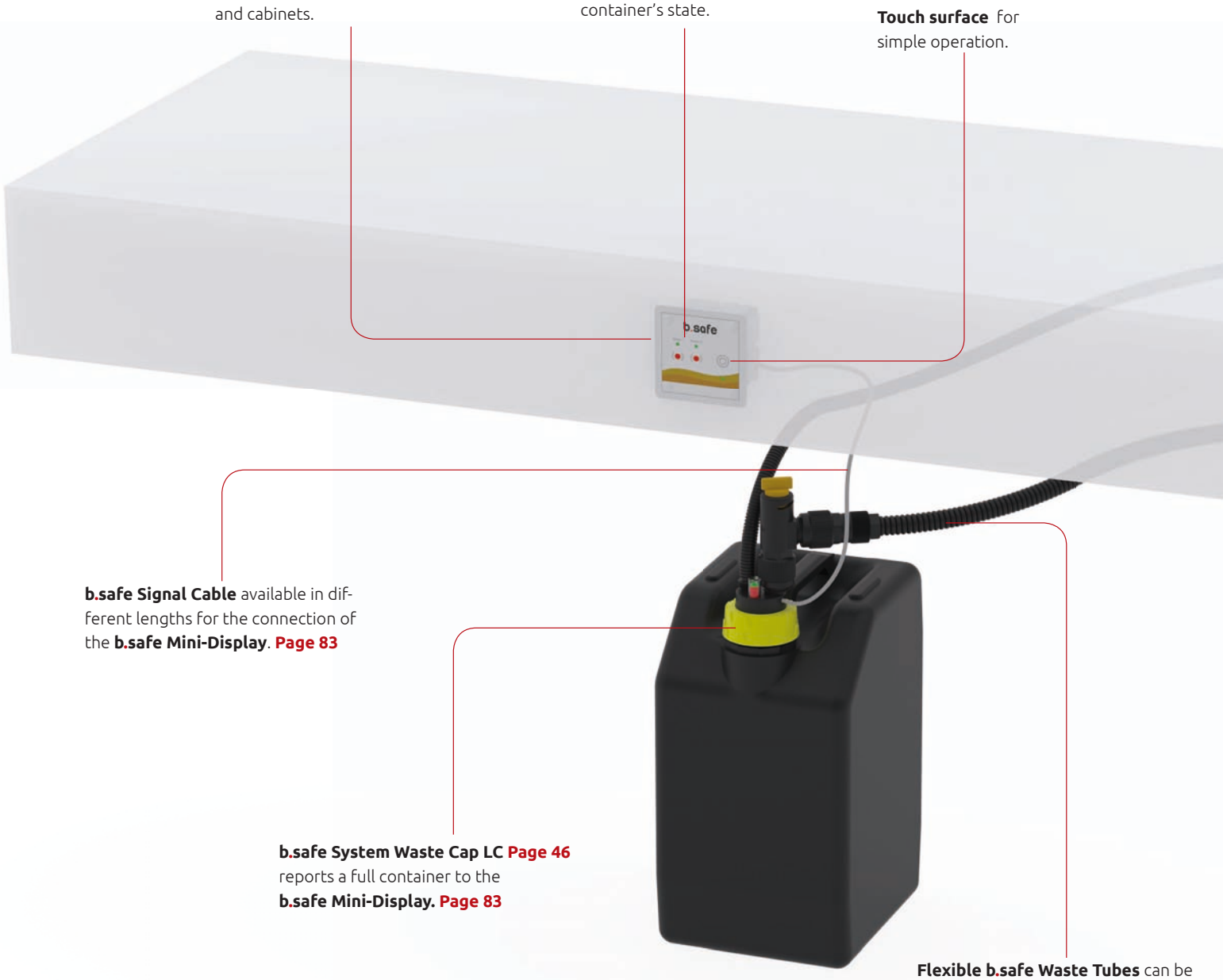

C


C


Housing for the integration in the front side of laboratory furniture and cabinets.

Coloured LED displays the container's state.

Touch surface for simple operation.



b.safe Signal Cable available in different lengths for the connection of the **b.safe Mini-Display**. **Page 83**

b.safe System Waste Cap LC Page 46 reports a full container to the **b.safe Mini-Display. Page 83**

Flexible b.safe Waste Tubes can be adapted to any installation position **Page 37**

b.safe APPROPRIATE

b.safe Isolated Amplifier Page 80
For a safe signal transmission between explosion-proof areas and not-explosion-proof areas.

b.safe Mini-Display Splitter

Alarm box with with touch buttons and LED indicators to monitor the operation and the fill level of the connected sensors. Programmed only to control the b.safe Splitter for monitoring 2 collection containers and an automatic switching from full to empty container. Only optical alarm when reaching the nominal capacity of container 1, optical and acoustic alarm when nominal capacity of both containers is reached. The acoustic alarm remains activated until an empty container is confirmed. Suitable for b.safe Waste Caps LC / System Waste Caps LC with main alarm. You can choose from 2 versions: “Wall” for an installation in front plates of lab furniture or “Table” with a case for tables. Including power supply (input: AC 100-240 V/50-60 Hz, 0,5 A, output: 24 V DC, 0,5 A) with plugs for EU, Australia, USA, Japan and UK.

	Version	No. of containers to be monitored	Outer dimensions of case, length x width x height, mm	Cat. No.
A	Table	2	110 x 65 x 70	R 659-04
B	Wall	2	84 x 84 x 70	R 658-04

Application:
Display unit to control the b.safe Splitter, which is available as an option in combination with connected fill-level sensors in b.safe Waste Caps and b.safe System Waste Caps. Aluminium case for an installation in front plates of lab furniture. Easy operation via touch surface. Special safety feature: the splitter function can use remaining volumes of full containers to prevent them from overflowing.

A

B

B

My ideas – my solution.

b.safe

New ideas professionally implemented

Create new things and forward the progress is the normal thing with b.safe! If existing solutions are not satisfying or I need support with new challenges, b.safe is my strong partner. Being manufacturer of customized products, the b.safe experts always have an open ear for my requirements and help to implement them in their innovative products.

b.safe System -stands for new products and constant improvement. From the idea to the final product.

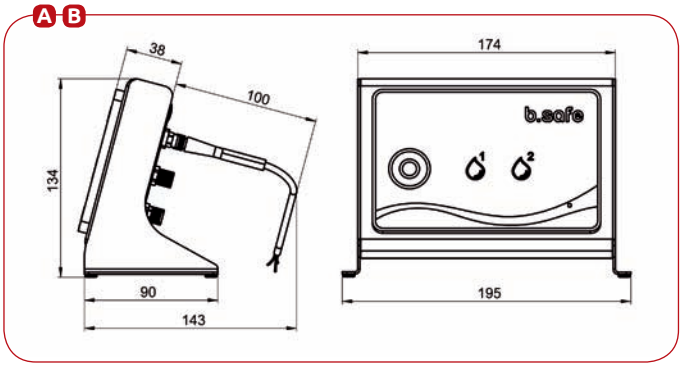
Sophisticated Safety Solutions for HPLC.

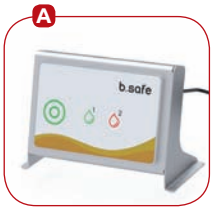
b.safe Display Table

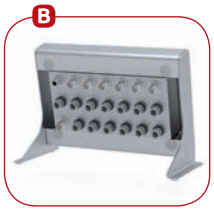
Alarm box with stainless steel case as stand-alone terminal. Front side with touch buttons and LED indicators to monitor the operation and the fill level of the connected sensors. Optical and acoustic main alarm when containers are full. The acoustic main alarm can be deactivated for 3 minutes until an empty container is confirmed. Suitable for b.safe Waste Caps LC / System Waste Caps LC with main alarm and b.safe Waste Caps DLC / System Waste Caps DLC with pre and main alarm. Including power supply (input: AC 100-240 V/50-60 Hz, 0,5 A, output: 24 V DC, 0,5 A) with plugs for EU, Australia, USA, Japan and UK.

	No. of channels	No. of containers to be monitored	Outer dimensions length x width x height, mm	Cat. No.
A	2	2	195 x 90 x 134	R 657-01
B	6	6	195 x 90 x 134	R 655-01

Application:
Display unit to monitor connected fill-level sensors in b.safe Waste Caps and b.safe System Waste Caps. Stainless steel case with foot to place it in the work area. Easy operation via touch surface.







Stainless steel housing with wide base for a safe stand on tables and worktops.

Touch surface for simple operation.

Coloured LED displays the container's state.

b.safe Signal Cable available in different lengths for the connection of the **b.safe Display**. **Page 83**

b.safe System Waste Cap DLC with pre- and main alarm. **Page 48**

Flexible b.safe Waste Tubes can be adapted to any installation position **Page 37**

b.safe APPROPRIATE

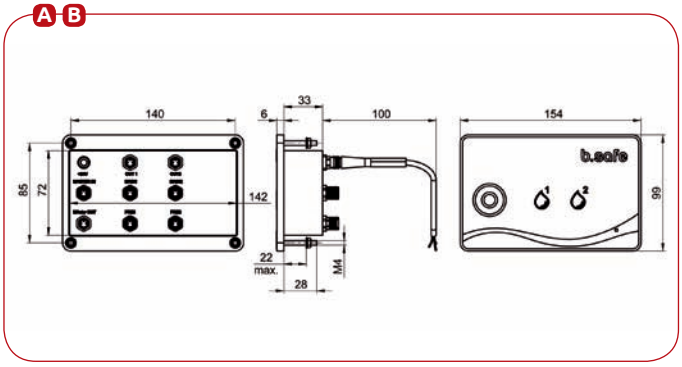
b.safe Combined Signal Device Page 77
For alerting in remote rooms.

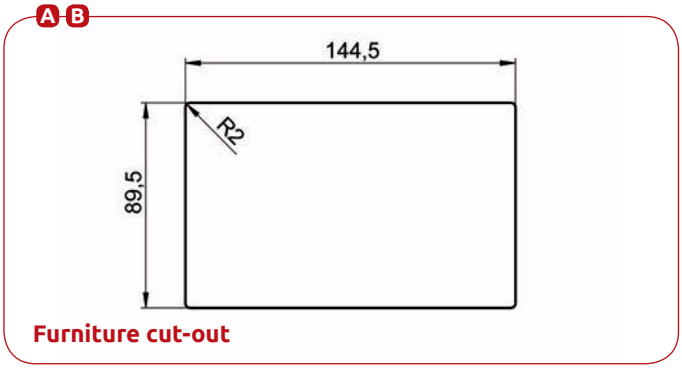
b.safe Display Wall

Alarm box with aluminium case for an installation in front plates of lab furniture. Front side with touch buttons and LED indicators to monitor the operation and the fill level of the connected sensors. Optical and acoustic main alarm when containers are full. The acoustic main alarm can be deactivated for 3 minutes until an empty container is confirmed. Suitable for b.safe Waste Caps LC / System Waste Caps LC with main alarm and b.safe Waste Caps DLC / System Waste Caps DLC with pre and main alarm. Including power supply (input: AC 100-240 V/50-60 Hz, 0,5 A, output: 24 V DC, 0,5 A) with plugs for EU, Australia, USA, Japan and UK.

	No. of channels	No. of containers to be monitored	Outer dimensions length x width x height, mm	Cat. No.
A	2	2	154 x 53 x 99	R 652-01
B	6	6	154 x 53 x 99	R 650-01

Application:
Display unit to monitor connected fill-level sensors in b.safe Waste Caps and b.safe System Waste Caps. Aluminium case for an installation in front plates of lab furniture. Easy operation via touch surface.



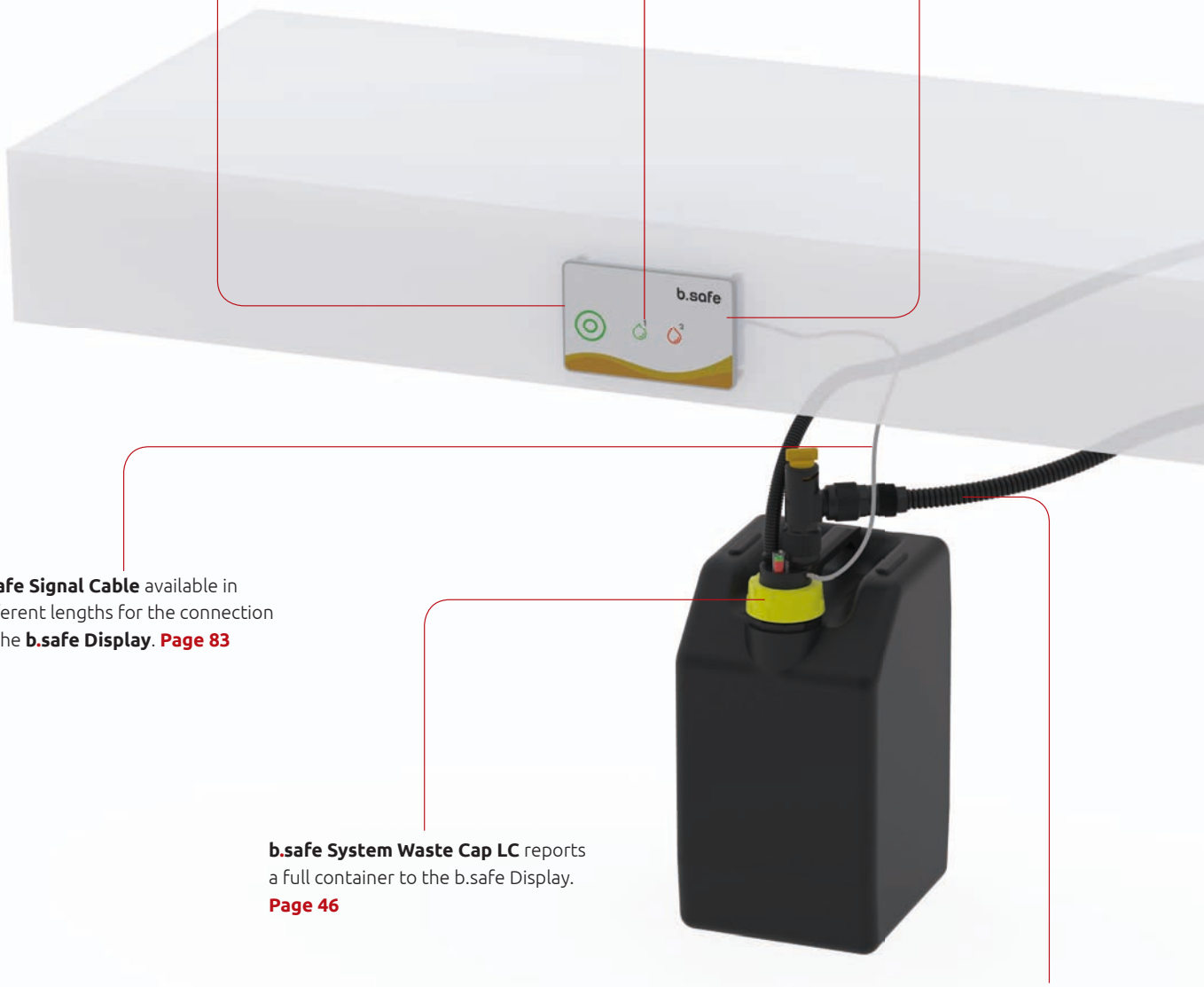


Furniture cut-out

Coloured LED displays the container's state.

For the integration in the front side of laboratory furniture and cabinets.

Touch surface for simple operation.



b.safe Signal Cable available in different lengths for the connection of the **b.safe Display**. **Page 83**

b.safe System Waste Cap LC reports a full container to the b.safe Display. **Page 46**

Flexible b.safe Waste Tubes can be adapted to any installation position. **page 34**

b.safe APPROPRIATE

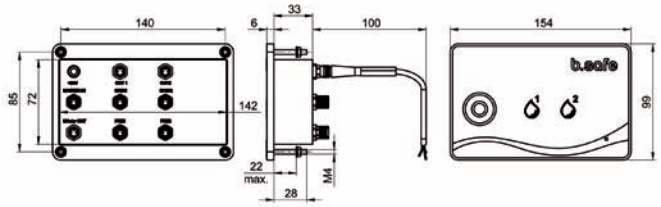
b.safe Isolated Amplifier Page 80
For a safe signal transmission between explosion-proof areas and not-explosion-proof areas.

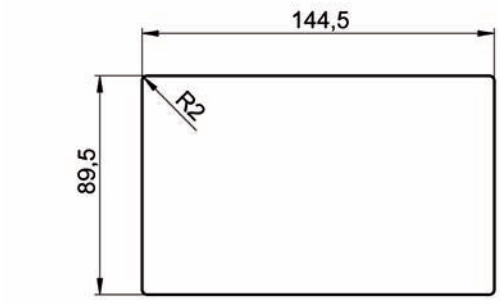
b.safe Display Splitter

Alarm box with aluminium case for an installation in front plates of lab furniture. Front side with touch buttons and LED indicators to monitor the operation and the fill level of the connected sensors. Programmed only to control the b.safe Splitter for monitoring 2 collection containers and an automatic switching from full to empty container. Only optical alarm when reaching the nominal capacity of container 1, optical and acoustic alarm when nominal capacity of both containers is reached. The acoustic main alarm can be deactivated for 3 minutes each until an empty container is confirmed. Suitable for b.safe Waste Caps LC / System Waste Caps LC with main alarm. Including power supply (input: AC 100-240 V/50-60 Hz, 0,5 A, output: 24 V DC, 0,5 A) with plugs for EU, Australia, USA, Japan and UK.

	No. of channels	No. of containers to be monitored	Outer dimensions length x width x height, mm	Cat. No.
	2	2	154 x 53 x 99	R 653-01

Application:
Display unit to control the b.safe Splitter, which is available as an option in combination with connected fill-level sensors in b.safe Waste Caps and b.safe System Waste Caps. Aluminium case for an installation in front plates of lab furniture. Easy operation via touch surface. Special safety feature: the splitter function can use remaining volumes of full containers to prevent them from overflowing.

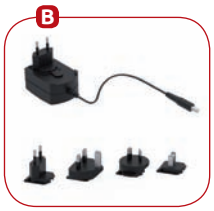




Furniture cut-out

Accessories and spare parts for b.safe Display

Compatible accessories for all versions of b.safe Display



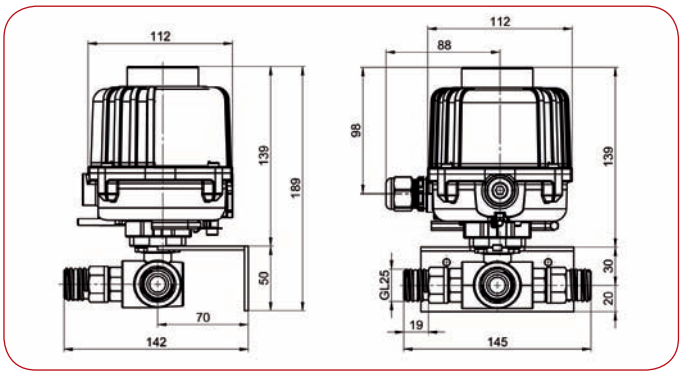
Description		Characteristics	Cat. No.
Combined Signal Device	A	Combinable alarm signal with red LED flashlight and additional siren (continuous tone) that can be used in a separate room or at high noise levels. Depending on the connected output socket at the b.safe Display it can be used as single alarm or to monitor several containers. IP65-protected housing made of ABS, housing O.D. approx. dia. 90 x height 97 mm. Including power supply (input: AC 100-240 V/50-60 Hz, 5,5 A, output: 24 V DC, 0,5 A) and plugs for EU, Australia, USA, Japan and UK.	R 635-01
Power supply	B	Input: AC 100-240 V/50-60 Hz, 5,5 A, output: 24 V DC, 0,5 A) with plugs for EU, Australia, USA, Japan and UK	R 621-01

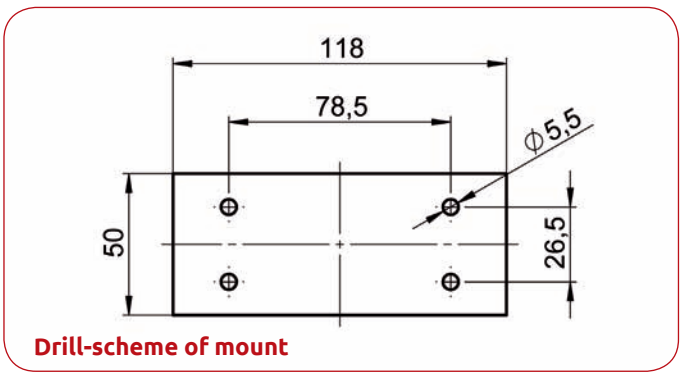
b.safe Splitter

3-Way stopcock with stainless steel casing and integrated control module. Incl. 2 mounted signal cables(length 2 m), power supply (input: 100-240 V/1,2 A, output: 24 V/max. 1,75 A, cable: 1,3 m) and wall mounting bracket made of aluminium. Connection thread GL25 to install b.safe Waste Tubes. In combination with either a b.safe Mini-Display Splitter (Cat.-No. R 658-04/R 659-04) or a b.safe Display Splitter (Cat. No. R 653-01) and b.safe Waste Caps with electronic filling level monitoring, the b.safe Splitter allows an automatic filling of two canisters subsequently at one solvent collection point. The b.safe Splitter has to be installed by qualified personnel.

	Outer dimensions L x W x H approx., mm	Connection thread		Cat. No.
	L x W x H approx., mm	3x GL25 male		R 680-01

Application:
Automatic switching from full to empty collection canister to prevent them from overflowing. Ideal to lead large waste volumes that occur in preparative HPLC safely in canisters that are easy to handle. Special safety feature: in case of a malfunction, the splitter function uses remaining volumes in full canisters to prevent them from overflowing. The use of filling level monitoring devices of other brands with a b.safe Splitter has to be checked individually.





Drill-scheme of mount

b.safe Desktop Mount Multiport
allows a direct connection of capillaries and tubing to the waste disposal system.
Page 26

Indicates the canister's status and reports full canisters:

b.safe Mini-Display Splitter
Page 70
or
b.safe Display Splitter
Page 76

The 3-way-valve **b.safe Splitter** changes the valve position once the canister is full so that the waste is led into the empty canister and spillage is prevented.

Flexible **b.safe Waste Tubes** can be adapted to any installation position. **Page 34**

b.safe Signal Cable available in different lengths for the connection of the b.safe Display. **Page 83**

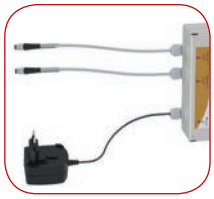
b.safe System Waste Caps LC
reports a full container to the b.safe Display. **Page 46**

b.safe APPROPRIATE

b.safe Waste Tube Smooth Page 35
Flexible tube with smooth inner surface for a drain without residues.

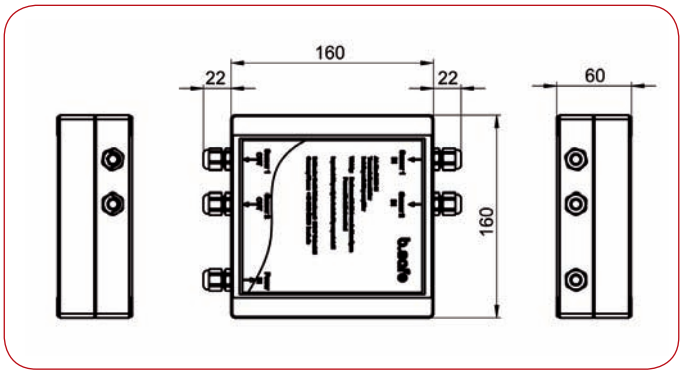
b.safe Isolated Amplifier

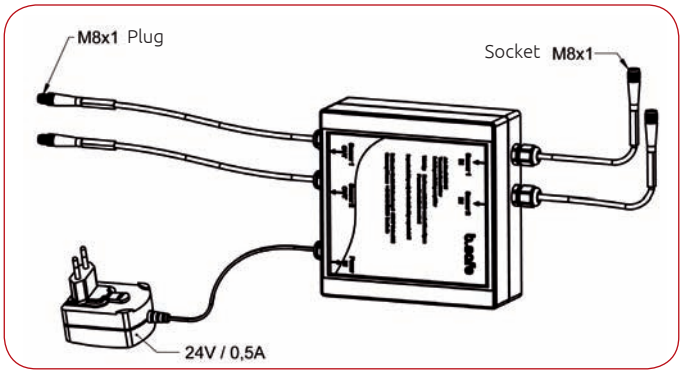
Delivered in ready-to-assemble plastic housing made of ABS (IP66) that prevents unintentional contact of live parts. With clearly labelled screw connections to connect up to 2 b.safe Level Sensors and to operate them safely in explosion-proof areas. Incl. power supply (90-264 V / 47-63 Hz) with plug adapter for EU, Australia, USA, Japan, and UK. The installation of b.safe Isolated Amplifier and the connection of the signal cable has to be carried out by qualified personnel.



	Outer dimensions mm			Cat. No.
	160 x 160 x 60			R 660-01

Application:
Encapsulated housing for an installation e. g. at the rear side of a safety cabinet. Safe signal exchange between explosion-hazardous and explosion-proof areas by galvanic isolation of the sensor side and the output side. By using the b.safe Isolated Amplifier in the explosion-proof area, its electronic alerting system prevents ignitable sparks from arising in the explosive atmosphere around the sensors. Combined with the b.safe Display, the b.safe Isolated Amplifier enables an automatic recognition of sensors that are not connected or damaged as well as line breaks. The use of a b.safe Isolated Amplifier with filling level monitoring devices of other brands has to be checked individually.

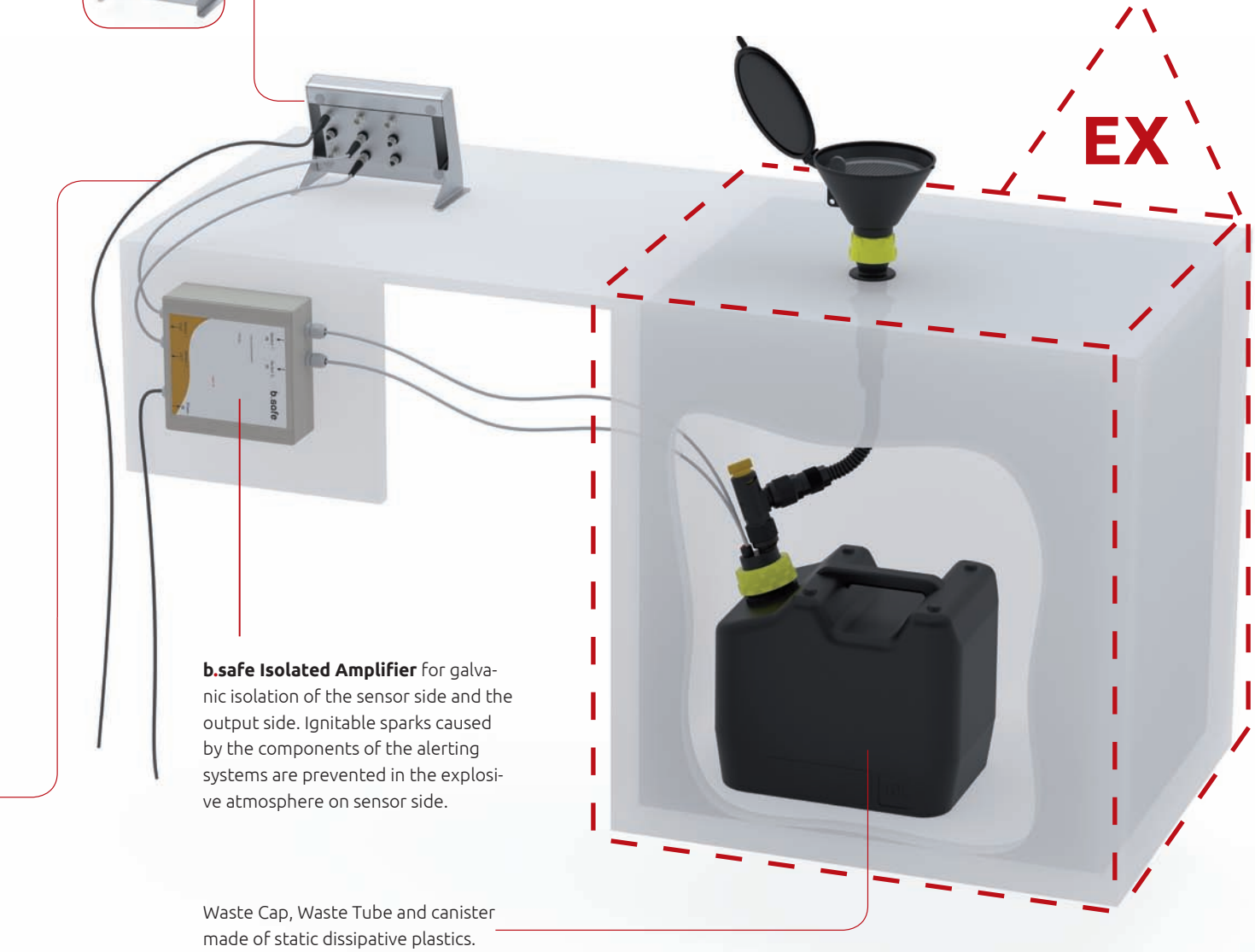




By connecting a **b.safe Isolated Amplifier** to a b.safe Display, damaged or not properly connected cabels and sensors as well as line breaks can be recognized.

With optical and acoustic alarm for full canisters:

b.safe Mini-Display Wall
Page 68
or
b.safe Display Table
Page 72



b.safe Isolated Amplifier for galvanic isolation of the sensor side and the output side. Ignitable sparks caused by the components of the alerting systems are prevented in the explosive atmosphere on sensor side.

Waste Cap, Waste Tube and canister made of static dissipative plastics.

b.safe WE CAN HELP

All products of b.safe SYSTEM can be built in by technically experienced staff.

This can for example be the user, a house technician, specialized lab furniture makers or the in-house assembly team of Bohlender GmbH.

Please don't hesitate to contact us if you're not capable to make the assembly according to our detailed operating instructions. We can help! Better b.safe!

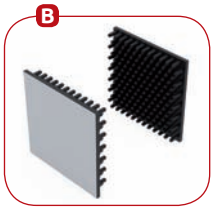
b.safe Disc Sensor

Optionally for fill level or empty level control in containers and canisters made of non-conductive materials. The sensor is attached to the outside of the container with the included fastening material (adhesive hook-and lock strips or hook-and lock tape) at the height of the level to be monitored. Via a Signal Cable (Cat. No. R 645-.., page 83), the sensor is connected with an alarm box (b.safe Mini Display, page 66-68 or b.safe Display, page 72-74). The signal cable is not included in the delivery. Not suitable for use in explosive areas or with an Isolated Amplifier.

	Type of connection			Cat. No.
	Plug			R 640-05

Application:
Avoid spill over of canisters by connecting the Disc Sensor to a b.safe Mini-Display (page 66-68) or a b.safe Display (page 72-74) for electronic level control. Signal Cables (Cat. No. R 645-..) to connect the Disc Sensor with an alarm box are available separately, see page 83.

Accessories and spare parts for b.safe Disc Sensor

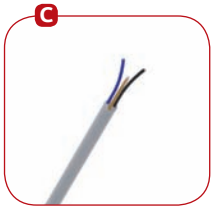


Spare part		Description	Cat. No.
Hook-and-loop tape	A	Hook-and-loop tape, width 10 mm x length 2 m. Simply thread the tape into the side brackets of the Disc Sensor. If necessary, it can be cut depending on the size of the container. When the container is full, the tape can be removed and attached to the next container.	R 647-02
Hook-and-loop Strips	B	Two-piece adhesive hook-and-loop strips, width 25 x length 25 mm. One piece with self-adhesive back can be stuck outside of the container, the second on the rear side of the Disc Sensor without covering the sensor surface. By means of hook-and-loop, the sensor is attached to the container. For emptying, the sensor can easily be removed and afterwards attached again to its correct position.	R 648-01

b.safe Signal Cables

To connect e.g. Waste Caps with electronic fill level control or sensors to a b.safe Display to monitor the fill level.

	Cable length m	Connection 1	Connection 2	Cat. No.
	2	A socket	B plug	R 645-02
	3	A socket	B plug	R 645-03
	5	A socket	B plug	R 645-05
	10	A socket	B plug	R 645-10
	0,3	A socket	C braids	R 644-07
	2	A socket	C braids	R 644-12
	2	B plug	C braids	R 643-12



b.safe WE CAN HELP

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This can for example be the user, a house technician, specialized lab furniture makers or the in-house assembly team of Bohlender GmbH.

Please don't hesitate to contact us if you're not capable to make the assembly according to our detailed operating instructions. We can help! Better b.safe!

b.safe Direct Filling System

The b.safe Direct Filling System is a highly specialized solution for the disposal of especially viscous liquids or liquid waste with solid contents.
Only a b.safe Funnel with hinged lid and the b.safe Mini Display for controlling the filling level of your waste canister are visible in the working area of your hood. The funnel is fixed directly over a safety cabinet T90.
The funnel is connected to a telescopic disposal tube made of stainless steel. With this vertical connection, waste is led with a high flow rate directly into the container.

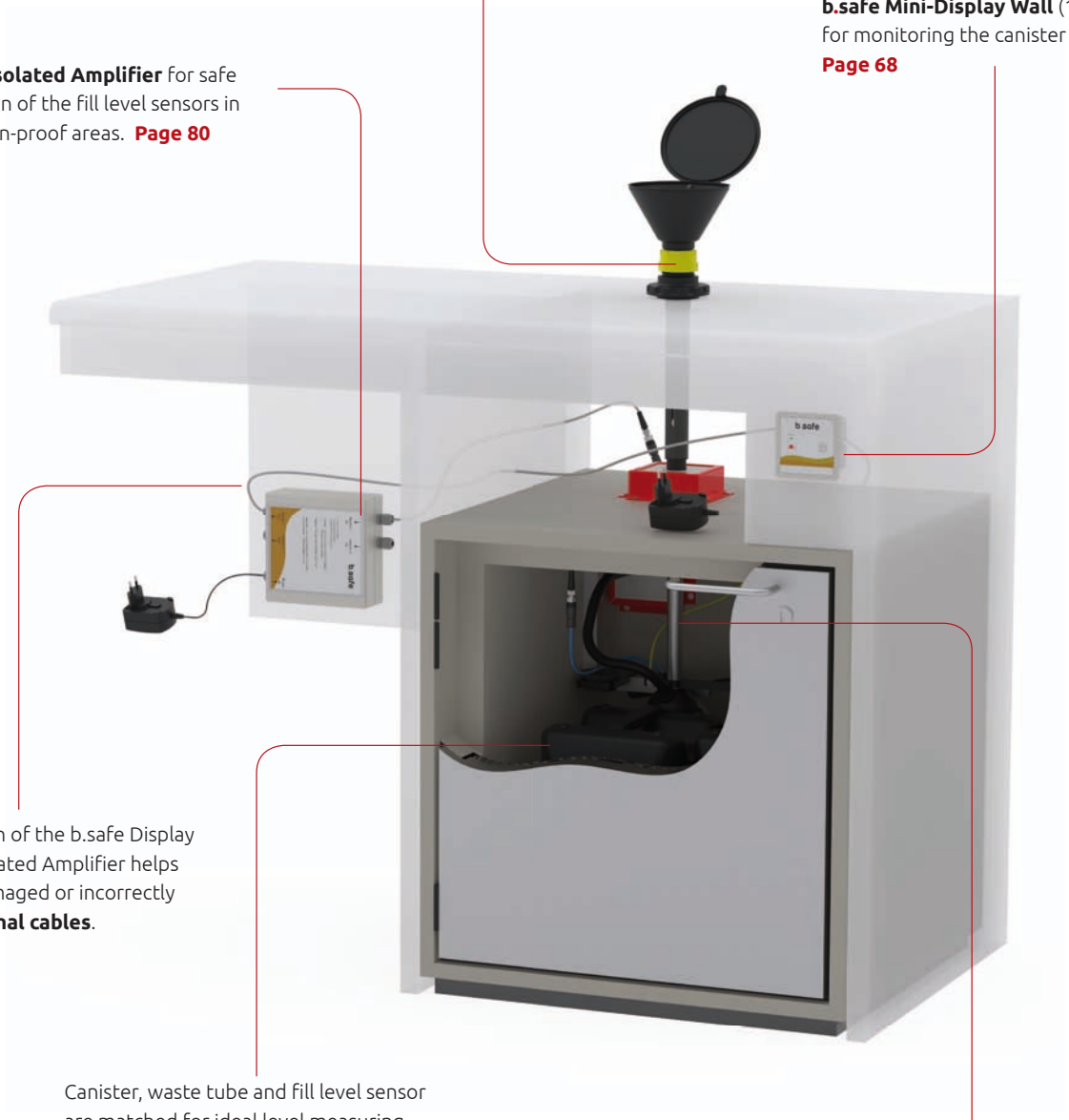
The lower end of this waste tube is provided with the canister cap with fill level sensor and vent hose. The vapors which occur during filling of the canisters are directly sucked here.
For changing the canister, the lock-nut on the worktop has to be released and the telescopic disposal tube automatically moves upwards by spring force. This mechanism lifts the canister cover and a collecting vessel is placed automatically under the tube. Dripping down liquid rests are collected directly.

Since the sensors for fill level control are integrated in the canister cap, the full container can be exchanged by an empty standard canister S60.
All parts of the Direct Filling System are suitable for the use in explosion-proof environments and prepared for installation on site.

Connection compatible with all **b.safe Funnels** with GL45 thread. **Page 68**

b.safe Mini-Display Wall (1-channel) for monitoring the canister fill level. **Page 68**

b.safe Isolated Amplifier for safe operation of the fill level sensors in explosion-proof areas. **Page 80**



The connection of the b.safe Display to a b.safe Isolated Amplifier helps to identify damaged or incorrectly connected **signal cables**. **Page 83**

Canister, waste tube and fill level sensor are matched for ideal level measuring.

Vertical discharge of waste – waste tube is drained completely.

b.safe Direct Filling System

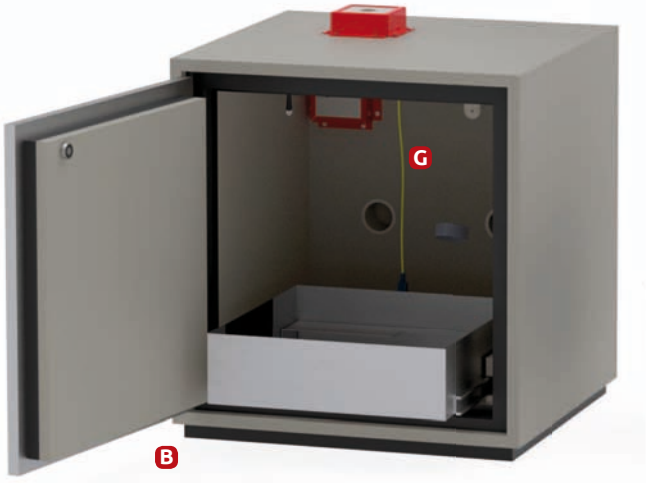
Highly specialized system for the disposal of especially viscous liquids or liquid waste with solid contents.

	Door	Number of connectable containers	Outer dimensions of safety cabinet w x d x h, mm	Cat. No.
	Left-hinged	1x 10 l	593 x 574 x 630	R 1500-05

Application:
For the safe disposal of all kinds of liquid waste.

Scope of delivery:

- **A** b.safe Funnel 130 made of static dissipative PE-EX with GL 45 cap, hinged lid and sieve
- **B** Safety base cabinet T90 in colour RAL7035 (light grey), outer dimensions: W 593 x D 574 x 600 mm, all passages in fire protection compliant design
- **C** Telescopic disposal tube made of stainless steel for working height 90 cm with lock nut, canister lid, capacitive fill level sensor, vent hose and collecting vessel
- **D** b.safe Isolated Amplifier including power supply, for more details see Cat. No. R 660-01 on page 80
- **E** b.safe Mini-Display Wall (1 channel) including power supply, for more details see Cat. No. R 658-01 on page 68
- **F** Signal cable for connecting fill level sensor to b.safe Isolated Amplifier and b.safe Mini-Display
- **G** Grounding cable
- **H** Two b.safe Canisters S60, volume 10l, made of static dissipative PE-EX, Cat. No. R 236-10

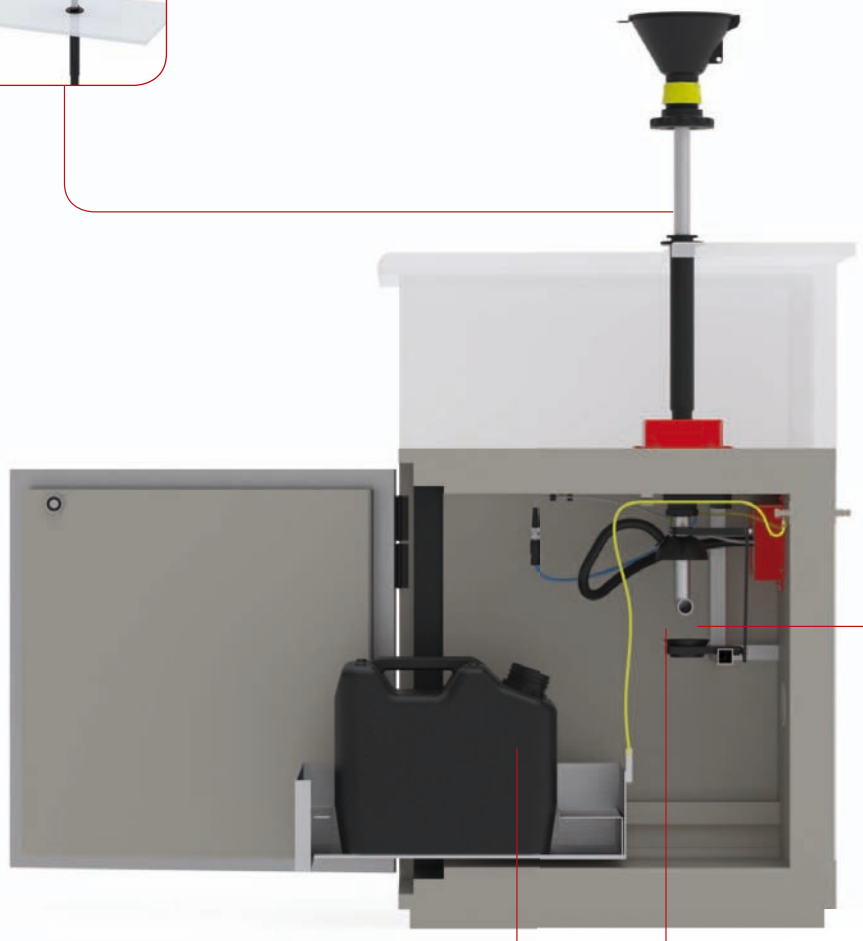


Telescopic disposal tube with automatic spring mechanism

Bottom tube position: canister is connected, discharge possible

Top tube position: canister is not connected, no discharge possible.

Automatically extending drip tray collects dripping down liquid rests from the tube



Fill level sensors integrated in canister lid, use of standard canisters is possible.

Immersion depth suitable for canister S60 with inclined neck and 10 l nominal volume.

Sophisticated Safety Solutions – custom made!

You are looking for a solution exactly adapted to your application?

As a manufacturing company, we can make products to your specifications. This is easier, quicker and often more economic than you may expect.
Contact our experts – we give advice and support already starting with the construction and production as per your requirements and in compliance with the chosen raw materials – already from 1 piece.

We only need a drawing (a sketch is sufficient) and some further information.

You have a special request?
www.bsafe.de or **+49 (0) 93 46-92 86-0**

Also made by Bohlender.

TIP

Desiccators and Drying Cabinets from sicco

Stable, functional, custom-made - for dust-free storage in dry or inert atmosphere.

Ask for your catalogue or get more information:

www.sicco.de

b.safe Waste Pipes-System

The b.safe Waste Pipe System is a rigid piping system consisting of straight Waste Pipes, which are connected with suitable fittings. With this fixed installed system, liquid solvent wastes can be led directly from the HPLC device into the collecting canister.

The single pipe is connected by simply pushing it into the lock nut of the joining piece. By turning the nut, the pipe will be held firmly and tightly by the internal clamp ring.

The combination possibilities for the connectors, like e.g. elbow, pipe bend, allow many different installations. Using T-connections, disposal points and HPLC devices can be integrated into the Waste Pipe System via e. g. b.safe Waste Tubes or b.safe Sytem Caps.

Particularly innovative is the corresponding system for table and wall mounting. Angle supports made of steel plates are slip-proof mounted on a table, wall mounts can directly be fixed on appropriate, vertical surfaces. The Waste Pipes are fixed on the mountings by means of special magnet holders. With the magnets, the lines can easily be adjusted in height to achieve the necessary slope.

At the end of the line you will find a collecting canister. It's fill level can be monitored by means of a b.safe Waste Cap for fill level control and a b.safe Display.

Lock nut and internal clamp ring provide a strong and tight connection.

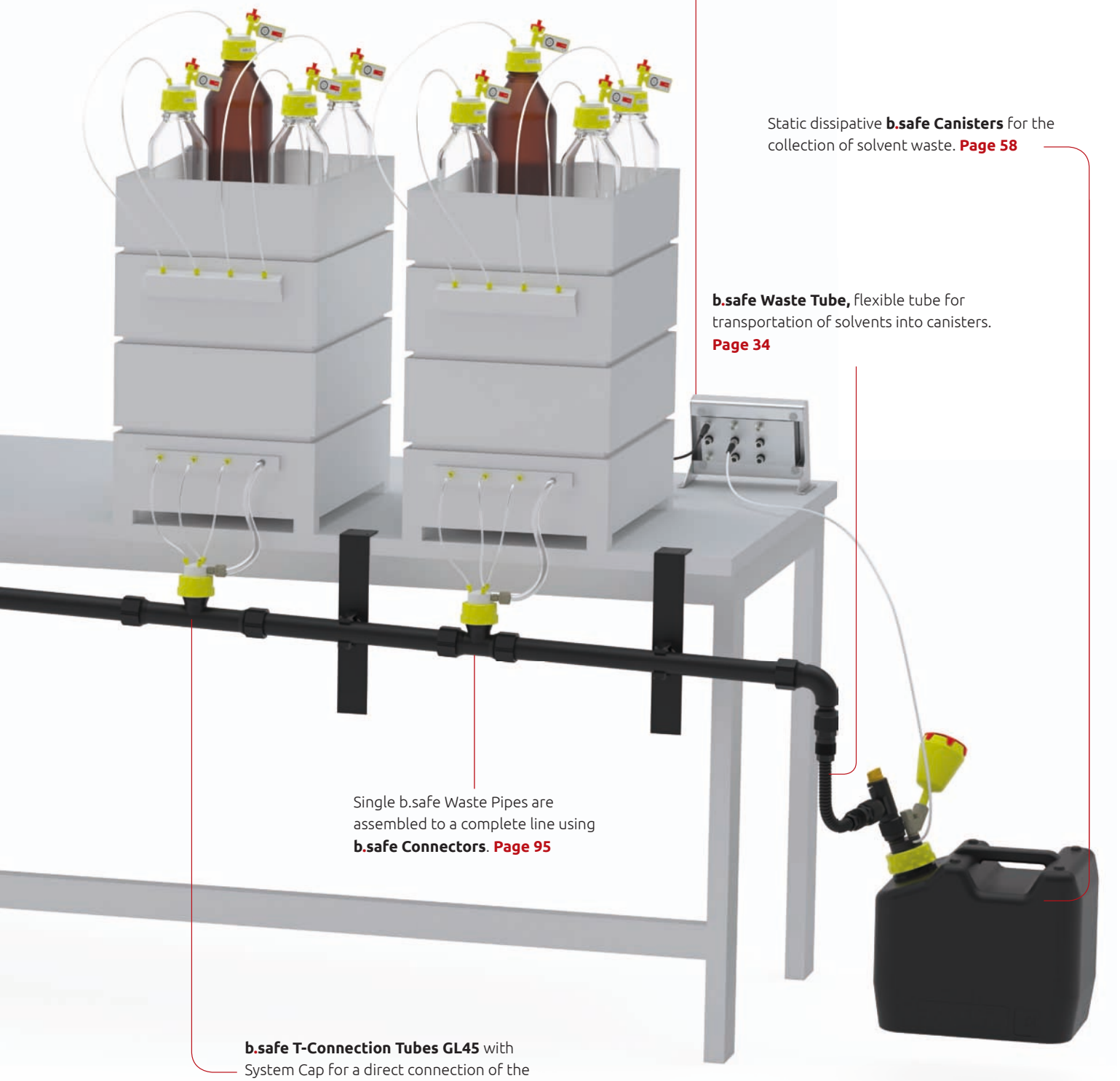
b.safe Magnet Holder: Waste pipes are just clipped into the pipe clamp and adjusted in height to achieve the necessary slope. **Page 99**

b.safe Funnel for a direct disposal of waste e. g. of sample preparation. **Page 22**

Monitor the fill-level of the collecting canister with a **b.safe Display / b.safe Mini Display**. **Page 66-74**

Static dissipative **b.safe Canisters** for the collection of solvent waste. **Page 58**

b.safe Waste Tube, flexible tube for transportation of solvents into canisters. **Page 34**



Single b.safe Waste Pipes are assembled to a complete line using **b.safe Connectors**. **Page 95**

b.safe T-Connection Tubes GL45 with System Cap for a direct connection of the disposal lines from a HPLC device. **Page 96**

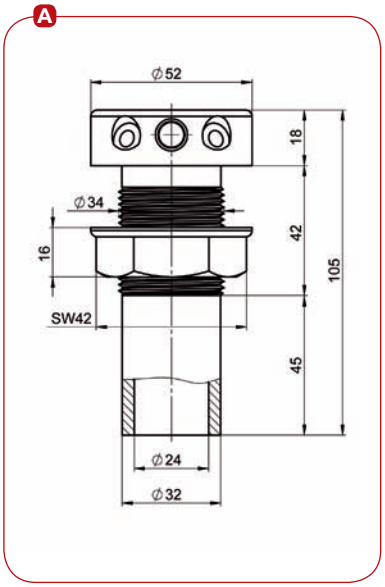
b.safe Desktop Mount Multiport for Waste Pipes

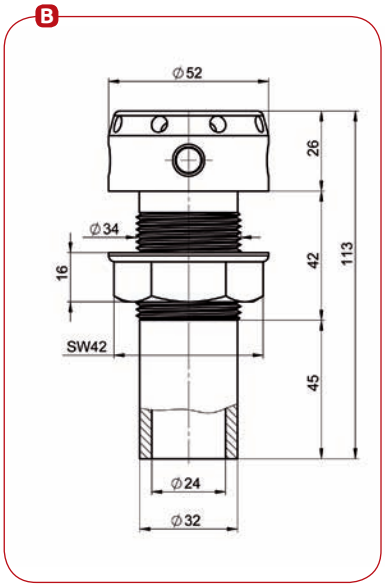
Material: **PE-EX**| Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

Made of static dissipative PE-EX, suitable for tiles with a thickness of 10 to 35 mm and bore dia. 35 mm, easy fixing by counter nut. Low installation height due to connections at the sides, all threads are inclined to provide additional sloping and connection of tubes without bending.
Max. connections at upper side: 4x2 capillaries (female thread UNF 1/4“) to connect capillaries with b.safe fittings, 4x1 tube connection (female thread NPT 1/8“) for hose connectors. Fittings and hose connectors are not included in the scope of delivery.
Connections at bottom: O.D. 32 mm for direct connection with rigid b.safe Pipe Connections.

	Connection lower side	Total length mm	No. of capillary connections	No. of tube connections	Cat. No.
A	O.D.-Ø 32 mm	105	4 x UNF 1/4“	2 x NPT 1/8“	R 1127-02
B	O.D.-Ø 32 mm	105	8 x UNF 1/4“	4 x NPT 1/8“	R 1127-04

Application:
One connection for up to 2 HPLC systems that can be integrated directly in laboratory hoods or working tables. b.safe Waste Tubes lead liquid solvent waste directly into connected canisters.





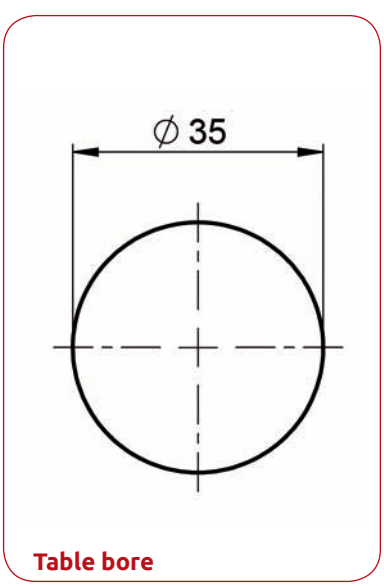


Table bore

Compact design for low installation height

Alternatively compatible with **b.safe Corrugated Tubing Coupling** for leak free connection of corrugated tubing **Page 110**

Inclined thread for additional sloping to avoid backflow.

Tube connection dia. 32 mm for direct connection to the b.safe Waste Pipe System.

Different types of **hose connectors** for safe connection of different tubing diameters **Page 112**

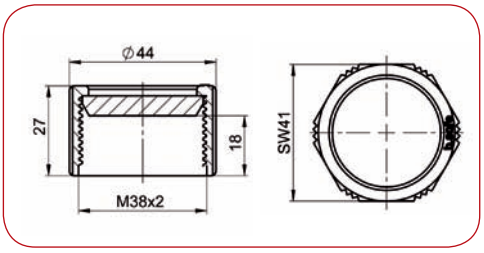
b.safe WE CAN HELP

All products of b.safe SYSTEM can be built in by technically experienced staff.

This can for example be the user, a house technician, specialized lab furniture makers or the in-house assembly team of Bohlender GmbH.

Please don't hesitate to contact us if you're not capable to make the assembly according to our detailed operating instructions. We can help! Better b.safe!

b.safe Blind Caps for Waste Pipes

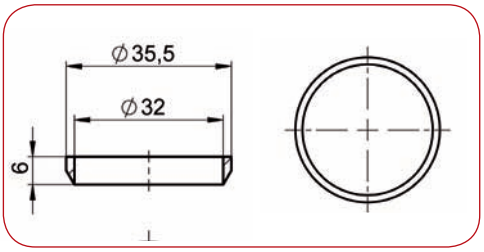


Material: **PE-EX, PTFE-EX**| Temperature resistance: **-50 °C to +80 °C** | Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

Cap made of PE-EX with pressed-in conical sealing plate made of static-dissipative PTFE-EX. Suitable sealing cap for clamp connections for tube O.D. 32mm.

	For thread			Cat. No.
	M38x2			R 1160-05

b.safe Sealing Ring for Waste Pipes



Material: **PE-EX, PTFE-EX**| Temperature resistance: **-50 °C to +80 °C** | Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

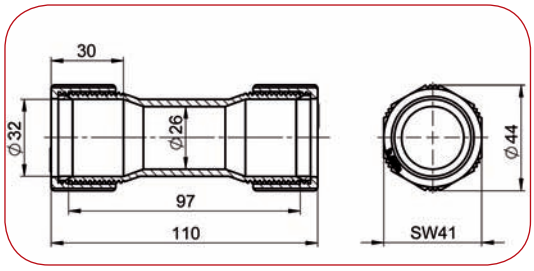
Conical sealing ring made of static dissipative PTFE-EX. Suitable spare part for clamp connections for tube O.D. 32 mm.

	O.D., mm	I.D., mm	Height mm	Cat. No.
	35,5	32	6	R 1161-01

b.safe Connector

Material: **PE-EX, PTFE-EX**| Temperature resistance: **-50 °C to +80 °C** | Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

Straight connector made of static dissipative PE-EX with lock nuts and clamp rings on both sides for fixing and clamping b.safe Waste Pipes with O.D. 32 mm.

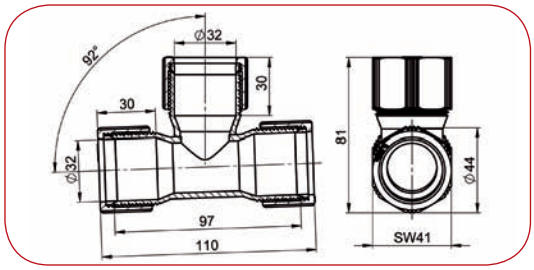


	Shape	Connections	Dimensions L x Ø mm	Cat. No.
	Straight	2 x Clamp connections for O.D. 32 mm	110 x 44	R 1172-01

b.safe T-Connection Tubes

Material: **PE-EX, PTFE-EX**| Temperature resistance: **-50 °C to +80 °C** | Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

T-shaped connector made of static dissipative PE-EX with 3 x union nut and clamp ring to insert and clamp b.safe Waste Pipes with O.D. 32 mm.

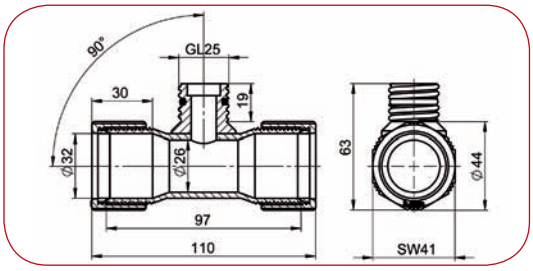


	Shape	Lateral connections	Central connection	Total length mm	Cat. No.
	T	2x clamp connection for O.D. 32 mm	clamp connection for O.D. 32 mm	110	R 1192-01

b.safe APPROPRIATE

b.safe Waste Pipes Page 99
Cuttings of static dissipative PE tubes to build up a modular pipe system for the disposal of solvents.

b.safe T- Connection Tubes GL25

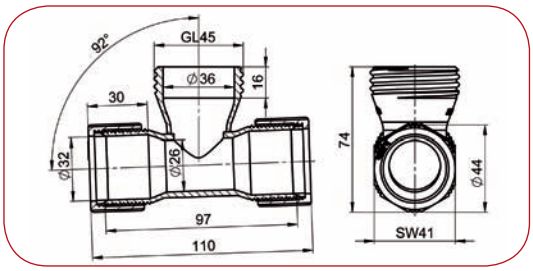


Material: **PE-EX, PTFE-EX**| Temperature resistance: **-50 °C to +80 °C** | Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

T-shaped connector made of static dissipative PE-EX, lateral connections with union nut and clamp ring to insert and clamp b.safe Waste Pipes with O.D. 32 mm. Central connection with male thread GL25 to mount e.g. b.safe Waste Tubes.

	Shape	Lateral connections	Central connection	Total length mm	Cat. No.
	T	2x clamp connection for O.D. 32 mm	GL25 male	110	R 1190-01

b.safe T- Connection Tubes GL45



Material: **PE-EX, PTFE-EX**| Temperature resistance: **-50 °C to +80 °C** | Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

T-shaped connector made of static dissipative PE-EX, lateral connections with union nut and clamp ring to insert and clamp b.safe Waste Pipes with O.D. 32 mm. Central connection with male thread GL45 to mount e.g. b.safe System Caps.

	Shape	Lateral connections	Central connection	Total length mm	Cat. No.
	T	2x clamp connection for O.D. 32 mm	GL45 male	110	R 1194-01
	T	2x clamp connection for O.D. 32 mm	GL45 male	210	R 1194-02

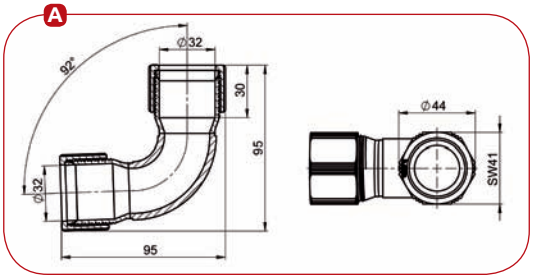
b.safe Elbow Connector

Material: **PE-EX, PTFE-EX**| Temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

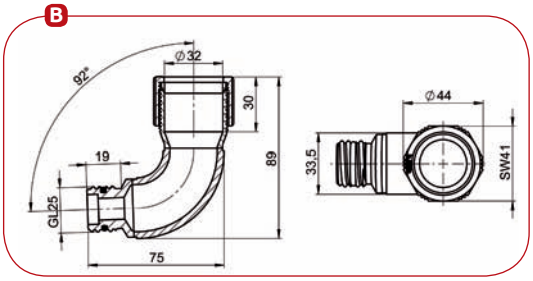
Elbow tube approx. 90° made of static dissipative PE-EX. Connection 1: lock nut and clamp ring for inserting and clamping b.safe Waste Pipes with O.D. 32 mm. Connection 2: either lock nut and clamp ring for clamping b.safe Waste Pipes or male thread GL25 for transition to flexible b.safe Waste Tubes.

	Shape	Connection 1	Connection 2	Dimensions, L x W, mm	Cat. No.
A	Elbow tube	Clamp connections for O.D. 32 mm	Clamp connections for O.D. 32 mm	89 x 89	R 1182-01
B	Elbow tube	Clamp connections for O.D. 32 mm	GL25 male	75 x 89	R 1180-01

A



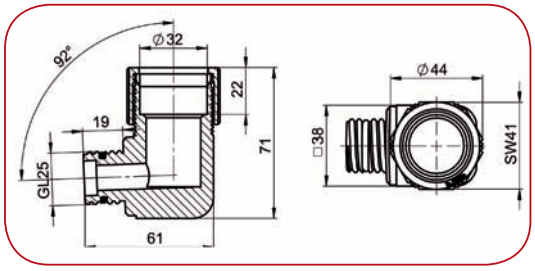
B



b.safe APPROPRIATE

b.safe Waste Tube Page 34
Flexible tube for introducing solvents into canisters.

b.safe Angular Connector

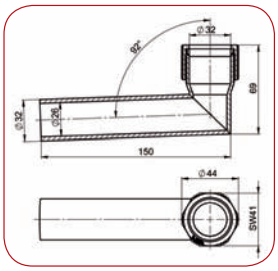


Material: **PE-EX, PTFE-EX**| Temperature resistance: **-50 °C to +80 °C** | Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

Angular piece approx. 90° made of static dissipative PE-EX. Connection 1: lock nut and clamp ring for inserting and clamping b.safe Waste Pipes with O.D. 32 mm. Connection 2: male thread GL25 for transition to flexible b.safe Waste Tubes.

	Bore shape	Connection 1	Connection 2	Dimensions, L x W, mm	Cat. No.
	L	Clamp connections for O.D. 32 mm	GL25 male	71 x 63	R 1185-01

b.safe Elbow Connecting Tube

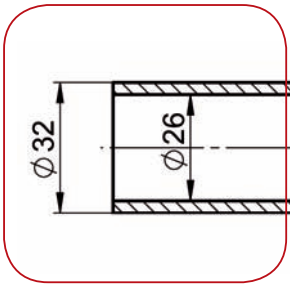


Material: **PE-EX, PTFE-EX**| Temperature resistance: **-50 °C to +80 °C** | Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

Elbow tube approx. 90° made of static dissipative PE-EX. With lock nut and clamp ring for inserting and clamping b.safe Waste Pipes with O.D. 32 mm, end piece with O.D. 32 mm. Available in two different lengths.

	Shape	Connection 1	Connection 2	Usable length, mm	Total length, mm	Cat. No.
	L	Clamp connection for O.D. 32 mm	Tube O.D. 32 mm	110	150	R 1175-15
	L	Clamp connection for O.D. 32 mm	Tube O.D. 32 mm	460	500	R 1175-50

b.safe Waste Pipes

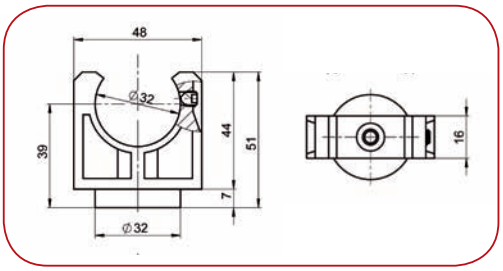


Material: **PE-EX, PTFE-EX**| Temperature resistance: **-50 °C to +80 °C** | Chemical resistance: **++ very good** | Conductivity: **10^6 Ohm**

Straight tube made of static dissipative PE-EX. O.D. 32 mm suitable for b.safe Connecting Tubes with clamp connections for Waste Pipes.

	Connection	Diameter, mm	Length, mm	Cat. No.
	Tube O.D. 32 mm	I.D. 26 x O.D. 32	300	R 1179-02
	Tube O.D. 32 mm	I.D. 26 x O.D. 32	600	R 1179-05
	Tube O.D. 32 mm	I.D. 26 x O.D. 32	1.200	R 1179-10

b.safe Magnet Holder for Waste Pipes



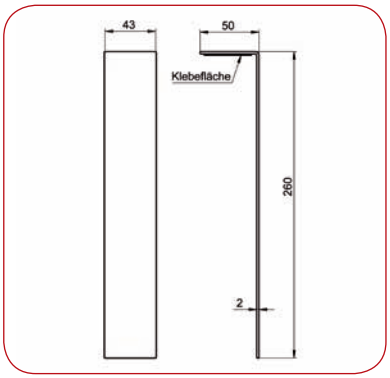
Pipe clamp made of PE with permanently fixed power magnets. b.safe Waste Pipes can easily be clipped into the pipe clamp for tube O.D. 32 mm. In combination with a suitable desktop- or wall mount, b.safe Waste Pipes can easily be fixed in height by means of the magnet. The included stud screw is used to secure the connection and to prevent the waste pipe from twisting.

	Suitable for	Dimensions L x Ø x H, mm		Cat. No.
	Tube O.D. 32 mm	48 x 32 x 51		R 1162-32

b.safe Desktop Mounting Bracket for Waste Pipes

Black, powder-coated angle plate made of steel. Contact area with silicone-free glue pad and 2 bores dia. 4,2 mm for non-slip fixing on the desktop. Waste Pipes with tube O.D. 32 mm can be fixed and adjusted in height on the long side of the plate by using suitable b.safe Magnet Holders.

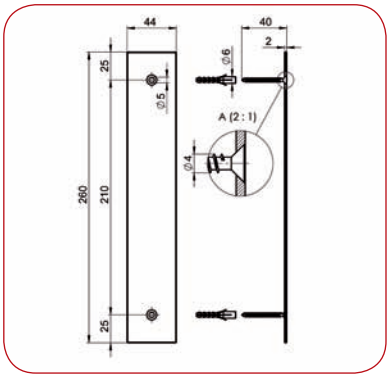
	Fixing surface L x W, mm	Contact area, L x W, mm		Cat. No.
	260 x 44	50 x 44		R 1165-03



b.safe Wall Mounting Bracket for Waste Pipes

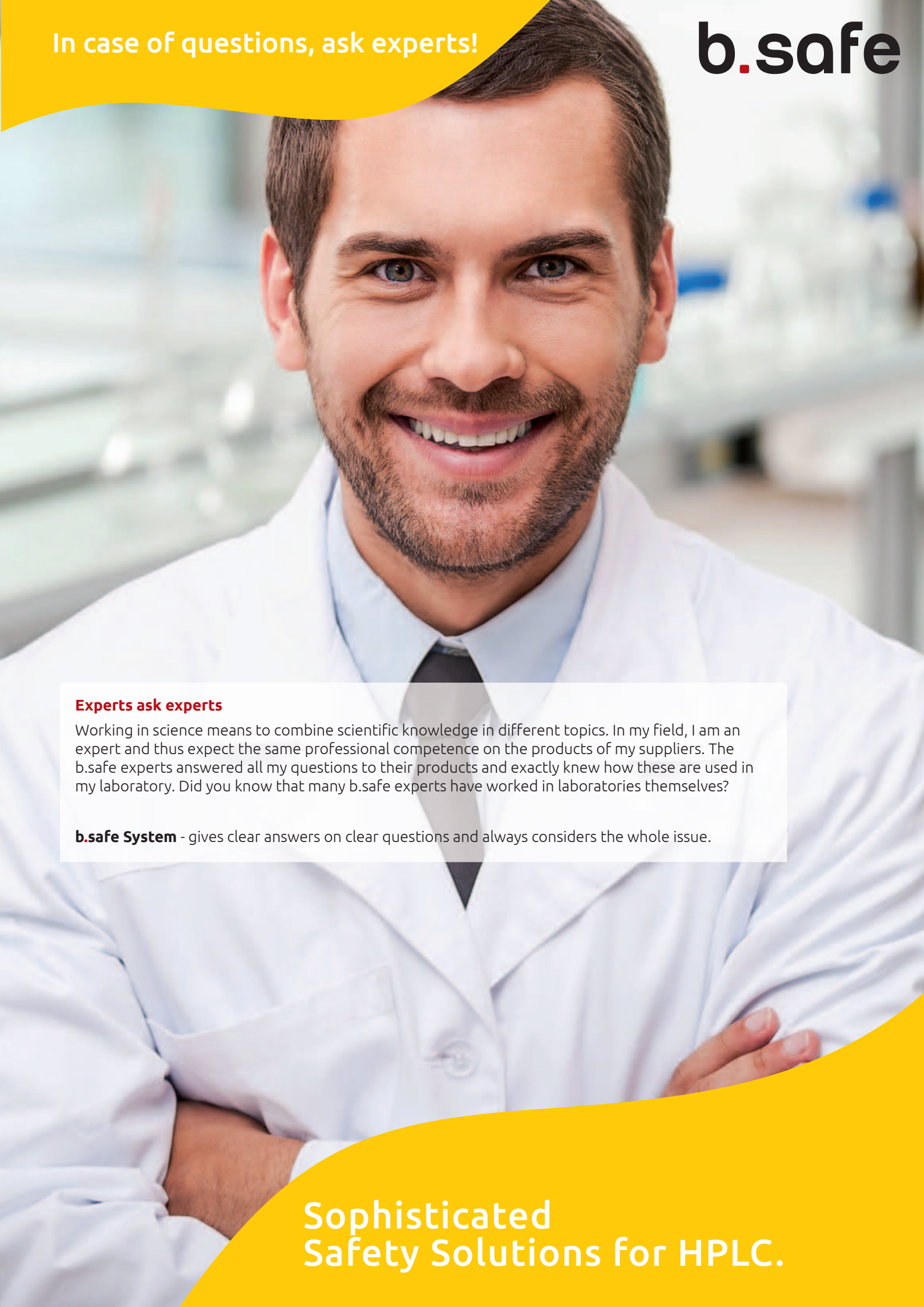
Black, powder-coated plate made of steel. With 2 bores dia. 4,2 mm for wall mounting with the included fixing material. Waste Pipes with tube O.D. 32 mm can be fixed and adjusted in height on the front side of the plate by using suitable b.safe Magnet Holders.

	Fixing surface L x B, mm			Cat. No.
	260 x 44			R 1164-03



In case of questions, ask experts!

b.safe



Experts ask experts

Working in science means to combine scientific knowledge in different topics. In my field, I am an expert and thus expect the same professional competence on the products of my suppliers. The b.safe experts answered all my questions to their products and exactly knew how these are used in my laboratory. Did you know that many b.safe experts have worked in laboratories themselves?

b.safe System - gives clear answers on clear questions and always considers the whole issue.

Sophisticated Safety Solutions for HPLC.

b.safe Accessories

Please check the following pages for helpful accessories to adapt b.safe SYSTEM products to your special conditions of use.

Some examples of use:

b.safe Hose Connectors for a direct connection of different tubing diameters to b.safe System Waste Caps and b.safe Multiports. Page 112

b.safe Antistatic Corrugated Tubing is sold per meter and can be cut to any needed installation length. Page 103.

b.safe Corrugated Tubing Coupling made for connecting corrugated tubing without any leakage to b.safe System Waste Caps and b.safe Multiports. Page 110.

b.safe Flexible Cable Conduit to bundle several parallely running hoses. Page 108

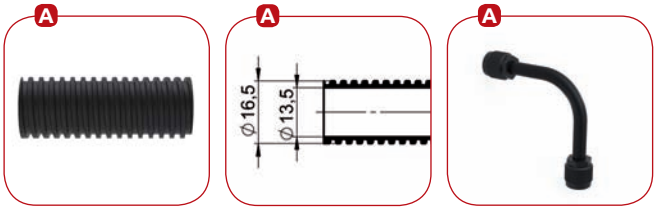
b.safe Grounding Cables in different versions for a safe grounding of vessels and components made of static dissipative materials. Page 107

b.safe Antistatic Corrugated Tubing

Chemical resistance: **++ very good** | Conductibility: **10^6 Ohm**

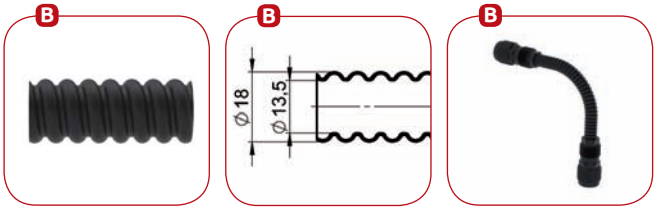
Flexible corrugated tubing made of static dissipative plastics. Ordered quantities are supplied in rolls by the metre. For more details see below table.

	I.D. mm	O.D. mm	Material	Cat. No.
A	approx. 13,5	approx. 16,5	PTFE-EX	R 773-16
B	approx. 13,5	approx. 18	PTFE-EX	R 773-18
C	approx. 11	approx. 14	PE-EX	R 774-14
D	approx. 9,5	approx. 13,5	PFA-EX	R 775-13



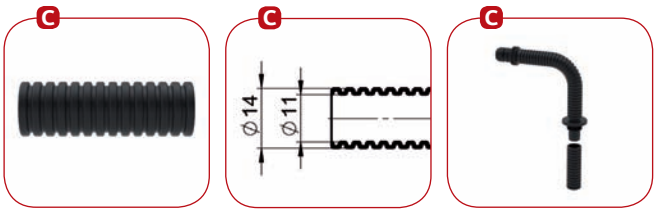
SUITABLE for
b.safe Waste Tube Smooth

Page 35



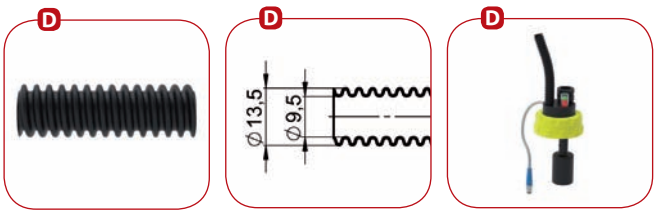
SUITABLE for
b.safe Waste Tube

Page 34



SUITABLE for
b.safe Venting Hose

Page 56



SUITABLE for
b.safe connector GL14 of System Waste Caps

Page 44-50

b.safe EX Tubing

Material: **PTFE-EX** | Temperature resistance: **-200 °C to +250 °C** |
Chemical resistance: **+++ universal** | Conductivity: **10^6 Ohm**

Made of static dissipative PTFE-EX, special compound made of PTFE and finest, highly pure carbon dust (less than 2,5 %). Colour: black. Order quantities smaller than the maximum production length are supplied in rolls with continuous length.

I.D. mm	O.D. mm	Wall thickness mm	Cat. No.
0,8 (1/32“)	1,6 (1/16“)	0,4	R 770-02
1,6 (1/16“)	3,2 (1/8“)	0,8	R 770-08
4,0	6,0	1,0	R 770-10
6,0	8,0	1,0	R 770-12
8,0	10,0	1,0	R 770-14
10,0	12,0	1,0	R 770-16

Application:
For transport of solvents or easily flammable liquids.

b.safe PTFE-Tubing

Material: **PTFE** | Temperature resistance: **-200 °C to +250 °C** |
Chemical resistance: **+++ universal**

Translucent to milky white tubing. Order quantities smaller than the maximum production length are supplied in rolls with continuous length.

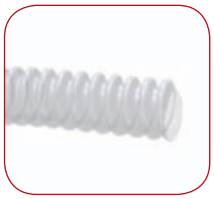
I.D. mm	O.D. mm	Wall thickness mm	Cat. No.
0,8 (1/32“)	1,6 (1/16“)	0,4	R 750-02
1,0	1,6 (1/16“)	0,3	R 750-04
1,4	2,2	0,4	R 750-06
1,6 (1/16“)	3,2 (1/8“)	0,8	R 750-08

Application:
Perfectly suitable as tubing for aggressive liquids.

b.safe Corrugated Tubing

Material: **PE** | Temperature resistance: **-50 °C to +250 °C** |
Chemical resistance: **++ very good**

Translucent to milky white tubing. Order quantities smaller than the maximum production length are supplied in rolls with continuous length.



	I.D. mm	O.D. mm	Wall thickness mm	Cat. No.
	approx. 6,5	approx. 10,0	approx. 1,75	R 753-05

Application:
Perfectly suitable as tubing for aggressive liquids.

b.safe Capillary Cutters

Ideal for cutting capillaries and elastic tubes without reinforcement.

	Up to tubing O.D. mm	Guide dia. mm	Cat. No.
A	8	1,6 / 2,3 / 3,2 / 3,8 / 4,2 mm including replacement blades	R 570-01
B	28		R 572-05

	Accessories	Cat. No.
C	Replacement blades for Cat. No. R 572-05	R 573-05

Application:
The guide bores at Cat. No. R 570-01 help to get a clean cut of the capillaries.

b.safe Fittings

Material: **PFA** | Temperature resistance: **-200 °C to +260 °C** |
Chemical resistance: **+++ universal**

Fittings made of PFA to fix tubing in the capillary connectors (thread UNF 1/4" 28G) of b.safe Caps and b.safe Waste Caps. The conical seal cone clamps the tubing and seals the connection safely.

	For Tubing O. D.	Colour	Packing unit	Cat. No.
	1,6 mm (1/16")	green	10 pcs.	M 501-06
	2,2 mm (7/8")	purple	10 pcs.	M 501-11
	2,2 mm (7/8")	grey	10 pcs.	M 501-12
	3,2 mm (1/8")	milky-white	10 pcs.	M 501-15
	3,2 mm (1/8")	blue	10 pcs.	M 501-16
	3,2 mm (1/8")	red	10 pcs.	M 501-17
	3,2 mm (1/8")	yellow	10 pcs.	M 501-18

b.safe Blind Fittings

Material: **PFA, PTFE** | Temperature resistance: **-200 °C to +260 °C** |
Chemical resistance: **+++ universal**

Blind fittings made of PFA for closing unused capillary connections on b.safe Caps and b.safe Waste Caps.

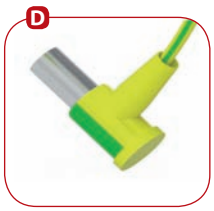
	Suitable for	Material	Packing unit	Cat. No.
A	Capillary Connector (thread UNF 1/4")	PFA milky white	10 pcs.	M 501-01
B	Exhaust Filter (thread GL 14)	PTFE white	1 pcs.	M 501-45
C	Hose Connector (thread NPT 1/8")	PTFE white	1 pcs.	M 501-50

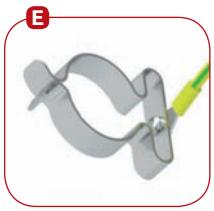
Application:
For tight closure of unused connectors on b.safe Caps and b.safe Waste Caps. With ergonomic gripping surface or knurl for easy assembly. The version with ground joint has an integrated nut to loosen stuck ground joints.

b.safe Grounding Cables

For earth connection of vessels and components made of static dissipative materials. Version as per below chart, the scope of delivery of the ring cable lug includes screw, nut and washer.

	Connection 1		Connection 2	Cable length, m	Cat. No.
A	clip	A	clip	1,5	R 601-01
A	clip	B	ring cable lug M6	1,5	R 603-01
A	clip	B	ring cable lug M6	3,0	R 603-03
A	clip	C	banana plug	1,5	R 604-01
D	MC plug dia. 6 mm	B	ring cable lug M6	1,5	R 605-01
A	clip	E	clip for tube dia. 13-18 mm	3,0	R 606-05
A	clip	E	clip for tube dia. 32 mm	3,0	R 606-01
B	ring cable lug M6	E	clip for tube dia. 32 mm	3,0	R 607-03
B	ring cable lug M6	B	ring cable lug M6	1,5	R 612-01
B	ring cable lug M6	B	ring cable lug M6	3,0	R 612-03
F	Stainless steel strap with tension lock for circumference 195 x 195 mm	A	clip	1,5	R 615-03





b.safe APPROPRIATE

b.safe Signal Cables Page 83
In different lengths for connecting a b.safe Display.

b.safe Antistatic Mats

Mat made of static dissipative material with permanently mounted grounding cable including clip for earthing connection.

Dimensions L x W mm	Connection	Cable length m	Cat. No.
1200 x 600	clip	1,5	R 630-01

Application:
For grounding vessels made of static dissipative materials or persons before handling with easy flammable liquids.

b.safe Flexible Cable Conduit

Material: **PE** | temperature resistance: **-50 °C to +80 °C** |
Chemical resistance: **++ very good**

Expandable cable conduit to bundle several hose lines or signal cables, can be cut to the required length.

	Length m			Cat. No.
	10			M 564-01

Application:
Space-saving bundling of parallel hose lines or signal cables.

b.safe Clip for Tubes and Cables

Material: **POM** | Temperature resistance: **-30 °C to +100 °C** |
Chemical resistance: **++ very good**

For an easy bundling and fixing of signal cables, grounding cables, Waste Tubes and vent tubes inside of safety cabinets and built-in installations. Clip made of mechanically tight POM for safe clipping of the different cables or tubes. For fixation to wall,it is supplied including fastening material.

	For tube/pipe O.D. mm	Outer dimensions, mm	Fixation to wall	Cat. No.
A	1x 18/ 1x 14/ 2x 4/ 1x 3,5	Ø 34,5 x H 10	No	R 1402-05
B	1x 18/ 1x 14/ 2x 4/ 1x 3,5	L 34,5 x B 29 x H 17	Yes	R 1403-05

b.safe APPROPRIATE

b.safe Antistatic Corrugated Tubing
Page 103
Sold in rolls with continuous lengths in full meters for an easy cutting to the desired length.

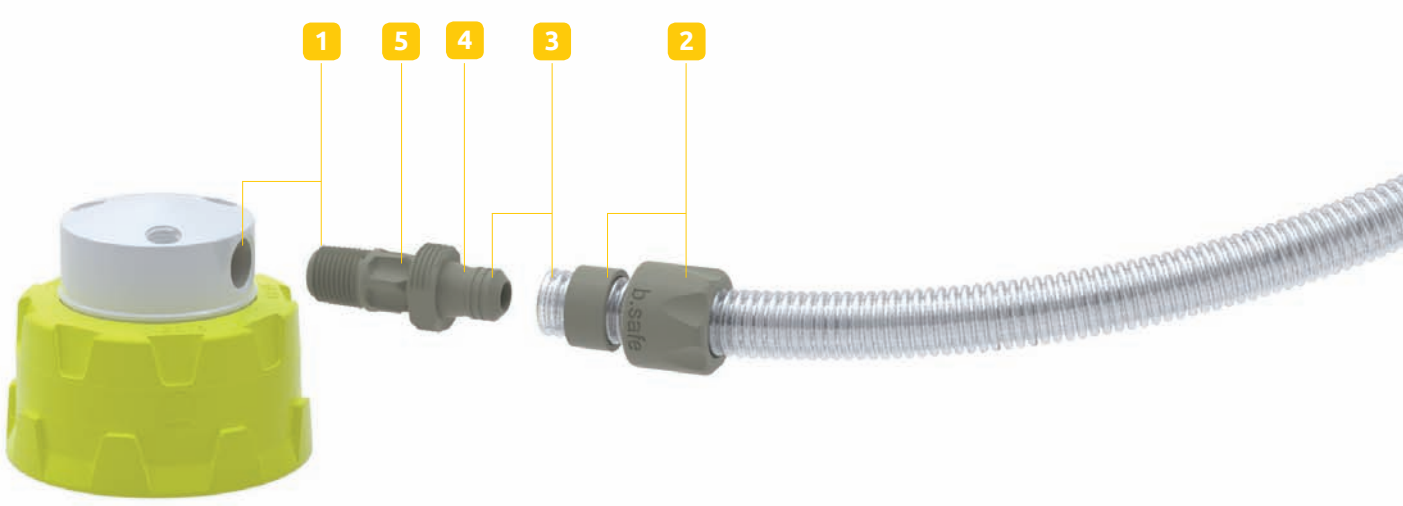
b.safe Corrugated Tubing Coupling

b.safe products provide solutions for many demands, also for tight and leak-free connections of corrugated tubing as supplied e. g. with HPLC devices of the manufacturers Agilent or Thermo Scientific. It is not possible to get a tight connection on waste caps if you use standard hose connectors with these hard-walled, inflexible tubes.

You cope perfectly with this challenge by using b.safe Corrugated Tubing Couplings. With this special screw joint, you get a tight connection between corrugated tubing and the hose connection (thread NPT 1/8") on b.safe Waste Caps and b.safe System Waste Caps.

Assembly instructions:

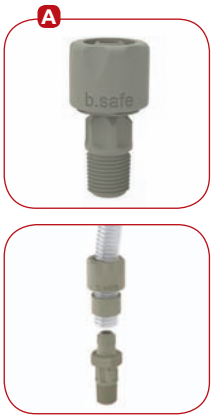
1. Screw the b.safe Corrugated Tubing Coupling into the hose connection (thread NPT 1/8") of your Waste Cap.
2. Push the locking nut and the clamp ring on the tube end.
3. Put the tubing on the tapered end of the coupling and push the tubing to the stop.
4. Push also the clamp ring and the locking nut to the stop. Secure the connection by screwing the locking nut onto the coupling.
5. Put a fork wrench (wrench size 10 mm) on the recessed grips on the coupling. Use the fork wrench to prevent the coupling from turning while the locking nut is tightened firmly for a leak-free connection.



b.safe Corrugated Tubing Coupling

Material: **PP** | Temperature resistance: **0 °C to +110 °C** |
Chemical resistance: **++ very good**

Three-part coupling consisting of coupling, locking nut made of PP and clamp ring made of FEP. To connect hard-walled corrugated tubing with the hose connection (NPT 1/8" thread) on b.safe Waste Caps. Locking nut with ergonomic gripping surface, additional grip hollows with SW10 on the coupling.



	Suitable for	I. D. of corrugated tubing mm	O. D. of corrugated tubing mm	Cat. No.
A	Hose connection (thread NPT 1/8")	6,5	10,0	M 514-03
A	Hose connection (thread NPT 1/8")	8,5	11,5	M 514-05

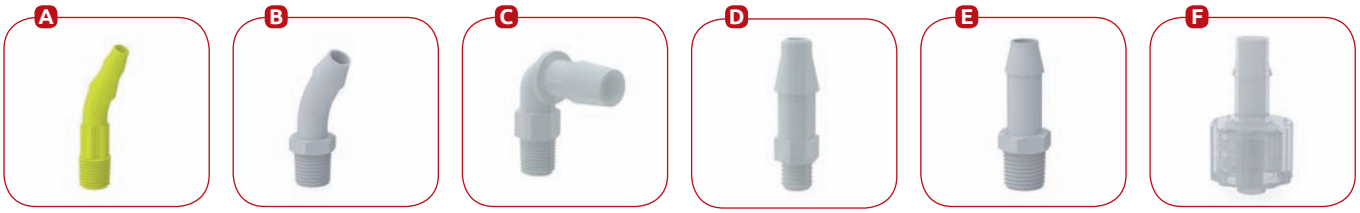
Application:
Choose the b.safe Corrugated Tubing Coupling as per your HPLC tubing. Devices of Agilent Technologies for example contain corrugated tubing with I. D. 6,5 mm. Devices of Thermo Scientific contain corrugated tubing with I. D. 8,5 mm.

b.safe APPROPRIATE

b.safe Corrugated Tubing Page 105
Sold in rolls with continuous lengths in full meters for an easy cutting to the desired length.

b.safe Hose Connectors

For the connection of elastic tubing (e. g. Viton®, Tygon, silicone) on b.safe Waste Caps. Packing Unit: 1 piece.



	Connecting thread	Version	For tubing I. D.	Length mm	Bore dia. mm	Material	Cat. No.
A	Hose connection (NPT 1/8" thread)	bent	5,5-8	45	4	PP yellow	M 503-01
B	Hose connection (NPT 1/8" thread)	bent	6-8	45	4	PTFE white	M 503-05
C	Hose connection (NPT 1/8" thread)	elbow 90°	6,5-8	30	5	PP milky white	M 503-08
C	Hose connection (NPT 1/8" thread)	elbow 90°	9,5-10,5	32	7	PP milky white	M 503-09
D	Hose connection (NPT 1/8" thread)	straight	2-3	23	1,8	PP milky white	M 503-10
D	Hose connection (NPT 1/8" thread)	straight	3-4	26	2,3	PP milky white	M 503-11
D	Hose connection (NPT 1/8" thread)	straight	4-5	26	2,8	PP milky white	M 503-12
D	Hose connection (NPT 1/8" thread)	straight	5-6	30	3,5	PP milky white	M 503-13
D	Hose connection (NPT 1/8" thread)	straight	6,5-8	36	4,8	PP milky white	M 503-14
E	Hose connection (NPT 1/8" thread)	straight	6-8	45	4	PTFE white	M 503-15
D	Hose connection (NPT 1/8" thread)	straight	9-10,5	40	7	PP milky white	M 503-16
D	NPT 1/4" thread	straight	12-13,5	48	10	PP milky white	M 513-01
C	NPT 1/4" thread	elbow 90°	12-13,5	41	10	PP milky white	M 513-02
D	Capillary connection (UNF 1/4" thread)	straight	6-8	30	3,6	PP milky white	M 518-01
F	Male Luerlock	straight	4-5	21	3,2	PP milky white	M 519-01

Application:
For direct connection of waste tubing on b.safe Waste Caps.

b.safe Technical Information

- Functionality
- Materials
- Determination of Threads

and much more

b.safe Exhaust Filter - Operating Principle

Activation of service life through touch of the button and/or mark individually on the back side

Splash-proof ventilation openings

No twisting, lid and filter body are inseparably linked

Activated carbon in the inside guarantees adsorption of harmful vapours

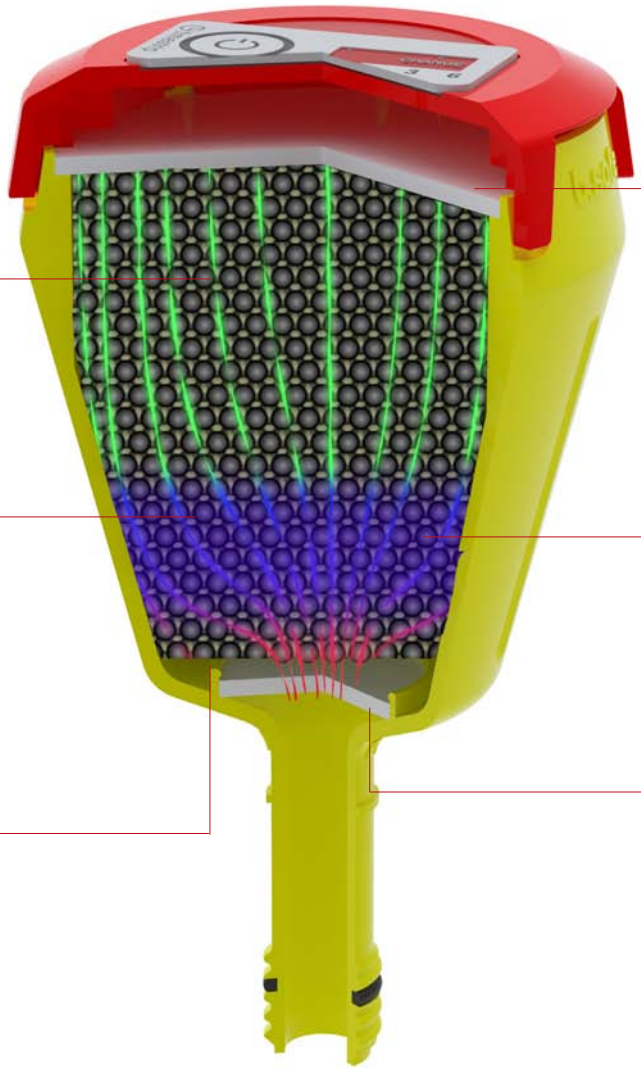
PP for high rigidity and fire class rating V-0

Good grip for easy installation of the Exhaust Filter on Waste Caps

Optimized postion of the O-ring for easy installation

Sophisticated design - plenty of space for Fittings and Hose Connectors

The activated carbon filling in the b.safe Exhaust Filters adsorbs harmful vapours that escape from the collected solvent waste. Only filtered air is emitted through the ventilation openings to the ambience.



Filter made of FDA conform PE to stabilize the activated carbon filling. Perfect air permeability of 300-1500 ml/min cm²

Supply Zone (green): proportion of the non-saturated activated carbon. The end of the Exhaust Filter's life cycle is reached as soon as this proportion is also saturated with solvents.

Active Zone (blue): also called adsorption zone. This part of the activated carbon is adsorbing the solvents in the air that is just flowing through the filter. It migrates upwards the more the saturated area grows.

Activated carbon with a surface of 1100 m²/g for reliable adsorption of harmful solvents during the entire service life of the b.safe Exhaust Filter

Prefilter for optimized flow behaviour (air permeability of 300-1500 ml/min cm²)

Saturated Zone (red): proportion of the activated carbon that is already saturared with solvents. During the expiration of the service life, the saturated zone migrates upwards until the Exhaust Filter is completely saturated at the end of its service life.

You like our b.safe Caps?
We are looking forward
to your feedback!
bsafe.de
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b.safe Activated Carbon

worth knowing

b.safe Activated Carbon sets new standards in the lab with a ball-pan hardness of 98-99 % and an inner surface of 1.100 m²/g. It is used for exhaust air purification by adsorption of organic solvents.

Low Edge Attraction

- Vibration density: 490 +/- 30 kg/m³
- The optimized particle size prevents clumping and sticking of the particles. This prevents the edge attraction effect, i. e. the flow through of exhaust air without any contact to the activated carbon.

Reduced Abrasion

- -Ball-pan hardness: > 95 Weight %
- In movement, activated carbon particles can abride. The resulting abrasion of smallest carbon particles can clog the passages.
- The high ball-pan hardness protects the single particles from abrasion and thus the consistency and filter performance of the activated carbon are not affected.

High Purity

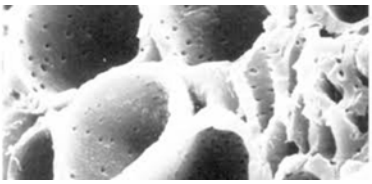
- Ash content (proportion of foreign particels in the activated carbon): < 12 Weight %
- The smaller the ash content, the more reliable the filter performance

Low Water Content

- Water content: < 5 Weight % (at time of delivery)
- Beside solvent vapours, also humidity e. g. in ambient air, is adsorbed by activated carbon. A small water content increases the adsorption capacity for solvents.

Particle size and Grain Diameter

- Grain diameter: 1,5 mm
- Particle size and thus flow resistance are especially adapted to the filtration and the flow behaviour of solvent vapours.



All stated data base on examination of the b.safe Activated Carbon in the state as delivered and analysis methods according to ASTM.

CCl4-Adsorption / Butane Activity

- CCl4-Adsorption: 70 Weight %
- CCl4-Adsorption respectively carbon tetrachloride activity stands for the loading of activated carbon with carbon tetrachloride and is a method to determine the pore volume.
- Due to the toxicity of carbon tetrachloride, this method has been replaced by the butane activity.
- Formule to calculate the butane activity: divide the CCl4-activity by 2,55

Large benefits often hide in small details. Should you require any detail, please contact us personally to talk about your individual requirements for safe HPLC.

Better b.safe

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b.safe Determination of Thread Types

Choosing a suitable fitting, screw cap or multiple distributor with the correct thread type and size is not as easy as it might seem.

Please use a sliding calliper for the determination of a thread type. Use it for the determination of the thread O. D. and the thread pitch. The pitch is the distance from one thread crest to the other as shown on our schematic drawings. Now the thread type can be determined by comparing the original thread with our figures. Once you have found a similar type, the actual thread size is identified by comparing the measured dimensions with the typical dimensions stated in the related chart.

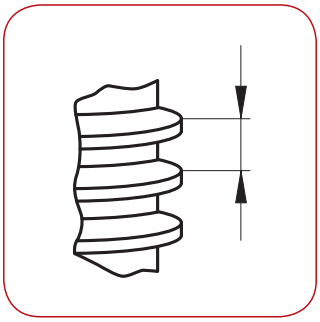
Of course, we will help you if you still have problems in determining your thread. Just send us a sample or counterpiece, we will be glad to help you with your choice. But please understand that we are not able to determine threads on faxed or scanned copies or pictures.

Important: Due to tolerances in production of different manufacturers, the dimensions of vessels can vary of up to 0.5 mm.

Measuring of canister thread

Measuring of bottle thread

Sample for canister thread



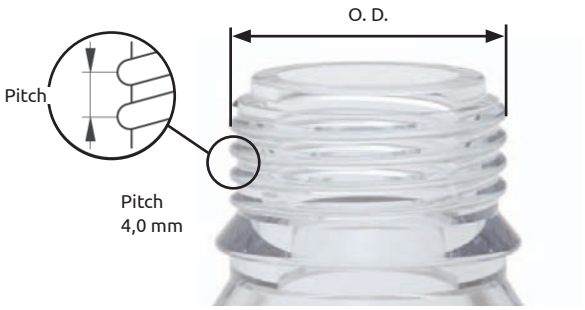
Thread pitch

Bottle Threads

GL Threads

- round threads at the flanks
- high pitch
- large flanks for important carrying power
- GL thread one-start thread
- GLS 80 thread three-start thread

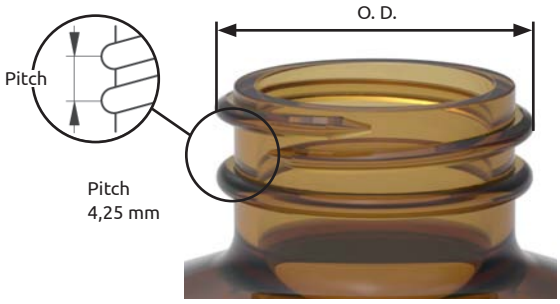
Example:
GL 45 – O. D. = 45 mm



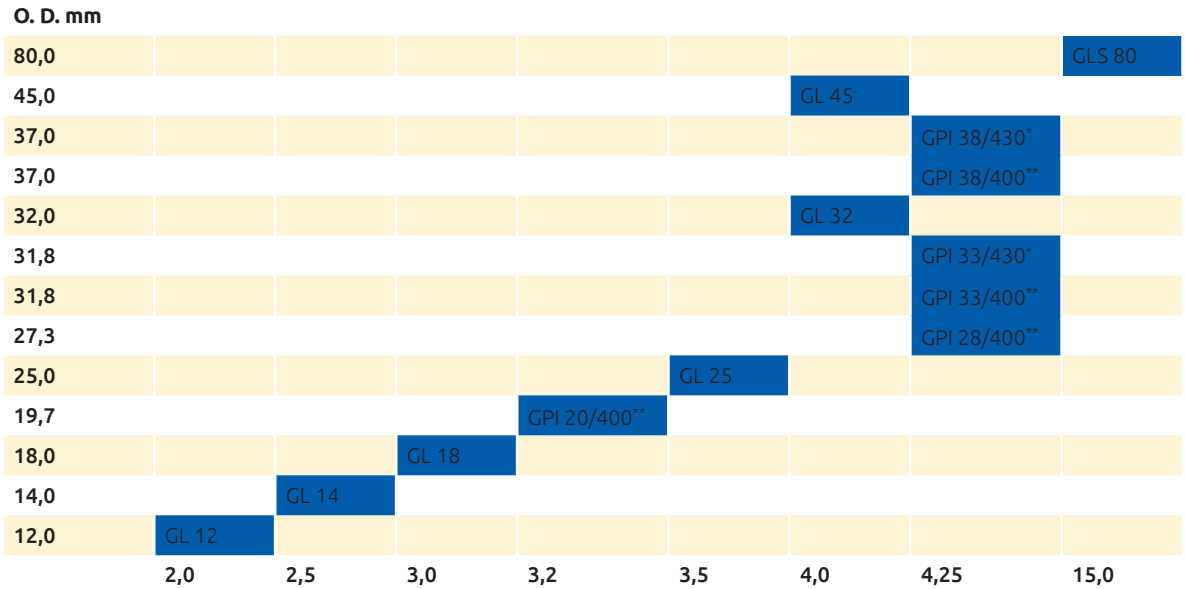
GPI

- GPI = Glass Packaging Institute, trade association representing the North American glass container industry
- voluntary standards for compatibility of glass containers and closures

Example:
GPI 38-400 – O. D. = 37 mm



Measurement chart



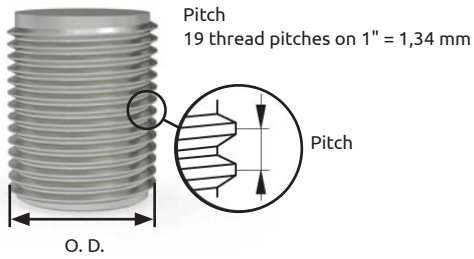
* high form of cap
** low form of cap

Connection Threads

G or R (Whitworth Pipe Thread) and BSP (British Standard Pipe)

- Main use in countries with imperial system
- G-threads: cylindrical O. D. and I. D.
- R-threads: tapered O. D. and cylindrical I. D.

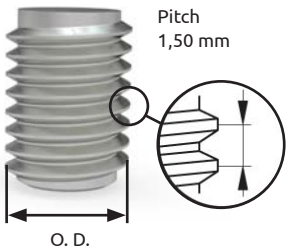
Example:
G 3/8" – O. D. = 16,5 mm



M (metric ISO thread) – Standard in Europe

- Cylindrical O. D. respectively I. D.
- Fine taper through metric thread
- best possible force transmission
- capital "M" plus an indication of nominal O. D., e. g. M 10
- deviating pitch from the standard is marked with an appendix, e. g. M 10 x 0,75.

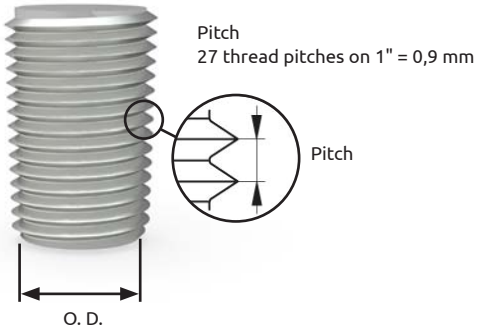
Example:
M 10 – O. D. = 10 mm



NPT (National Pipe Thread) Tapered American Pipe Thread

- tapered O. D. respectively I. D.
- self-sealing

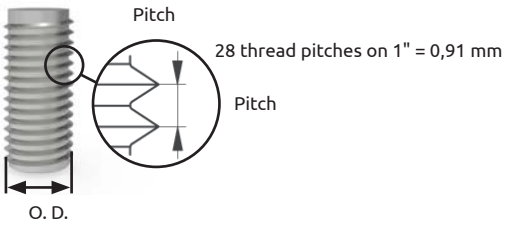
Example:
NPT 1/8" – O. D. = 9,9 mm



UNF 1/4" 28G

- Mainly used in chromatography / HPLC applications in the USA
- Digits 28 G and 32 G stand for the number of thread pitches at a length of one inch (25,4 mm)

Example:
UNF 1/4" 28G – O. D. = 6,2 mm



UNF ¼" 28G versus M 6

b.safe Fittings come with the most common HPLC thread UNF ¼" 28 G without exception. In addition, fittings and distributors with the very similar thread M 6 exist. These threads can only be distinguished by exact determination of their outer diameter or by using a test mandrel (it is possible to screw in a tube end fitting in the counterpart of the other thread for at least 2-3 rotations). The UNF ¼" thread has an outer diameter of 6.35 mm, the M 6 thread has exactly 6 mm (work tolerances are possible). We recommend to use only the UNF ¼" 28G thread to avoid confusion and double inventory.

Measurement chart

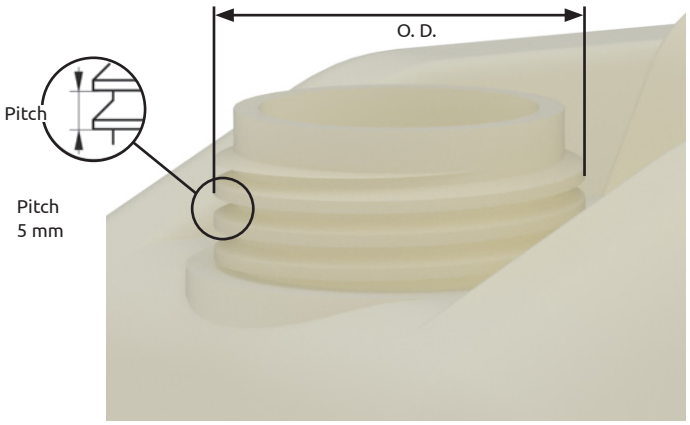
O. D. mm									
47,8									G/R 11/2"
20,8								G/R 1/2"	
16,5						G/R 3/8"			
13,2							NPT 1/4"		
13,0						G/R 1/4"			
10,0				M 10					
9,9	NPT 1/8"								
9,6		G/R 1/8"							
7,9					UNF 5/16"				
6,2		UNF 1/4"							
6,0			M 6						
	0,9	0,91	1,0	1,5	1,06	1,34	1,4	1,81	2,3
									Pitch mm

Canister Threads

Canister Thread S

- coarse buttress thread commonly used for many plastic vessels
- with known standardized threads as well as special manufacturers´ specifications
- In case of problems, please contact us

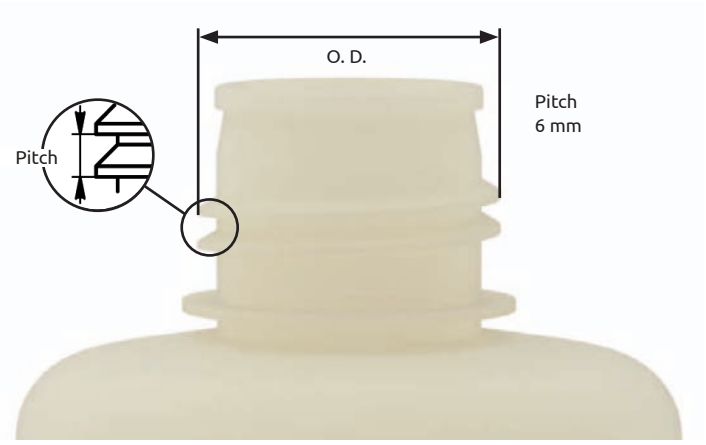
Example:
S 55 – O. D. = 54,0 mm



Nalgene®

- Carboys of the US-based company Nalgene are widely used in laboratories.

Example:
Nalgene® B 53 – O. D. = 54,0 mm



Measurement chart

O. D. mm					
94,0				S 95	
89,5				S 90	
88,0					B 83
70,5				S 70/71	
65,0				S 65	
62,0		B 63			
59,5				S 60/61	
54,0			S 55	B 53	
50,0		S50			
49,0		S 51			
39,5	S 40				
	3,5	4,0	5,0	6,0	12,7

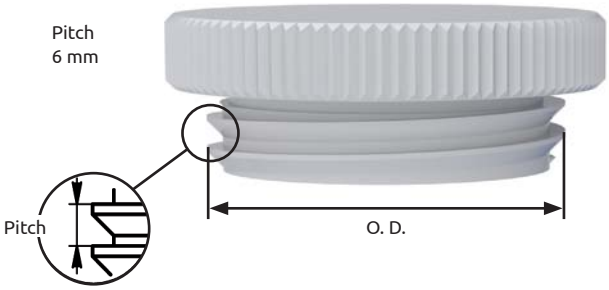
Pitch mm

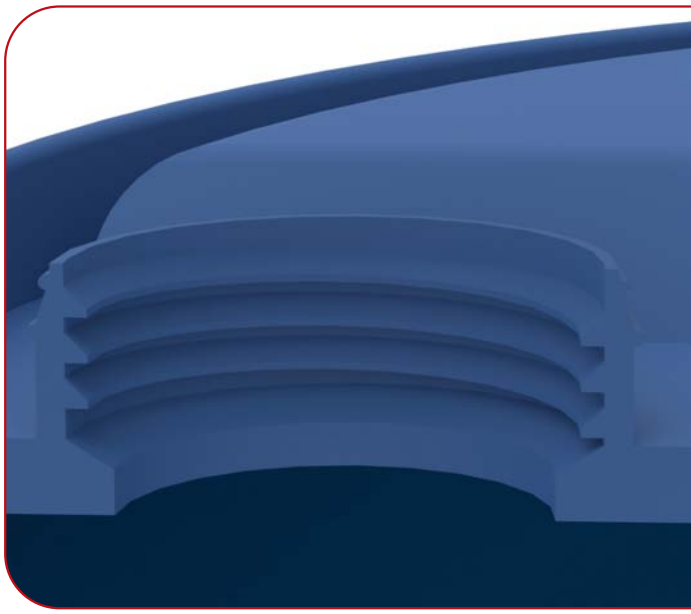
Barrel Threads

Barrel Threads

- Buttress threads
- Mauser 2” and Trisure 2” with coarse threads
- BSP 2” with much smaller thread pitch
- In case of problems, please contact us

Example:
BCS 70 x 6 MAUSER® 2" – O. D. = 69,5 mm





Measurement chart

O. D. mm			
69,5			Mauser 2“
59,6	G2“/BSP2“		
56,6		Tri Sure 2“	
	2,3	4,0	6,0
			Pitch mm

Thread overview

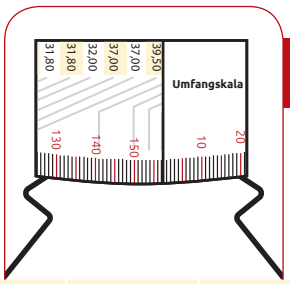
Instruction

- Measure the O. D.
- Measure the pitch
- Determine your thread by means of the chart

O. D. mm										
94,00										
89,50										
88,00										
80,00										
70,50										
69,50										
65,00										
62,00										
59,60										G2"/BSP2"
59,50										
56,60										
54,00										
50,00										
49,00										
47,80										G/R 11/2"
45,00										
39,50										
37,00										
37,00										
32,00										
31,80										
31,80										
27,30										
25,00										
20,80									G/R 1/2"	
19,70										
18,00										
16,50						G/R 3/8"				
14,00										
13,20							NPT 1/4"			
13,00						G/R 1/4"				
12,00										GL 12
10,00								M 10		
9,90	NPT 1/8"									
9,60		G/R 1/8"								
7,90					UNF 5/16"					
6,20		UNF 1/4"								
6,00			M 6							
	0,90	0,91	1,00	1,06	1,34	1,40	1,5	1,81	2,00	2,30
				Connection thread				Bottle thread		

* high form of cap
** low form of cap

Important note for printing:
Print this page in its original size



Instruction

- Wind the tape measure around the thread
- Read the dimensions
- Determine your thread by means of the chart

2,50	3,00	3,20	3,50	4,00	4,25	5,00	6,00	12,70	15,00	Pitch mm
	Barrel thread				Canister thread					
							S 95			94,00
							S 90			89,50
								B 83		88,00
									GLS 80	80,00
							S 70/71			70,50
							Mauser 2"			69,50
							S 65			65,00
				B 63						62,00
										59,60
							S 60/61			59,50
				Tri Sure 2"						56,60
						S 55	B 53			54,00
				S 50						50,00
				S 51						49,00
										47,80
				GL 45						45,00
			S 40							39,50
					GPI 38/430*					37,00
					GPI 38/400**					37,00
				GL 32						32,00
					GPI 33/430*					31,80
					GPI 33/400**					31,80
					GPI 28/400**					27,30
			GL 25							25,00
										20,80
		GPI 20/400*								19,70
	GL 18									18,00
										16,50
GL 14										14,00
										13,20
										13,00
										12,00
										10,00
										9,90
										9,60
										7,90
										6,20
										6,00

Perimeter scale

b.safe Materials

General information

Fluoroplastics belong to the family of thermoplastics. Due to their high molecular weight, polytetrafluorethylene cannot be processed with the classic thermoplast methods like injection moulding or extrusion. Both materials are transferred from powder form to semi-finished products by using special press-sintering techniques or the so called paste extrusion. All other fluoropolymers like PFA, FEP, ETFE, ECTFE, PVDF, THV or PVF are processed using the known production methods for thermoplastics.
The fully fluorinated materials PFA and FEP in particular require a corrosion resistant construction of the processing machines. With increasing the content of fluorine, the fluoropolymers offer a better chemical and higher thermal load.

Especially PTFE, PFA and FEP have the following unique properties:

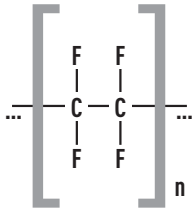
» almost universal chemical resistance
» high thermal load capacity (–200 °C up to +250 °C)
» non-flammable
» resistant to environmental changes (weather, light)
» non-adhesive
» ultra low friction coefficient
» unbreakable
» physiologically safe
» inert, tasteless, odourless
» UV-resistant
» not ageing, the properties do not change even during long-term storage
» without any aggregates like plasticizers or antioxidants
» unlimited sterilization with steam or ethylene oxide possible. A sterilization using high-energy radiation is not recommended.

All other fluorinated thermoplastics include beside the fully fluorinated monomer block tetrafluorethylene additional, non-fluorinated components. This allows to adapt systematically the properties and thus to facilitate the processing and to enlarge the range of applications.The chart below gives some general advice on the choice of the best suitable fluoropolymers:

Properties	PTFE	PFA	FEP	ETFE
Continuous operating temperature (°C)	250	250	205	150
Tear strength (MPa)	30	28	25	40
Permeation (Helium)	-	o	o	+
Sterilisable with Y-radiation	-	-	-	o
Chemical resistance	+++	+++	+++	+

Definition:
- \- not suitable, not recommended
- o possible, moderate to good
- \+ good
- +++ very good, best choice

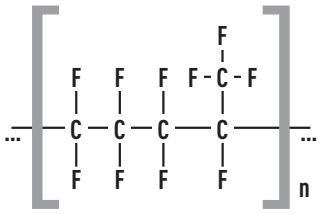
PTFE – Polytetrafluorethylene



Discovered in 1938 by research-chemists of the DuPont (USA) it was not introduced to the market until 1946. A partly crystalline fluoroplastic that belongs to the family of thermoplastics (but not suitable for injection moulding). The strong bond of the fluorine atom to the carbon atom as well as the almost complete shielding of the unbranched carbon chain by fluorine atoms result in a remarkably high chemical and thermal load.
PTFE has a thermal resistance ranging from -260 °C up to +250 °C, at short term up to +300 °C (e. g. no brittleness in boiling helium at -269 °C). This temperature range is not reached by any other plastic material.
The continuous operating temperature depends on the load. This means that PTFE can be used from -200 °C to +250 °C at moderate mechanical load. PTFE labware has a white appearance and a non-adhesive surface which is easy to clean. Furthermore, this material has excellent slip characteristics. A lubrication of turning steel or glass shafts is not necessary. Semi-finished PTFE rods are fabricated by isostatic pressing processes or extrusion. The final products are produced by machining the semi-finished materials.

Trade names
3M™ DyneonTM PTFE
by Dyneon
Teflon® by Chemours
Fluon® by AGC
Chemicals Europe

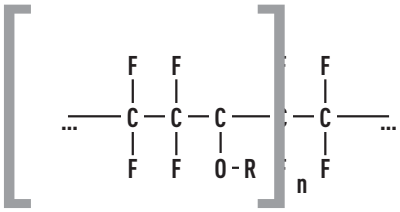
FEP – Tetrafluorethylene-Perfluoropropylene



A molten copolymer of tetrafluorethylene and perfluoropropylene with a high-molecular, partly crystalline structure which had been introduced on the market in 1960. Its mechanical and chemical properties are comparable with those of PTFE, however, the upper limit of the permanent working temperature is 50 °C lower (max. +205 °C). FEP is a typical thermoplastic material, which can be processed with the known production methods for this kind of material. New types with lower melting viscosity (= high melt flow index MFR) allow the processing at higher speed. FEP labware is translucent to transparent and non-porous.

Trade names
Teflon® FEP by Chemours
Dyneon™ Fluorothermoplastics
FEP by Dyneon
Neoflon® by Daikin

PFA – Perfluoralkoxy Copolymer

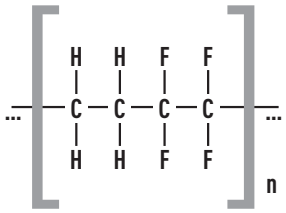


Fluorinated hydrocarbon with a high-molecular, partly crystalline structure. Compared to PTFE, it has additional side chains consisting of perfluorated alkoxy groups.
PFA can be processed using thermoplastic production methods and offers chemical and thermal properties equal to those of PTFE. PFA labware is translucent to transparent, non-porous and particularly useful in high-purity work. Big components with a total weight of several kilograms can be fabricated in a „single shot“ by using transfer moulding.

Trade names
Teflon® PFA by Chemours
Dyneon™ Fluorothermoplastics
PFA by Dyneon

ETFE – Ethylen-Tetrafluorethylene Copolymer

Partly fluorinated ethylene-tetrafluorethylene copolymer. Unlike the high-molecular PTFE which can be processed only by means of pressing or sintering, ETFE can be thermoplastic processed as already described before for PFA and FEP. I. e. this plastic material can be injection moulded or extruded with appropriate machines. In laboratories, this material is mainly used as compound with glass fibres for e. g. screw caps or screw joints. ETFE films have an excellent tear resistance. They are pervious to UV-rays and are therefore used for laboratory green houses as the VIS as well as the UV spectrum of the sun light can pass.



Trade names
Fluon® ETFE Resins by AGC Chemicals Europe
Tefzel® by Chemours
Dyneon™ Fluorothermoplastics ETFE by Dyneon

Standard Plastics – Technical Plastics - High-performance Plastics

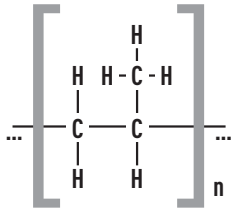
General Information

The permanent operating temperature is the most common characteristic to distinguish between standard plastics, technical plastics and high-performance plastics: for standard plastics, the limit is 90 to max. 100 °C, technical plastics can be operated within a range of 90 up to 140/150 °C. All high-performance plastics have a permanent operating temperature of more than 140/150 °C. The permanent operating temperature is defined as the maximum temperature with which the material can be operated for 20.000 hours but without loosing more than 50 % of its original rigidity and ductility. This means, a plastic material having a rigidity of 40 MPa in new condition has to show a rigidity of minimum 20 MPa after having been stored at its maximum permanent operating temperature for 20.000 hours.

Standard-Plastics

PP – Polypropylene

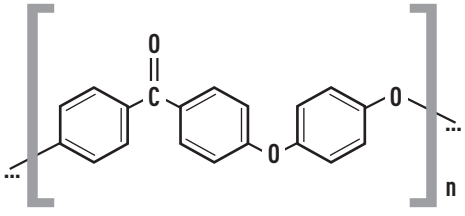
A polymer of ethylene with isostatic arrangement of methyl groups. It does not belong to the family of fluoroplastics. PP can be autoclaved (at +121 °C) and is distinguished by good mechanical and chemical properties almost up to its softening point. PP labware is unbreakable and an economical alternative with, however, restricted chemical and thermal resistance.



Trade names
Norolen® by BASF
Hostalen® by BASF

PEEK – Polyetheretherketone

Partly crystalline thermoplastic that withstands high temperatures. Due to its unique properties, PEEK is mainly used for high-value and highly stressable components. The high upper working temperature (+250 °C), the good chemical stability and resistance to hydrolysis as well as the high mechanical values of this material will allow PEEK to become the material of the future. PEEK components are commonly used as HPLC fittings, screw joints or as tubing. Its natural colour is brown, its price is considerably higher than that of PTFE or PFA. PEEK is available in many different types, e. g. modified for self-lubricating bearings.

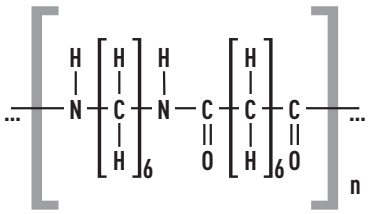


Trade names
Victrex® by Victrex
VESTAKEEP® PEEK by Evonik

Technical Plastics

PA – Polyamides

Condensation polymers obtained either from amino acids respectively from their lactams (e. g. caproic lactam) or diamine and dicarboxylic acid (e. g. adipic acid and hexamethylene-diamine). In general, polyamides are defined according to the number of carbon atoms of their monomers, e. g. PA 6 = polycarbonic lactam or PA 12 = polylauric lactam. PA 6 is the most commonly used polyamide. All polyamides are characterised by high strength and scuff resistance. The application range varies from simple turned parts such as screws or nuts to plain bearings or toothed wheels.

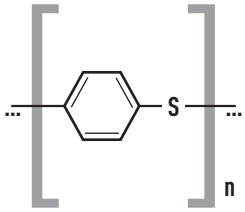


Trade names
Ultramid® by BASF
Durethan® by Bayer
Grilon® by Ems Chemie

High-performance Plastics

PPS – Polyphenylsiloxan

Technical high-performance plastic. This macromolecule consists of phenylene rings and one S-atom which provide a good chemical resistance even at high working temperatures. PPS is particularly suitable for the production of moulded pieces which are exposed to high mechanical and thermal stresses. Injection moulding is the most common processing technology for this material, in addition, single components can be made of semi-finished products by cutting. Special glass-fibre reinforced compounds offer an improved rigidity, sturdiness and dimensional stability under heat compared to non-reinforced compounds.



Trade names
Fortron® by Celanese
Ryton® by Phillips Petroleum Chemicals
Alton® Intern. Polymer Corp.

b.safe Materials - Chemical Resistance

Please note:

All information in our catalogue is based on current technical knowledge, experience and manufacturers' data. Users should check the suitability of parts and materials described in the catalogue before purchase.

BOHLENDER does not accept any warranty claims as to suitability and fitness of purpose of the materials and products described in this catalogue. Users should avoid making any assumptions on, or interpretation of, the data herein. **Therefore we cannot provide warranty and cannot accept responsibility for any damage.**

Additionally, an overview stating the chemical resistance of all b.safe materials against many different substances from A like Accumulator Acid up to Z link Zinc Nitrates is available for download on our website in pdf-format:

http://www.bsafe.de/materials

Categories of substances

Classes of substances at +20 °C	PTFE	PFA	FEP	PVDF	PP	PA
Aldehydes	+	+	+	+	◦	◦
Alcohols	+	+	+	+	+	–
Amines	+	+	+	◦	◦	◦
Bases/Caustic solutions	+	+	+	+	+	◦
Esters	+	+	+	◦	+	+
Ether	+	+	+	◦	◦	◦
Glycols	+	+	+	+	+	+
Ketones	+	+	+	◦	◦	+
Hydrocarbons, aliphatic	+	+	+	+	◦	+
Hydrocarbons, aromatic	+	+	+	+	◦	+
Hydrocarbons, halogenated	◦	+	+	+	◦	◦
Mineral oils	+	+	+	+	–	+
Oxidizing agents, strong	+	+	+	+	◦	–
Vegetable oils	+	+	+	+	◦	+
Acids inorganic	+	+	+	+	+	–
Acids organic	+	+	+	+	+	–
Lubricating oils	+	+	+	+	+	+

Definitions and abbreviations:
+ Excellent chemical resistance – continuous exposure for more than 30 days does not cause any damage or only minor damages.
◦ Limited chemical resistance – depending on the plastic material, a continuous exposure for a longer period of time may cause damages such as cracks, decrease of mechanical strength, discoloration, etc.
– Poor resistance – the plastic material can be deformed or destroyed.

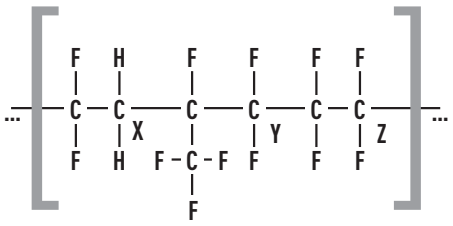
b.safe Elastomers

Their main characteristic is their elasticity: Elastomers can easily be stretched and bent and return to their original shape and size after being released. These synthetic materials are most commonly used for o-rings, flat gaskets or resilient elements.

NBR – Acrylonitrile-Butadiene-Caoutchouc

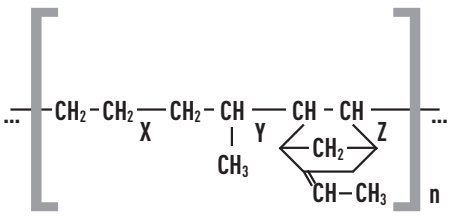
NBR is an elastomer on the base of acrylonitrite-butadiene-caoutchouc which is used as budget-priced sealing material (e. g. O-rings for stopcocks). This material has a good resistance in mineral oils and fats and is also resistant to HFA, HFB and HFC-hydraulic fluids. It has a very good elasticity. PERBUNAN® (trade name of company BAYER AG) is not resistant to brake fluids on the base of glycol, HFD liquids, aromatic compounds (e. g. benzole), ester, ketone and amines as well as in concentrated acids and caustic solutions. That is why it is not the ideal material for the chemistry.

FKM – Fluorocaoutchouc



Elastomer on the base of fluorocaoutchouc, more familiar as VITON®(DuPont). Many O-rings, lip seals and sleeves are made of FPM. It has a very good resistance to heat, chemicals, weather and ozone. Furthermore, it is resistant to sulphurated mineral oils and fats and to hardly inflammable HFD liquids (basis phosphor ester or chlorinated hydrocarbon). It is not resistant to anhydrous ammonia, caustic soda, potassium, ketones, ether, dioxane, as well as some amines and organic acids. For b.safe products, FPM is mainly used as sealing material, mostly protected from the medium by a PTFE sealing lip.

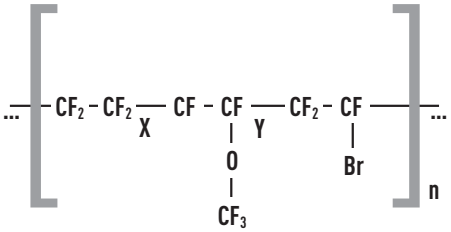
EPDM



EPDM 3 is an elastomer on the base of ethylene-propylene-diene-caoutchouc which is mostly used for gaskets and O-rings. The main applications are in the area of hot water, steam and suds. It is not resistant to hydraulic fluids on the base of mineral oil but it is weather-proof, non-ageing and resistant to ozone. At BOHLENDER, EPDM O-rings are mainly used for applications where VITON® O-rings are not sufficient.

FFKM – Perfluoro-Caoutchouc

An elastic sealing material with natural recovery and good accommodation to the sealing surfaces and a chemical resistance comparable with PTFE. FFKM O-rings have a very high chemical and thermal resistance. Such seals can withstand virtually all kinds of chemicals and can be used at long duration conditions with temperatures up to +260 °C. Perfluoro-caoutchouc is better known under the trade names KALREZ® by DuPont, CHEMRAZ® by Greene Tweed.

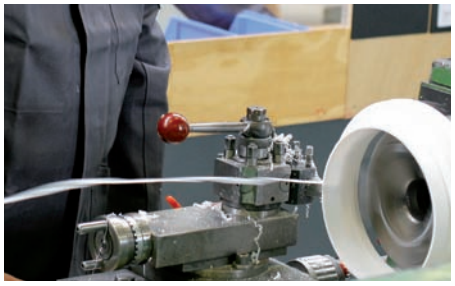


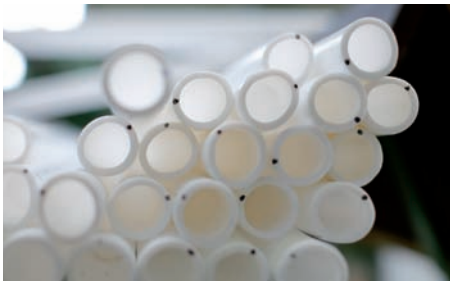
Elastomers - Chemical Resistance

Classes of substances at 20°C	NBR	FKM	FFKM	EPDM
Water	++	++	++	++
Acids	+	+	++	++
Lyes	+	+	o	++
Oils and fats	+	++	++	-
Fuels	+	++	++	-
Ozone	o	++	++	++
Hydrocarbon, aliphatic	++	++	++	-
Hydrocarbon, aromatic	-	++	++	-
Hydrocarbon, chlorinated	-	++	++	-
Temperature range, °C	-40 to +130	-20 to +200	-20 to +250	-30 to +140

Definition:
- \- not suitable, not recommended
- o possible, moderate to good
- \+ good
- +++ very good, best choice

BOHLENDER´s Commitment





For the environment

BOHLENDER takes its responsibility for the environment seriously. Our responsibility is not only a respectful handling of natural resources but also avoiding waste and integration of recycling in the production process.

» Even during the machining of PTFE (e. g. drilling, turning or milling) all cuttings are collected by means of suction through a special tube system directly on our machines. All chips as well as remnants of semi-finished items are sorted according to their purity and stored contamination-free in large containers before later being recycled. During recycling, all chips and remnants are converted by a specially developed process into usable semi-finished items.

» With regard to the environment, disposable products are no longer in our mind. Therefore all our products are designed for long-time use.

» Generation of chips can be avoided by using moulded parts. In addition, moulding reduces the consumption of PTFE powder and energy.

» Products made of the most common fluoroplastics are free of plasticizers and solvents. Thus, they are not harmful for the environment.

No PFOA / APFO use in production

Formerly, perfluorooctanoic acid (PFOA) respectively sal ammoniac (APFO) have been used as additives in the polymerisation process during the production of polytetrafluorethylene (PTFE).

The use of these additives was obligatory in the emission polymerization process but has also partly been used in the suspension polymerisation process.

Although PFOA respectively APFO are almost completely removed from the final product and can mostly be regained during the production process, the well-known manufacturers of PTFE have committed themselves by self-declaration to waive the use of PFOA and APFO in any production process as of the production year 2015. With the renunciation of PFOA and APFO it is ensured that these chemicals, which have not been classified as toxical so far, do not accumulate in the environment.

By supplier agreements, BOHLENDER GmbH ensures that all fluoroplastic materials used for our products have been manufactured without the use of the additives PFOA and/or APFO. Besides PTFE and PTFE-TFM, this includes also all fluoro-thermoplastics such as PFA, FEP ETFE or PVDF.

Bürgerstiftung Lauda-Königshofen

For the German Stem Cell Donor File

BOHLENDER does not only support the activities of the German Stem Cell Donor File for the typing of stem cells financially. Through the personal typing and registration as a stem cell donor, we would like to give hope to people suffering from leukemia or other disfunctions of haematosis. Nowadays, we can help concerned people through a stem cell donation. If a suitable donor cannot be found within the own family, patients have to rely on an unknown donor. The more typings and registrations, the higher the chance for the patients to get a suitable donation. Saving life through a little blood donation – BOHLENDER supports this activity from the bottom of the heart!

For promotion of sports and youth

The work with children and the youth in local sports clubs contributes to the advancement of physical, personal and social competences of the children and young adults and supports the competence to take actively part in the social life. As a matter of course, BOHLENDER has supported the local clubs (amongst them soccer and handball clubs) through the sponsoring of their sportswear for several years now. Only the ones who are healthy and fit can cope with the daily challenges in private and professional life.

For the Civic Foundation Lauda-Koenigshofen

The Civic Foundation Lauda-Koenigshofen was found end of 2013 by dedicated citizens and companies. The targets of this foundation are the development, advancement and appreciation of sustainable and innovative ideas and concepts in Lauda-Koenigshofen and its districts. These targets are reached by the strengthening of the civic engagement and the advancement of a sustainable development of the local community in the fields of family, education, sciences, environmental protection, health, heritage and international understanding. The family company BOHLENDER has its roots in Lauda and has had a deep connection to the city of Lauda-Koenigshofen for a long time now. We at BOHLENDER perfectly identify with the idea and targets of the civic foundation. As an initial founder we respectively engage ourselves.

Numerical Index

Alphabetical Index

b.safe

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+49 (0) 93 46 - 92 86-51

or by E-Mail:
info@bohlender.de

As a manufacturing company we can make products to your specifications. Please send us a drawing or a sketch together with answers to the questions listed below.

Return this form with contact details by fax or e-mail and we will be in touch to discuss details and give you a free, no obligation quote.

Sender

Company _____

Department _____

Contact person _____

Date and time to call _____

Address or P.O. Box _____

Postal Code and City _____

Phone / Fax _____

E-Mail _____

» Please describe the product required. _____

» What is the application? _____

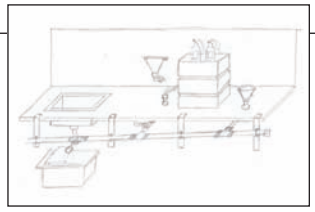
» Which are the critical dimensions and tolerances? _____

» Please specify material requirements. _____

» Please specify operating temperature range. _____

» What is the chemical load? _____

» Please state quantities. _____



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