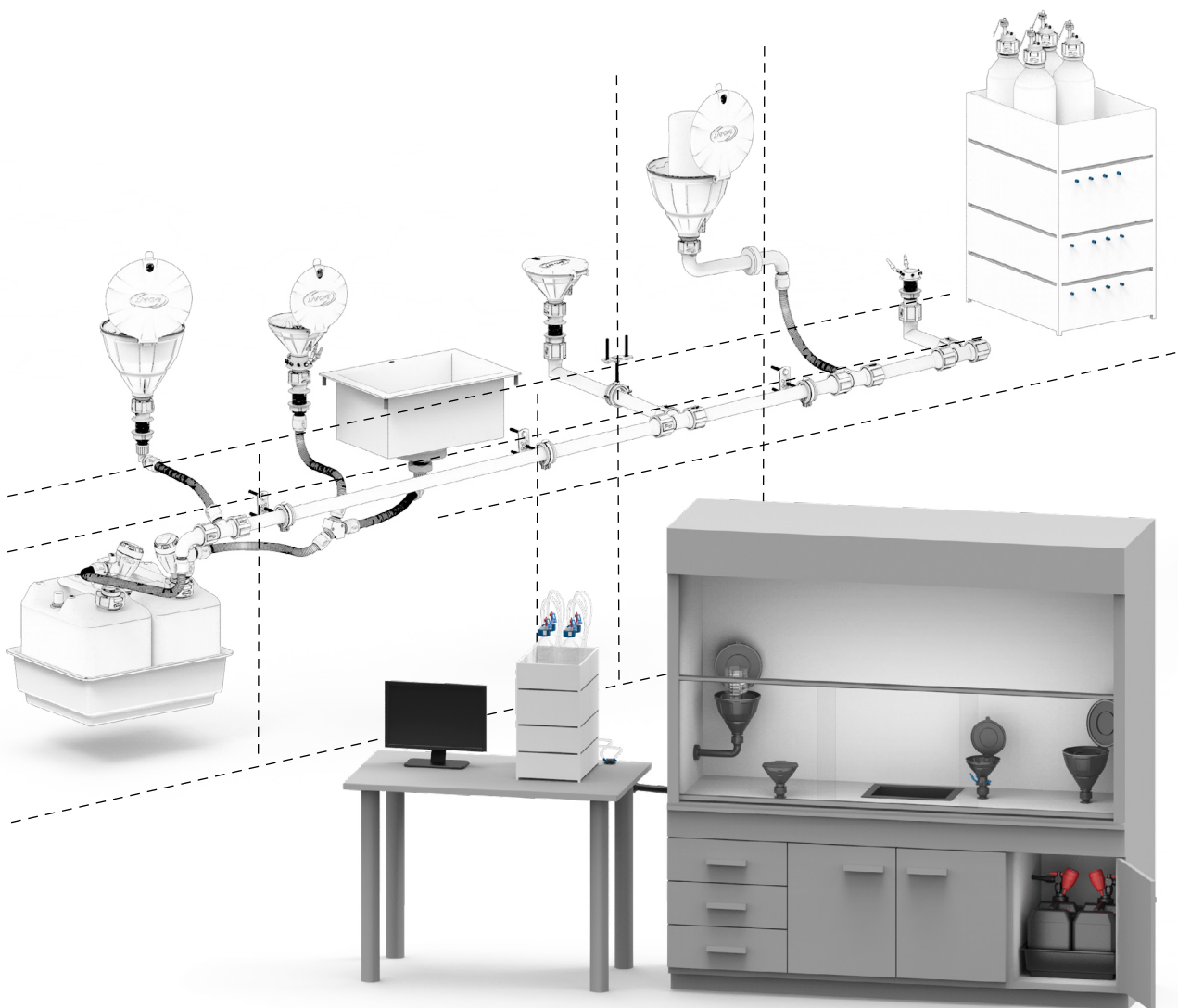


The System Catalogue

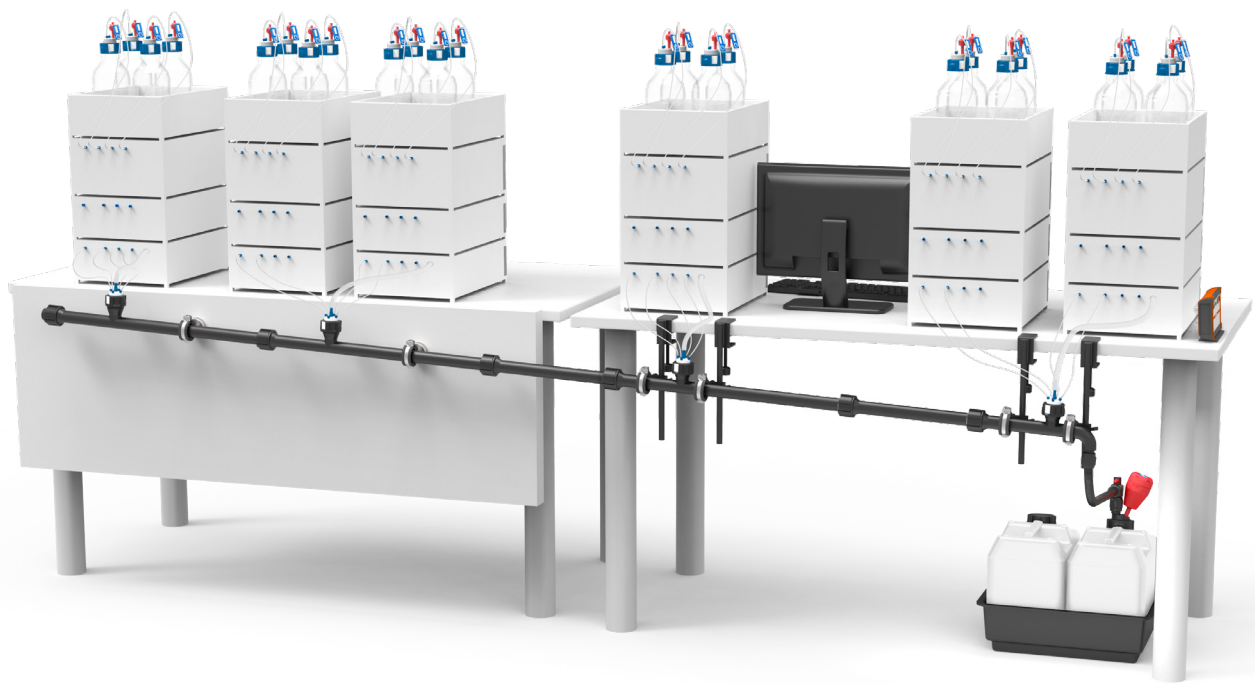
The right Strategy for Liquid Waste.



- ✓ Environment and health safety
- ✓ Sustainable waste management
- ✓ Modular and expandable system

SCAT **SymLine**
Chemical Waste Systems

Always stay up-to-date!
Please visit our website:
www.scatlabsafety.com



We bring Safety and Comfort to You.

Thank you for your interest in SCAT!

SCAT stands for Safety Center for Analytical Technologies in the field of solvent supply and disposal systems. Today's innovation and quality leadership of SCAT Europe GmbH is based on the former maintenance and service operation of SCAT of HPLC systems in analytical laboratories. During customer visits, we have observed very often how laboratory personnel are exposed to the risks of everyday laboratory life. As they are in direct contact with solvents, their health is clearly at stake here!

This is the driving force behind our mission: to make laboratories safer, for people and the environment.

We approach this in two ways. First of all, we use our many years of technological know-how to offer users the highest possible safety when handling solvents. Also, we are never getting tired of educating and raising awareness to what harmful health risks exist and how they can be avoided with the help of our products.

In 1998, SCAT was the first in the market and since then has been developing products with a whole lot of passion and high-quality awareness to achieve the highest-level safety. Systematically and continuously, we take the next evolutionary steps with innovative ideas and the use of new technologies. In doing so, we do not lose sight of our claim as market leader. For all of our products, the quality is in the details. We are particularly proud, for example, of our new pipe fittings, which can withstand a tensile force of 400 Newtons. With that, the tightness of the systems is permanently and substantially increased leaving no room for user error. This is unique! We do not save for the wrong reason. Instead, we constantly invest in high-quality materials which distinguishes ourselves from low-cost providers and saves us from plagiarism by other manufacturers. From our point of view, the highest possible protection and the health of employees should never be compromised. Incorrect savings mean a high safety risk for people and the environment.

As part of our safety concept, disposal is a central issue. With SymLine, we offer a modular disposal system for solvents that connects several HPLC stations in the simplest way. Whether the disposal systems are installed within an existing laboratory furniture or as a brand new installation specially planned for new laboratories. With our SymLine team, we always find the optimal solution.

We are happy to support and advise you right from the start and find an ideal concept even in difficult environments. As the systems are installed, our highly qualified service technicians go on site and take over the installation professionally.

With this catalogue we give you a first overview of our product lines and safety concepts. On our website you will always find the latest products and updates. However, it is our wish that you contact us directly so that we can advise you individually and personally that we can together find solutions for the safety of your employees.

In any case, we will never stop making the laboratory world a little safer.

Yours faithfully



Peter Rebehn

Managing Partner

SymLine is a brand of SCAT Europe GmbH



Explanation | Overview



ATEX compliant

ATEX: A widely used synonym for the ATEX directives of the European Union.

The term ATEX is derived from the French abbreviation for Atmosphere Explosive. This directive covers two guidelines in the field of explosion prevention, namely the

ATEX product directive 94/9/EG

and the

ATEX Operating Directive 1999/92/EG.

All of the products in this overview that we have marked with the ATEX symbol are suitable for use in potentially explosive atmospheres.



Funnel with sealing ring



PE-HD electrostatic conductive



Electrostatic conductive



Grounding connection



Removable strainer



Funnel with ball valve



Level control



Hinged lid



Outer diameter of thread

CONTENTS



SymLine - Intro

The right Strategy for Liquid Waste.

Filling Units

Filling Safely and Cleanly.

Pipe and Tube System

The Safe Way to Disposal.

Disposal

Hazardous Vapours under Control.

Level Control

Always Up-To-Date.

High Flow Solution

The Waste Disposal System for Viscous Chemicals.

SymLine FLEX

The Flexible Waste Disposal System for HPLC Work Stations.

Accessory

Useful Helpers from our Range.

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Intro

Filling Units

Pipe and Tube System

Disposal

Level Control

High Flow Solution

FLEX

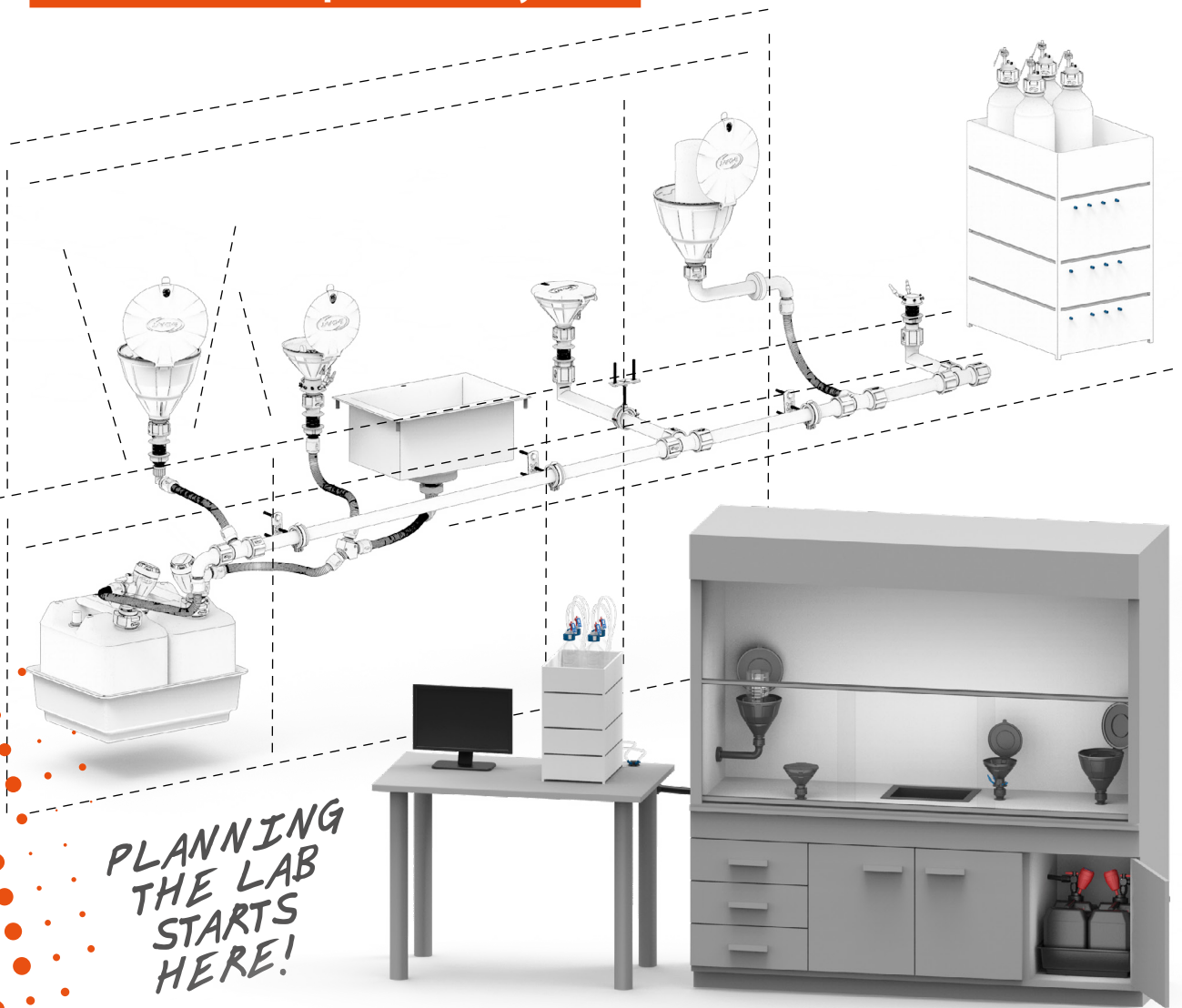
Accessory



SymLine - Intro

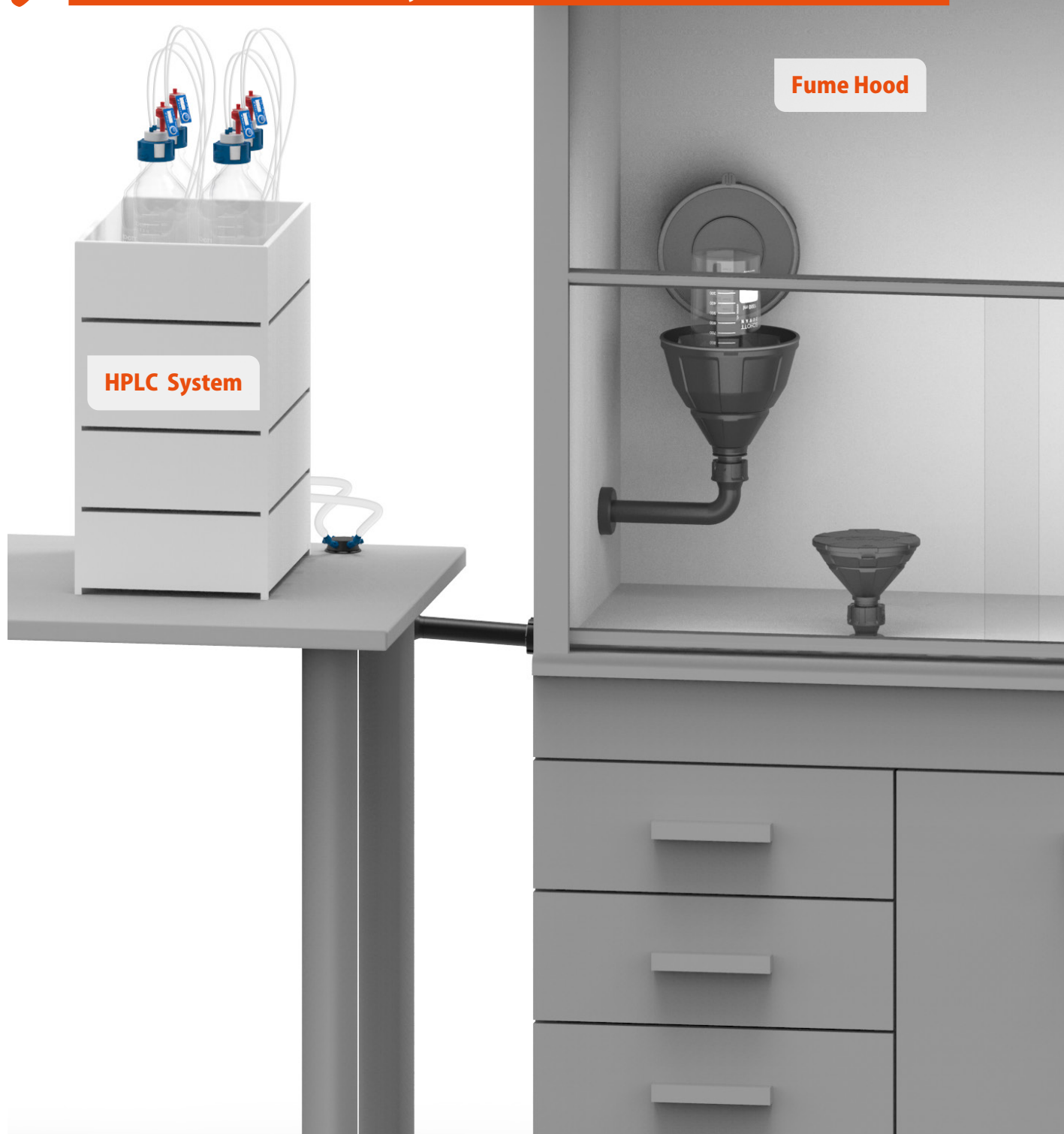
The right Strategy for Liquid Waste.

- ✓ Environment and health safety
- ✓ Sustainable waste management
- ✓ Modular and expandable system



PLANNING
THE LAB
STARTS
HERE!

- ✓ **Safe waste management for solvents**
- ✓ **Perfectly integrated in / at the lab furniture**
- ✓ **Modular and flexible system for installation and extension**



Sample view for an HPLC connection and a SymLine integration in a fume hood.

Safety and maximum comfort in the disposal of liquid waste

This is what the SymLine[®] principle stands for. Environmental protection, more free space, fewer hazards at the workplace - the SymLine[®] system is integrated directly into your laboratory equipment. The waste containers are stored outside the work area for more safety, comfort and sustainable environmental protection.

Filling Units



Central Collection Point



The rear view of a laboratory fume hood.

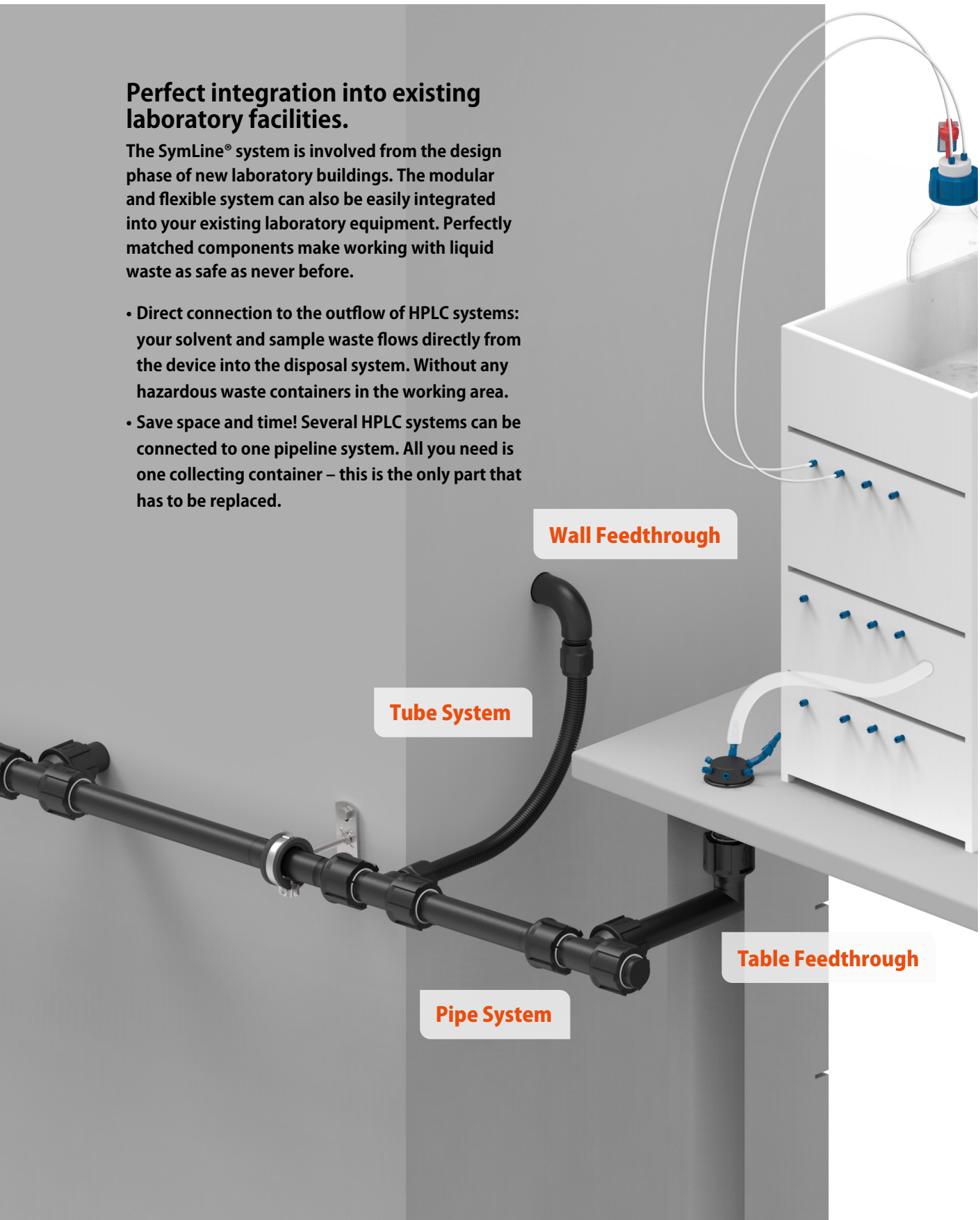


The representation serves to illustrate possible installations and does not correspond to the real laboratory. Pipe system and attachment are installed in the service shaft of the fume hood.

Perfect integration into existing laboratory facilities.

The SymLine[®] system is involved from the design phase of new laboratory buildings. The modular and flexible system can also be easily integrated into your existing laboratory equipment. Perfectly matched components make working with liquid waste as safe as never before.

- Direct connection to the outflow of HPLC systems: your solvent and sample waste flows directly from the device into the disposal system. Without any hazardous waste containers in the working area.
- Save space and time! Several HPLC systems can be connected to one pipeline system. All you need is one collecting container – this is the only part that has to be replaced.



Wall Feedthrough

Tube System

Pipe System

Table Feedthrough

Intro

Filling Units

Pipe and Tube System

Disposal

Level Control

High Flow Solution

FLEX

Accessory



- ✓ **Compliant with TRGS & BGRCI**
- ✓ **Active disposal & storage**
- ✓ **Modular / individual configuration**

Extraction TRGS 727:

4.5.1 Conductive or dissipative containers
(1) During the filling and emptying of the container, all conductive or dissipative parts of the system must be electrically connected and grounded.

1 HPLC Connection

Connection of waste tubes directly to the disposal system!

2 Safety Funnels

Disposal is done directly in the fume hood - no long walks to the waste bins.

3 Sinks

For cleaning and rinsing laboratory glasses and instruments. The useful cover increases the work surface when not in use.

4 Pipe and Tube System

Numerous connection options for optimal integration. Individual tube lengths and adapters ensure maximum flexibility.

5 Grounding & Antistatic

Dissipative plastics ensure optimal protection against static charging and sparking!



6 Safety Waste Caps

Gases and vapours do not get into the laboratory air. Exhaust filters and vent lines eliminate health and environmental hazards effectively.

7 Containers

Collection containers for liquid waste.

8 Safety Cabinets

Explosion and fire protection according to the latest standards.

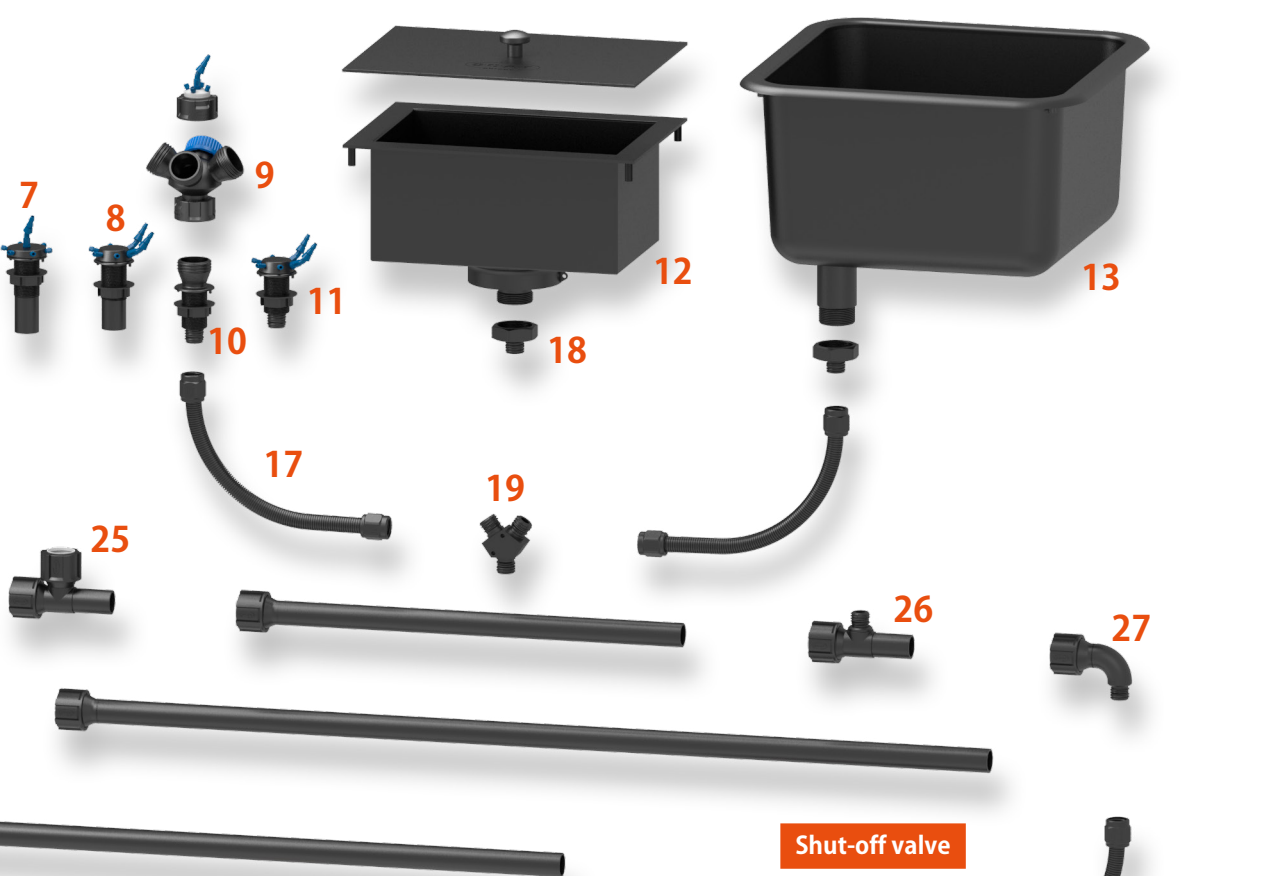


SymLine system components

- 1 317 633 Funnel ARNOLD with sieve
- 2 317 638 Funnel ARNOLD with ball valve
- 3 318 962 Funnel MARCO
- 4 450 120 Funnel LISA-Extension
- 5 450 045 Safety Waste Cap LISA
- 6 306 498 Safety Waste Cap
- 7 106 412 HPLC Table feedthrough pipe
- 8 106 669 HPLC Table feedthrough flat pipe
- 9 306 509 4-in-1 Collector NICOLE
- 10 106 455 Table feedthrough tube connection
- 11 106 616 HPLC Table feedthrough flat tube
- 12 117 989 Sink with cover
- 13 118 003 Sink
- 14 106 450 Table feedthrough with pipe connection
- 15 106 601 Rear wall feedthrough for ARNOLD
- 16 106 612 Rear wall feedthrough for MARCO
- 17 106 569 SymLine FlexTube / 106 575 FlexTube Pro
- 18 106 584 Thread adapter sink/tube
- 19 106 476 Tube connector Y-Distributor
- 20 106 430 Connection pipe, angled 150 mm
- 21 106 438 Connection pipe, angled 200 mm
- 22 106 440 Connection pipe, angled 500 mm
- 23 106 690 Connection pipe, straight 600 mm
- 24 106 700 Connection pipe, straight 1200 mm
- 25 106 712 T-Piece for pipes
- 26 106 711 T-Piece for pipes with tube connection
- 27 106 456 Curved element pipe to tube
- 28 106 475 Shut-off valve
- 29 306 482 Safety Waste Cap
- 30 106 480 Safety Waste Cap electr. level control
- 31 106 490 Exhaust tube
- 32 410 535 Exhaust filter
- 33 106 548 Built-in Signalbox²
- 34 108 088 Table Signalbox
- 35 700 003 Canister
- 36 117 985 Collection tray with removable base insert

HPLC Connection

Sinks



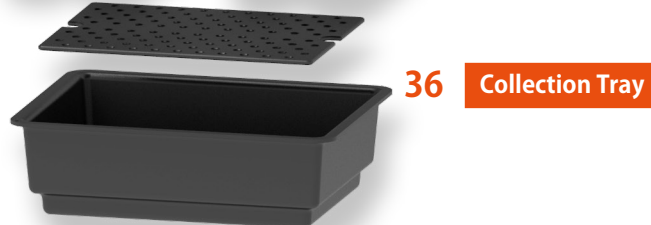
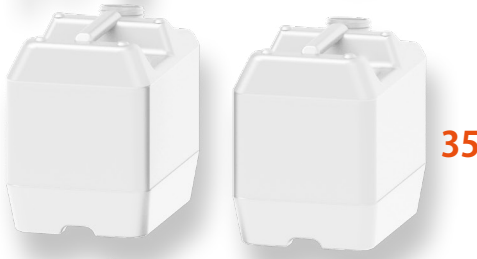
Shut-off valve

Tube System

**Electronic Level Control
Signalboxes**

Exhaust Filter / Exhaust Tube

Safety Waste Caps



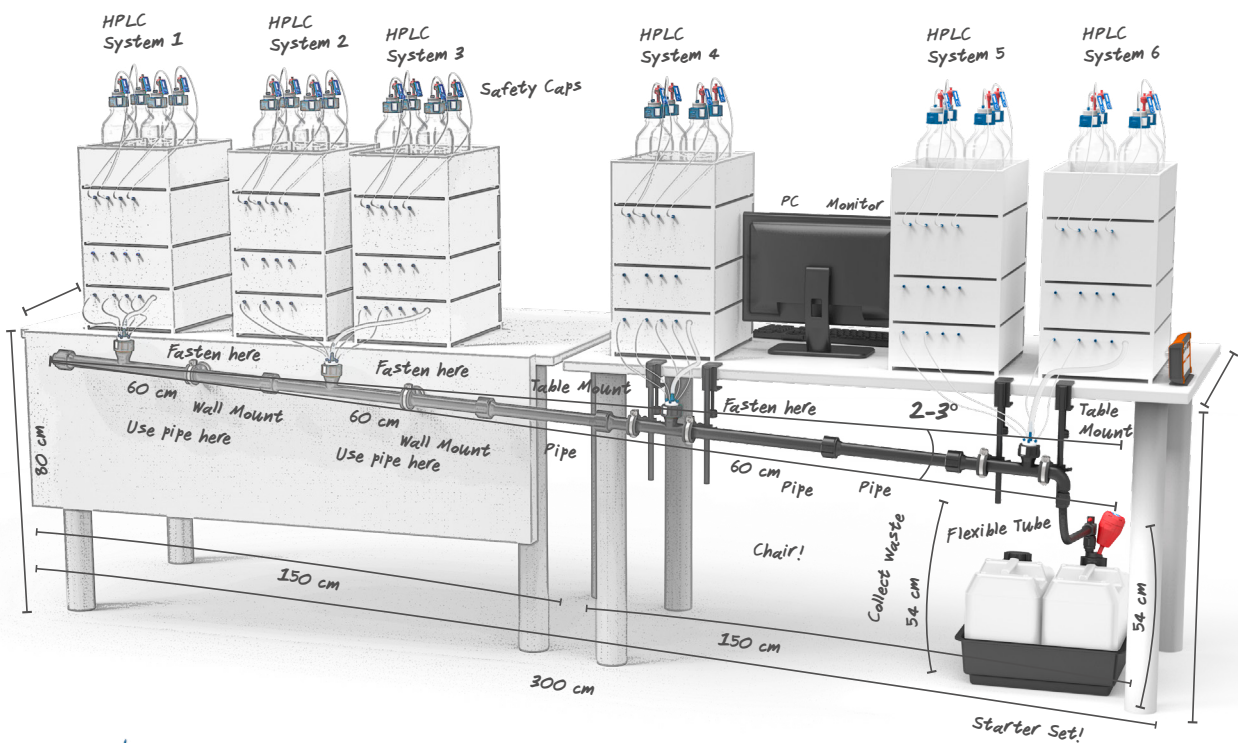
- Intro
- Filling Units
- Pipe and Tube System
- Disposal
- Level Control
- High Flow Solution
- FLEX
- Accessory

- ✓ Consulting & planning
- ✓ Integrated installation
- ✓ Space-saving assembly



To the SymLine "Classic" system,
chapter "Filling Units", starting from page 32.

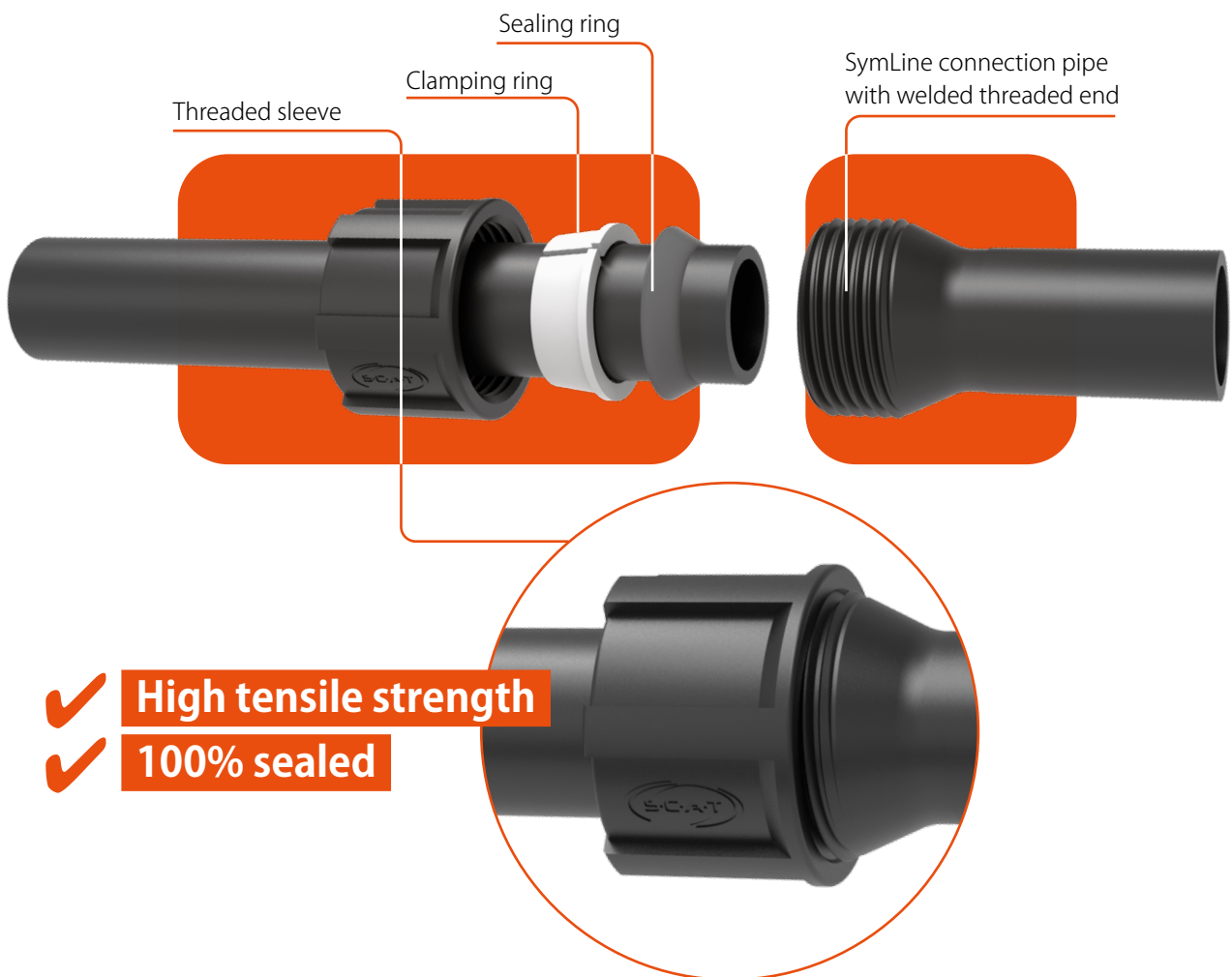
- ✓ Consulting & planning
- ✓ Do-it-yourself built-on
- ✓ Flexible conversion



To the SymLine FLEX system,
chapter "FLEX", starting from page 90.

The tubular system: safe attachment, optimum flow direction

The SymLine FLEX tube extensions have a funnel-shaped threaded sleeve at one end and a smooth tube opening at the other. In order to tightly interconnect the tubular system, the threaded sleeve, clamping ring and sealing ring are simply pushed over the smooth end of one tube, and this is then firmly screwed on to the threaded part of the following extension piece (i.e. on the other tube). When done properly (tightening torque 10 - 15 Nm), the resulting connection will withstand a tensile force of **400 N**. The system allows for optimum flow of waste liquids and prevents leakage.

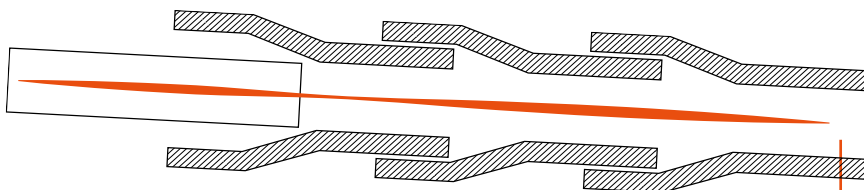


- ✓ High tensile strength
- ✓ 100% sealed

Pipe system

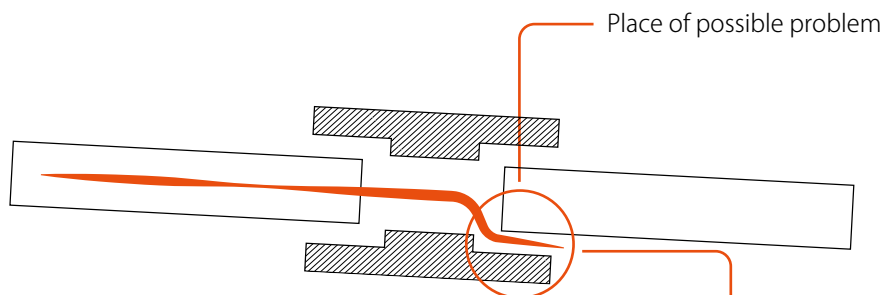
The principle "smooth tube end runs in funnel-shaped threaded socket" optimally leads waste liquids and prevents leaks. This SymLine design is the global standard for all types of waste disposal cycles and their installations. Trust SymLine - the market leader - for safe disposal.

SymLine construction method - optimal for waste transport



SymLine construction, with optimum liquid flow.
Liquids flow continually downwards, from the smooth pipe end, into the interconnected threaded one.

Typical construction principle - prone to leaking!



Smooth pipe ends are interconnected, using connecting sleeves. This results in increased danger of leakage.

Proactive protection against risks of ignition.

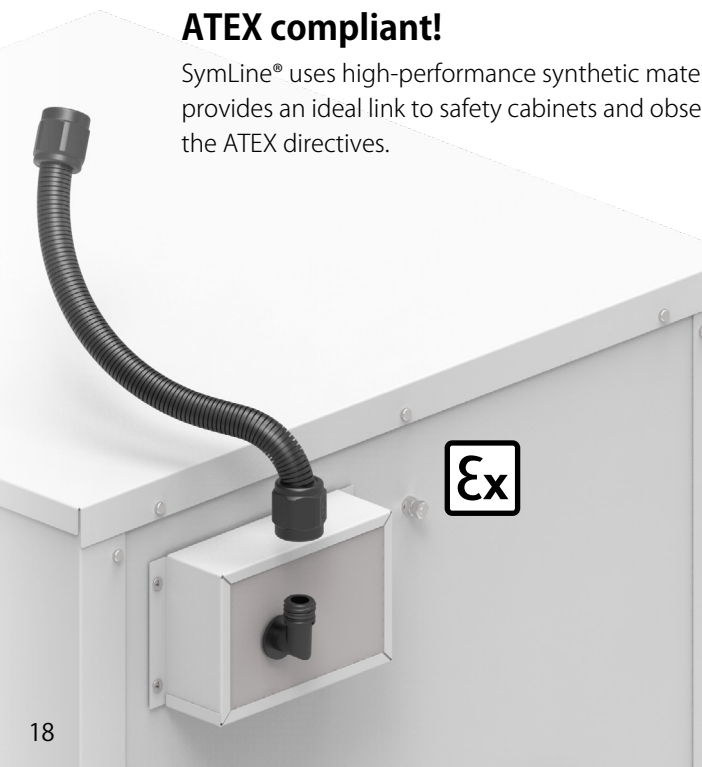
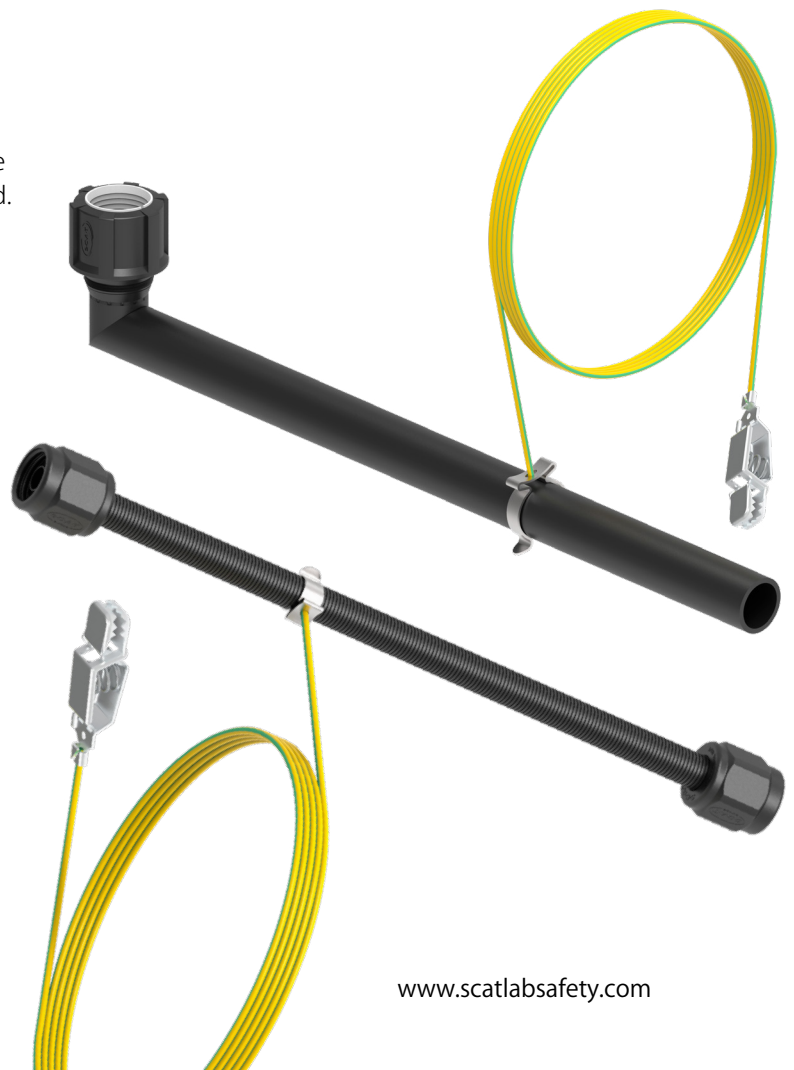
Why is grounding necessary?

Special care is required when collecting flammable liquids. Static charging may occur during drainage which is the cause of static sparking and increased fire risk. SymLine[®] built-in solutions made of electrostatic conductive plastics prevent static charging and can be secured by means of additional grounding connections.

There are a number of directives and regulations that define how to assess and avoid risks of ignition and which proactive measures to take. Of special importance are the German Trade Association Rules for Safety and Health at Work (BGR) issued by the German Federation of Institutions for Statutory Accident Insurance and Prevention, HVBG): BGR 132 - Directive 'Static Electricity'. In terms of contents this corresponds mainly to the international norm CENELEC 50404 and the latest Technical Regulations for Hazardous Substances (TRGS) TRGS 727 (formerly TRBS 2153) - Avoiding ignition risks caused by electrostatic charging. Electrostatic conductive synthetic materials which have a volume resistance $> 10^4 \Omega$ & $< 10^9 \Omega$ can be used in protective systems which are subject to the ATEX directive provided they are sufficiently grounded.

ATEX compliant!

SymLine[®] uses high-performance synthetic materials, provides an ideal link to safety cabinets and observes the ATEX directives.



By adding carbon, the plastic turns black and becomes electrostatic conductive.



SymLine material properties

All components made of electrostatic conductive plastic can be earthed and are suitable for voltage equalization, as per TRGS 727. Electrically conductive PE-HD EC displays a discharge resistance against earth of $< 10^9 \Omega$, as per DIN EN 61340-5-1, and is suitable for Zones 0, 1 and 2, as per the German Hazardous Substances Ordinance (GefStoffV), EN 1127-1, DIN EN 60079-10-1 and DIN EN 60079-10-2. It is resistant to chemicals, as defined in SEFA 3 and SEFA 8.



- TRGS 727
- DIN EN 61340-5-1



- ATEX zone 0, 1 and 2
- EN 1127-1



- DIN EN 60079-10-1
- DIN EN 60079-10-2



- SEFA 3
- SEFA 8



The alternative to heavy stainless steel!

Organic solvents, acids, alkalis or other aggressive substances can be collected safely using the SymLine® system. There will be no problems of corrosion as they exist with stainless steel. Heavy stainless steel canisters are very difficult to transport when full. As a result of its light weight, electrostatic conductive plastic is the ideal material for use in the lab. This is why here SymLine® products have a considerable advantage.



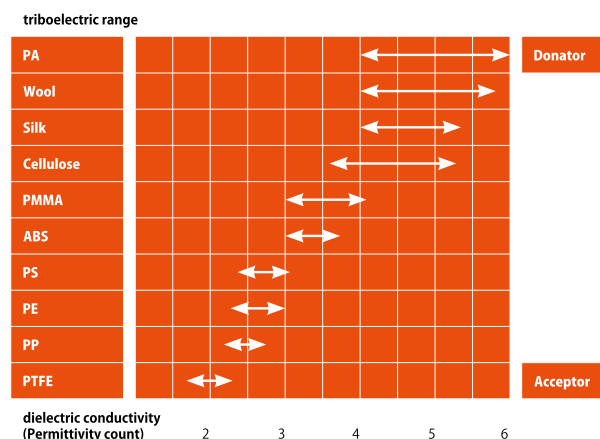
When handling flammable liquids: risks of electrostatic ignition in the laboratory?

Author: Kurt Moritz

Kurt Moritz is the expert for electrostatics and mechanical explosion protection in the Technical Plant Safety department of **Merck KGaA, Darmstadt**.

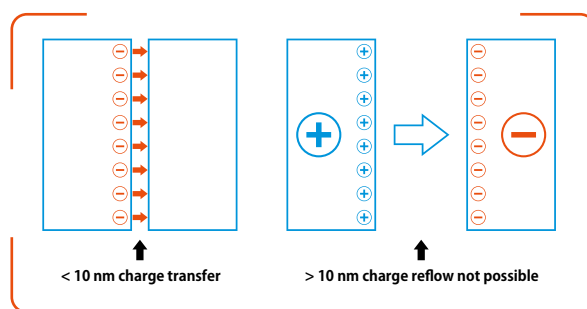
Electrostatics, commonly known as static electricity, is not produced through friction of two surfaces as per popular belief. It is generated by separating surfaces which have previously been in intensive contact. In this context, intensive contact refers to a surface having a dwell time, even if short, and a maximum distance of 10 mm to the other contact surface.

Depending on the conductivity and position in the triboelectric series, materials tend to pick up charged particles on their surfaces or transmit charged particles to the adjacent surface. In this case, conductive materials serve as electron suppliers (donator), while insulating materials absorb charged particles (acceptor).



Materials with higher permittivity serve as electron suppliers (donors). Those with lower permittivity tend to accept charged particles (acceptors).

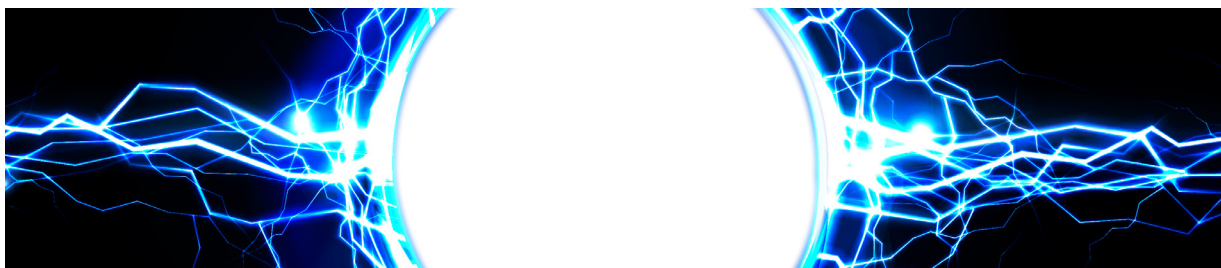
If the surfaces are separated quickly after such a charge transfer, and if at least one of these materials is a poor conductor of electricity, the electrical charge can no longer be transferred back to its origin. Consequently, this inability for charged particles to be transferred back results in an excess charge on one surface, while a charge deficiency is created on the other surface. During separation a voltage is generated, reaching up to the magnitude of kV.



Charge transfer upon contact, charge separation by surface separation.

Therefore, electrostatics is always a surface effect and occurs on the surface on a molecular or atomic level.

When working with solids, it is easy to recognize separation processes that may lead to charges, as these are generally visible movements. In general, visible movements are always present. Removing film layers, decanting material from a container or removing a synthetic piece of clothing from the body (fleece, polyester) are all examples that can lead to noticeable and sometimes visible static charge transfers.



As previously explained, for charge separation to occur at least one of the materials involved requires to be a poor conductor. Poor conductors (or „insulators“) include most plastics like PE, PVC, PVDF, PTFE, etc. However, solids are not measured in units of conductivity (unit: S/m) but in terms of their resistance (unit: Ω m). Siemens/ meter being the reciprocal of ohmmeter, the values are directly comparable, i.e. low conductivity corresponds to high resistance.

Liquids are also to be distinguished from an electrostatic point of view. Some substances also demonstrate a high resistance, meaning a poor ability to conduct electric charge.

These include, for example, aliphatic/aromatic hydrocarbons, such as ethers, as well as widely used solvents such as toluene, n-heptane, n-hexane, xylenes, etc.

Some nitriles (such as acetonitrile) and some esters are special in that they lead to unexpectedly high supercharges despite having relatively good conductivity - so far an unknown and hardly investigated effect. This means that electrostatic protection is especially important for such substances.

However, unlike to solids, the process of surface separation of liquids is not always recognizable as such.

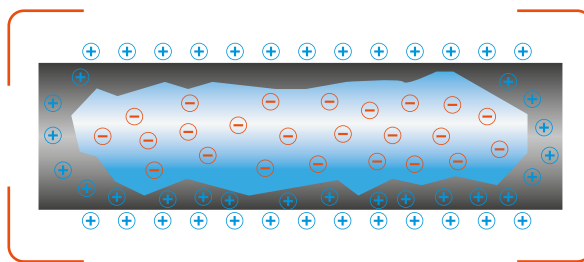
It is difficult to visually distinguish between flowing and stagnant conditions of a liquid-filled glass pipe or semi-transparent HPLC tube.

Even if so: the liquid always remains in contact with the inside surface of the tube/pipe. **However, no surfaces are separated in this process, are they?**

This is common misconception. Unlike solids, a so-called electrochemical double layer (also called a Helmholtz double layer) at the container or pipe wall

with different electrically charged layers. While the liquid flows along the pipe, the charge layer primarily located in the liquid is carried along.

Surface roughness, flow-inhibiting installations and cross-sectional changes favour these effects, increasing the charge of the system.



Charge separation on a molecular basis during transfer.

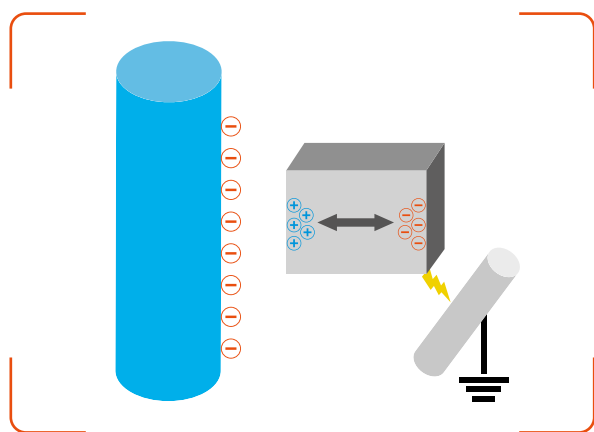
Of course, a certain volume of liquid as well as flow velocities are required in order to generate a charge.

In a closed system a flow velocity of typically <1 m/s is regarded as uncritical, as up to this point an equilibrium of charge transfer and charge reflow exists. However, this limit does not apply to pipe-exit conditions or decanting, since here different volume/ surface ratios are given. Furthermore, stopping the liquid flow will not allow for a charge reflow.

For the given reasons, filling a test tube from a laboratory wash bottle does not meet the criteria that lead to critical electrostatic charges, even though the wash bottle is also made of insulating material (generally LDPE or HDPE).

However, charges quantity is transferred at increasing velocities. **This situation may occur in capillaries and tubes of HPLC systems**, particularly when multiple tubes are combined, thus increasing the flow of waste solvents through a single tube. The associated separation or charging processes can be sufficiently strong to result in an electrostatic field being formed around the transfer tubes. If there are components inside the affected charge area which are conductive (such as metal parts) as well as non-grounded, they will become subject to a charge polarisation. This means that the opposing polarity increases towards the field; the same polarity is repelled. This polarisation effect of charged particles in non-grounded, conductive components can be so strong that a discharge of the excess charge or - depending on polarity - an equalisation of the charge deficit to the next grounded point takes place. Both generally manifest themselves in form of sparks.

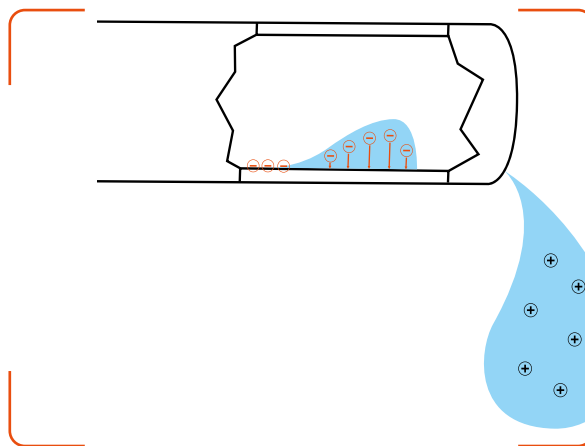
A typical example of building up a charge through induction are metallic components such as couplings or brackets connected to a transfer tube made from insulating material.



Polarisation of conductive, non-grounded parts through "induction". This may lead to a charge equalisation in form of a spark.

Even when pouring liquids flowing over surfaces and are, subsequently, collected in containers (e.g. waste solvents that are poured through a funnel into a collection container), charges may accumulate. Initially, the funnel may take on one polarity due to the separation process between liquid and funnel. The oppositely charged liquid collects in the container and transmits its charge to the container. If the funnel and container are not electrically/electrostatically

connected to each other, a different electric potential forms on both components, i.e. a charge that can be discharged in the form of sparks. This creates an ignition risk.



Charge separation when pouring a liquid with high conductivity (such as methanol, THF, acetonitrile) and a body of insulating material (such as PE/PTFE/etc.). Charges can also accumulate with reversed properties (conductive body and insulating liquid).

Incidents with damaging effects due to electrostatic charges and discharges when transferring liquids and waste solvents are well-known and documented.

How do you avoid electrostatic ignition risks when handling solvents in laboratories?

There are three different types of electrostatic discharge that apply to laboratory conditions. A risk assessment taking into account the three types is used to evaluate the risk as well as to specify safeguards, and by this mitigates electrostatic hazards.

The most common type is the discharge by spark which always occurs when conductive materials are charged by separating their surfaces from insulating materials or by "induction".

These charged, conductive objects may include

- └ **packaging materials such as canisters, alloy bottles, metal containers**
- └ **persons**
- └ **tools such as funnels, pipe components, sieves and filters**
- └ **as well as flammable solvents with high conductivity (alcohols, ketones) if their charges cannot be discharged.**

The charge accumulates in the same way as in a capacitor. If the potential is high enough, the charge is equalized with another conductive object to another potential (generally to the grounded point).

The use of conductive or dissipative earthing materials prevents spark discharges.

The charge is equalised via the ground connection and a possible charge is harmlessly discharged. At the same time, conductive, grounded containers are capable of grounding the conductive liquids they hold.



The safe grounding of conductive components prevents spark discharges. Dissipative materials must also be grounded.

The second relevant type of discharge is the brush discharge.

This occurs on surfaces made of insulating material which have been charged by separating operations such as rubbing, wiping, the removal of protective films, etc., or by spraying.

Insulating solid surfaces can only be charged by such surface processes. Charging via induction does not occur in insulating materials, as the poor conductivity does not allow the charged particles in the material to be moved/polarised.

If a charged insulating surface is given a grounded conductor, such as by the approach of a metal object or a person, the electrostatic field concentrates towards this grounding point and develops into a spark manifesting on the surface - the brush discharge.

Brush discharges are lower in energy than spark discharges and cannot ignite flammable dust-air mixtures with a minimum ignition energy of > 1 mJ. However, the energy of the brush discharge is sufficient to ignite flammable solvent vapours or combustible gases.

Depending on the combustible material (e.g. belonging to the explosion group IIC) and how likely ignitable solvent vapour-air mixtures are (e.g. "occasional" (zone 1), an insulating material surfaces > 20 cm² made of insulating material may be evaluated as critical.

In certain conditions, containers such as canisters, bottles etc or tools made of insulating material are supplied with a manufacturer release for use with flammable solvents. However, the operator must observe the manufacturer specifications and conditions of use (such as "Dry wiping prohibited", "...only for designated use", etc.).

To protect against brush discharges, surfaces made of insulating material must not be charged by rubbing, wiping, or similar operations in the simultaneous presence of flammable vapours.

Alternatively, the use of conductive or dissipative materials is recommended, as they discharge safely when grounded. In this way the prerequisite for brush discharge, namely charged insulation surfaces, is not given.



Using conductive or dissipative grounding materials avoids insulation surfaces being present. This means that the prerequisite for brush discharges is no longer given.

The third type of discharge observed in laboratories is the propagating bush discharge.

This mainly occurs inside plants and on surfaces made of insulating material if so-called „strong charge-generating processes“ take place simultaneously. For example, these conditions are present in insulating tubes through which aerosols or solid particles are transferred at high velocities.

A tube exposed to the conditions of propagating brush discharge is generally recognisable by a dark mark, with a length of several centimetres. At the centre of the mark perforation of the wall due the discharge can be seen. A propagating brush discharge contains enough energy to ignite fuel-air mixtures of any kind. However, as several conditions are required for the generation of this type of discharge, the probability of occurrence is relatively low. If in doubt, seek an expert opinion.

Since propagating brush discharges only occur on surfaces made of insulating material, the use of conductive or dissipative transport or conveyor systems is also an adequate safeguard in this situation.

Electrostatics and its ignition risks is a very complex issue. The requirements for components and parts used in so-called hazardous areas, i.e. zones in which flammable atmospheres occur frequently and to a great extent, are effectively regulated.

But even in areas with high air exchange and lower solvent volumes which are not defined as hazardous zones, care must be taken to avoid creating electrostatic ignition sources near emission points or in areas of handling solvents. An electrostatic discharge occurring in this area would inevitably cause the mixture to ignite and, in a worst-case scenario, would cause the container to explode.

Instead, this emission should initially be avoided by using suitable filtration systems. If this is not possible, care must be taken to ensure that no electrostatic hazards can be created near solvent emission points or in areas where these substances are handled (i.e. waste solvent collection points).

In order to do so, it must be ensured that not only the previously specified safeguards for solvent systems are applied, but also additional mitigations such as grounding of operators through dissipating floor mats

and appropriate footwear are considered. Electrostatic requirements for the hazardous areas listed above are regulated differently depending on national regulations.

In Germany, the "Technische Regel für Gefahrstoffe" ("Technical Regulations for Hazardous Substances"), or TRGS 727 (formerly TRBS 2153), stipulates electrostatic requirements in hazardous areas under the title „Prevention of ignition hazards due to electrostatic charge“.

At European level, CENELEC (EUROPEAN COMMITTEE FOR ELECTROTECHNICAL STANDARDIZATION) CLC/TR 50404:2003 superseded by CLC/TR 60079-32-1:2015 Electrostatics - Code of practice for the avoidance of hazards due to static electricity, is applied.

These regulations describe hazards and specify safety measures. Therefore, this source can also be used as reference or for specific questions.

Kurt Moritz

Kurt Moritz is the expert for electrostatics and mechanical explosion protection in the Technical Plant Safety department of **Merck KGaA, Darmstadt.**

**You are in the planning phase?
We are ready to assist you!**

Ask your lab furniture manufacturer, lab planner or the SymLine planning team.



Safety Cap

Proven SCAT safety technology provides for optimum protection, both during the supply, and during the disposal, of solvents. Solvent vapors are blocked and filtered out. The system is therefore independent of other extraction systems within the laboratory.

SCAT Safety Caps ensure that your solvents are kept clean and remain stable. They protect users and the environment from the effects of solvent vapors, and enable a continual smooth operation of the HPLC facility.

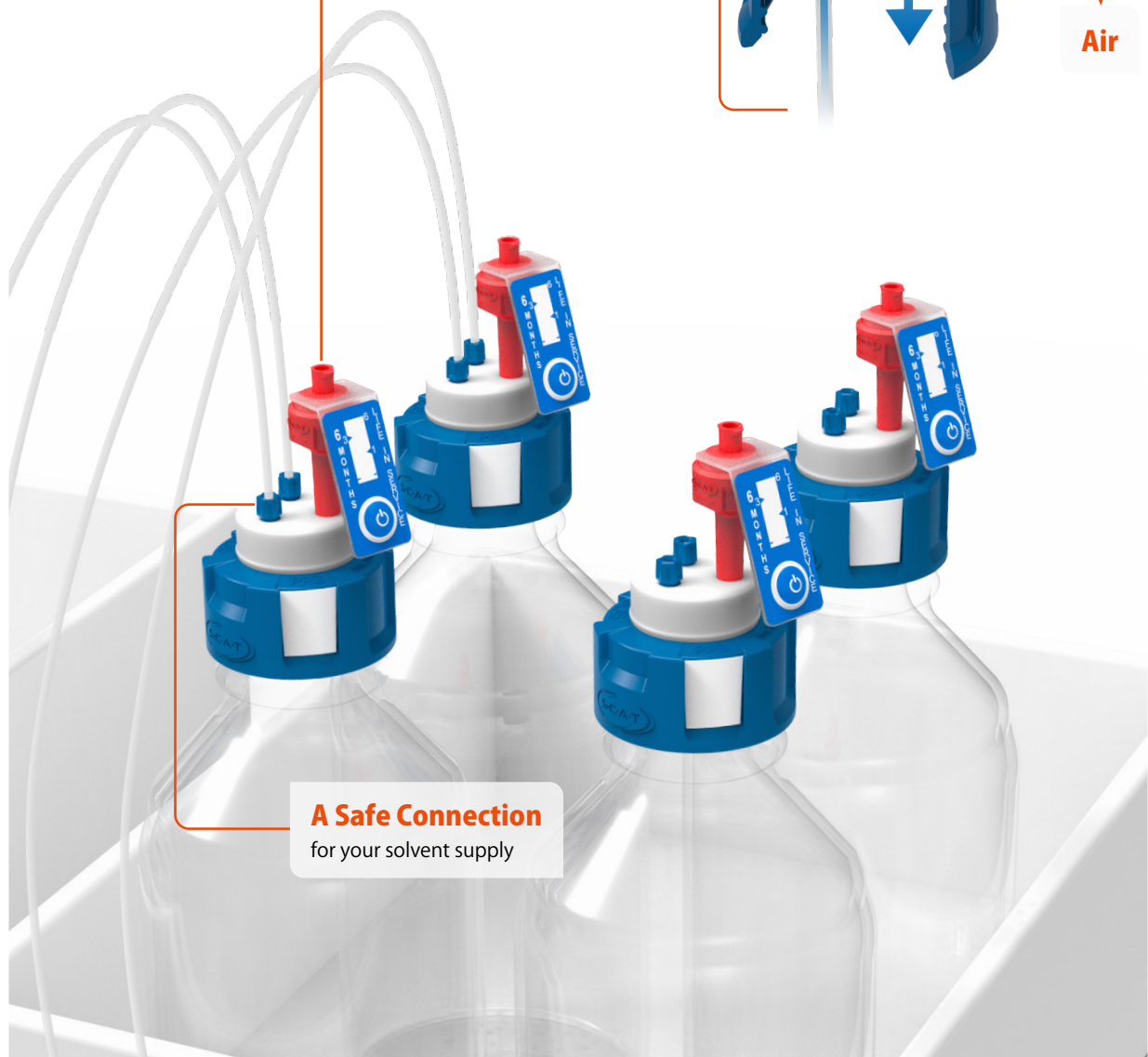
Supply

Solvent

Air

Safety Caps

with air ventilation valve



A Safe Connection

for your solvent supply

Disposal



Safety Waste Cap

Liquid laboratory waste can consist of a wide variety of substances and tends to produce toxic fumes. Users often do not know which mixtures are stored in their containers. The closed SymLine disposal system provides reliable protection against these toxic fumes. The Safety Waste Cap provides a safe connection to the waste containers. The freely rotatable core made of electrically conductive plastic ensures an ergonomic and secure closure and is suitable for use in potentially explosive areas and is ATEX-compliant! **Exhaust systems can be connected directly to our Safety Waste Cap in order to be able to remove pollutants via the laboratory exhaust air - the SymLine standard for safe collection of liquid laboratory waste.**



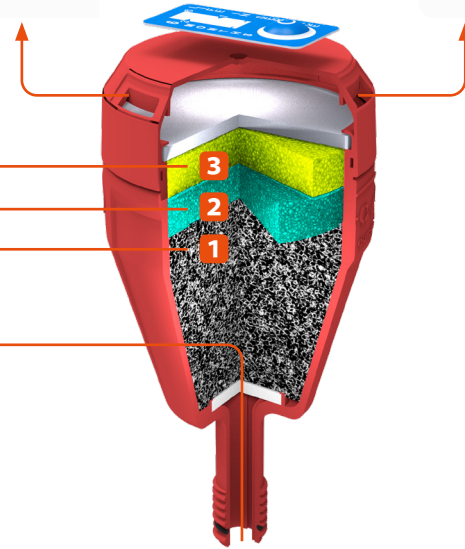
Safety Waste Cap
with exhaust tube

Exhaust Filter
with three types
of active carbon

- 3. layer - binds acids
- 2. layer - binds alkalis
- 1. layer - adsorbs solvent vapors

Filtered

Air



Vapors

Safety Waste Cap
with exhaust filter



Exhaust Filter

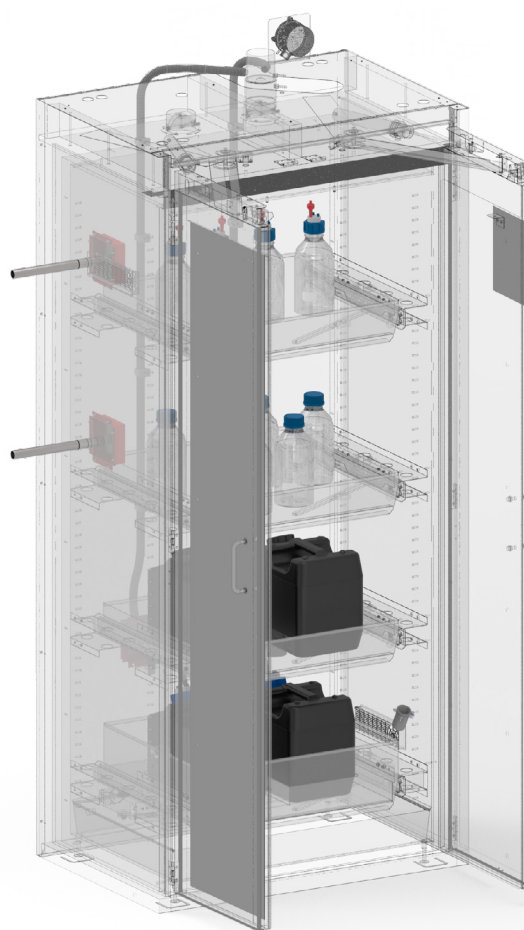
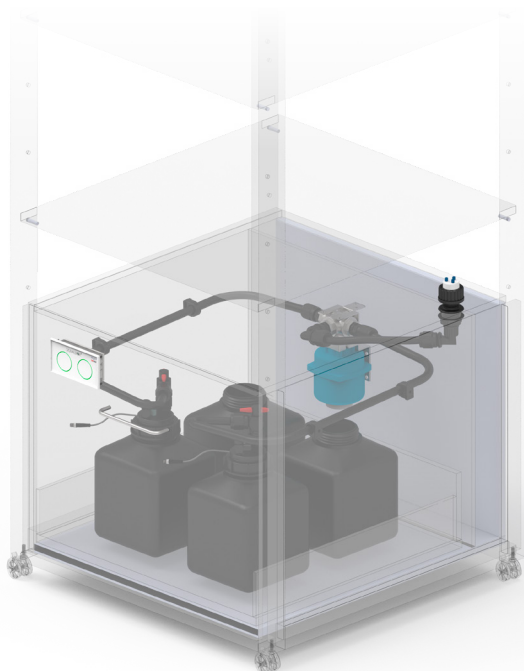
The SCAT exhaust filters offer optimal protection against the toxic laboratory waste vapors that are produced when there is no laboratory exhaust air. Thanks to the bevelled core of the Safety Waste Cap, exhaust filters can be connected without offset adapters. Due to the composition of 3 layers of active carbon, SCAT exhaust filters are suitable for adsorbing solvent vapours and binding acids and alkalis.

SymLine custom-made products

With the large number of different applications, it can happen that a system of standard components does not meet the demand perfectly. Therefore, we offer customized solutions meeting the customers' individual requirements. This gives the system a unique flexibility and individuality, whereby the highest quality standard is given at all times!

Mobile HPLC rack

Can be used flexibly thanks to castors. Safety Waste Cap with table feedthrough. Waste disposal with level control and automatic switching via 3-way ball valve.



Safety cabinet with HPLC connection for supply and disposal

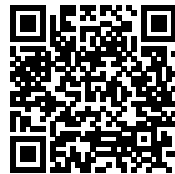
Tall safety cabinet with steel tube feedthrough for HPLC tubes and capillaries. Through attachments the fire protection is maintained. HPLC supply and disposal without any contact with solvents.



Our Partners

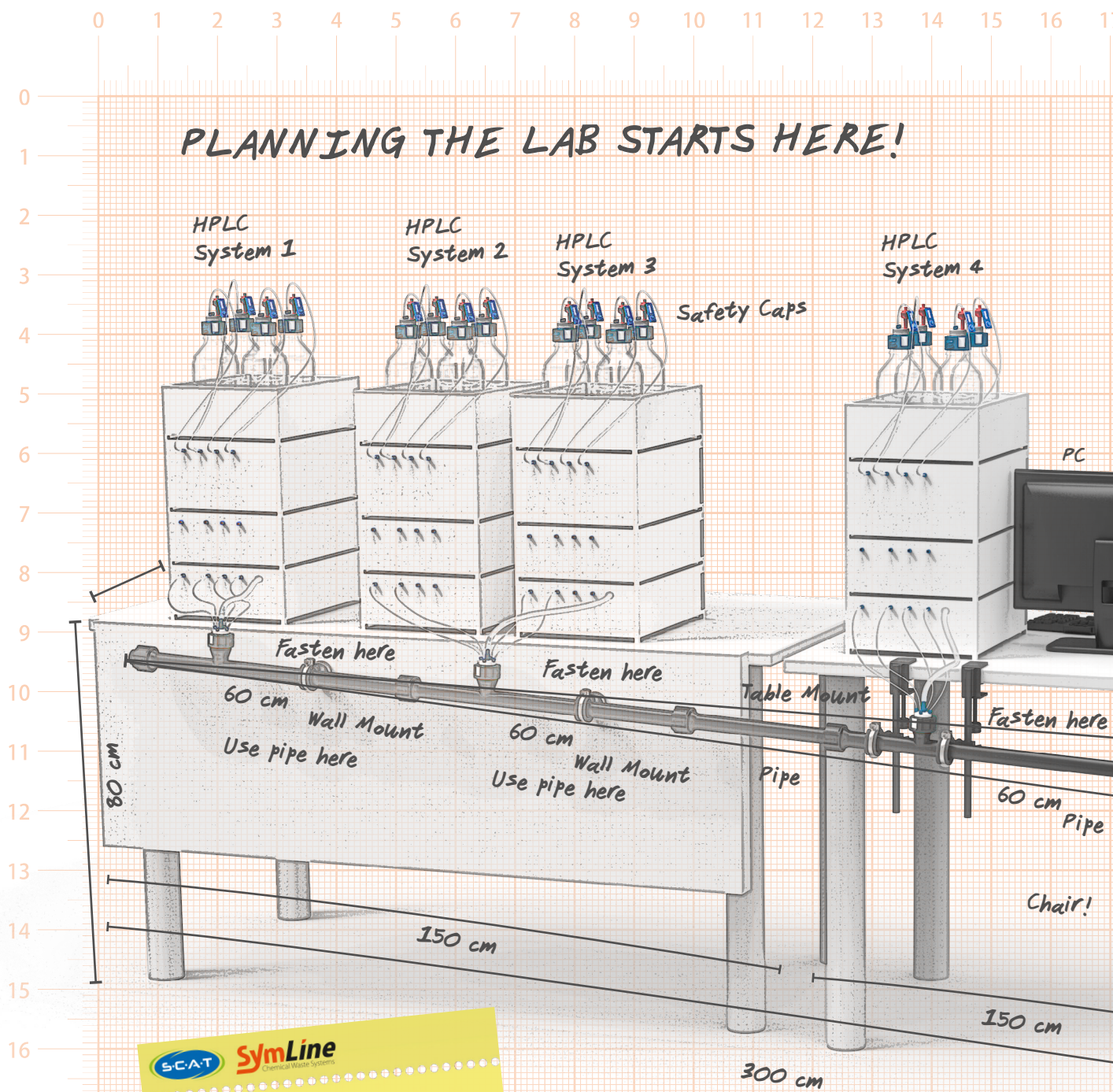
You can find an overview of our partners at:
scatlabsafety.com/CONTACT/Contact-Partners/

Or follow the **QR code** for more information



We're here to help

Do you have any questions about SymLine[®] or would you like to tell us something? Contact us, we look forward to hearing from you.



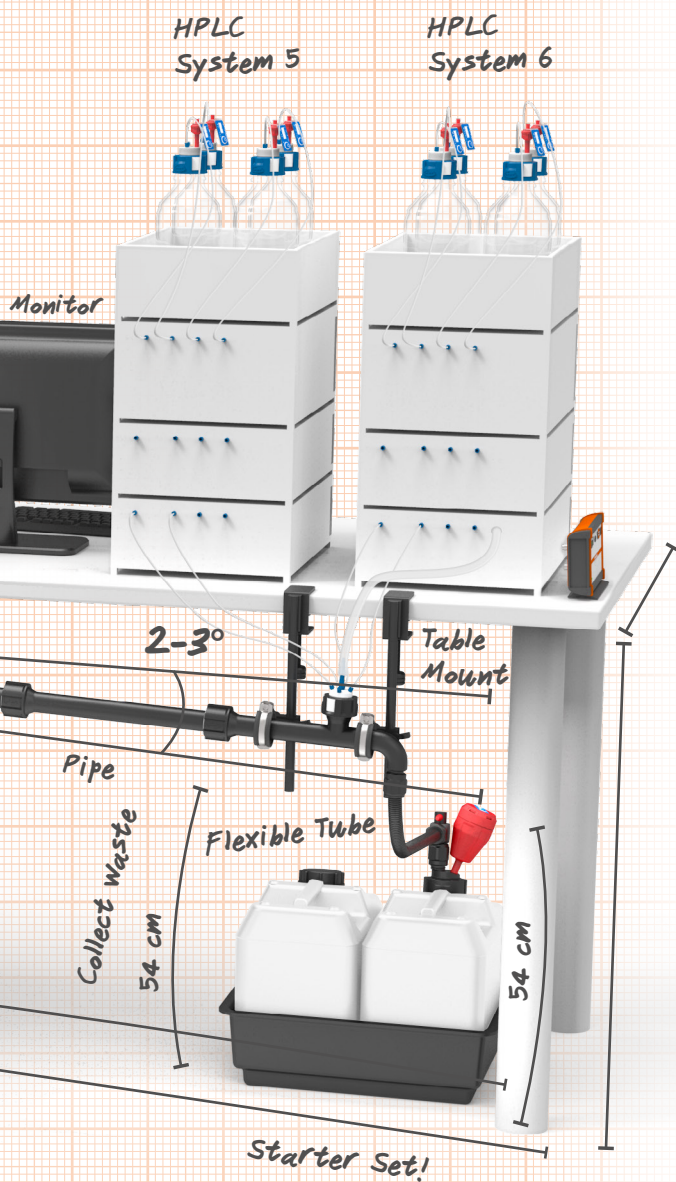
SCAT SymLine
Chemical Waste Systems

We provide BIM data!
Building Information Modeling (BIM).
We provide BIM data for your
technical department. Contact our
SymLine team for a download link.

7 18 19 20 21 22 23 24 25 26

**You are in the planning phase?
We are ready to assist you!**

Ask your lab furniture manufacturer, lab planner or the SymLine planning team.



SymLine[®]

Chemical Waste Systems



Filling Units

Filling Safely and Cleanly.

- ✓ Space-saving attachment
- ✓ Ergonomical
- ✓ Safe protection against vapors



The funnel that thinks for itself:

SymLine[®] safety funnels safely contain harmful liquids - depending on the design, either through the integrated ball valve and/or the hinged lid. The funnels are firmly screwed to the work table or rear wall of the fume hood and connected to the SymLine[®] system. In this way, all waste liquids are safely routed to the collection containers. Splashes, spilled dangerous goods and/or escaping vapours are a thing of the past.

Hinged lid with sealing ring.



Removable dirt stainer:

Catches magnetic stirring bars and coarse dirt.



Click closure:

Enables easy, quick opening and closing.

The ball valve:

Floats when filled and closes automatically after all liquids have drained. This leaves both hands free for safe handling of the waste liquids.



Electrostatic conductive:

Our funnels are made of an electrostatic conductive material and can be grounded.



Dimensionally stable design:

The design ensures high stability, durability and prevents deformation of the funnel.

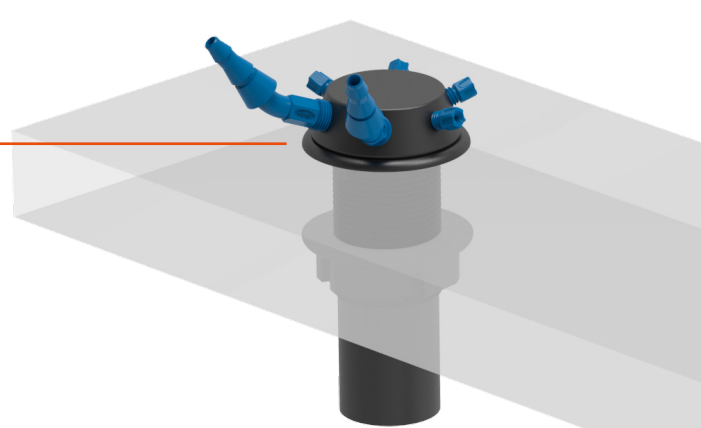


Sink:

The sink is connected directly to the disposal system. It is used to clean and rinse laboratory glasses and instruments.

Table feedthrough and Safety Waste Cap with funnel:

Direct connection to the outlet of the HPLC systems: This way your solvent and sample waste can be disposed of directly from the device. No hazardous waste containers in the work area.



HPLC desktop mount:

Thanks to the integrated connections for capillaries and tubes, the installation protrudes only slightly from the work surface.



Intro

Filling Units

Pipe and Tube System

Disposal

Level Control

High Flow Solution

FLEX

Accessory

Waste disposal starts here!

The safe and clean solution for disposing of liquid waste directly in the work area.

- PE-HD electrostatic conductive
- Grounding connection (cable and clamp included)
- Hinged lid for safe closure
- Removable dirt sieve
- Can be combined with table and wall feedthroughs or directly on canisters



A

306 980 Funnel MARCO

- Safety funnel GL45 (f)
- L1 = 140 mm
- Grounding connection
- Hinged lid
- Removable dirt sieve
- Can be combined with table and wall mounts or directly on canisters
- Material: PE-HD-EL



B

420 045 Universal Waste Hub JAN

- Safety funnel GL45 (f)
- L1 = 140 mm
- Grounding connection
- Hinged lid
- Removable dirt sieve
- Material: PE-HD-EL
- 4 Connections capillary
- 3 Connections tube
- Fitting 1.6mm: 4 piece
- Fitting 2.3mm: 4 piece
- Fitting 3.2mm: 4 piece
- 4 Blind plug (for capillary)
- 3 Tube connector 5.0 -11.5 mm
- Exhaust filter M



Fig.	Part No.	Description	Material
A	306 980	Funnel MARCO, GL45, electrostatic conductive, Type 1	PE-HD-EL
	318 960	Funnel MARCO, S60/61, electrostatic conductive, Type 1	PE-HD-EL
B	420 045	Universal Waste Hub JAN, GL45, electrostatic conductive	PE-HD-EL
	420 060	Universal Waste Hub JAN, S60/61, electrostatic conductive	PE-HD-EL

A
317 638
Funnel ARNOLD

- Safety funnel GL45 (f)
- L1 = 200 mm
- Removable dirt sieve
- Can be combined with table and wall mounts or directly on canisters
- Grounding connection
- Hinged lid
- Ball valve
- Material: PE-HD-EL



B
317 633
Funnel ARNOLD

- Safety funnel GL 45 (f)
- L1 = 200 mm
- Ground connection
- Hinged lid
- Removable dirt sieve
- Can be combined with table and wall feedthroughs or directly on canisters
- Material: PE-HD-EL



Fig.	Part No.	Description	Material
A	317 638	Funnel ARNOLD, with hinged lid and ball valve, GL45, electrostatic conductive, Type 2	PE-HD-EL
	317 621	Funnel ARNOLD, with hinged lid and ball valve, S60/61, electrostatic conductive, Type 2	PE-HD-EL
B	317 633	Funnel ARNOLD with hinged lid, GL45, electrostatic conductive	PE-HD-EL
	317 634	Funnel ARNOLD with hinged lid, S60/61, electrostatic conductive	PE-HD-EL

A

118 003

Lab sink

- G 1 1/2" (m)
- PP electrostatic conductive
- Inside dimensions in mm:
400 x 400 x 250 (L x W x D)



Lab sink

The space-saving lab sink for cleaning and rinsing laboratory glasses and instruments.



B

117 989

Lab sink including cover

- G 1 1/2" (m)
- PE-HD electrostatic conductive
- Grounding connection (cable and clamp included)
- Removable dirt sieve
- Cover increases the work surface
- Inside dimensions in mm:
335 x 215 x 165 (L x W x D)

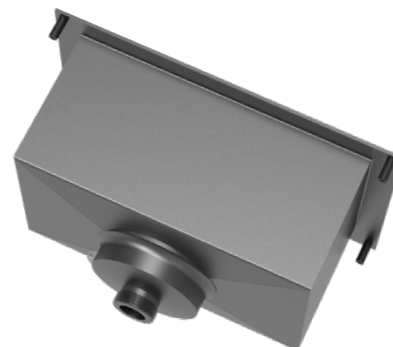
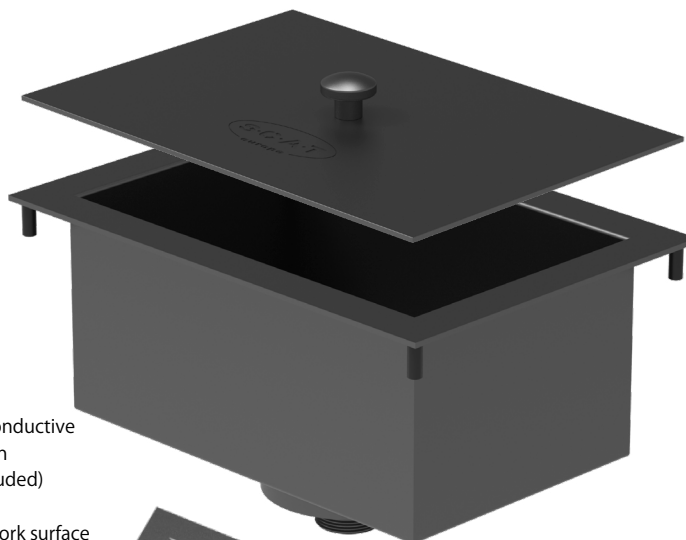


Fig.	Part No.	Description	Material
A	118 003	Lab sink, thread G 1 1/2" (m)	PP-EL
B	117 989	Lab sink including cover, thread G 1 1/2" (m)	PE-HD-EL

A
306 509
4-in-1 Collector
NICOLE
• 4x GL45
• L1 = GL45

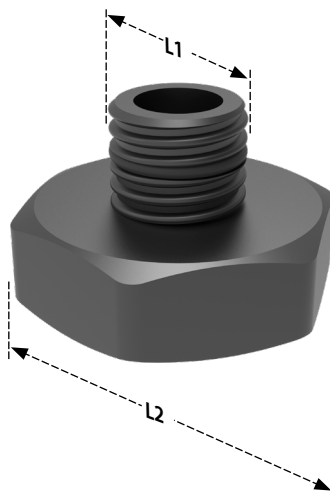


HPLC-Multiple collector

The 4-in-1 collector named NICOLE allows you to place up to 4 Safety Waste Caps on a collected drain.

- PE-HD electrostatically conductive
- Can be combined with Safety Waste Caps, table and wall feedthroughs

B
106 584
Thread adapter
• L1 = GL25 (m)
• L2 = G 1 1/2" (w)

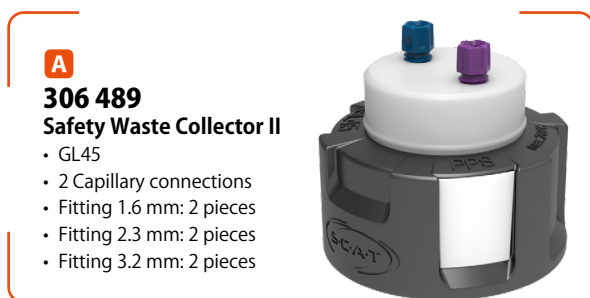


Thread adapter

Use the thread adapter to connect the lab sink to the SymLine® disposal system.

- PTFE electrostatically conductive
- Can be combined with pipe system, tube system with SymLine® FlexTube and FlexTube Pro

Fig.	Part No.	Description	Material
A	306 509	4-in-1 collector, NICOLE, 4x GL45 (m) to 1x GL45 (f), incl. blind cap for HPLC connection	PE-HD-EL
B	106 584	Thread adapter for lab sink, PTFE electrostatically conductive, GL25 (m) to G 1 1/2" (f)	PTFE-EL
	106 434	Drain adapter for lab sink, G 1 1/2" (f) / 32 mm OD	PTFE-EL



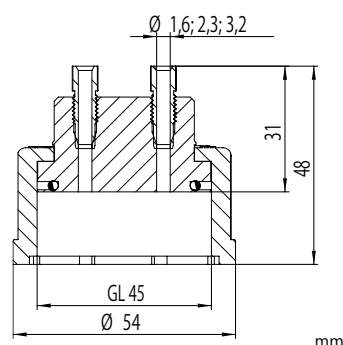
- A**
306 489
Safety Waste Collector II
- GL45
 - 2 Capillary connections
 - Fitting 1.6 mm: 2 pieces
 - Fitting 2.3 mm: 2 pieces
 - Fitting 3.2 mm: 2 pieces

Safety Waste Collector

SymLine® Safety Waste Collector route the waste tubes from your HPLC system directly into the disposal system. A choice of 2, 3, 4, 5 or 7 connections offers you complete freedom. Fittings for different capillary diameters are included in the scope of delivery.



- B**
306 491
Safety Waste Collector III
- GL45
 - 3 Capillary connections
 - Fitting 1.6 mm: 3 pieces
 - Fitting 2.3 mm: 3 pieces
 - Fitting 3.2 mm: 3 pieces



- C**
306 498
Safety Waste Collector IV
- GL45
 - 4 Capillary connections
 - 1 Tube connection
 - Fitting 1.6 mm: 4 pieces
 - Fitting 2.3 mm: 4 pieces
 - Fitting 3.2 mm: 4 pieces
 - Tube connector: 1 piece



- D**
117 816
Tube connector
- Straight
 - 6 - 8 mm ID

Fig.	Part No.	Description	Connections	Incl. Fittings for capillary-OD			Incl. Tube conn.
				Ø 1.6 mm	Ø 2.3 mm	Ø 3.2 mm	Ø 5.0 - 11.5 mm
A	306 489	Safety Waste Collector II, GL45	2	2x	2x	2x	
B	306 491	Safety Waste Collector III, GL45	3	3x	3x	3x	
	306 492	Safety Waste Collector VII, GL45	7	7x	7x	7x	
	306 493	Safety Waste Collector IV, GL45	4	4x	4x	4x	
	306 494	Safety Waste Collector V, GL45	5	5x	5x	5x	
	306 497	Safety Waste Collector II + 1, GL45	3	2x	2x	2x	1x
C	306 498	Safety Waste Collector IV, GL45	5	4x	4x	4x	1x
D	117 816	Tube connector, straight, 6 - 8 mm ID, PP, UNF 1/4" 28G, suitable for capillary connection					
	160 502	Blind plug for capillary connection UNF 1/4" 28G, PFA, colorless, PU = 5 pieces					



- A**
106 455
Table feedthrough
- Material: PE-HD-EL
 - 1x GL45 (m)
 - 1x GL25 (m)



Cleverly integrated

The table feedthrough can be integrated into almost all work areas and is the perfect connection to the subsequent substructure in fume hoods.

- B**
106 450
Table feedthrough
- Material: PE-HD-EL
 - 1x GL45 (m)
 - 1x (OD) Ø 32 mm

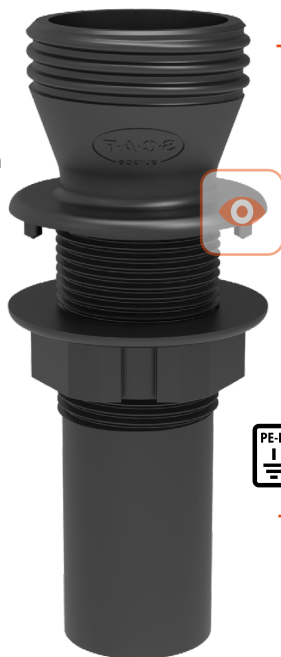
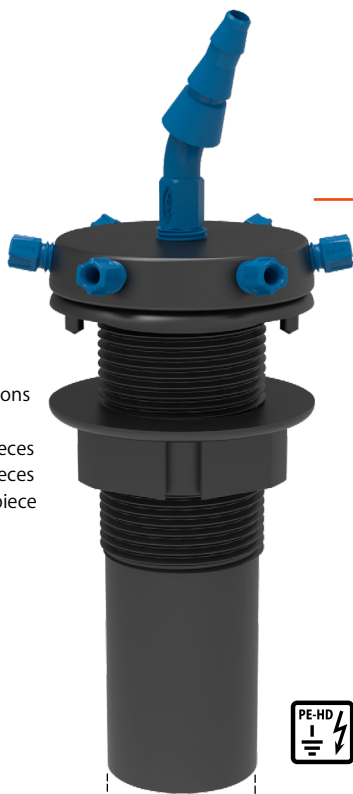


Fig.	Part No.	Description	Material
A	106 455	Table feedthrough GL45 (m) / GL25 (m)	PE-HD-EL
B	106 450	Table feedthrough GL45 (m) / Ø 32 mm OD	PE-HD-EL

A
106 412
HPLC-Table
feedthrough

- L = Ø 32 mm OD
- 6 Capillary connections
- 1 Tube connection
- Fitting 2.3 mm: 6 pieces
- Fitting 3.2 mm: 6 pieces
- Tube connector: 1 piece
- Material: PE-HD-EL



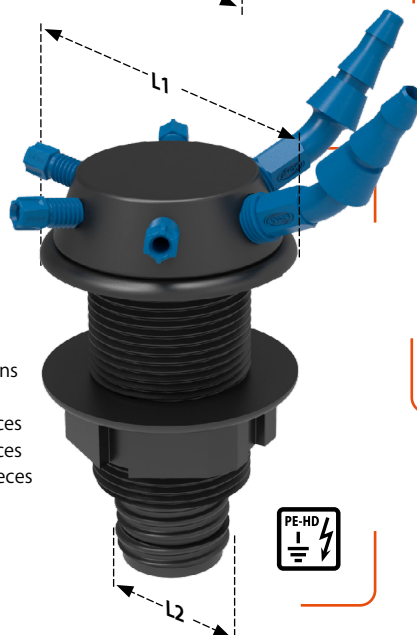
All-in-one

Table feedthrough and HPLC waste collector in one. Thanks to the integrated connections for capillaries and tubing, the installation protrudes only slightly from the work surface.



B
106 616
HPLC-Table
feedthrough

- L1 = Ø 53mm
- L2 = GL25 (m)
- 4 Capillary connections
- 2 Tube connections
- Fitting 2.3 mm: 4 pieces
- Fitting 3.2 mm: 4 pieces
- Tube connector: 2 pieces
- Material: PE-HD-EL



C
106 669
HPLC-Table
feedthrough

- L1 = Ø 53 mm
- L2 = Ø 32 mm OD
- 4 Capillary connections
- 2 Tube connections
- Fitting 2.3 mm: 4 pieces
- Fitting 3.2 mm: 4 pieces
- Tube connector: 2 pieces
- Material: PE-HD-EL
- Can be combined with pipe system

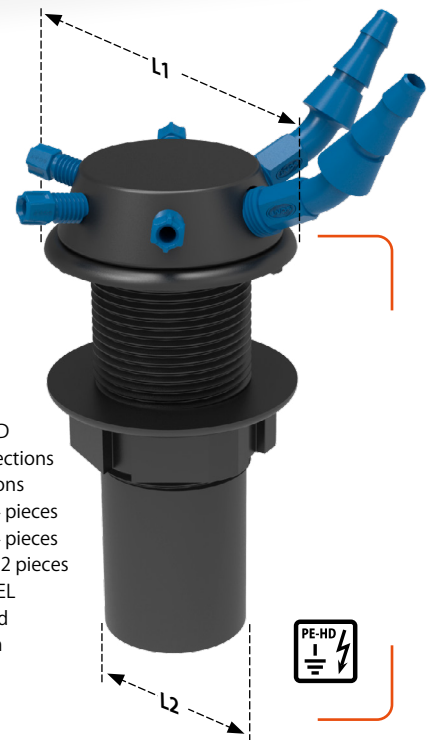


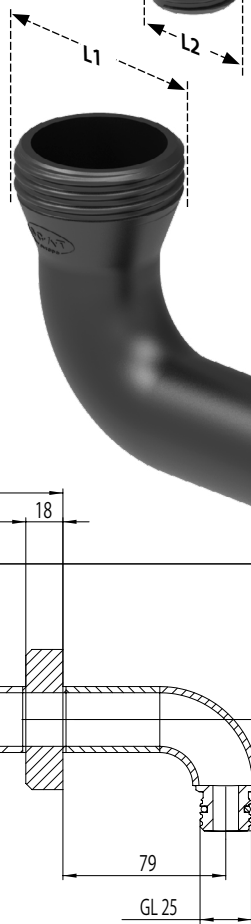
Fig.	Part No.	Description	Material
A	106 412	HPLC-Table feedthrough; connection 32 mm OD pipe with 6x UNF1/4" 28G and 1x NPT1/8" connection; including 6x fittings for capillary diameter (outside) Ø 2.3 mm, Ø 3.2 mm; including 1x tube connector curved Ø 5.0 - 11.5 mm	PE-HD-EL
B	106 616	HPLC-Table feedthrough; GL25 with 4x UNF1/4" 28G and 2x NPT1/8" connection on the side; including 4x fittings for capillary diameter (outer) Ø 2.3 mm, Ø 3.2 mm; including 2x tube connector curved Ø 5.0 - 11.5 mm	PE-HD-EL
C	106 669	HPLC-Table feedthrough; connection 32 mm OD tube with 4x UNF1/4" 28G and 2x NPT1/8" connection on the side; including 4x fittings for capillary diameter (outer) Ø 2.3 mm, Ø 3.2 mm; including 2x tube connector curved Ø 5.0 - 11.5 mm	PE-HD-EL



A
106 612
Wall feedthrough
• L1 = GL45 (m)
• L2 = GL25 (m)
• Material: PE-HD-EL

More free work space

With the rear wall mount, you make optimal use of your work area and there is more space for samples and structures, disposal can take place directly in the fume hood.



B
106 601
XL Wall feedthrough
• L1 = GL 45 (m)
• L2 = GL 25 (m)
• Material: PE-HD-EL

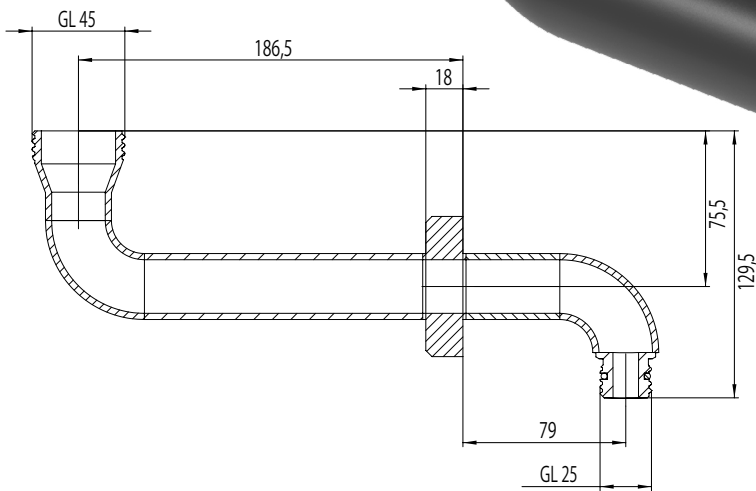


Fig.	Part No.	Description	Material
A	106 612	Wall feedthrough GL45 (m) / GL25 (m)	PE-HD-EL
B	106 601	Wall feedthrough long, GL45 (m) , GL25 (m), for funnel ARNOLD with hinged lid, V2.0, GL45 (317 633)	PE-HD-EL

- Intro
- Filling Units
- Pipe and Tube System
- Disposal
- Level Control
- High Flow Solution
- FLEX
- Accessory

SymLine[®]

Chemical Waste Systems



Pipe and Tube System

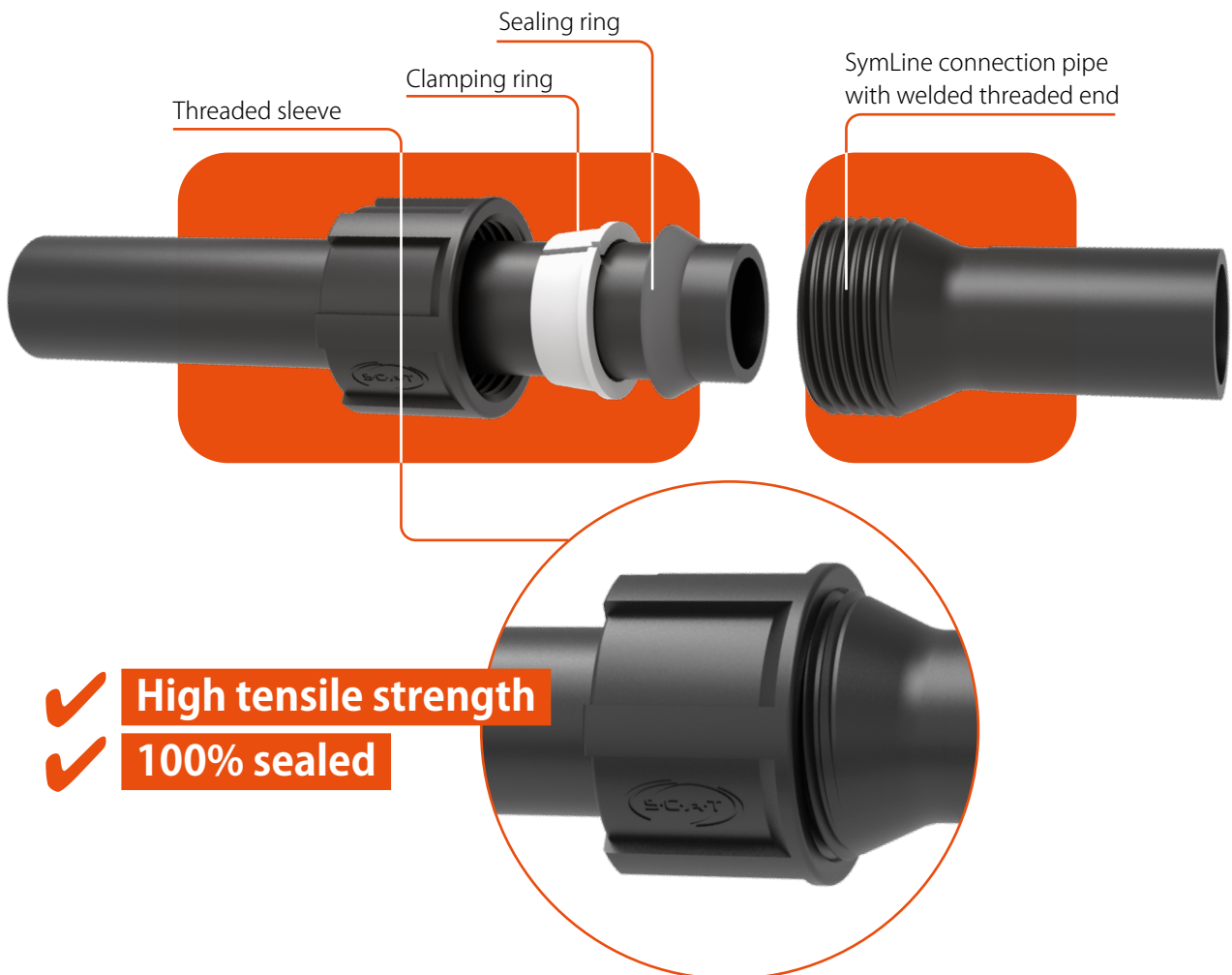
The Safe Way to Disposal.

- ✓ Individually adaptable to each laboratory
- ✓ Reaches every corner
- ✓ High tensile strength
- ✓ 100% sealed



The tubular system: safe attachment, optimum flow direction

The SymLine FLEX tube extensions have a funnel-shaped threaded sleeve at one end and a smooth tube opening at the other. In order to tightly interconnect the tubular system, the threaded sleeve, clamping ring and sealing ring are simply pushed over the smooth end of one tube, and this is then firmly screwed on to the threaded part of the following extension piece (i.e. on the other tube). When done properly (tightening torque 10 - 15 Nm), the resulting connection will withstand a tensile force of **400 N**. The system allows for optimum flow of waste liquids and prevents leakage.



SymLine material properties

All components made of electrostatic conductive plastic can be earthed and are suitable for voltage equalization, as per TRGS 727. Electrically conductive PE-HD-EL displays a discharge resistance against earth of $< 10^9 \Omega$, as per DIN EN 61340-5-1, and is suitable for Zones 0, 1 and 2, as per the German Hazardous Substances Ordinance (ATEX), EN 1127-1, DIN EN 60079-10-1 and DIN EN 60079-10-2. It is resistant to chemicals, as defined in SEFA 3 and SEFA 8.



• TRGS 727

• DIN EN 61340-5-1



• ATEX zone 0, 1 and 2

• EN 1127-1



• DIN EN 60079-10-1

• DIN EN 60079-10-2



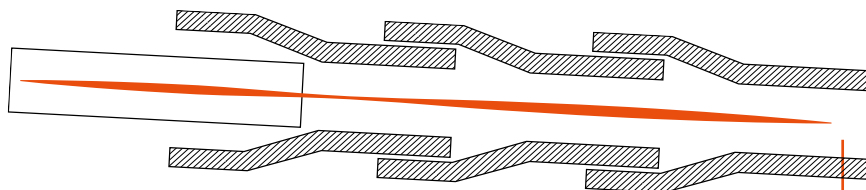
• SEFA 3

• SEFA 8

Pipe system

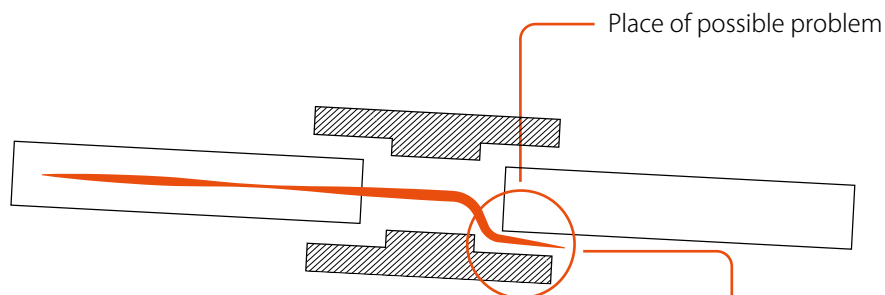
The principle "smooth tube end runs in funnel-shaped threaded socket" optimally leads waste liquids and prevents leaks. This SymLine design is the global standard for all types of waste disposal cycles and their installations. Trust SymLine - the market leader - for safe disposal.

SymLine construction method - optimal for waste transport



SymLine construction, with optimum liquid flow.
Liquids flow continually downwards, from the smooth pipe end, into the interconnected threaded one.

Typical construction principle - prone to leaking!



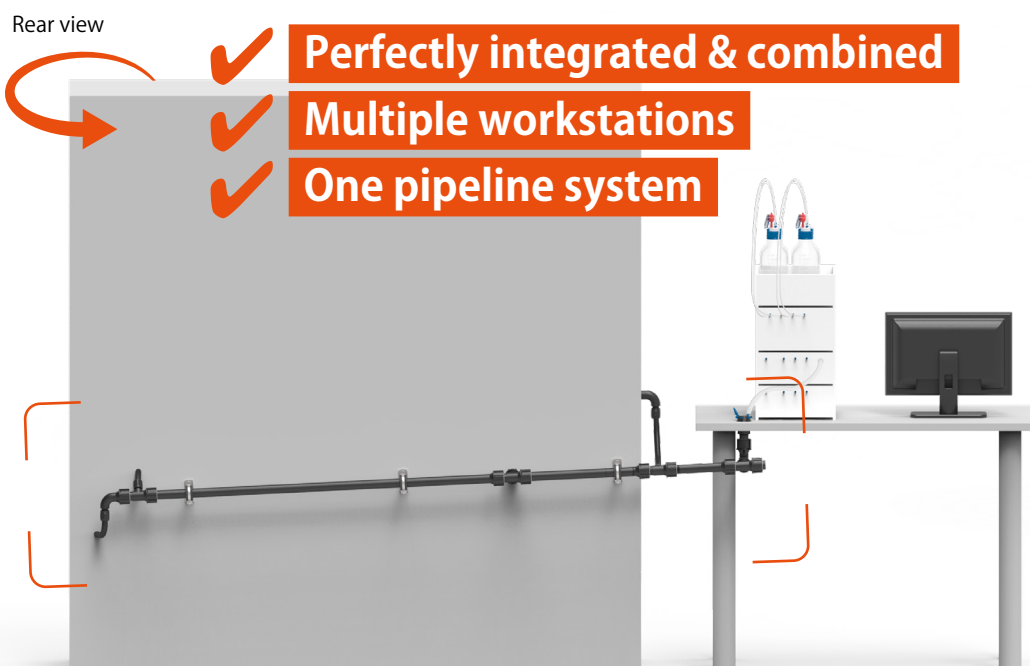
Smooth pipe ends are interconnected, using connecting sleeves.
This results in increased danger of leakage.

Perfect integration, variable and safe

The SymLine pipe and tube system adapts to your laboratory equipment and can flexibly be integrated in the planning phase of new laboratory buildings or in existing work environments. Liquid waste can flow from several work stations via pipe elements and tubes to a central collection point. No hazardous waste containers in the work area! Liquid waste transferred safely and compliantly between the work and storage areas.



Example illustration, HPLC, table and fume hood

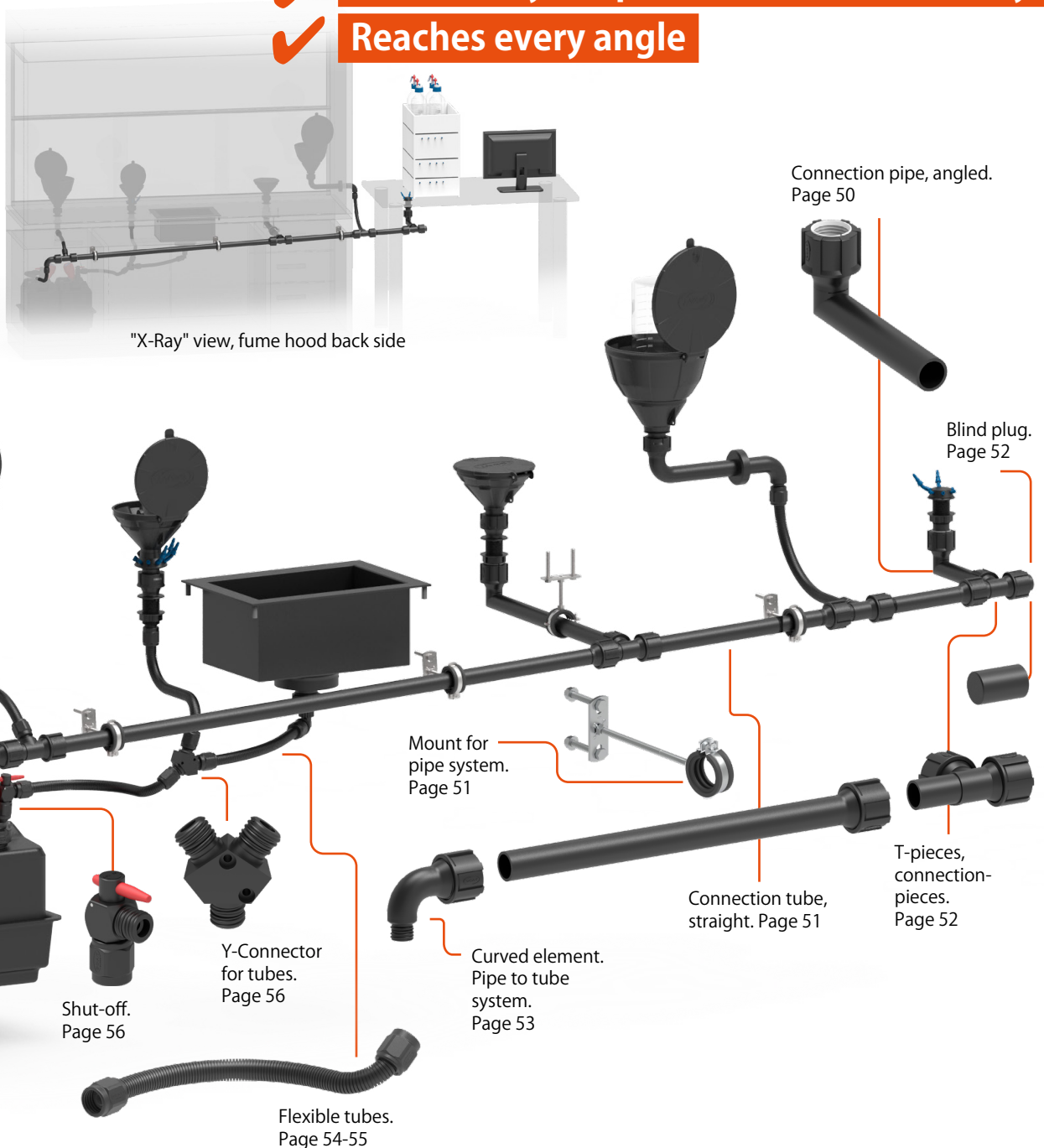


Back side with pipe and tube system

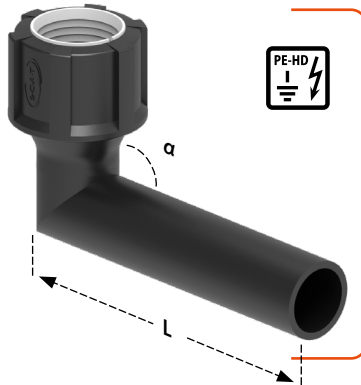
Flexible in every detail

You are free to choose when installing and placing your filling units. Whether funnel, collection tray or table feed through, thanks to flexible tubes, pipe connections and numerous connecting pieces, every angle can be reached. Tubes and pipes are available in different lengths and can also be shortened according to your needs.

- ✓ Individually adaptable to each laboratory
- ✓ Reaches every angle



- A**
106 430
Connection pipe angled
- 1x (ID) Ø 32 mm
 - 1x (OD) Ø 32 mm
 - L = 150 mm
 - $\alpha = 93^\circ$
 - Material: PE-HD-EL



Connection pipes, angled, with 3° incline



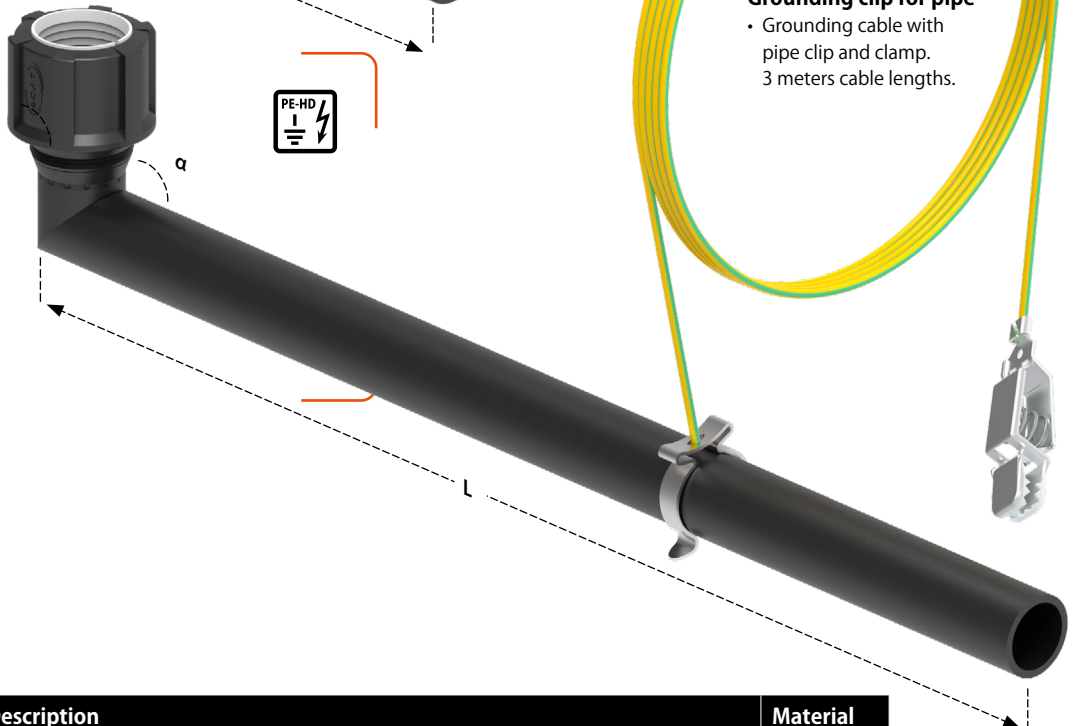
- Screw connection with Ø 32 mm inner diameter, end piece with Ø 32 mm outer diameter
- 3° incline
- PE-HD electrostatic conductive
- Can be combined with desktop mounts, connectors and grounding clip

- B**
106 438
Connection pipe angled
- 1x (ID) Ø 32 mm
 - 1x (OD) Ø 32 mm
 - L = 200 mm
 - $\alpha = 93^\circ$
 - Material: PE-HD-EL



Angled pipe pieces connected to feedthroughs, serve as the start of each disposal route below the work area

- C**
106 440
Connection pipe angled
- 1x (ID) Ø 32 mm
 - 1x (OD) Ø 32 mm
 - L = 500 mm
 - $\alpha = 93^\circ$
 - Material: PE-HD-EL



- D**
108 176
Grounding clip for pipe
- Grounding cable with pipe clip and clamp. 3 meters cable lengths.

Fig.	Part No.	Description	Material
A	106 430	Connection pipe angled, 1x (ID) Ø 32 mm, 1x (OD) Ø 32 mm, length 150 mm	PE-HD-EL
B	106 438	Connection pipe angled, 1x (ID) Ø 32 mm, 1x (OD) Ø 32 mm, length 200 mm	PE-HD-EL
C	106 440	Connection pipe angled, 1x (ID) Ø 32 mm, 1x (OD) Ø 32 mm, length 500 mm	PE-HD-EL
D	108 176	Grounding clip for Ø 32 mm pipe, with cable and clamp, 3 m length	

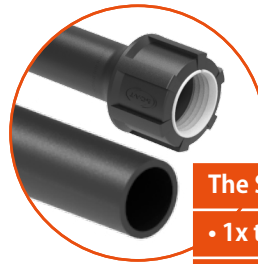
Connection pipes, straight

- Screw connection with \varnothing 32 mm inner diameter, end piece \varnothing 32 mm outer diameter
- PE-HD electrostatic conductive
- Can be combined with angled connection pipes, connection pieces and grounding clip

A

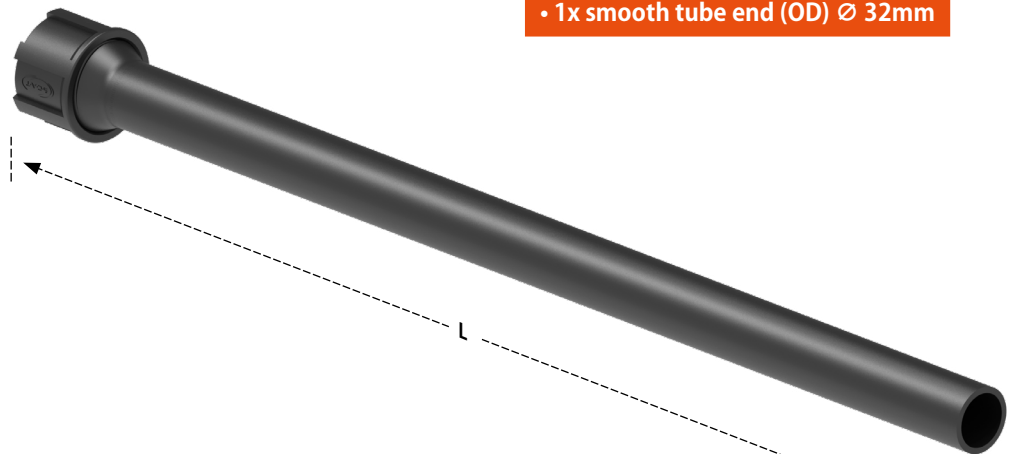
106 690 Connection pipe straight

- 1x (ID) \varnothing 32 mm
- 1x (OD) \varnothing 32 mm
- L = 600 mm
- Material: PE-HD-EL

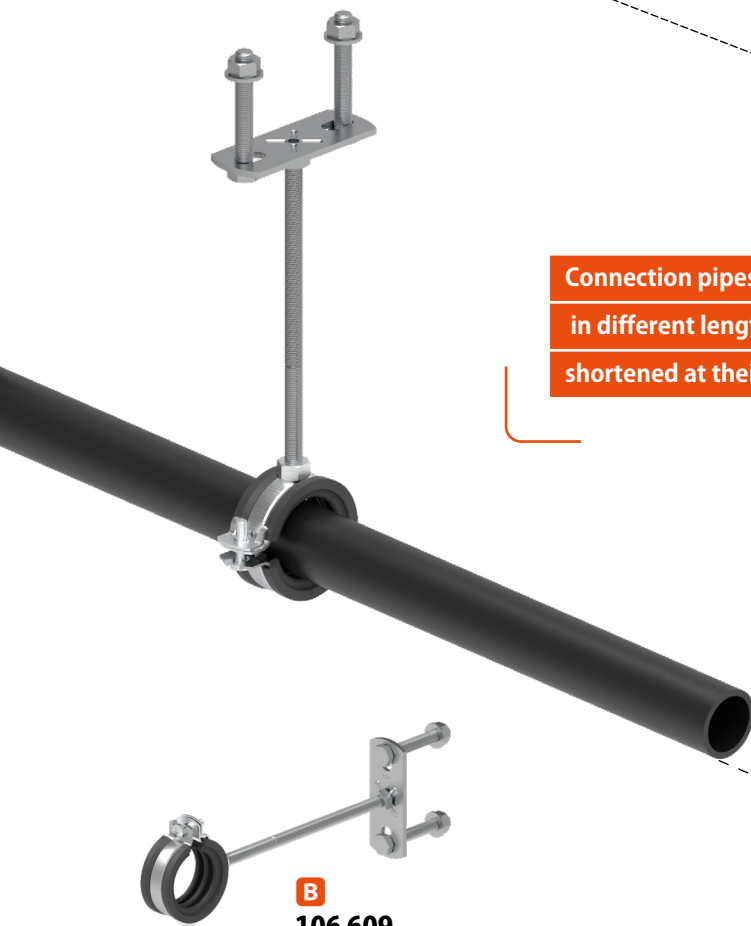


The SymLine construction:

- 1x threaded connector (ID) \varnothing 32mm
- 1x smooth tube end (OD) \varnothing 32mm



Connection pipes are preconfigured in different lengths and can be shortened at their smooth side



B

106 609 Attachment for pipe system

- including screws

SCAT SymLine
Chemical Waste Systems

Flexible tube length

With a suitable pipe cutter, you can adjust the length of the pipes as needed. Shorten the smooth side of the tubes to the desired length.

Fig.	Part No.	Description	Material
A	106 690	Connection pipe, straight, 1x (ID) \varnothing 32 mm, 1x (OD) \varnothing 32 mm, length 600 mm	PE-HD-EL
	106 700	Connection pipe, straight, 1x (ID) \varnothing 32 mm, 1x (OD) \varnothing 32 mm, length 1200 mm	PE-HD-EL
B	106 609	Attachment for pipe system \varnothing 32 mm	

A

106 712

T-Piece for pipes

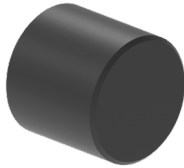
- 2x (ID) Ø 32 mm
- 1x (OD) Ø 32 mm
- Dimensions: 120 x 93 x 56 mm
- Material: PE-HD-EL
- Can be combined with table feedthrough, angled and straight connection pipes



B

106 423
Blind plug

- (OD) Ø 32 mm
- Dimensions: 50 mm
- Material: PE-HD-EL



C

106 711
T-Piece for pipes with GL25 (m)

- 1x (ID) Ø 32 mm
- 1x GL25 (m)
- 1x (OD) Ø 32 mm
- Dimensions: 120 x 70 x 56 mm
- Material: PE-HD-EL



GL25 (m)
SymLine tube connection

Connectors

- Screw connection with Ø 32 mm inner diameter, end piece Ø 32 mm outside diameter
- PE-HD electrostatic conductive
- Can be combined with pipe and tube system



- Can be used variably
- Every angle reachable

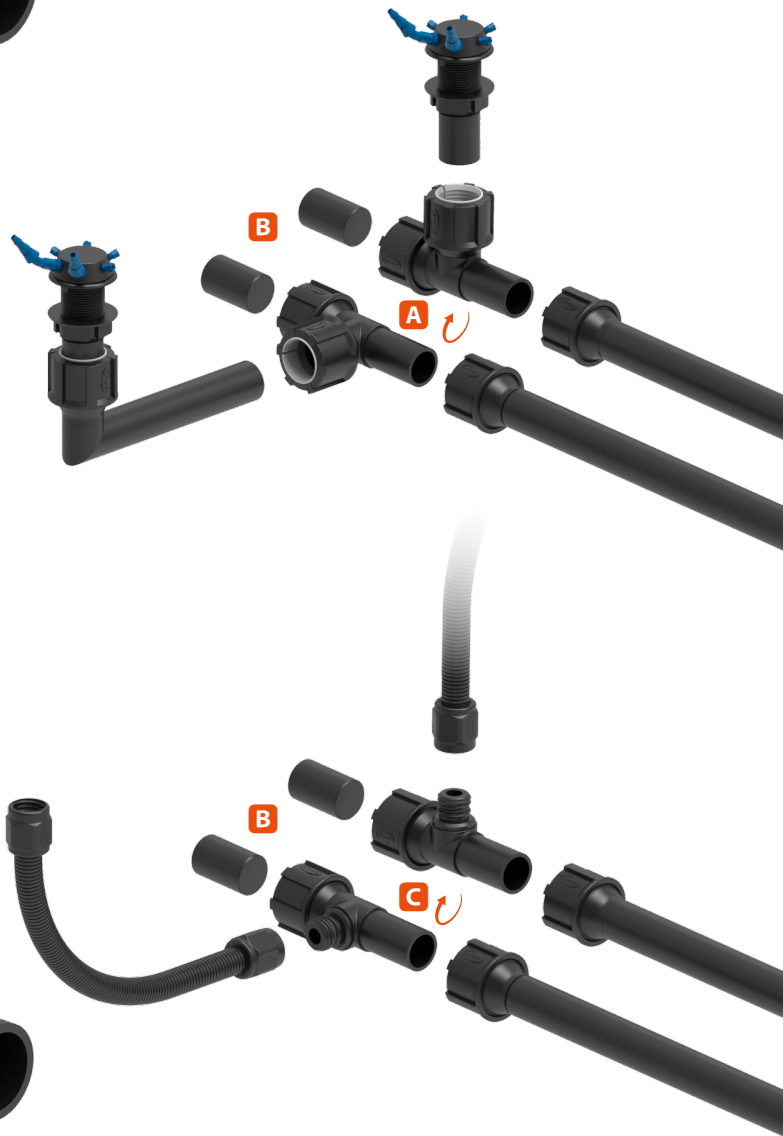


Fig.	Part No.	Description	Material
A	106 712	T-Piece, 2x Ø (ID) 32 mm, 1x Ø (OD) 32 mm	PE-HD-EL
B	106 423	Blind plug for pipe Ø (OD) 32 mm	PE-HD-EL
C	106 711	T-Piece, 1x Ø (ID) 32 mm, 1x GL25 (m), 1x Ø (OD) 32 mm	PE-HD-EL

- A**
106 421
Curved element for pipes
- 1x (ID) Ø 32 mm
 - 1x (OD) Ø 32 mm
 - Dimensions: 92 x 90 x 56 mm
 - Material: PE-HD-EL



- Can be used variably
- Every angle reachable



Curved elements

- Screw connection with Ø 32 mm inner diameter, end piece Ø 32 mm outside diameter or GL25 tube connection
- PE-HD electrostatic conductive
- Can be combined with pipe and tube system

- B**
106 457
Curved element pipe to tube with 3° incline
- 1x (ID) Ø 32 mm
 - 1x GL25 (m)
 - Dimensions: 76 x 76 x 56 mm
 - Material: PE-HD-EL



- C**
106 456
Curved element pipe to tube
- 1x (ID) Ø 32 mm
 - 1x GL25 (m)
 - Dimensions: 84 x 90 x 56 mm
 - Material: PE-HD-EL



Fig.	Part No.	Description	Material
A	106 421	Curved element, Ø (ID) 32 mm to Ø (OD) 32 mm	PE-HD-EL
B	106 457	Curved element with 3° incline, Ø (ID) 32 mm to GL25 (m)	PE-HD-EL
C	106 456	Curved element, Ø (ID) 32 mm to GL25 (m)	PE-HD-EL

A B C D

106 569

**FlexTube
GL25 (f)**

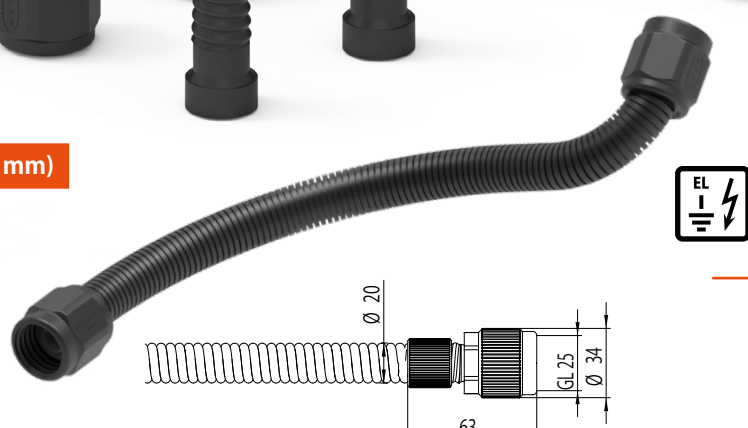
- 2x GL25 (f)
- Material: PTFE-EL

- Can be assembled - easy installation. If necessary, shorten tubes flexibly, then mount the optimised screw connection and seal.

- 
- Fitting & bracket included

• Spiral inner wall

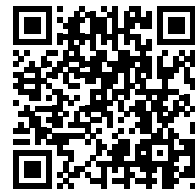
• Increased bending radius (≥ 25 mm)



FlexTube, inner wall spiral

- PTFE for the best possible chemical resistance
- Electrostatic conductive $< 10^6$ (max) Ω
- \varnothing 19.8 mm outer diameter
- \varnothing 11.5 mm inner diameter

Installation guide



All media-touching parts made of PTFE-EL

Fig.	Part No.	Description	Material
A	106 569	SymLine® FlexTube GL25 (f), length 600 mm, \varnothing 19.8 mm OD	PTFE-EL
B	106 568	SymLine® FlexTube GL25 (f), length 1000 mm, \varnothing 19.8 mm OD	PTFE-EL
C	106 567	SymLine® FlexTube GL25 (f), length 1500 mm, \varnothing 19.8 mm OD	PTFE-EL
D	106 566	SymLine® FlexTube GL25 (f), length 2500 mm, \varnothing 19.8 mm OD	PTFE-EL
E	108 270	Grounding cable for SymLine® FlexTube, with cable and clamp, 3 m	

ABCD

**106 575
FlexTube Pro
GL25 (f)**

- 2x GL25 (f)
- Material: PTFE-EL



- Fitting & bracket included

• Smooth inner wall

• Avoids deposits

• Bending radius (≥ 60 mm)

- Can be assembled - easy installation. If necessary, shorten tubes flexibly, then mount the optimised screw connection and seal.

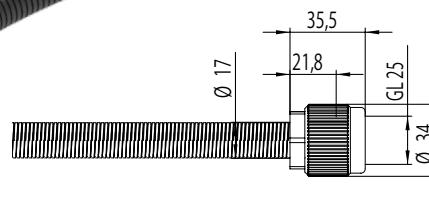
**FlexTube Pro,
inner wall smooth**

- PTFE for the best possible chemical resistance
- Electrostatic conductive $< 10^6$ (max) Ω
- \varnothing 16.9 mm outer diameter
- \varnothing 10.7 mm inner diameter



All media-touching parts made of PTFE-EL

i Installation guide



E

**108 270
Grounding cable for tube**

- Grounding cable with tube clip and clamp, 3 meter cable length.



Fig.	Part No.	Description	Material
A	106 575	SymLine® FlexTube Pro GL25 (f), length 600 mm, \varnothing 16.9 mm OD	PTFE-EL
B	106 574	SymLine® FlexTube Pro GL25 (f), length 1000 mm, \varnothing 16.9 mm OD	PTFE-EL
C	106 573	SymLine® FlexTube Pro GL25 (f), length 1500 mm, \varnothing 16.9 mm OD	PTFE-EL
D	106 572	SymLine® FlexTube Pro GL25 (f), length 2500 mm, \varnothing 16.9 mm OD	PTFE-EL
E	108 270	Grounding cable for SymLine® FlexTube, with cable and clamp, 3 m	

A

106 475

Shut-off valve, angled

- 1x GL25 (f)
- 1x GL25 (m)
- Dimensions: 60 x 86 x 36 mm
- Material: PTFE-EL
- Stops the flow of waste liquids into the canister. Drip-free canister change or emptying.
- Compatible with Safety Waste Caps, connectors, manifolds and the SymLine FlexTube's.

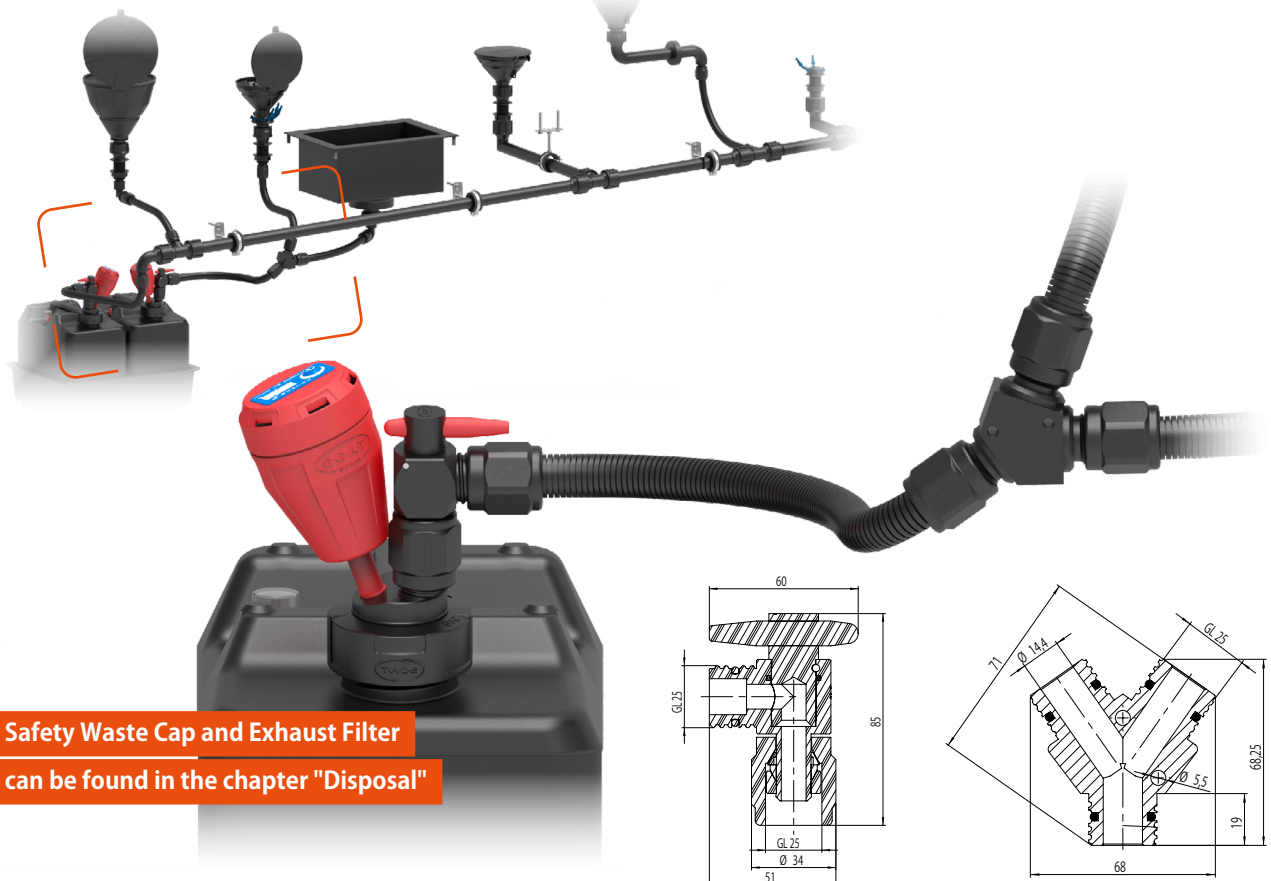


B

106 476

Y-Distributor

- 3x GL25 (m)
- Dimensions: 68 x 69 x 36 mm
- Material: PE-HD-EL
- Merging two SymLine FlexTube's to one exit. Two 0.5 mm holes for wall mounting.
- Compatible with the SymLine FlexTube's.



Safety Waste Cap and Exhaust Filter can be found in the chapter "Disposal"

Fig.	Part No.	Description	Material
A	106 475	Shut-off, angled, 1x GL25 (w) to 1x GL25 (m), incl. spanner	PTFE-EL
B	106 476	Y-Distributor, 3x GL25 (m), with 2 mounting holes	PE-HD-EL

A

106 611

Cabinet feed-through

- Feedthrough in safety cabinets with wall thickness max. 100 mm and bore \varnothing 35 mm, lock nut with silicone seals for clamp mounting.
- 2x GL25 (m)
- Dimensions: 35 x 56 x 189 mm
- Material: PE-HD-EL
- Compatible with fire protection attachment 106 605



B

106 605

Fire protection package

- Sheet metal housing with plaster insert for fire protection of cabinet or pipe feedthroughs in safety cabinets, undrilled.
- Incl. 4 fastening screws.
- Dimensions: 182 x 104 x 48 mm

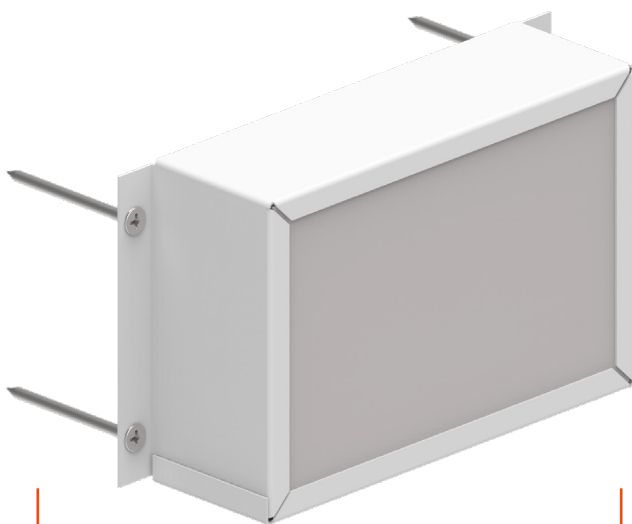


Fig.	Part No.	Description	Material
A	106 611	Cabinet feed-through, angled, 2x GL25 (m)	PE-HD-EL
B	106 605	Fire protection package, sheet metal housing with plaster insert, 4x fastening screws	

SymLine[®]

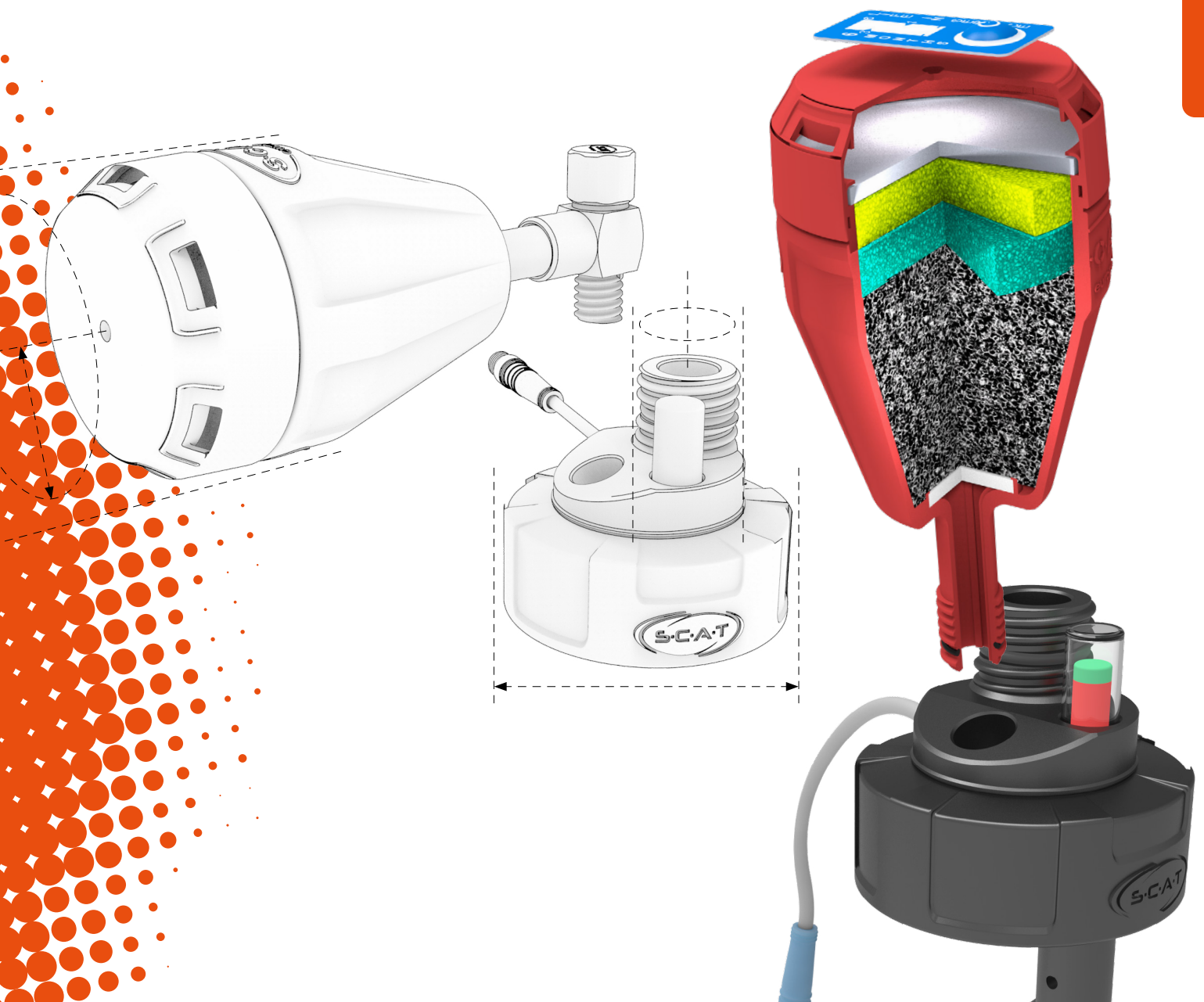
Chemical Waste Systems



Disposal

Hazardous Vapors under Control.

- ✓ Closed system
- ✓ Clean laboratory air
- ✓ Standardised connections

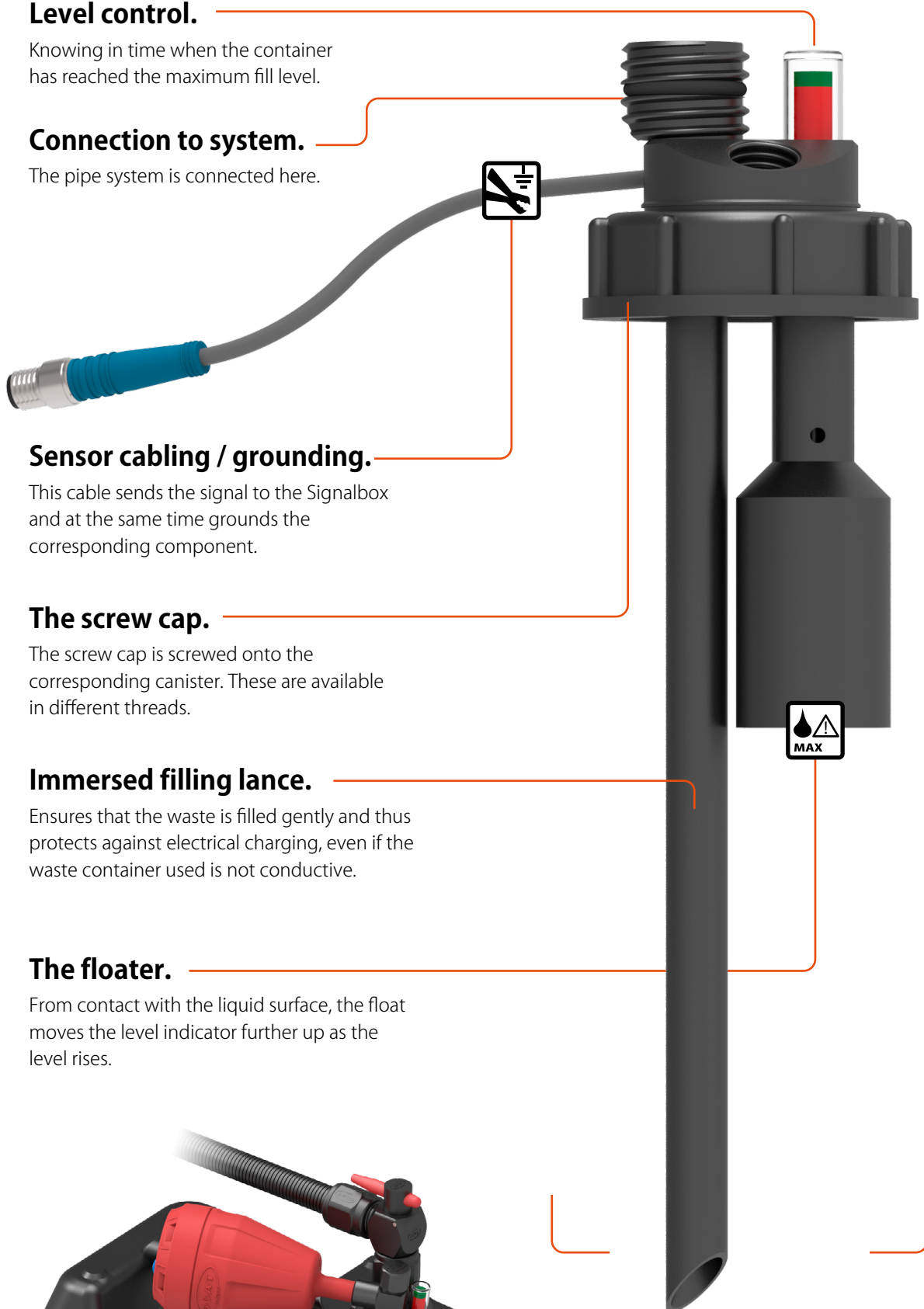


Level control.

Knowing in time when the container has reached the maximum fill level.

Connection to system.

The pipe system is connected here.



Sensor cabling / grounding.

This cable sends the signal to the Signalbox and at the same time grounds the corresponding component.

The screw cap.

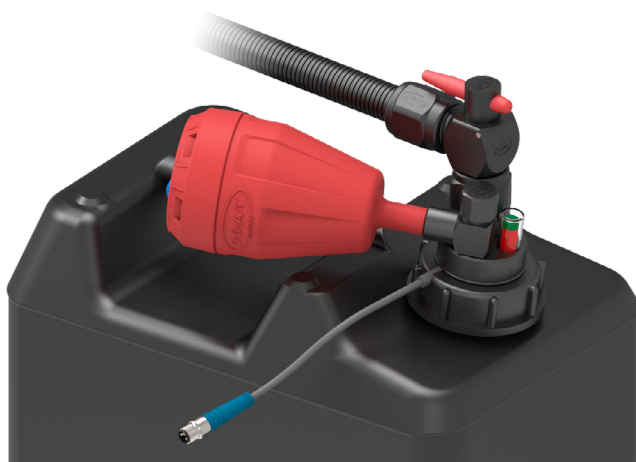
The screw cap is screwed onto the corresponding canister. These are available in different threads.

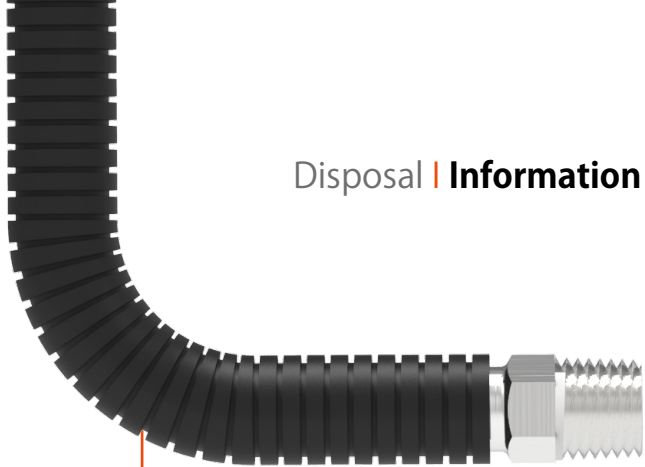
Immersed filling lance.

Ensures that the waste is filled gently and thus protects against electrical charging, even if the waste container used is not conductive.

The floater.

From contact with the liquid surface, the float moves the level indicator further up as the level rises.





Exhaust ventilation tube.

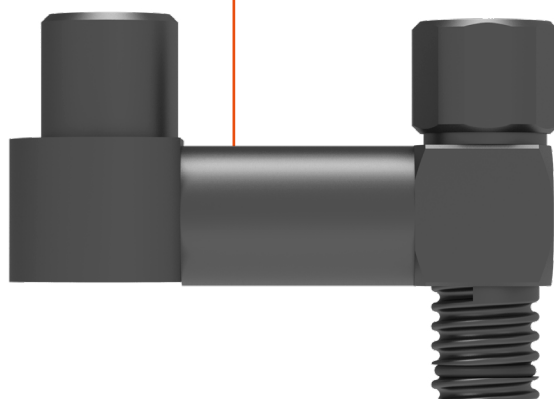
The exhaust ventilation tube conducts vapors directly into the ventilation system installed in the laboratory. It is used in place of the exhaust air filter.

Exhaust filter.

The exhaust filter filters the vapors escaping from the container. This keeps the air in the laboratory clean.

Angled adapter.

If there is not enough space on the Safety Waste Cap, an angled adapter can be the solution.



Intro

Filling Units

Pipe and Tube System

Disposal

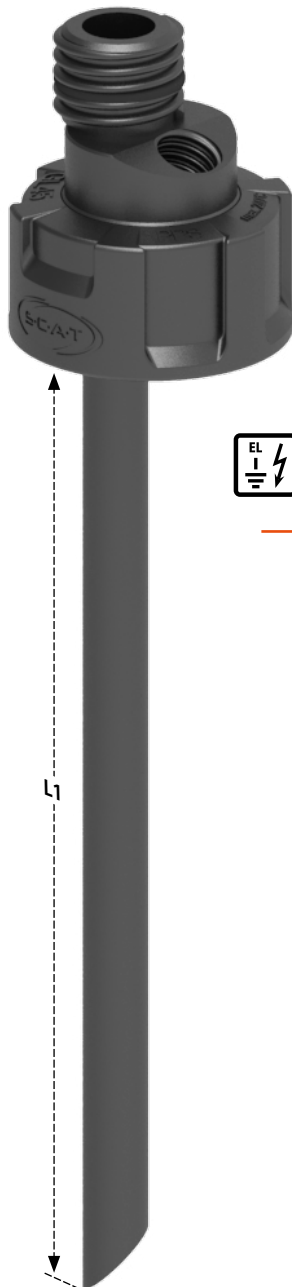
Level Control

High Flow Solution

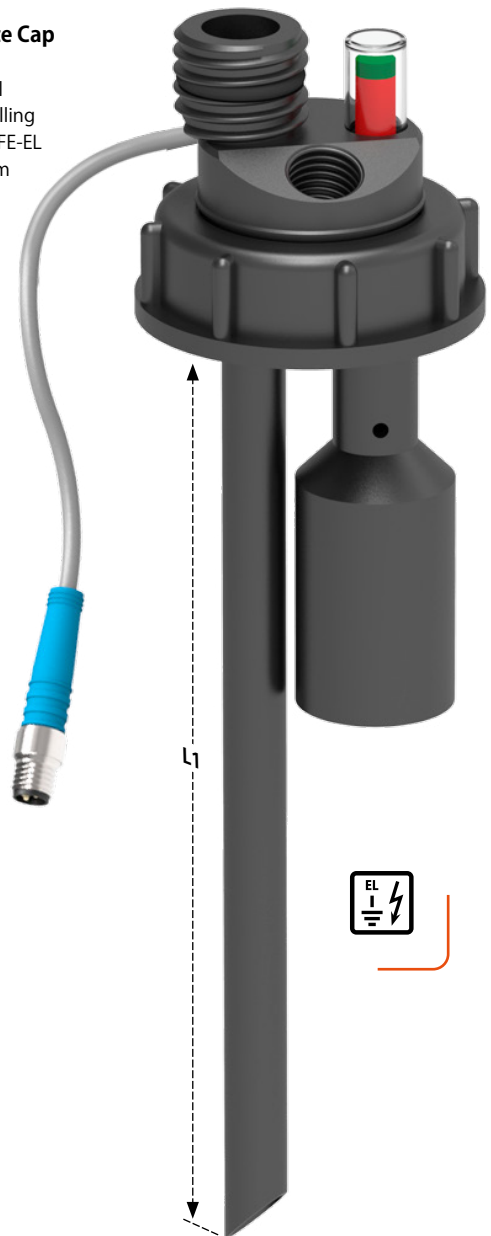
FLEX

Accessory

- A**
106 527
Safety Waste Cap
- Immersed filling
 - Material: PTFE-EL
 - L1 = 200 mm
 - GL45



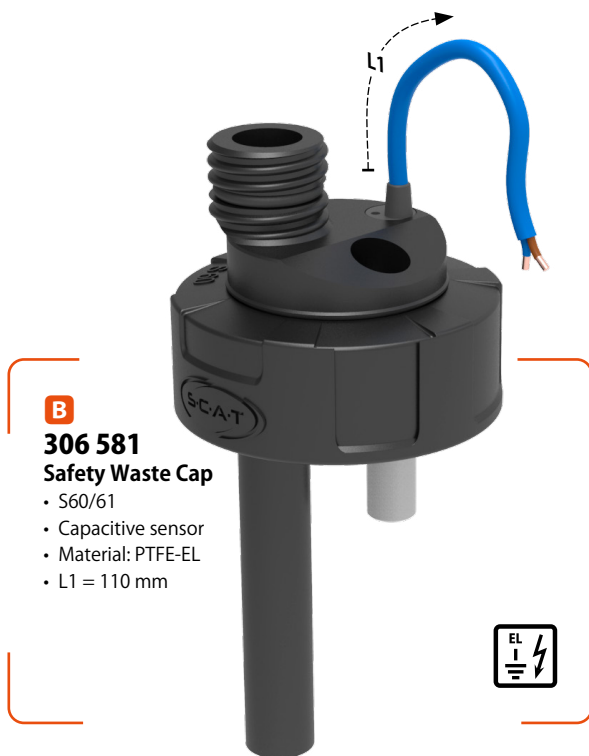
- B**
106 478
Safety Waste Cap
- Electronic level control
 - Immersed filling
 - Material: PTFE-EL
 - L1 = 200 mm
 - S55



Safety Waste Caps with electronic level control are ATEX compliant for use in potentially explosive areas! Labelling:
II 2G Ex ia IIB T6 Gb

Fig.	Part No.	Description	Material
A	106 527	Safety Waste Cap, GL45	PTFE-EL
B	106 478	Safety Waste Cap, S55 with electronic level control	PTFE-EL
	106 522	Safety Waste Cap, S55	PTFE-EL

- ✓ **ATEX compliant**
- ✓ **PTFE - EL**
- ✓ **Connection for electronic level control**



B
306 581
Safety Waste Cap
• S60/61
• Capacitive sensor
• Material: PTFE-EL
• L1 = 110 mm



A
106 480
Safety Waste Cap
• Material: PTFE-EL
• S60/61



C
306 482
Safety Waste Cap
• S60/61
• Material: PTFE-EL



Safety Waste Caps with electronic level control are ATEX compliant for use in potentially explosive areas! Labelling: **II 2G Ex ia IIB T6 Gb**

Fig.	Part No.	Description	Material
A	106 480	Safety Waste Cap, S60/61 with electronic level control	PTFE-EL
	106 484	Safety Waste Cap, S90 with electronic level control	PTFE-EL
B	306 581	Safety Waste Cap S60/61 with capacitive sensor	PTFE-EL
C	306 482	Safety Waste Cap S60/61	PTFE-EL



A
410 534
Exhaust Filter M V3.0
• With splash protection
• Change indicator
• 3 Months service life



B
410 535
Exhaust Filter M V3.0
• With splash protection
• Change indicator
• 6 Months service life



C
407 982
Exhaust Filter M V3.0
• With splash protection
• Change label
• 6 Months service life



D
407 986
Exhaust Filter L V3.0
• With splash protection
• Change indicator
• 12 Months service life

Fig.	Part No.	Description	Material
A	410 534	1x Exhaust Filter S, V3.0, with splash protection and change indicator, service life 3 months	PP
	490 335	4x Exhaust Filter S, V3.0, with splash protection and change indicator, service life 12 months	PP
B	410 535	1x Exhaust Filter M, V3.0, with splash protection and change indicator, service life 6 months	PP
	490 336	2x Exhaust Filter M, V3.0, with splash protection and change indicator, service life 12 months	PP
C	407 982	1x Exhaust Filter M, V3.0, with splash protection and change label, service life 6 months	PP
	490 914	2x Exhaust Filter M, V3.0, with splash protection and change label, service life 12 months	PP
D	407 986	1x Exhaust Filter L, V3.0, with splash protection and change indicator, service life 12 months	PP
	490 986	2x Exhaust Filter L, V3.0, with splash protection and change indicator, service life 24 months	PP

✓ **Three types of active carbon for more safety!**

Functional layers!

For yet more safety, there are three different types of active carbon (layered), offering a broad spectrum of capabilities, as well as more functions, e.g. HPLC buffer solutions are now also bound:

- 3rd layer - binds acids**
- 2nd layer - binds alkalis**
- 1st layer - adsorbs solvent vapors**

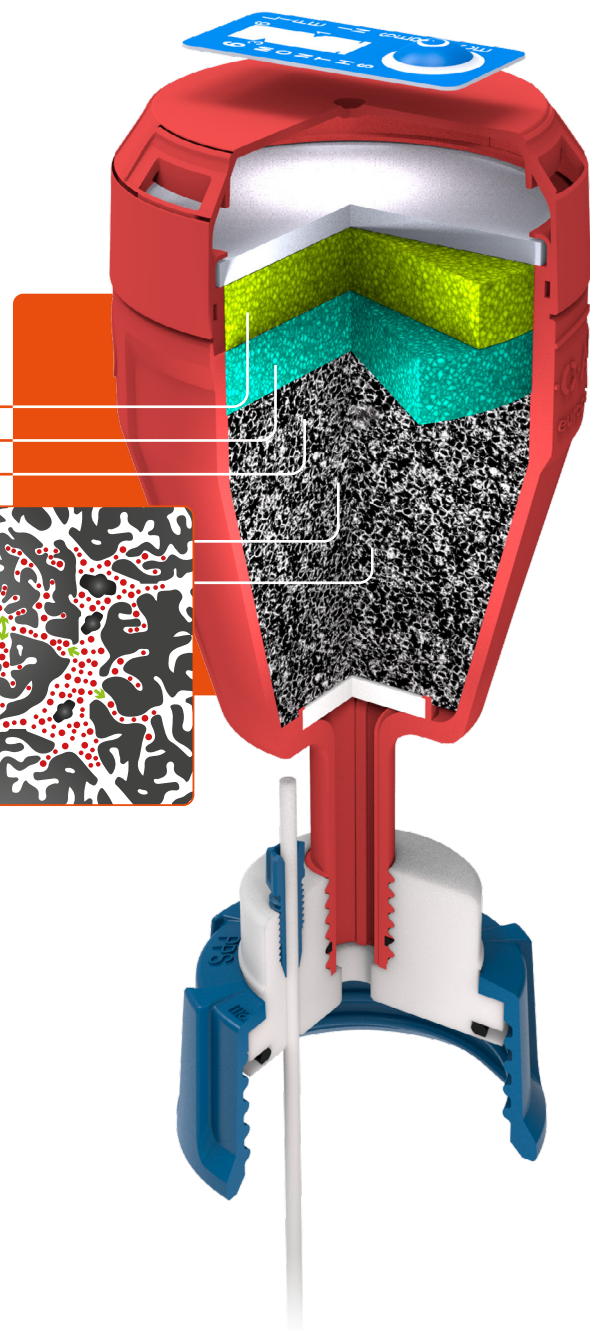
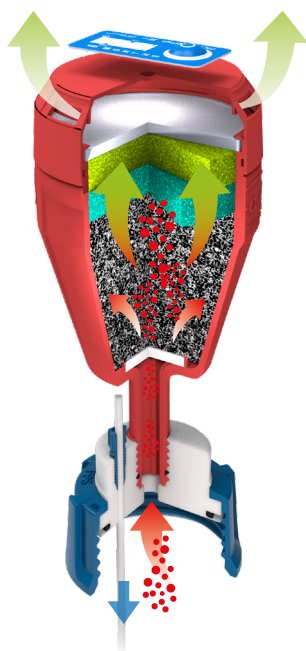
> 90% CTC adsorption

The ability to bind has been increased by 20%!

1,500 m²/g

The inner adsorption surface area has been increased by 25%!

SCAT Exhaust filters block harmful vapors and ensure safe pressure equalization in the waste containers of your HPLC systems. Our basic activated carbon is optimised for the absorption of organic solvent vapors and **tested according to official ASTM / DIN / ISO test methods.**



		Test method
Ball-pan-hardness (weight percent)	96 %	ASTM D 3802
Inner surface	1,500 m ² /g	DIN ISO 9277
Tapped density	415 ± 30 kg/m ³	ASTM D 2854
CTC Adsorption (weight percent)	> 90 %	ASTM D 3467
Grain diameter	1.4 - 3 mm	ASTM D 2862
Ash content (weight percent)	max. 5 %	ASTM D 2866
Water content (weight percent)	max. 5 %	ASTM D 2867

- Intro
- Filling Units
- Pipe and Tube System
- Disposal
- Level Control
- High Flow Solution
- FLEX
- Accessory

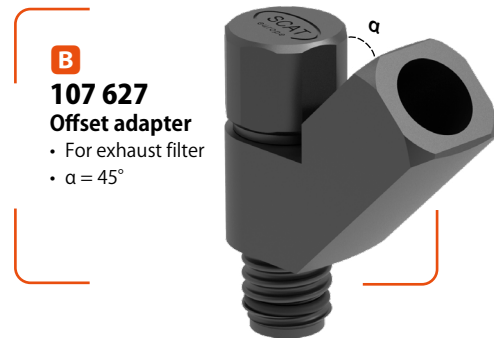
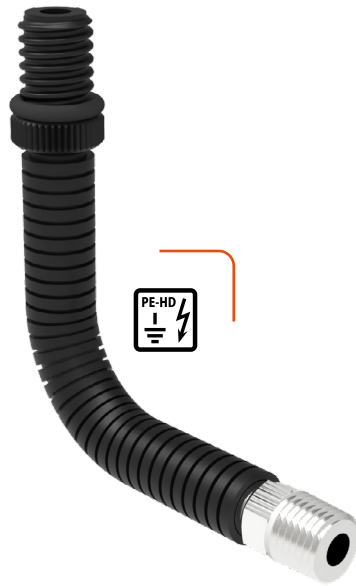


Fig.	Part No.	Description	Material
A	107 622	Offset adapter, 90°, long	PE-HD-EL
B	107 627	Offset adapter, 45°	PE-HD-EL
C	107 621	Extension for exhaust filter	PE-HD-EL
D	107 624	Offset adapter for exhaust filter, 90°	PE-HD-EL

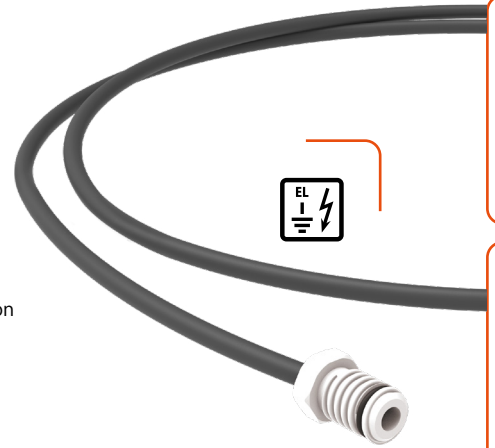
A
106 490
Exhaust ventilation tube

- Length 1500 mm
- GL14 (m)
- NPT1/4"



B
106 693
Exhaust ventilation tube

- Non-return function
- Length 2000 mm
- GL14 (m)
- NPT1/4"



Intro

Filling Units

Pipe and Tube System

Disposal

Level Control

High Flow Solution

FLEX

Accessory



✓ **Can be used in the safety cabinet.**

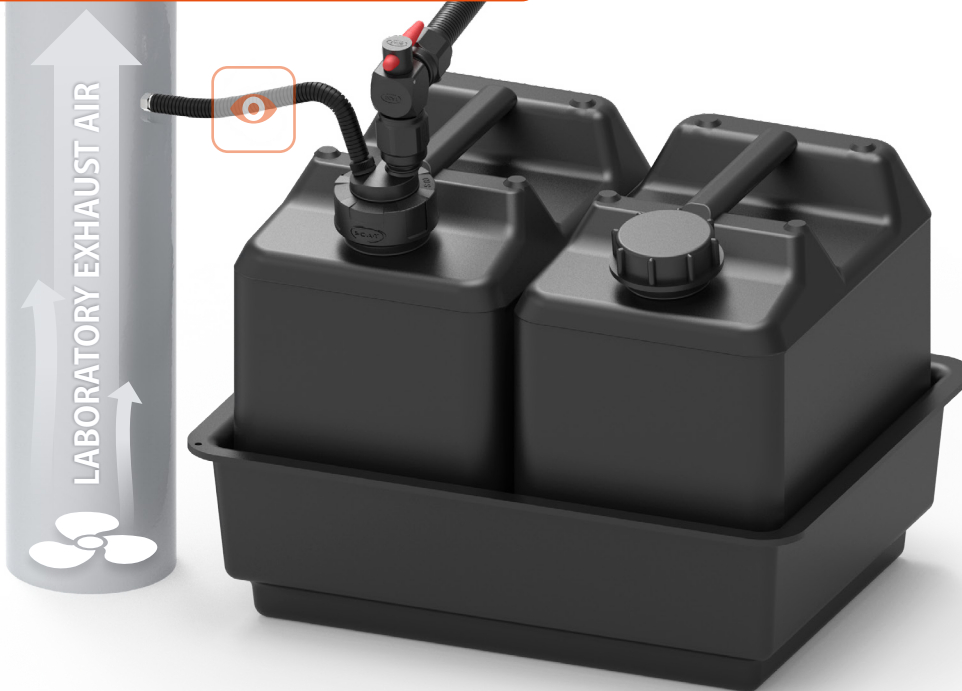


Fig.	Part No.	Description	Material
A	106 490	Exhaust ventilation tube, 1500 mm, GL14 (m) NPT1/4"	PE-HD-EL
B	106 693	Exhaust ventilation tube with non-return function, 2000 mm, GL14 (m)	PTFE-EL

B
700 002
Multilayer
Carboy Canister

- PE-HD-EL
- 5 Liter
- S60/61
- 1.3 lbs



C
700 003
Multilayer
Carboy Canister

- PE-HD-EL
- 10 Liter
- S60/61
- 1.8 lbs



D
700 004
Multilayer
Carboy
Canister

- PE-HD-EL
- 20 Liter
- S60/61
- 3.1 lbs



A
700 001
Round
Drum

- PE-HD
- 60 Liter
- S60/61
- 8.0 lbs



E
700 005
Carboy
Canister

- PE-HD
- 20 Liter
- S60/61
- 2.7 lbs



F
700 006
Carboy
Canister

- PE-HD
- 10 Liter
- S60/61
- 2.1 lbs



Fig.	Part No.	Thread	Content	Description	Classification	Dimensions	Material	
A	700 001	S60/61	60 Liter (15 Gal.)	Round drum with handle, natural color	UN-Y approved	FDA approved	14.19"Ø x 26.25"H	PE-HD
B	700 002	S60/61	5 Liter (1.32 Gal.)	Multilayer carboy canister with handle, natural color, groundable	UN-Y approved	Meets FDA standards	6.46"L x 7.64"W x 9.02"H	PE-HD-EL
C	700 003	S60/61	10 Liter (2.64 Gal.)	Multilayer carboy canister with handle, natural color, groundable	UN-Y approved	Meets FDA standards	7.17"L x 9.13"W x 12.24"H	PE-HD-EL
D	700 004	S60/61	20 Liter (5.28 Gal.)	Multilayer carboy canister with handle, natural color, groundable	UN-Y approved	Meets FDA standards	9.65"L x 11.42"W x 15.71"H	PE-HD-EL
E	700 005	S60/61	20 Liter (5.28 Gal.)	Carboy canister with handle, natural color	UN-Y approved	Meets FDA standards	11.5"L x 9.75"W x 15.38"H	PE-HD
F	700 006	S60/61	10 Liter (2.64 Gal.)	Carboy canister with handle, natural color	UN-Y approved	Meets FDA standards	11.22"L x 9.45"W x 9.72"H	PE-HD

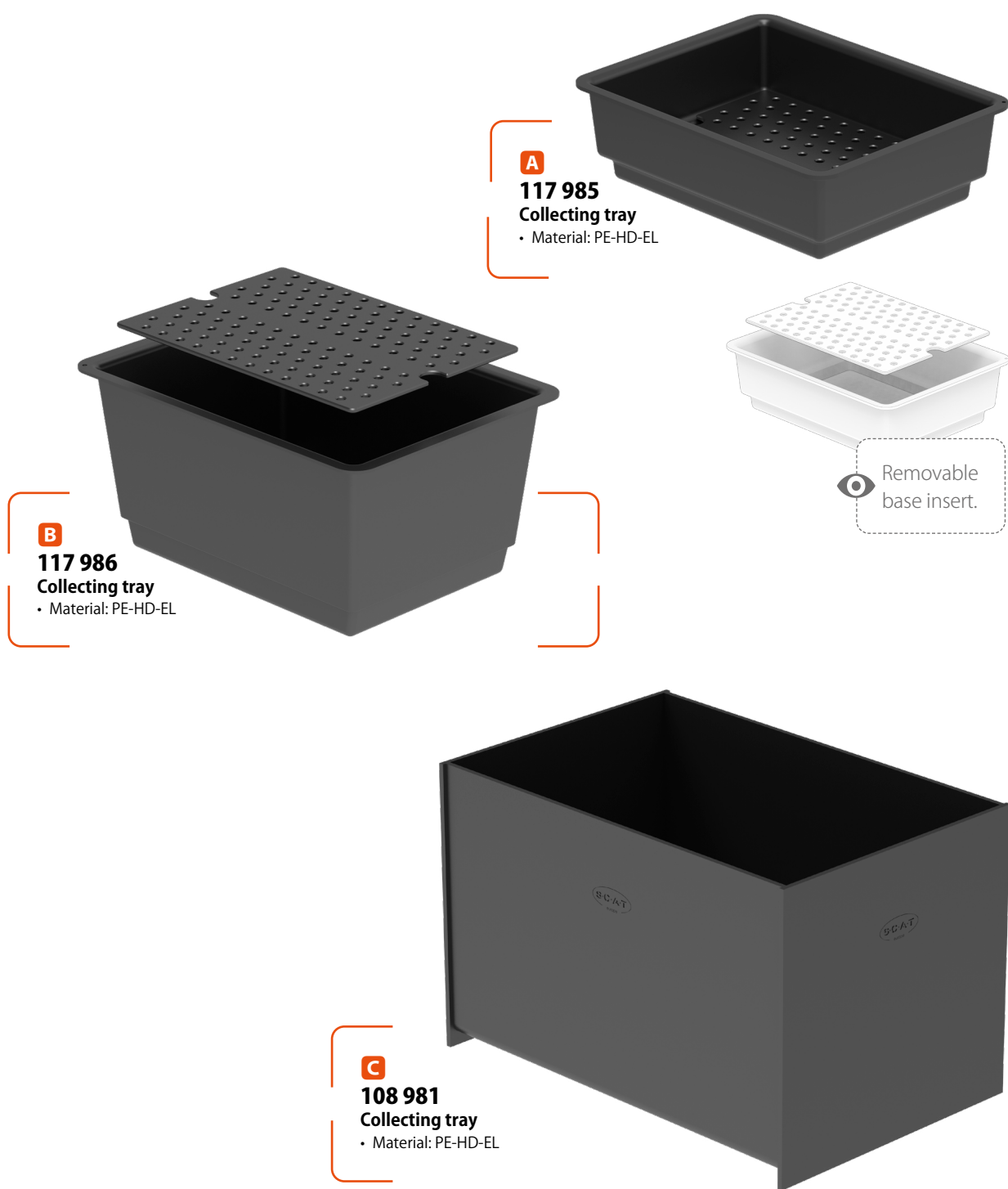


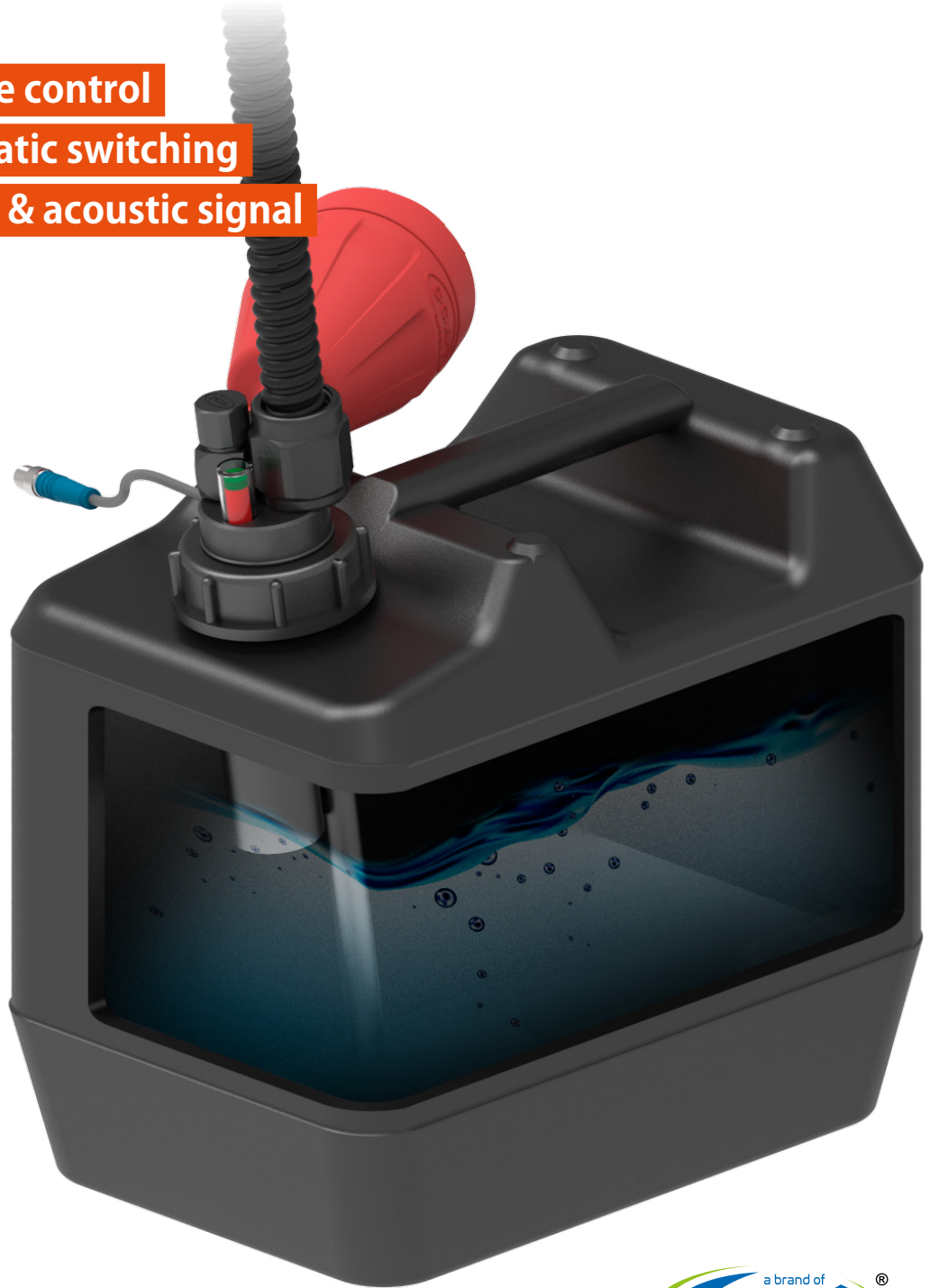
Fig.	Part No.	Description	Material
A	117 985	Collecting tray with base insert, PE-HD electrostatic conductive, Dimensions (W x H x D): 285 x 95 x 385 mm (inside), Dimensions (W x H x D): 355 x 135 x 445 mm (outside)	PE-HD-EL
B	117 986	Collecting tray with base insert, PE-HD electrostatic conductive, Dimensions (W x H x D): 295 x 200 x 415 mm (inside), Dimensions (W x H x D): 365 x 240 x 490 mm (outside)	PE-HD-EL
C	108 981	Collecting tray, PE-HD electrostatic conductive, Dimensions (W x H x D): 200 x 200 x 300 mm (inside), Dimensions (W x H x D): 225 x 215 x 325 mm (outside)	PE-HD-EL



Level Control

Always Up-To-Date.

- ✓ **Reliable control**
- ✓ **Automatic switching**
- ✓ **Optical & acoustic signal**



Function of the Built-in Signalbox.

LEDs & acoustic buzzer warn you in good time before the filling level of your collection containers reaches the critical level. The alarm can be muted via the touch control panel while the container is being changed. Pumps or other external devices can be conveniently controlled via the integrated interface.

Optical signal.

Depending on the fill level, the LEDs light up with different colors to show this visually.

Acoustic signal.

An acoustic signal sounds when the desired maximum level is reached.



The Built-in Signalbox can be integrated precisely into your system.

The Signalbox.

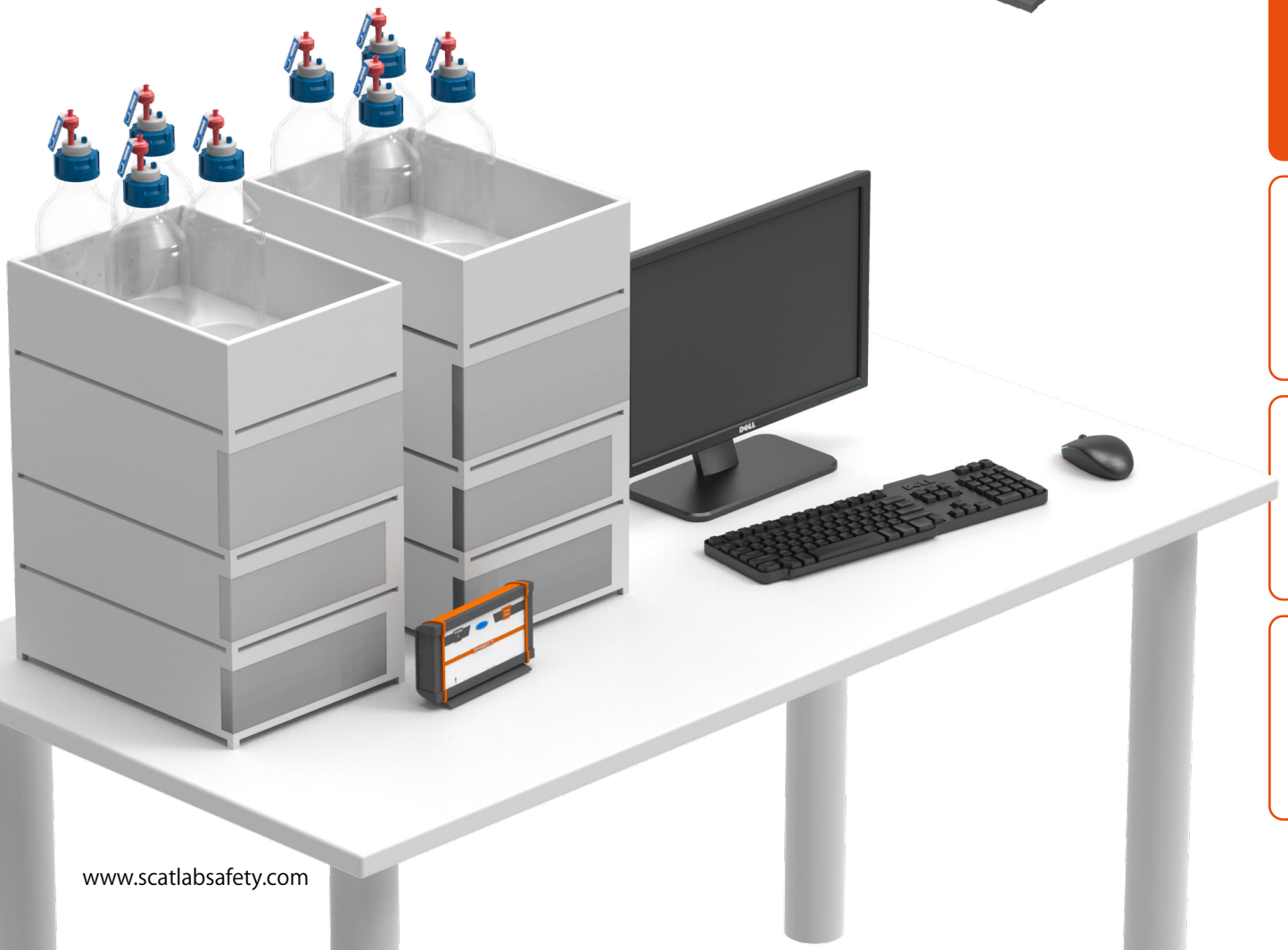
Optical and acoustic warning when the critical filling level is reached: This means that containers can no longer overflow unnoticed. Compatible with all SCAT level sensors.

Optical signal.

Depending on the fill level, the LEDs light up with different colors to show this visually.

Acoustic signal.

An acoustic signal sounds when the desired maximum level is reached.



A

106 583

Built-in Signalbox²

- Monitor two levels at the same time
- Perfect integration into laboratory furniture
- Touch control panel
- Optical and acoustic alarm signals
- Compatible with switch amplifier



Exit

Power & input

B

108 050
Signal cable

- Length 3 m



Fig.	Part No.	Description
A	106 583	Built-in Signalbox ² (US)
	108 304	Signal cable 1.5 m
B	108 050	Signal cable 3 m
	108 037	Signal cable 5 m
	108 038	Signal cable 10 m

A

**108 119
Signalbox T1**

- Monitoring 1 fill level
- With stand
- Optical and acoustic alarm signals
- Compatible with switch amplifier



Standard equipment
for all signal boxes:
integrated interface for
external devices.

B

**108 121
Signalbox T5**

- Monitoring of 5 levels
- With stand
- Optical and acoustic alarm signals
- Compatible with switch amplifier



Abb.	Part No.	Description
A	108 119	Signalbox T1 - USA
B	108 121	Signalbox T5 - USA

- Intro
- Filling Units
- Pipe and Tube System
- Disposal
- Level Control**
- High Flow Solution
- FLEX
- Accessory

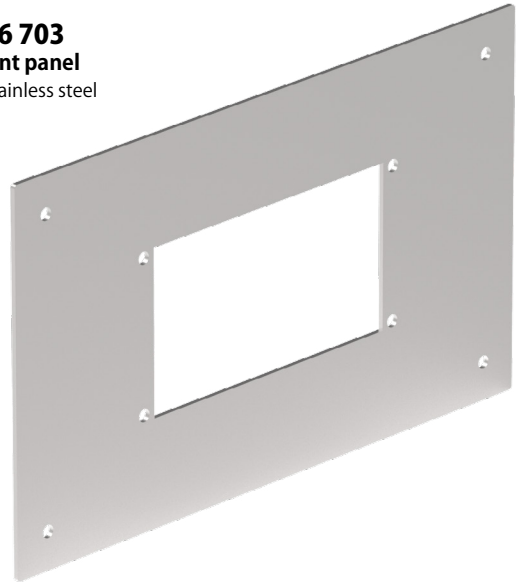
A

106 658
Mount for
Built-in Signalbox
• Stainless steel



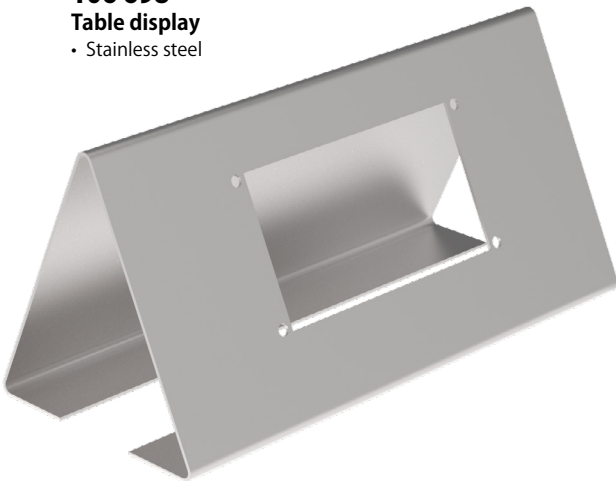
B

106 703
Front panel
• Stainless steel



C

106 698
Table display
• Stainless steel



D

106 580
Mount for
3-way ball valve
• Stainless steel

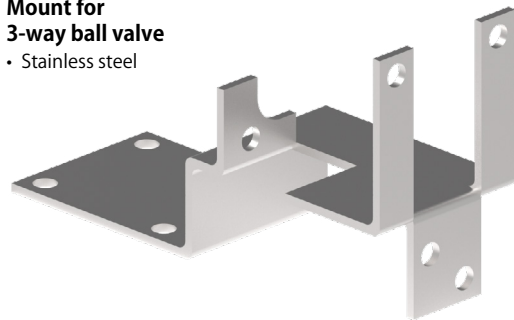
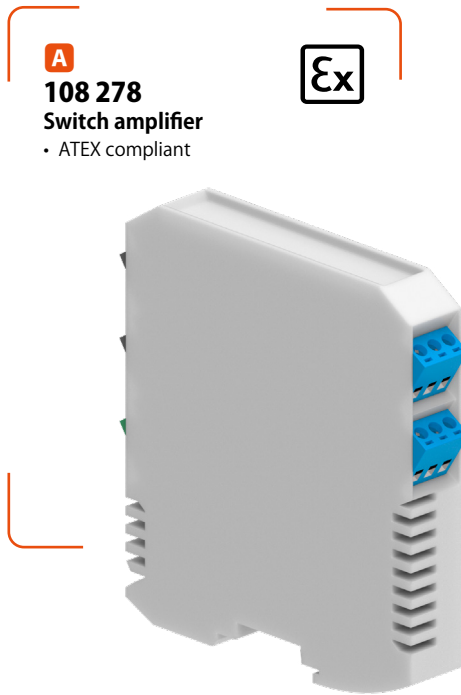


Fig.	Part No.	Description
A	106 658	Mount for Built-in Signalbox ² , stainless steel brushed, wall thickness: 2 mm
B	106 703	Front panel for Built-in Signalbox ² , stainless steel, wall thickness: 2 mm
C	106 698	Table display for Built-in Signalbox ² , stainless steel brushed, wall thickness: 2 mm
D	106 580	Mount for, 3-way ball valve, stainless steel (1.4301)



Ex According to the ATEX guidelines, Ex-sensors for use in potentially explosive areas (Ex-zones) must be protected with an isolating switch amplifier. Signal boxes and isolating amplifiers must be located outside the Ex-zone.



Fig.	Part No.	Description
A	108 278	Switch amplifier
B	108 219	Cable set for connecting the isolating amplifier and the Built-in Signalbox ² 3.5 m
C	106 590	Housing for switch amplifier
D	106 678	Switch amplifier set "EU plug" consisting of 1x A , 2x B and 1x C

A

- 107 000**
Electronic Switchbox
- For Built-in Signalbox²
 - For Signalbox T1 / T5



B

- 160 178**
3-Way Ball Valve
- Electronically controllable



C

- 106 750**
SymLine - Set for automatic switching
- 1x **A** (107000)
 - 1x **B** (160178)
 - 1x Mount (106580)
 - 2x Signal cable (108050)



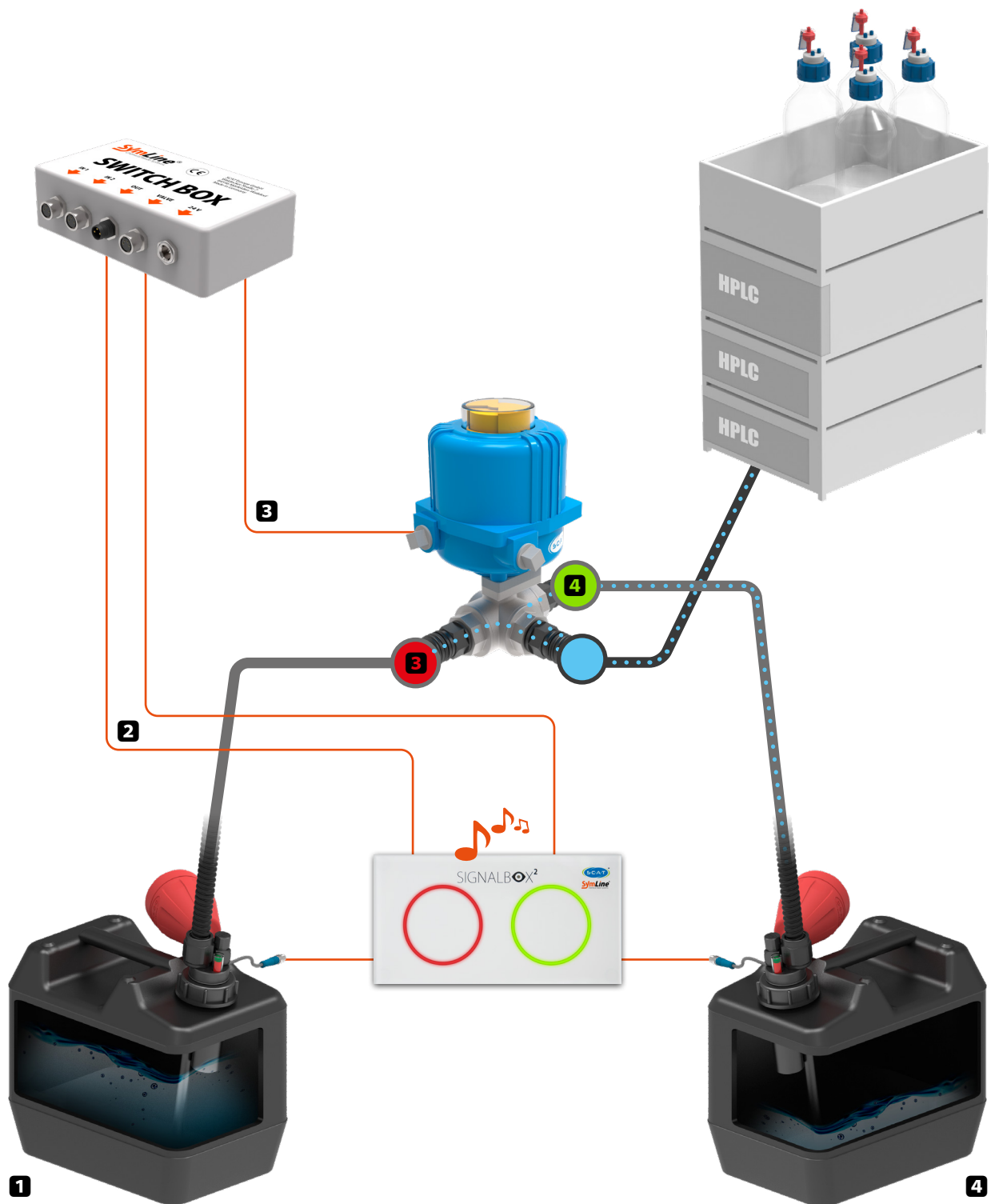
Automatically diverting waste liquid in the reserve canister.

Disposal can take place over the weekend, for example, without the user having to empty or change containers in the meantime.

SCAT SymLine
Chemical Waste Systems

Switchbox compatible with all electronic SCAT Europe[®] and SymLine[®] level sensors as well as the Signalbox T5 and Built-in Signalbox²

Fig.	Part No.	Description
A	107 000	Electronic switchbox
B	160 178	3-Way Ball Valve, electronically controllable
	106 580	Mount, 3-Way Ball Valve, stainless steel (1.4301)
C	106 750	SymLine - Set for automatic switching, consisting of 1x A , 1x B , 1x Mount for 3-way ball valve (106580), 2x Signal cable for electronic level monitoring, length = 3 m (108050)



1 Container full

The Safety Waste Cap with electronic filling level control sends a signal to the connected signal box.

2 Signalbox

The electronic signal box sends the signal to the connected switch box.

3 Switchbox

The switch box controls the connected 3-way ball valve.

4 Detour

The 3-way ball valve closes the flow of waste liquid into the full container and diverts the liquid into the connected reserve canister.

A

502 042

Continuous level control

- Sensor
- Signalbox
- Integrated isolation switch amplifier



B

106 507

Safety Waste Cap S60

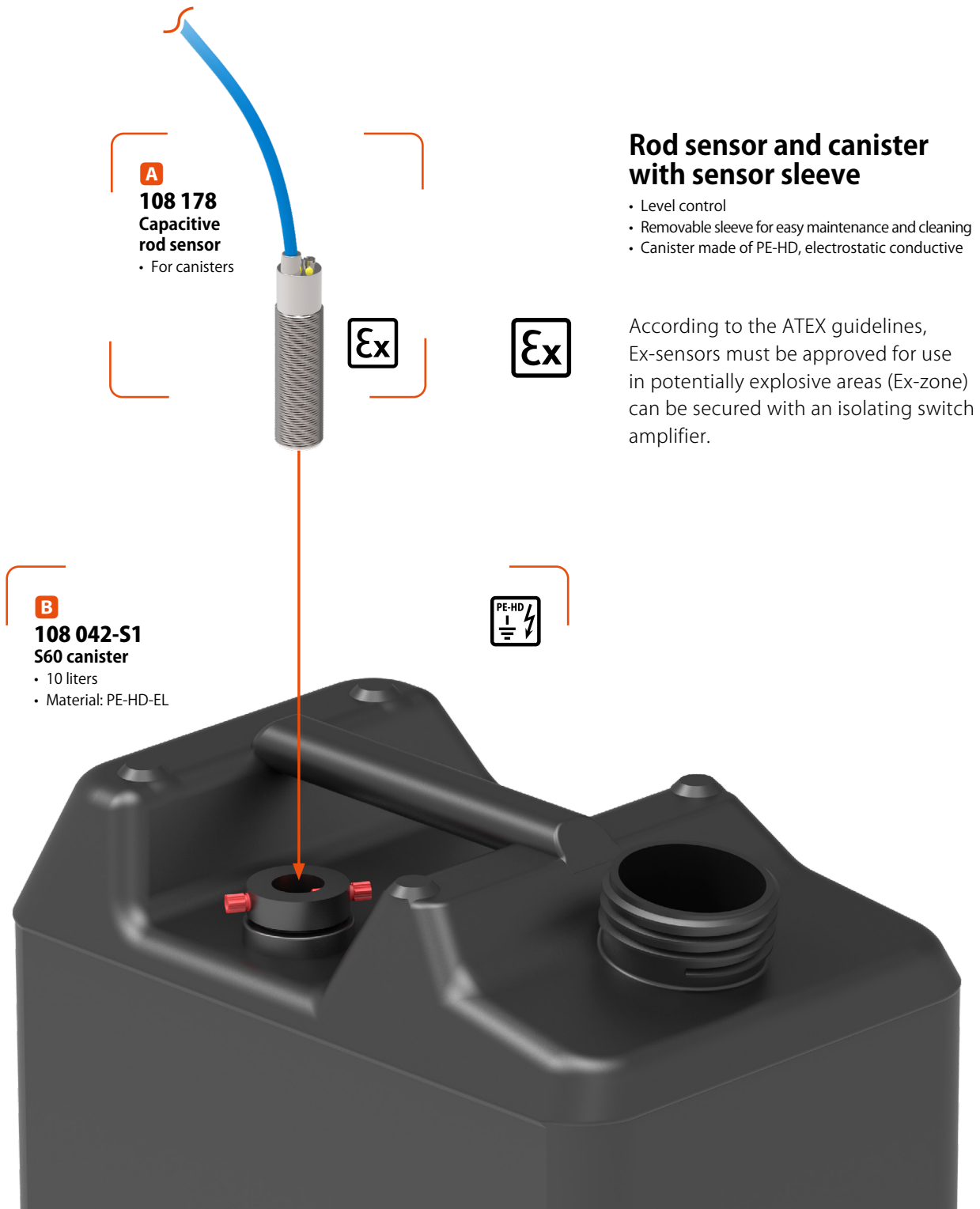
- Material: PTFE-EL



Measure filling levels permanently

- Automatic warning for 5 different levels freely selectable
- Accuracy up to $\pm 0.5\text{mm}$
- The signal box offers 4 freely configurable outputs for controlling external devices
- The compact design and the independent mains supply enable easy handling and installation, even outside of control cabinets

Fig.	Part No.	Description	Material
A	502 042	Continuous level control, sensor and controlbox	
B	106 507	Safety Waste Cap S60 - especially for continuous level control	PTFE-EL



A
108 178
Capacitive rod sensor
• For canisters

Ex

Ex

B
108 042-S1
S60 canister
• 10 liters
• Material: PE-HD-EL

PE-HD / EL

Rod sensor and canister with sensor sleeve

- Level control
- Removable sleeve for easy maintenance and cleaning
- Canister made of PE-HD, electrostatic conductive

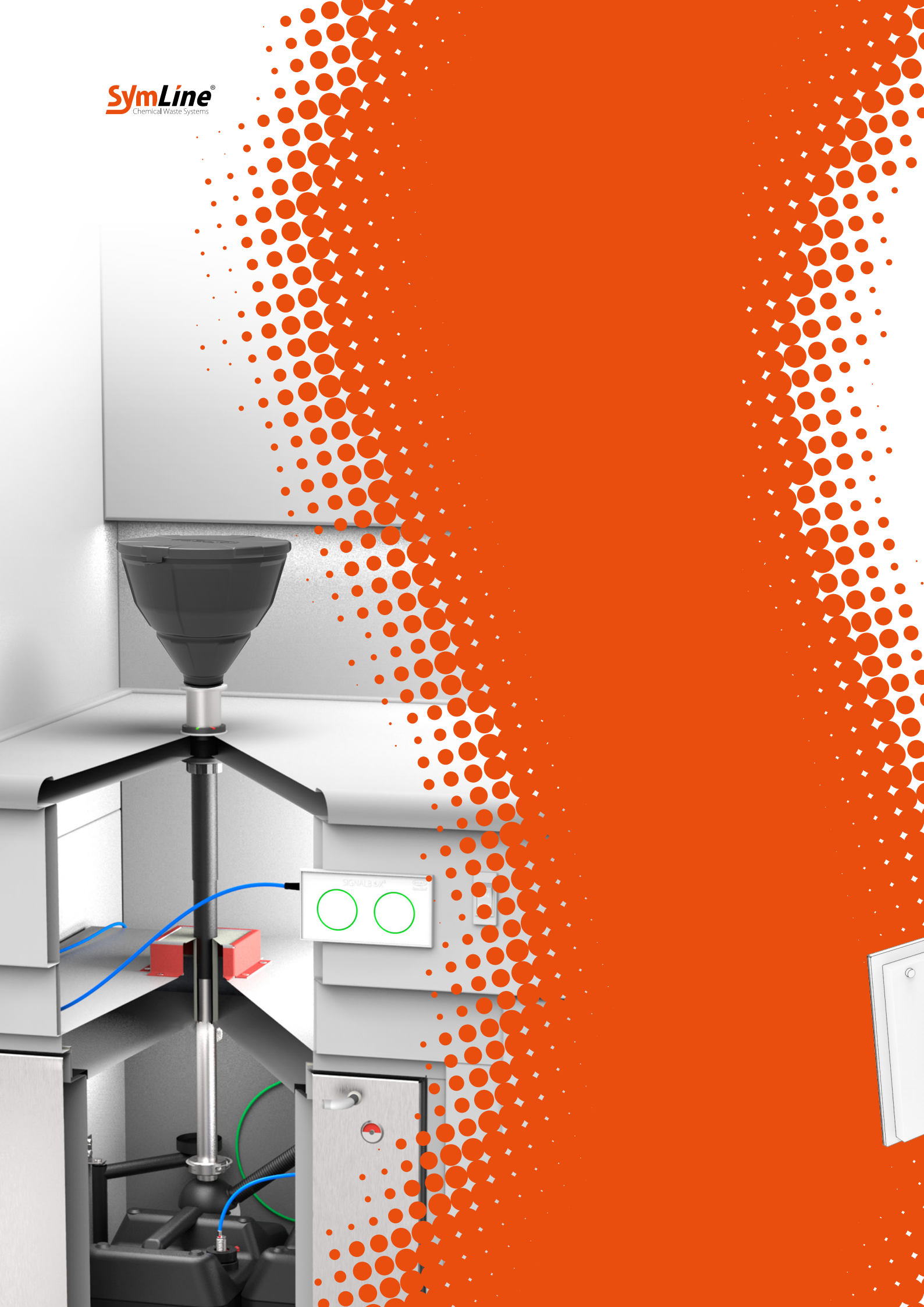
According to the ATEX guidelines, Ex-sensors must be approved for use in potentially explosive areas (Ex-zone) can be secured with an isolating switch amplifier.

Fig.	Part No.	Description	Material
A	108 178	Capacitive rod sensor for canister 108 042-S1	Brass
B	108 042-S1	S60 canister, 10 liters, conductive with integrated sensor holder for sensor 108 178	PE-HD-EL
	108 278	Switch amplifier	

- Intro
- Filling Units
- Pipe and Tube System
- Disposal
- Level Control**
- High Flow Solution
- FLEX
- Accessory

SymLine[®]

Chemical Waste Systems



High Flow Solution

The Waste Disposal System
for Viscous Chemicals.

- ✓ Fast draining without congestion
- ✓ Durable
- ✓ Easy to clean



Gives you the ability to collect liquid waste directly within the fume cabinet - thereby avoiding the awkward use of canisters. Hence, more working space is made available. Liquid level control allows for continual supervision of the canisters, even from outside.

90° Drop
for viscous waste
and high flowrates.

Fire Protection

Feed duct conforms with fire protection regulations

Automatic Drip Protection

prevents any dripping of residual liquid into the safety cabinet

Safety Funnel

with hinged lid

Main Pipe

- V4A stainless steel
- Easy to clean

Leading Pipe

for installation within the worktop

Liquid Level Control

Direct Extraction

of fumes and hazardous substances at the canister opening

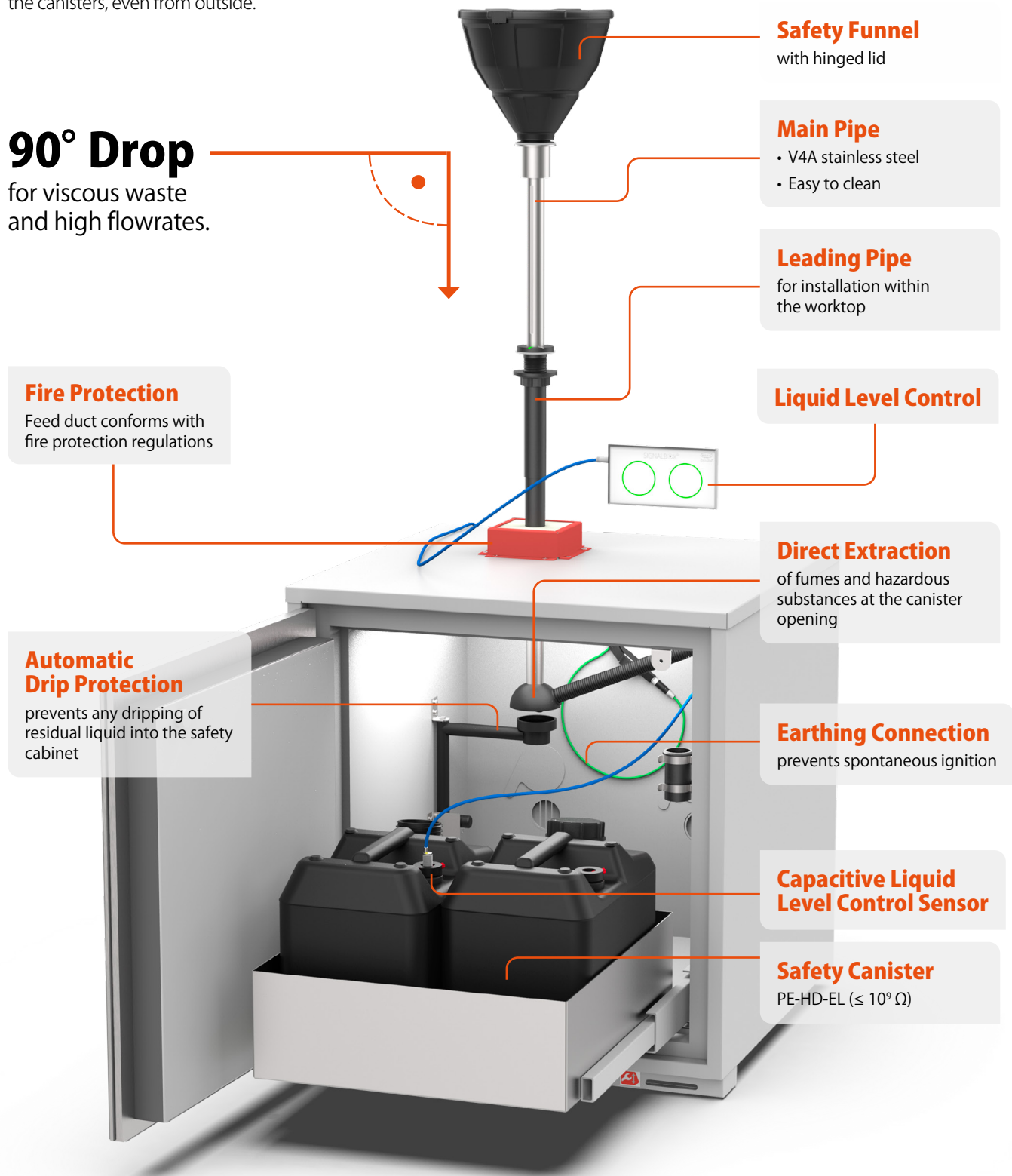
Earthing Connection

prevents spontaneous ignition

Capacitive Liquid Level Control Sensor

Safety Canister

PE-HD-EL ($\leq 10^9 \Omega$)

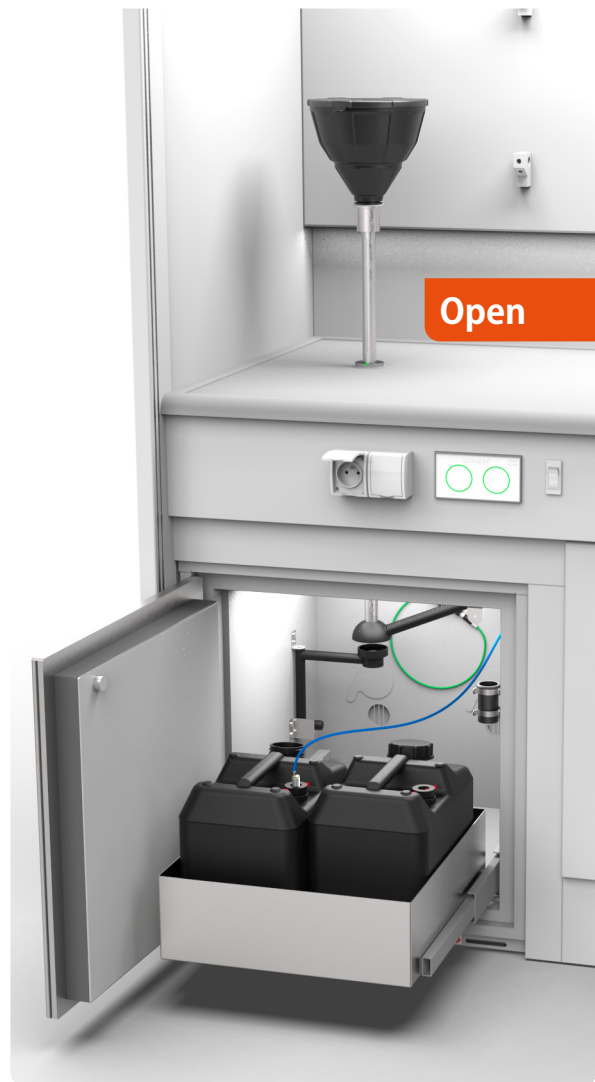


- ✓ **Fast canister exchange**
- ✓ **High degree of working comfort**
- ✓ **Safety cabinet remains clean**

Fast and simple canister exchange - this was one of the demands on the High Flow Solution from our customers. The main pipe with a 90° drop is simply pulled up, in order to disconnect the canister.

The automatic drip protection collects residual liquid from the pipe, thereby ensuring that the safety cabinet remains clean.

After exchanging the canisters, the system is simple to reconnect and can then be immediately reused.



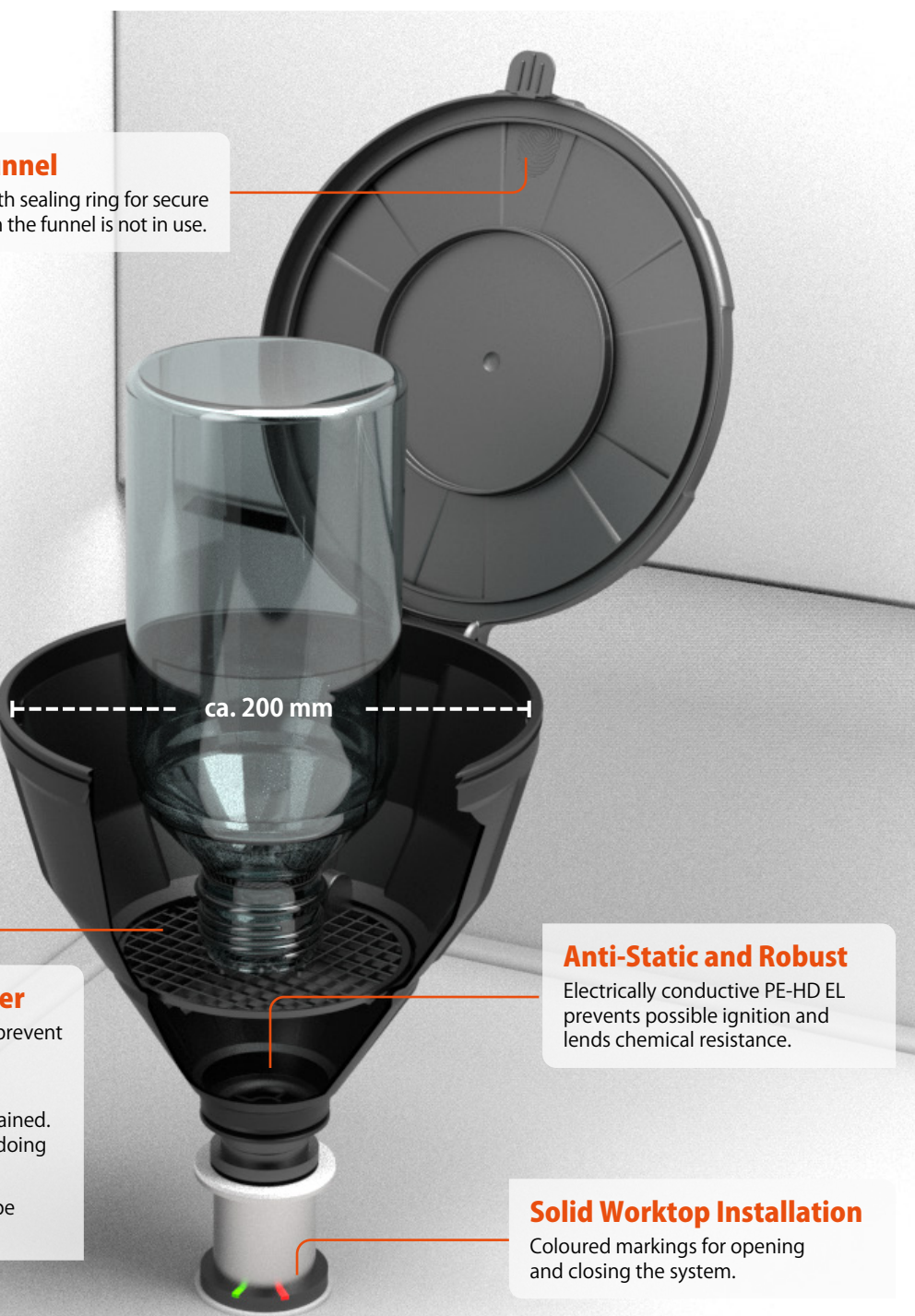
- ✓ **Safely closed**
- ✓ **Easily cleaned**
- ✓ **Time saving**

Safety first

Each component of the system has been designed for maximum safety, smart handling and easy cleaning - in order to save on time and work involved.

Safety Funnel

Hinged lid with sealing ring for secure closure, when the funnel is not in use.



Dirt-Collecting Stainer

Collects magnetic stirrers, to prevent them falling into the canister.

Test tubes or bottles may be placed upon the sieve and drained. This gives you more time for doing other things.

The dirt-collecting sieve can be removed for cleaning.

Anti-Static and Robust

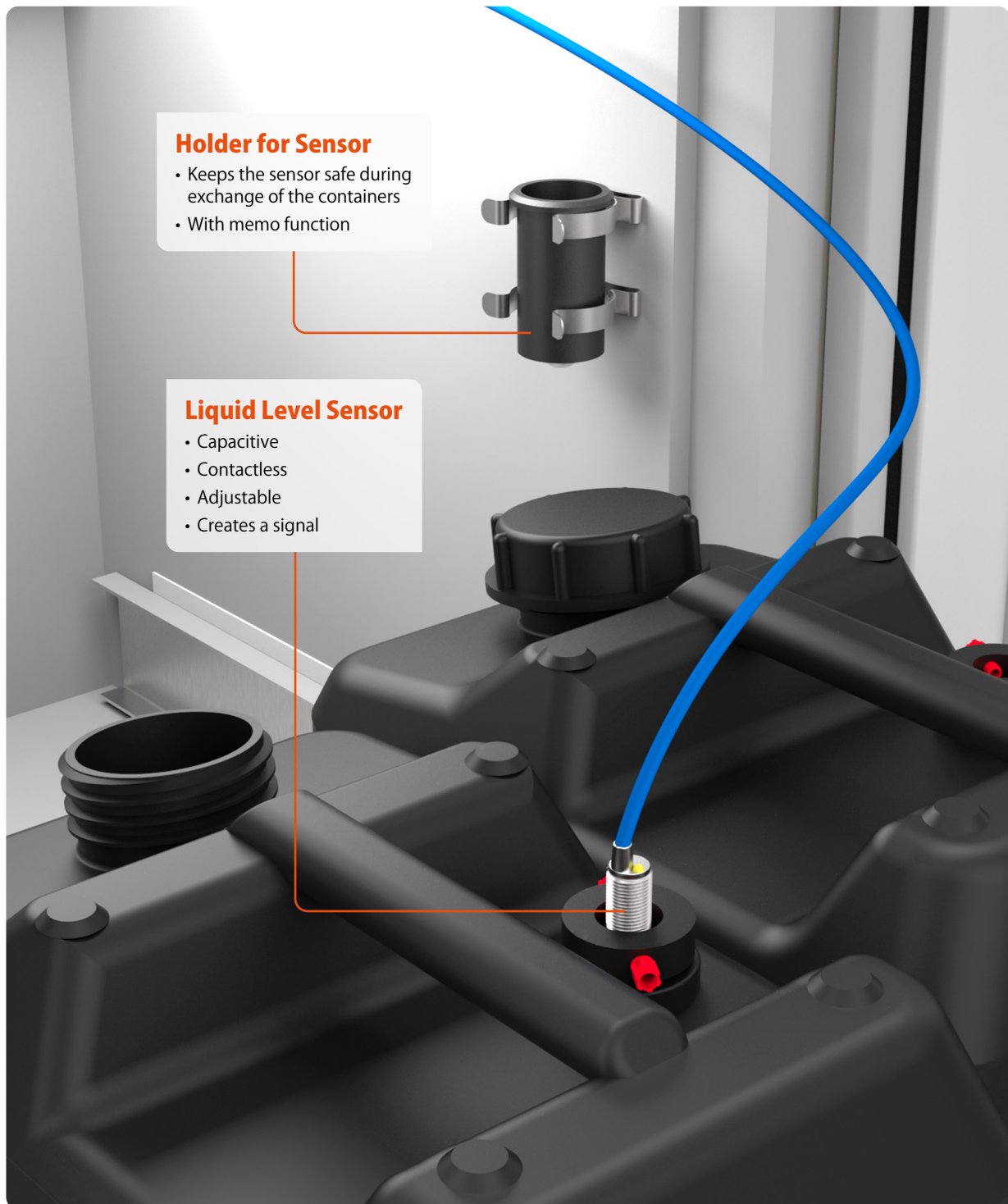
Electrically conductive PE-HD EL prevents possible ignition and lends chemical resistance.

Solid Worktop Installation

Coloured markings for opening and closing the system.

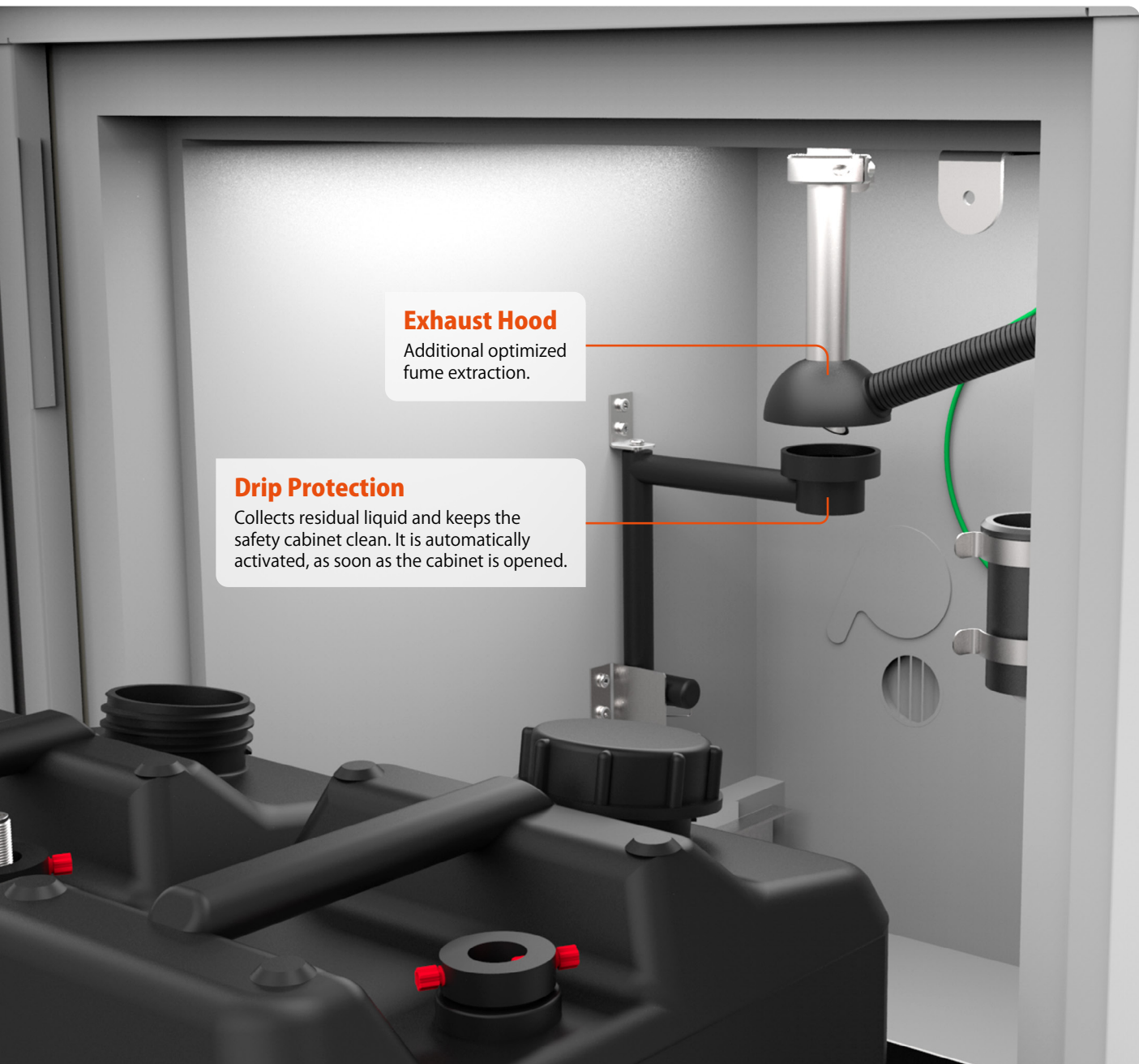
✓ **Ease of handling**

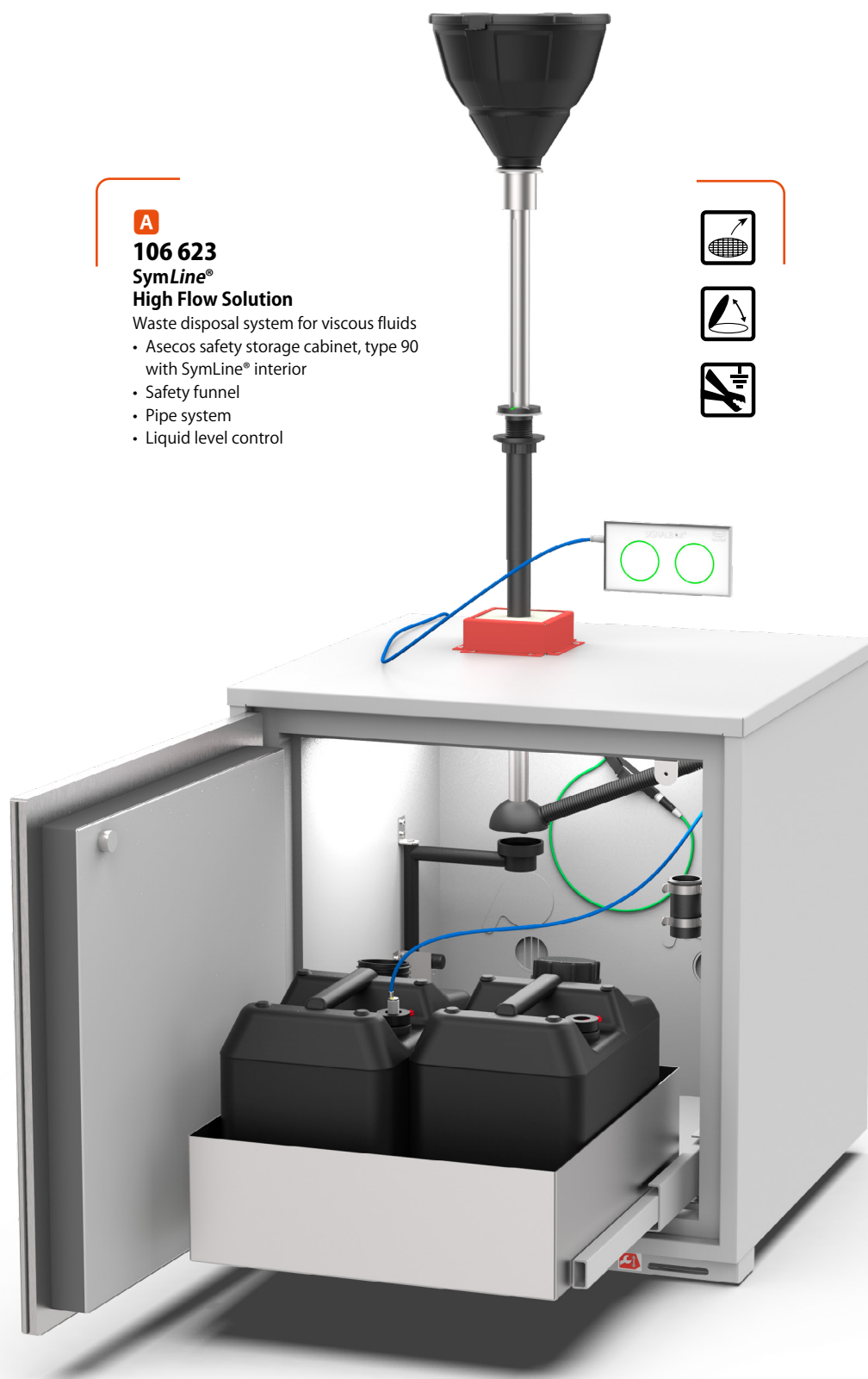
Don't take any risks regarding health and safety: the liquid level memo function reminds you to replace the sensor after canister exchange - this, for safe monitoring of your liquid levels and to prevent any overflowing.



The automatic drip protection is activated, whenever the cabinet is opened. Residual liquids are thereby prevented from contaminating the interior of the safety cabinet.

We even offer double the safety as regards fume extraction, as the exhaust hood removes additional vapors - directly from the opening of the canister.





A

106 623
SymLine[®]
High Flow Solution

- Waste disposal system for viscous fluids
- Asecos safety storage cabinet, type 90 with SymLine[®] interior
 - Safety funnel
 - Pipe system
 - Liquid level control



Fig.	Part No.	Description
A	106 623	SymLine[®] High Flow Solution

SymLine[®]

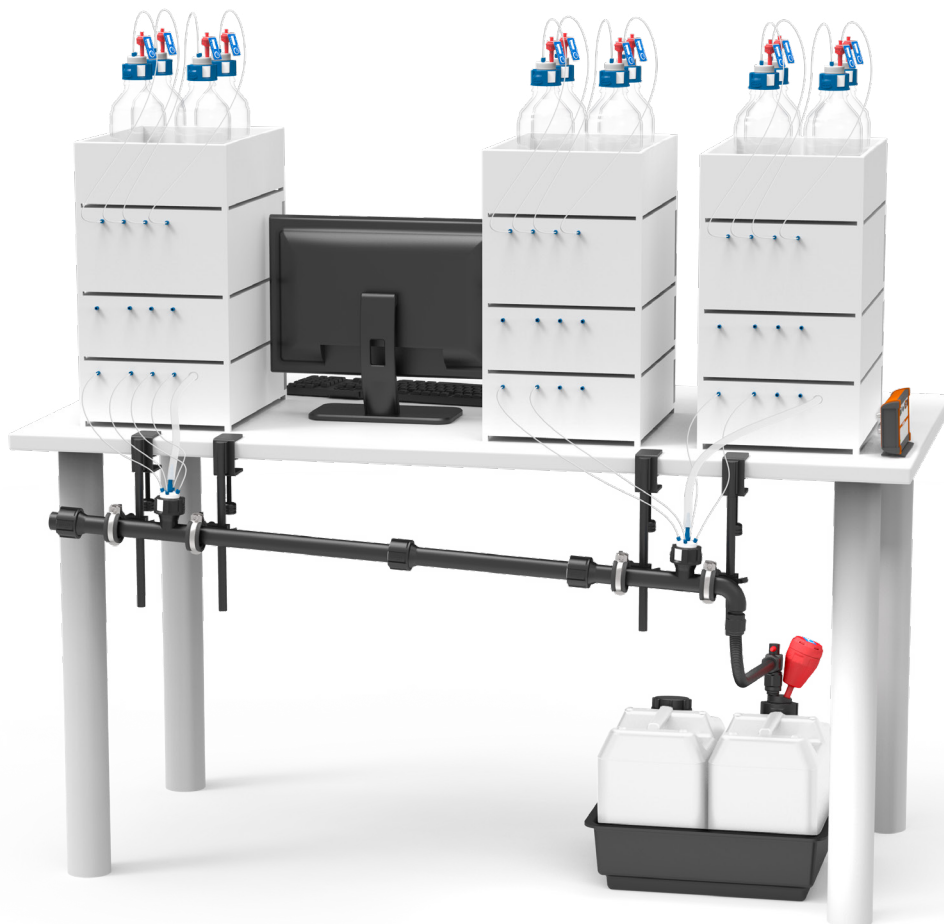
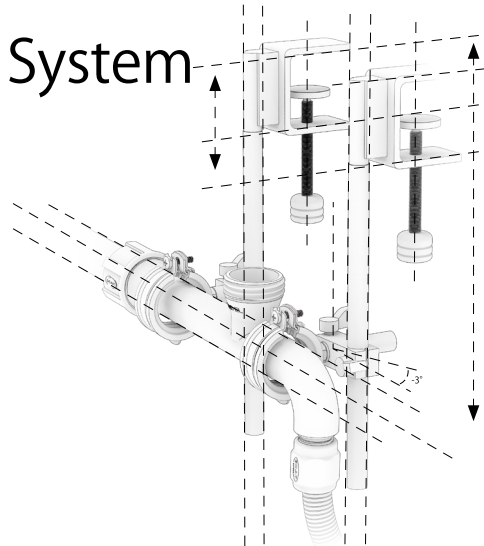
Chemical Waste Systems



SymLine FLEX

The Flexible Waste Disposal System for HPLC Work Stations.

- ✓ Retrofit / laboratory refit
- ✓ Simple Installation
- ✓ Do-it-yourself modular system



BEFORE



AFTER



Intro

Filling Units

Pipe and Tube System

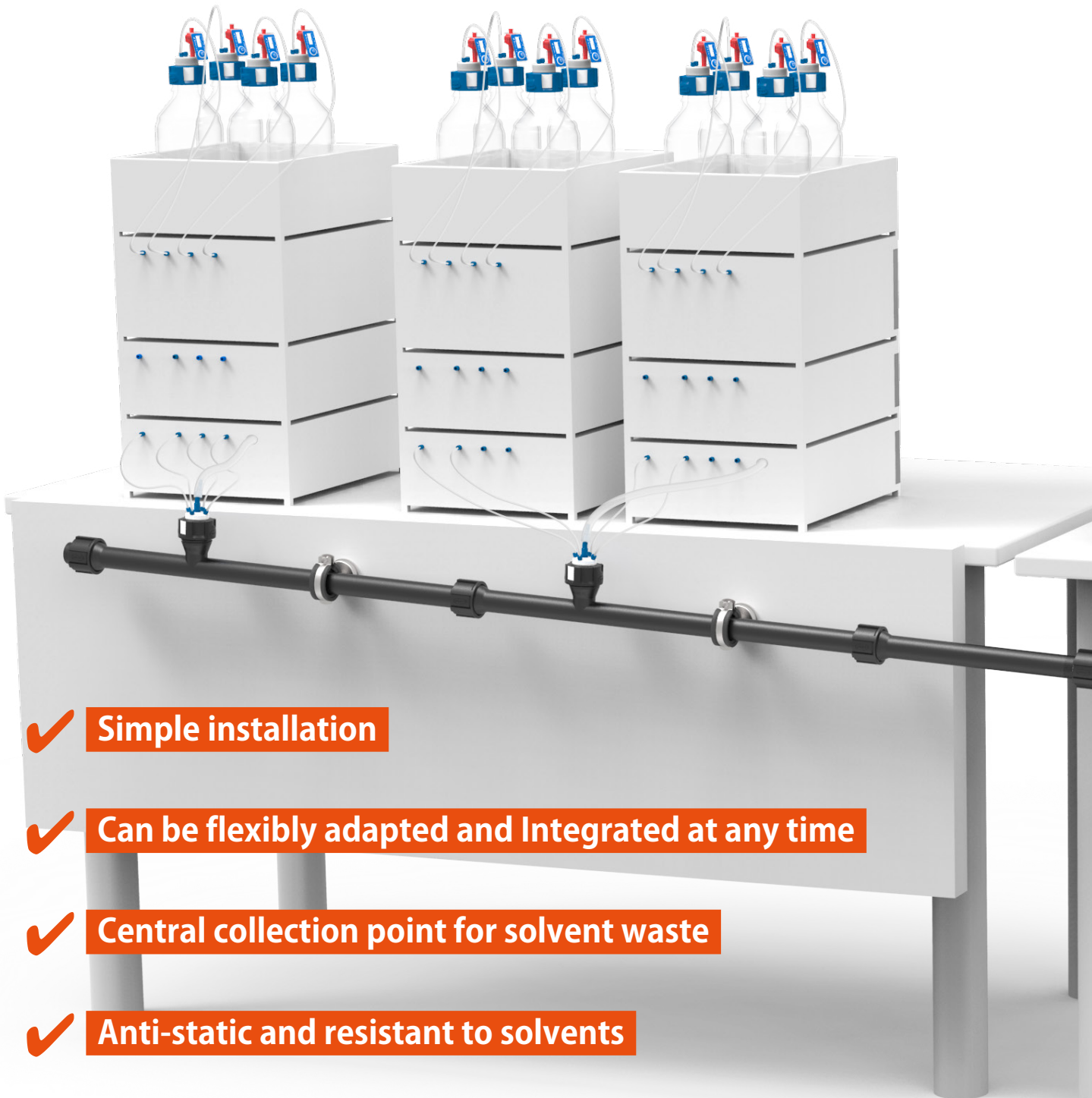
Disposal

Level Control

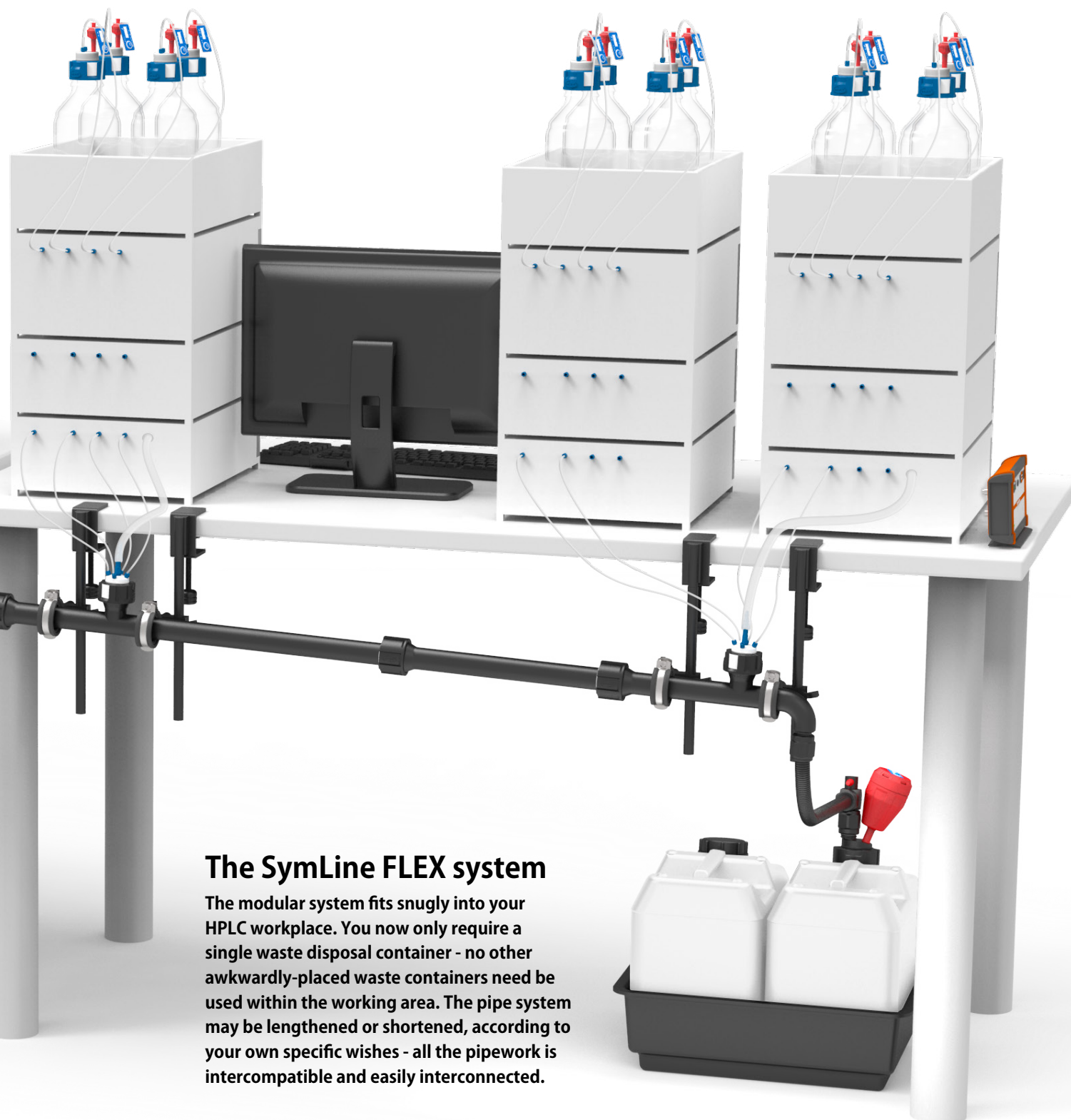
High Flow Solution

FLEX

Accessory



- ✓ **Simple installation**
- ✓ **Can be flexibly adapted and Integrated at any time**
- ✓ **Central collection point for solvent waste**
- ✓ **Anti-static and resistant to solvents**
- ✓ **Closed system, suitable for both solvent feed and waste disposal**



The SymLine FLEX system

The modular system fits snugly into your HPLC workplace. You now only require a single waste disposal container - no other awkwardly-placed waste containers need be used within the working area. The pipe system may be lengthened or shortened, according to your own specific wishes - all the pipework is intercompatible and easily interconnected.

Intro

Filling Units

Pipe and Tube System

Disposal

Level Control

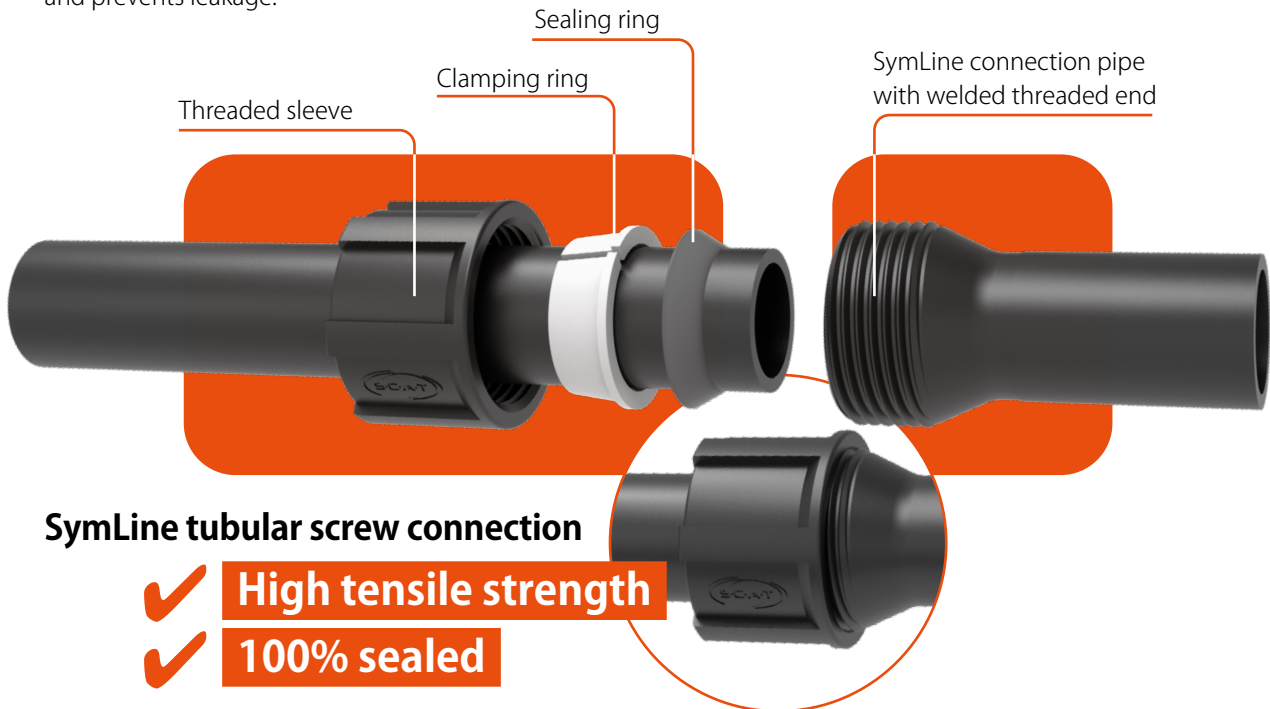
High Flow Solution

FLEX

Accessory

The tubular system: safe attachment, optimum flow direction

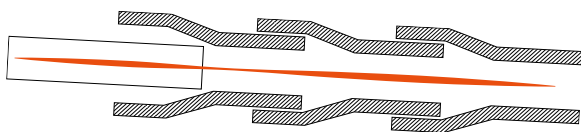
The SymLine FLEX tube extensions have a funnel-shaped threaded sleeve at one end and a smooth tube opening at the other. In order to tightly interconnect the tubular system, the threaded sleeve, clamping ring and sealing ring are simply pushed over the smooth end of one tube, and this is then firmly screwed on to the threaded part of the following extension piece (i.e. on the other tube). When done properly (tightening torque 10 - 15 Nm), the resulting connection will withstand a tensile force of **400 N**. The system allows for optimum flow of waste liquids and prevents leakage.



SymLine tubular screw connection

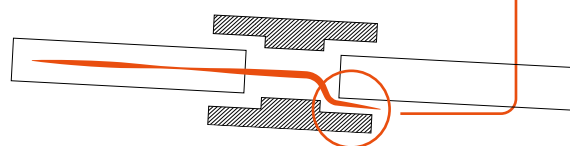
- ✓ **High tensile strength**
- ✓ **100% sealed**

SymLine construction method - optimal for waste transport



SymLine construction, with optimum liquid flow. Liquids flow continually downwards, from the smooth pipe end, into the interconnected threaded one.

Typical construction principle - prone to leaking!



Smooth pipe ends are interconnected, using connecting sleeves. This results in increased danger of leakage.



SymLine material properties

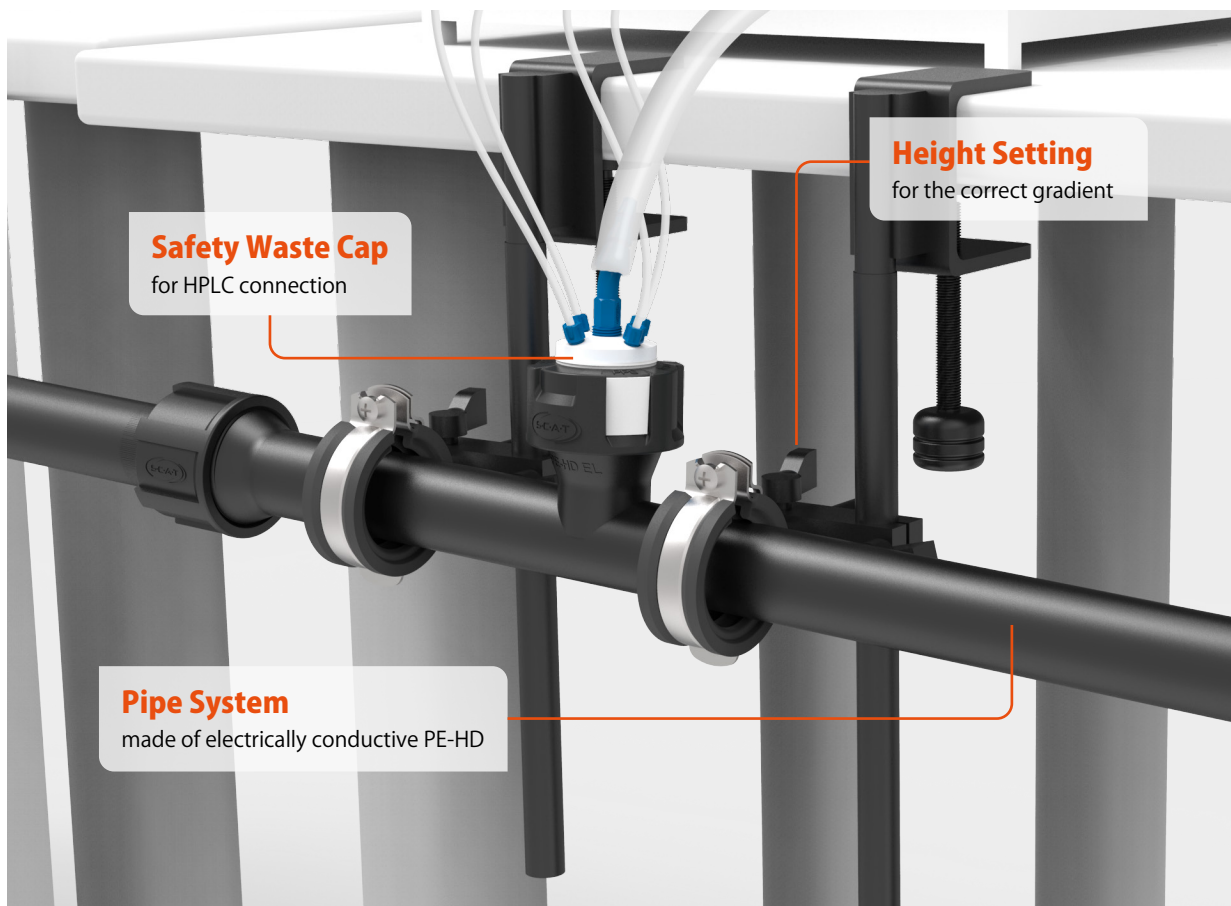
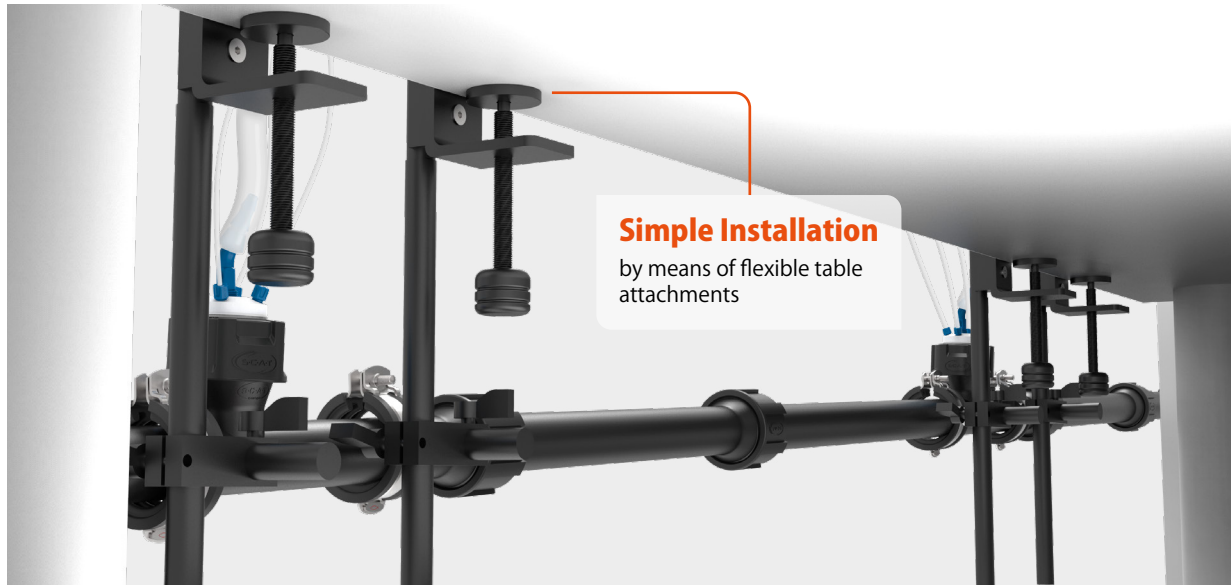
All components made of electrostatic conductive plastic can be earthed and are suitable for voltage equalization, as per TRGS 727. Electrically conductive PE-HD-EL displays a discharge resistance against earth of $< 10^9 \Omega$, as per DIN EN 61340-5-1, and is suitable for Zones 0, 1 and 2, as per the German Hazardous Substances Ordinance (GefStoffV), EN 1127-1, DIN EN 60079-10-1 and DIN EN 60079-10-2. It is resistant to chemicals, as defined in SEFA 3 and SEFA 8.

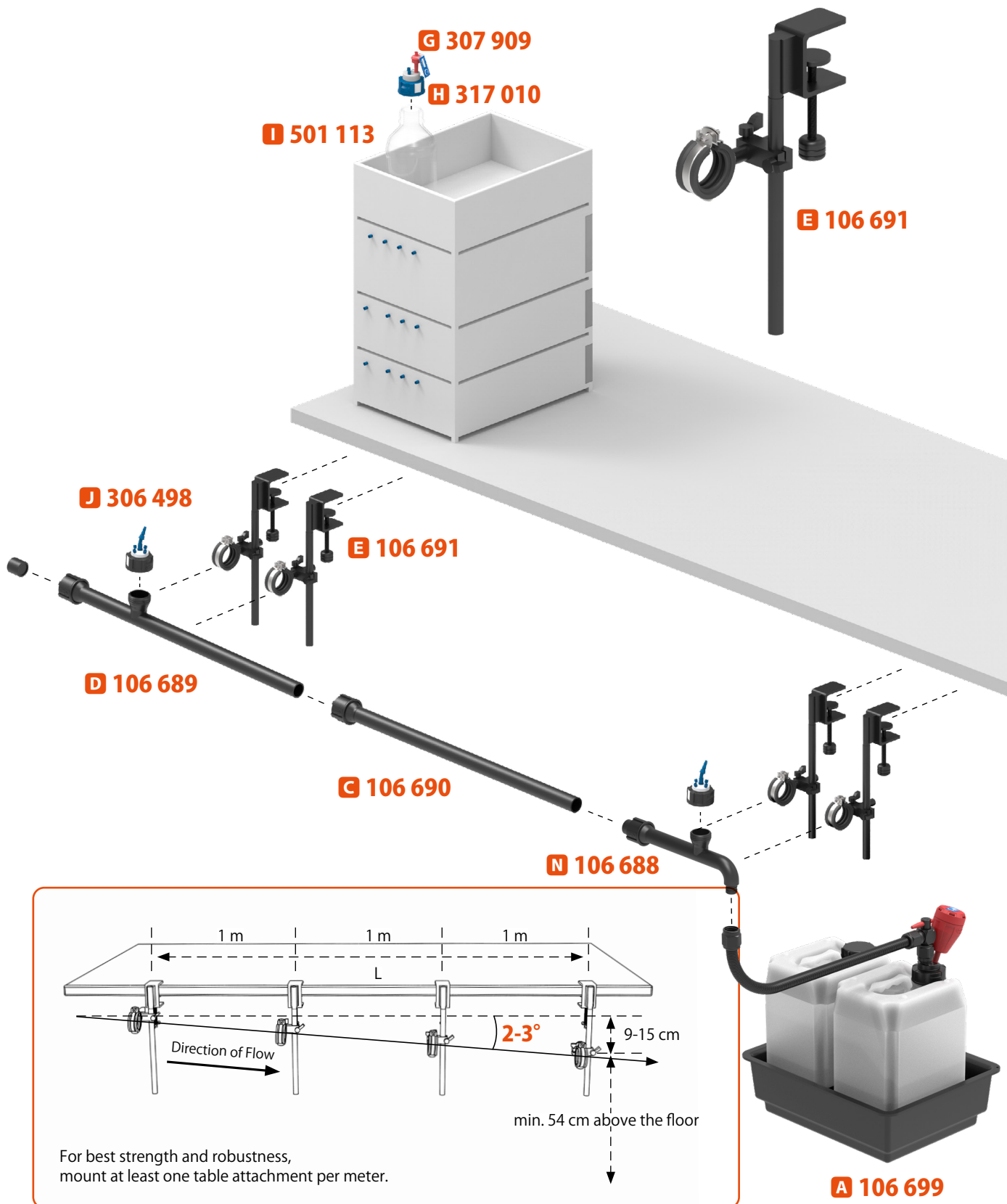
- ✓ **• TRGS 727**
• DIN EN 61340-5-1
- ✓ **• ATEX zone 0, 1 and 2**
• EN 1127-1
- ✓ **• DIN EN 60079-10-1**
• DIN EN 60079-10-2
- ✓ **• SEFA 3**
• SEFA 8

Installation: easy, flexible and safe

The flexible table installation allows for connections to your equipment to be made at any desired place. The resultant height then gives the required gradient - leading to a safe downward flow of liquid.

A table mounting is possible for various tabletop thicknesses, and the required attachments can be installed at the tabletop without the use of any tools.





Incline (degr.)	corresponds to %	Height difference per metre	Max. length for a table height of 89 cm
2°	3,49 %	3 cm	L = 687 cm
3°	5,24 %	5 cm	L = 457 cm

Flexible wall attachment

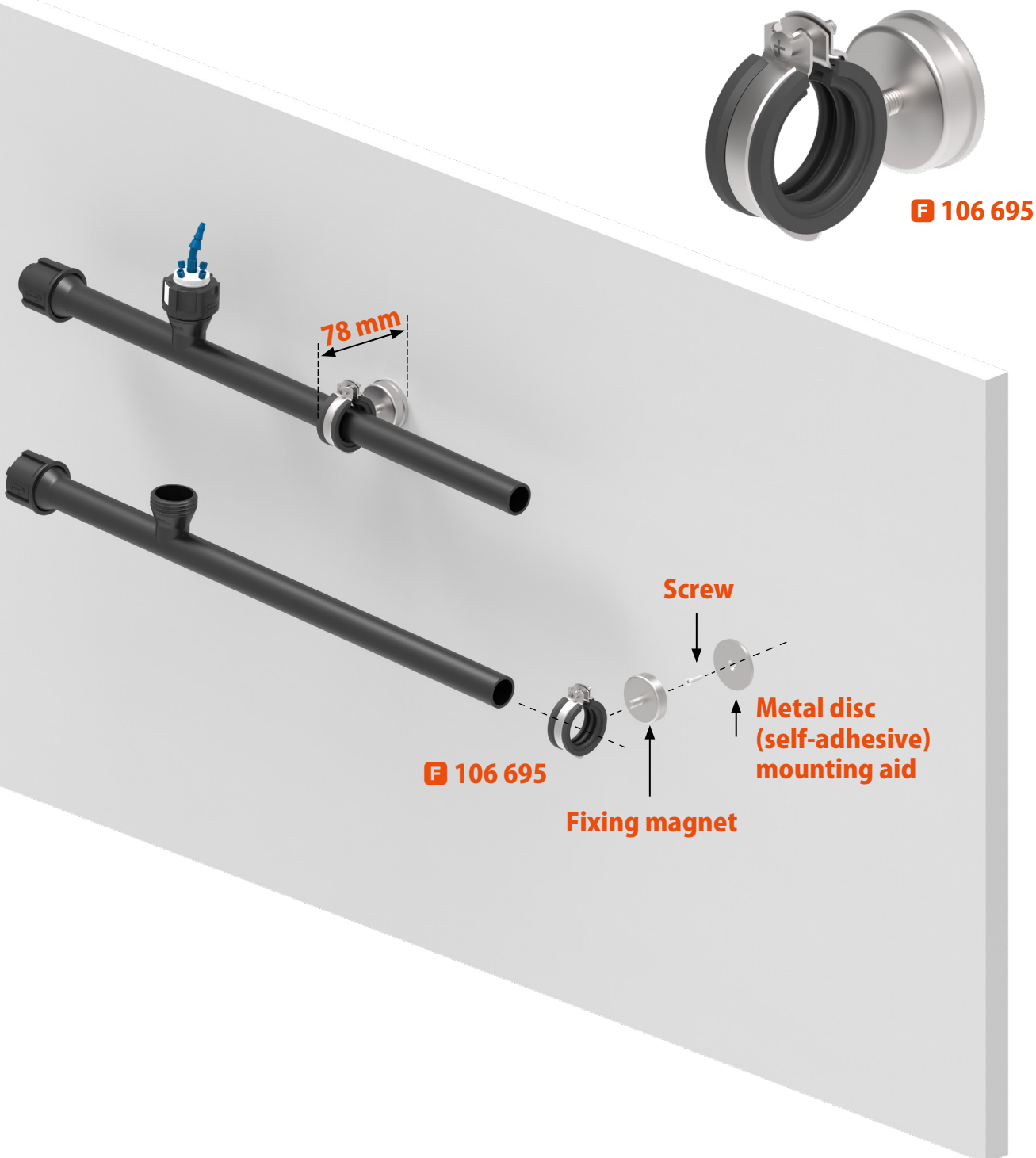
Screw fastening: suitable for wooden and synthetic surfaces.

Self-adhesive: non-destructive, suitable for almost all surface types.

We only recommend self-adhesive variants as an aid to attachment!

Magnetic: non-destructive, suitable for metal surfaces.

The strong fixing magnet provides for a sufficiently strong attachment - without screws.



A SET

106 699

**SymLine Flex
Starter Set US**

- 1x Safety Waste Cap
- 1x Exhaust filter
- 2x Canisters
- Collection tray
- Blind plug
- Grounding cable
- FlexTube with shut-off valve



B SET

106 701

**SymLine FLEX- E-Pack
for Starter Set**

- Safety Waste Cap S60/61 (106480)
- Signal cable (108050) length = 3 m
- Signalbox T1 - US model



C
106 690
Extension 1

- Ø 32 mm pipe
- L1 = 600 mm
- Material: PE-HD EL

D
106 689
Extension 2

- Ø 32 mm pipe
- L1 = 600 mm / L2 = 200 mm / L3 = 400 mm
- 1 Connection for Safety Waste Cap **D**
- Material: PE-HD EL

106 700
Extension 3

- Ø 32 mm pipe
- L1 = 1200 mm
- Material: PE-HD EL

N
106 688
Basic 32 pipe

- Ø 32 mm pipe
- L1 = 310 mm
- Material: PE-HD EL
- GL45 connection

O
106 713
T-piece

- Ø 32 mm pipe
- Material: PE-HD EL
- GL45 connection

P
106 727
Curved element

- Ø 32 mm pipe
- Material: PE-HD EL
- GL45 connection

E
106 691
Table attachment

- for Ø 32 mm pipes
- for table tops with up to 45 mm height

max. 45 mm

F
106 695
Wall attachment

- for Ø 32 mm pipes
- 3 Fastening options:**
- Self-adhesive (Mounting aid)
- Screw fastening
- Magnetic

i Flexible pipe lengths

The specific pipe lengths required can be constructed, using a suitable pipe cutter. Shorten the pipes to the desired lengths, on their smooth sides.



SCAT SymLine
Chemical Waste systems

More extensions
in chapter pipe and tube system on **Site 51**.

- Intro
- Filling Units
- Pipe and Tube System
- Disposal
- Level Control
- High Flow Solution
- FLEX**
- Accessory

Safety Cap

Proven SCAT safety technology provides for optimum protection, both during the supply, and during the disposal, of solvents. Solvent vapors are blocked and filtered out. The system is therefore independent of other extraction systems within the laboratory.

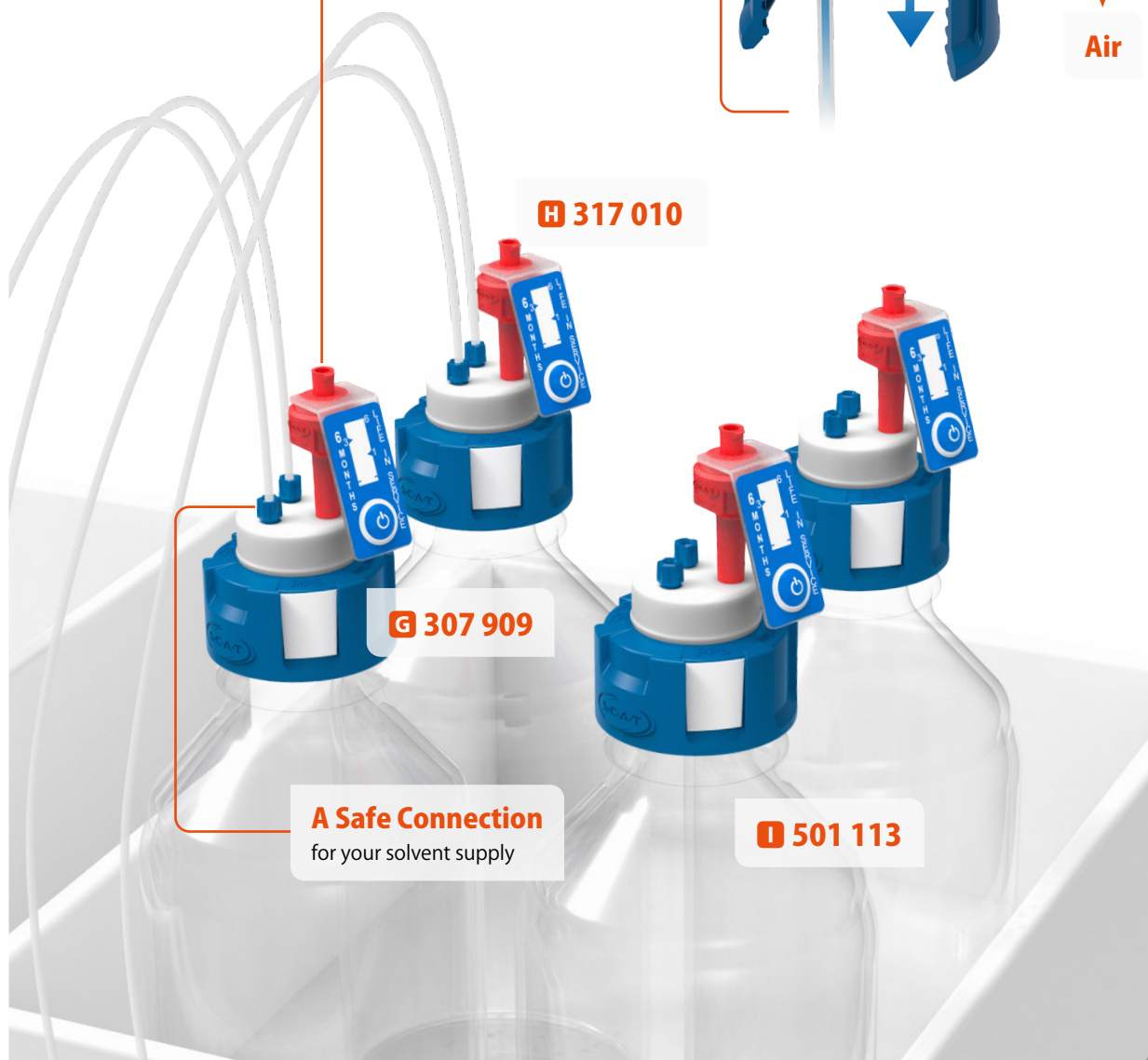
SCAT Safety Caps ensure that your solvents are kept clean and remain stable. They protect users and the environment from the effects of solvent vapors, and enable a continual smooth operation of the HPLC facility.

Safety Caps

with air ventilation valve

Solvent

Air



317 010

307 909

A Safe Connection
for your solvent supply

501 113

Safety Waste Cap

The integrated exhaust filter allows for optimum safety at the point of collection. It provides for a safe equalization of pressure within the container, and solvent fumes are filtered out. The liquid level control ensures that containers cannot overflow, without it being noticed.

Exhaust Filter
with three types
of active carbon

- 3. layer - binds acids
- 2. layer - binds alkalis
- 1. layer - adsorbs solvent vapors

Shut-Off Valve

for safe container exchange

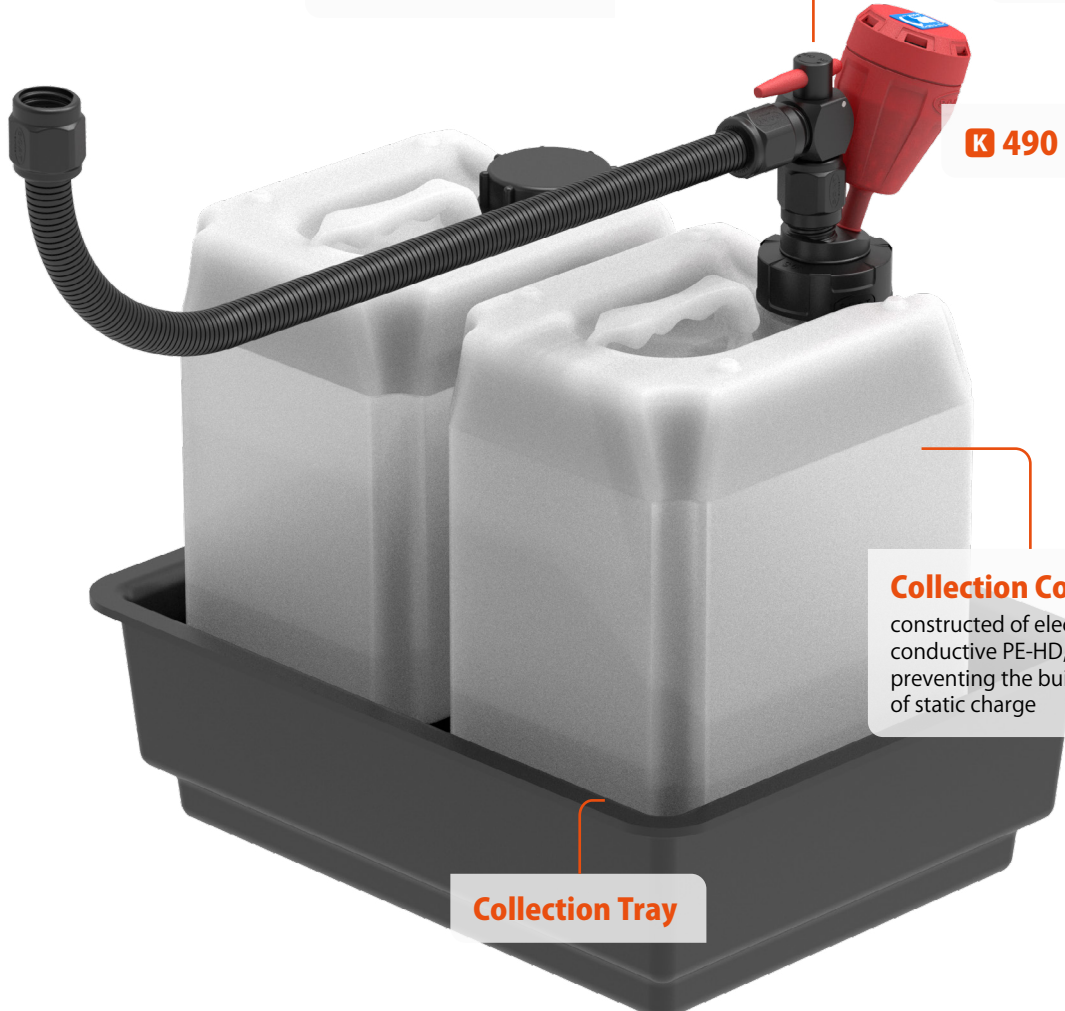
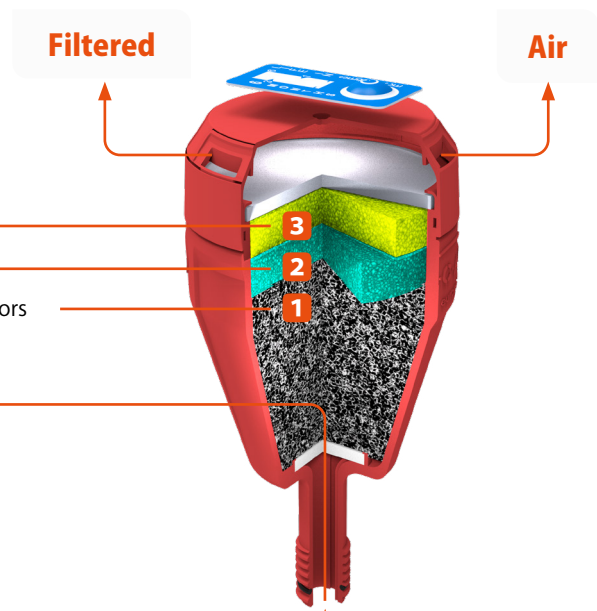
Vapors

K 490 336

Collection Container

constructed of electrically
conductive PE-HD, thereby
preventing the buildup
of static charge

Collection Tray



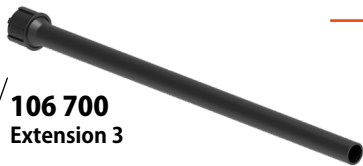
A SET
106 699
SymLine Flex
Starter Set US



B SET
106 701
SymLine FLEX- E-Pack
for Starter Set



C
106 690 / **106 700**
Extension 1 / Extension 3



D
106 689
Extension 2



N
106 688
Basic 32 pipe



O
106 713
T-piece



P
106 727
Curved element



E
106 691
Table attachment



F
106 695
Wall attachment
3 Fastening options:
• Self-adhesive (Mounting aid)
• Screw fastening
• Magnetic



Fig.	Part No.	Description
A	106 699	SymLine Flex Starter Set US: FlexTube with shut-off valve, 1x Safety Waste Cap, 1x Exhaust filter, 2x Canisters, Collection tray, Grounding cable, Blind plug
B	106 701	SymLine FLEX- E-Pack for Starter Set: Safety Waste Cap S60/61, Signalbox T1 - US model, Signal cable length = 3 m
C	106 690	SymLine FLEX Extension 1, Ø 32 mm pipe, PE-HD-EL, length 600 mm
C	106 700	SymLine FLEX Extension 3, Ø 32 mm pipe, PE-HD-EL, length 1200 mm
D	106 689	SymLine FLEX Extension 2, Ø 32 mm pipe, PE-HD-EL, length 600 mm, 1x connection for Safety Waste Cap D
N	106 691	SymLine FLEX Basic 32 pipe, Ø 32 mm pipe, PE-HD-EL, length 310 mm, GL45 connection
O	106 713	SymLine FLEX T-piece, Ø 32 mm pipe, PE-HD-EL, GL45 connection
P	106 727	SymLine FLEX Curved element, Ø 32 mm pipe, PE-HD-EL, GL45 connection
E	106 691	SymLine FLEX Table attachment, for Ø 32 mm pipes, for table tops with up to 45 mm height
F	106 695	SymLine FLEX Wall attachment, for Ø 32 mm pipes

G

307 909
SCAT SafetyCap II

- For HPLC solvent supply
- With air ventilation valve
- 2 connections for Ø 3.2 mm OD capillaries
- GL45 thread



H

317 010
SCAT Air Ventilation Valve (V2.0)

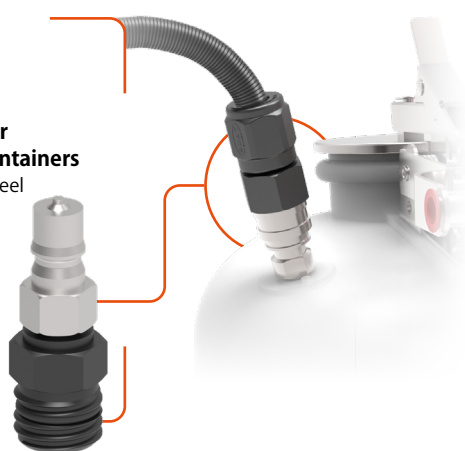
- For SCAT Safety Caps
- Lifetime: 6 months



J

160 529
Adapter for Justrite Containers

- stainless steel
- PE-HD-EL
- GL25



K

306 498
SCAT Safety Waste Cap

- For HPLC waste tubes
- 4 Connections for Ø 2.3 / 3.2 mm OD capillaries
- 1 Connection for Ø 5.0 - 11.5 mm ID tube
- Includes blind plugs for unused connections
- Includes fittings and tube connections
- GL45 thread



I

501 113
Supply bottle

- 1 litre, clear glass
- GL45 thread



L

490 336
SCAT Exhaust Filter

- For the collection unit
- 3 layers of active carbon



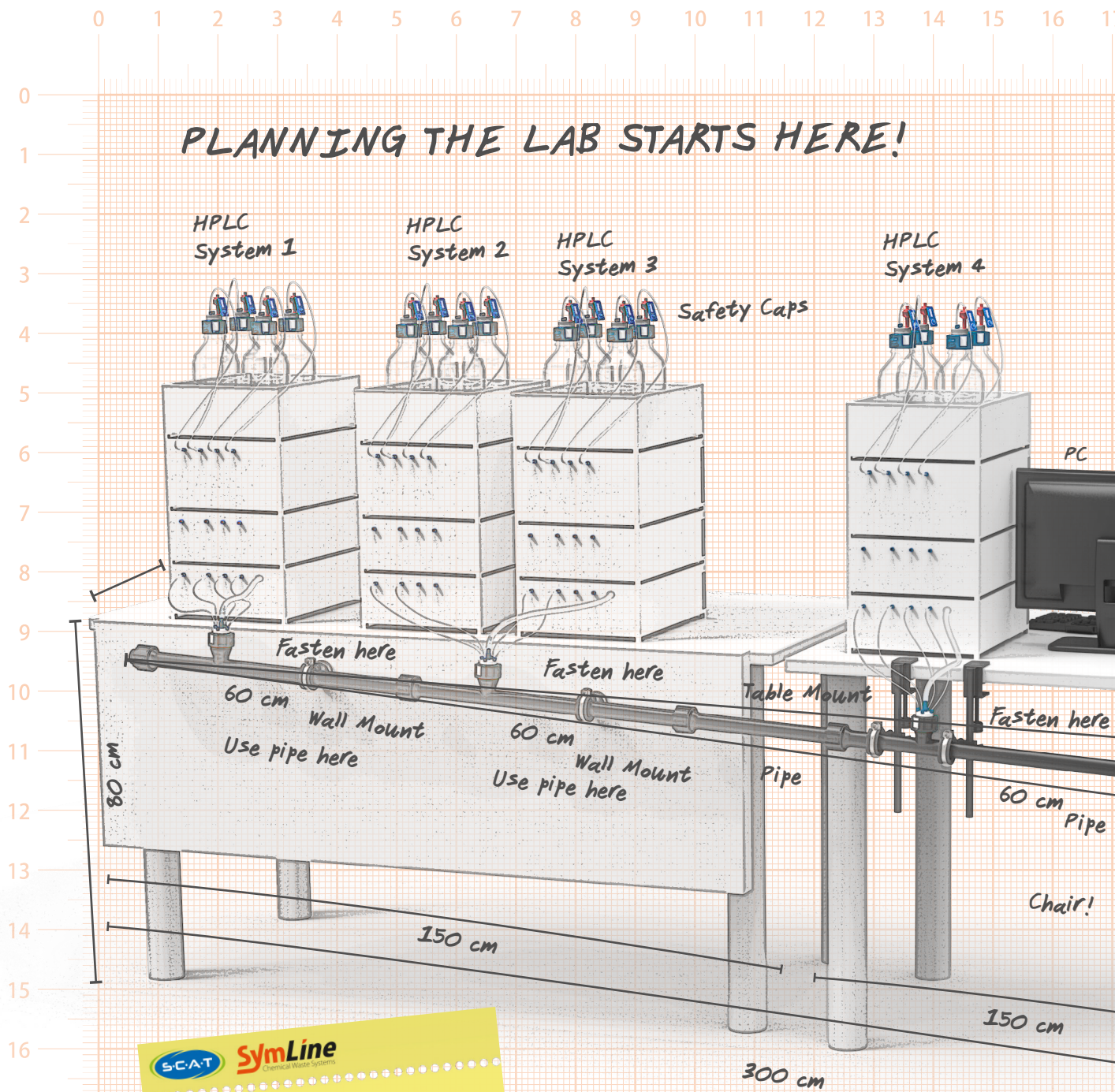
M

399 202
HPLC Starter Kit 3

- For HPLC solvent supply
- 4x SafetyCap III with air ventilation valve
- Each with 3 connections for Ø 1.6 / 2.3 / 3.2 mm OD capillaries
- Includes blind plugs for unused connections
- GL45 thread



Fig.	Part No.	Description
G	307 909	SCAT Safety Cap with Air Ventilation Valve and exchange indicator
H	317 010	SCAT Air Ventilation Valve with exchange indicator
I	501 113	Supply bottle for solvents, 1 litre, clear glass, round
J	160 529	Adapter for Justrite Containers, PE-HD electrostatic conductive, GL25 (m) to stainless steel
K	306 498	SCAT Safety Waste Cap
L	490 336	SCAT Exhaust Filter V3.0 reserve pack, with exchange indicator, Lifetime: 2x 6 months
M	399 202	HPLC Starter Kit 3



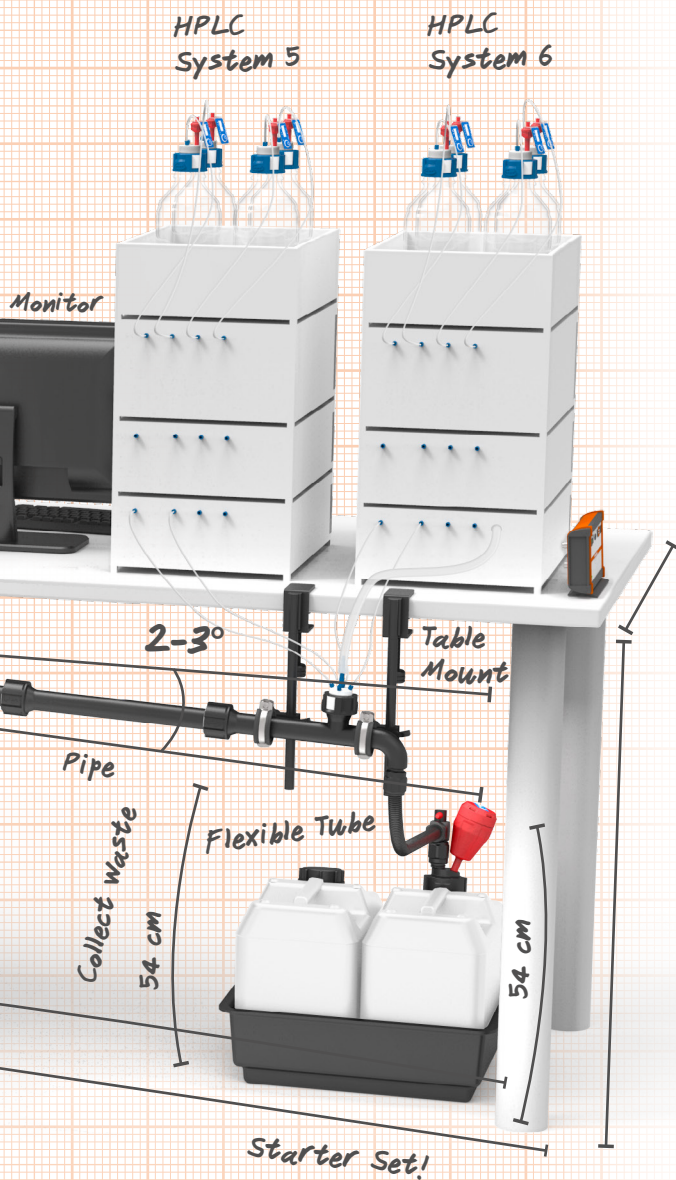
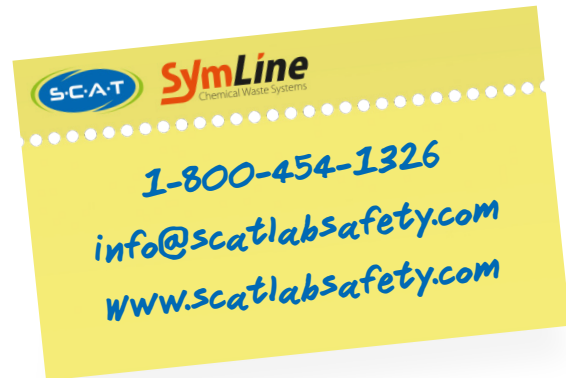
SCAT SymLine
Chemical Waste Systems

We provide BIM data!
Building Information Modeling (BIM).
We provide BIM data for your
technical department. Contact our
SymLine team for a download link.

7 18 19 20 21 22 23 24 25 26

**You are in the planning phase?
We are ready to assist you!**

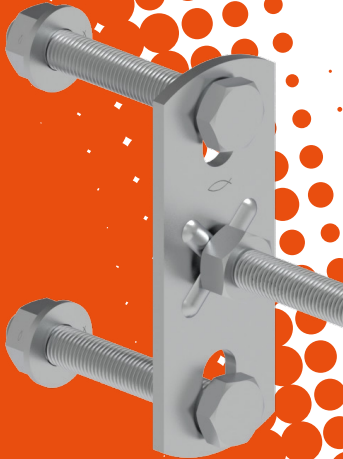
Ask your lab furniture manufacturer, lab planner or the SymLine planning team.



- Intro
- Filling Units
- Pipe and Tube System
- Disposal
- Level Control
- High Flow Solution
- FLEX
- Accessory

SymLine[®]

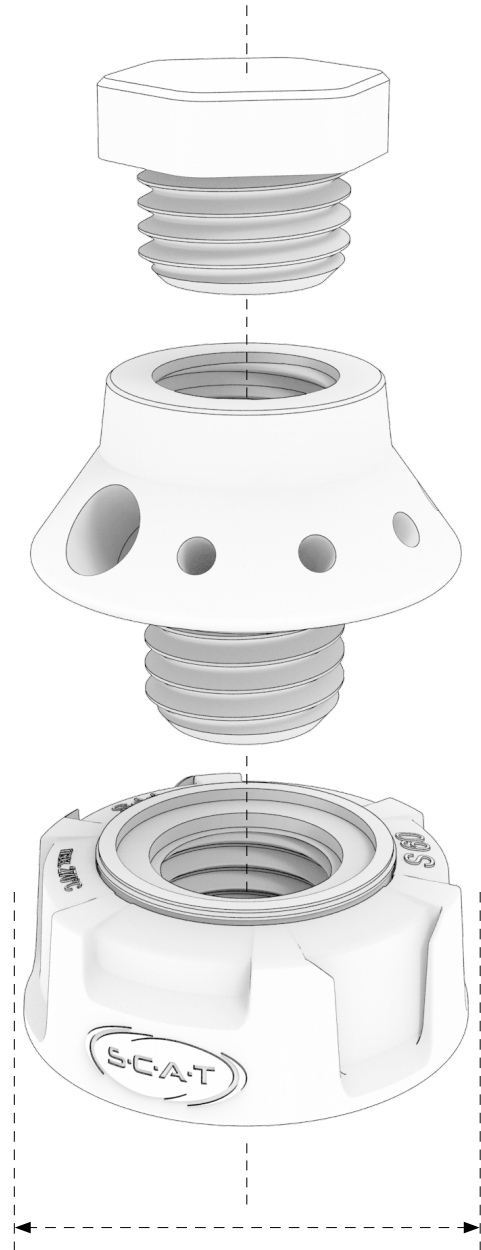
Chemical Waste Systems



Accessory

Useful Helpers from our Range.

- ✓ Safety Waste Cap
- ✓ Filter and ventilation
- ✓ Tubes and cables



A

450 060
LISA S60/61

- 4 Capillary connections
- 3 Tube connections
- Fitting 1.6 mm: 4 piece
- Fitting 2.3 mm: 4 piece
- Fitting 3.2 mm: 4 piece
- Tube connector: 3 piece
- Blind plug



B

450 110
Blind plug

- Material: PTFE - EL



C

450 100
LISA extension

- 4 Capillary connections
- 3 Tube connections
- Fitting 1.6 mm: 4 piece
- Fitting 2.3 mm: 4 piece
- Fitting 3.2 mm: 4 piece
- Tube connector: 3 piece



D

450 120
Funnel extension

- Safety funnel
- L1 = 140 mm
- Hinged lid
- Removable dirt sieve
- Material: PE-HD-EL



E

450 130
LISA extension

- GL25 Tube connector



F

450 121
LISA extension

- Electronic level control

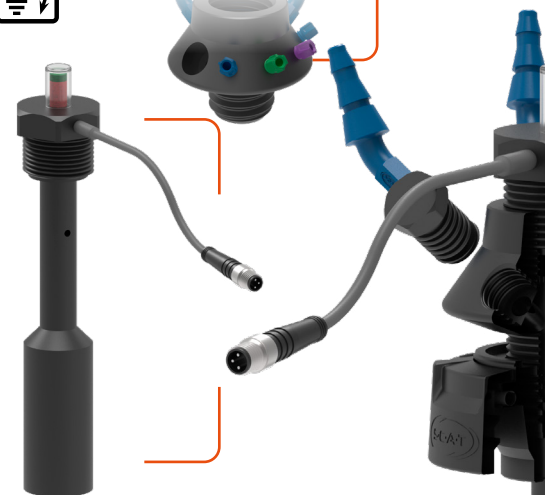
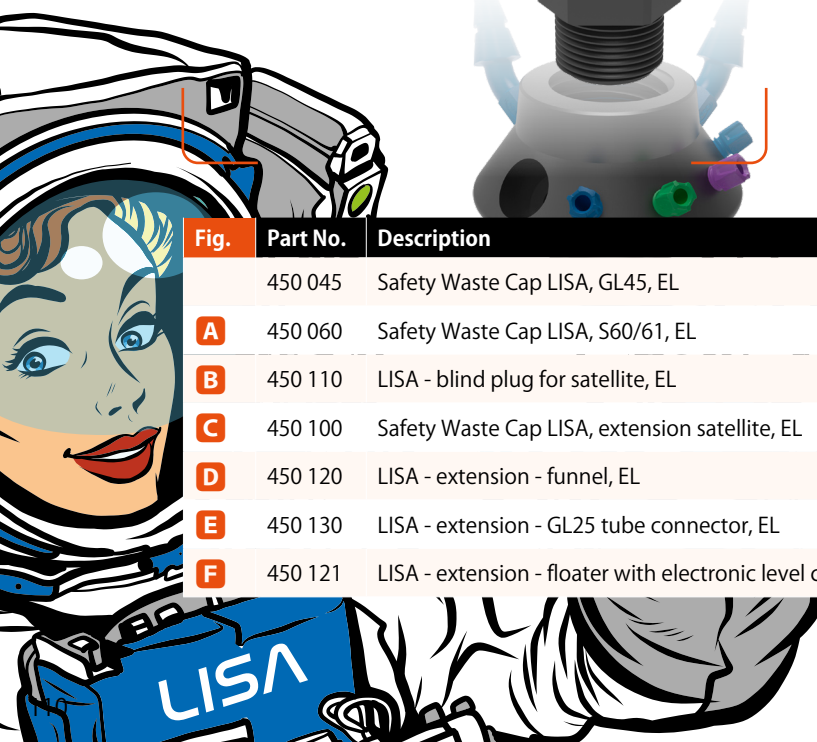



Fig.	Part No.	Description	Material
	450 045	Safety Waste Cap LISA, GL45, EL	PTFE-EL
A	450 060	Safety Waste Cap LISA, S60/61, EL	PTFE-EL
B	450 110	LISA - blind plug for satellite, EL	PTFE-EL
C	450 100	Safety Waste Cap LISA, extension satellite, EL	PTFE-EL
D	450 120	LISA - extension - funnel, EL	PE-HD-EL
E	450 130	LISA - extension - GL25 tube connector, EL	PTFE-EL
F	450 121	LISA - extension - floater with electronic level control, EL	PTFE-EL



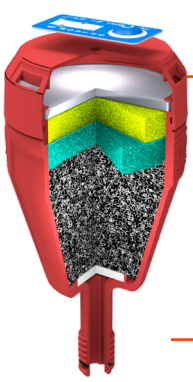
A
410 534
Exhaust Filter S V3.0

- With splash protection
- Change indicator
- 3 months service life



B
410 535
Exhaust Filter M V3.0

- With splash protection
- Change indicator
- 6 months service life



C
407 982
Exhaust Filter M V3.0

- With splash protection
- Change advice label
- 6 months service life



D
407 986
Exhaust Filter L V3.0

- With splash protection
- Change indicator
- 12 months service life



E
106 490
Ventilation set

- Length 1,500 mm
- GL14 (m)
- NPT1/4"




Fig.	Part No.	Description	Material
A	410 534	1x Exhaust Filter S, V3.0, with splash protection and change indicator, 3 months service life	PP
	490 335	4x Exhaust Filter S, V3.0, with splash protection and change indicator, 12 months service life	PP
B	410 535	1x Exhaust Filter M, V3.0, with splash protection and change indicator, 6 months service life	PP
	490 336	2x Exhaust Filter M, V3.0, with splash protection and change indicator, 12 months service life	PP
C	407 982	1x Exhaust Filter M, V3.0, with splash protection and change label, 6 months service life	PP
	490 914	2x Exhaust Filter M, V3.0, with splash protection and change label, 12 months service life	PP
D	407 986	1x Exhaust Filter L, V3.0, with splash protection and change indicator, 12 months service life	PP
	490 986	2x Exhaust Filter L, V3.0, with splash protection and change indicator, 24 months service life	PP
	106 471	Piece of tube for exhaust, PFA, length 100 mm, electrostatic conductive	PFA
E	106 490	Ventilation tube, 1,500 mm, GL14 (m) NPT1/4"	PE-HD-EL
	106 677	Ventilation tube, type 1 for connecting to exhaust filter connection, GL14 (m), ID = 4 mm, OD = 6 mm, smooth outside and inside, PTFE electrostatic conductive, length 2 m	PTFE-EL
	106 693	Ventilation tube with non-return function, 2,000 mm, GL14 (m), PTFE electrostatic conductive	PTFE-EL



A
108 016
PTFE-EL-Tube
• ID = 4 mm
• OD = 6 mm



B
108 015
PFA-EL-Tube
• ID = 9 mm
• OD = 13 mm

- ✓ **Several lengths**
- ✓ **Electrostatic conductive**
- ✓ **Complete compatibility**

Safe flow

Like many of our components, our tubes are also made of electrostatic conductive material. Especially suitable for our SymLine range.



Fig.	Part No.	Description	Material
A	108 016	PTFE-EL-Tube, electrostatic conductive, black, ID = 4 mm, OD = 6 mm, unit = 1 m	PTFE-EL
	108 017	PTFE-EL-Tube, electrostatic conductive, black, ID = 6 mm, OD = 8 mm, unit = 1 m	PTFE-EL
	108 018	PTFE-EL-Tube, electrostatic conductive, black, ID = 8 mm, OD = 10 mm, unit = 1 m	PTFE-EL
	108 019	PTFE-EL-Tube, electrostatic conductive, black, ID = 10 mm, OD = 12 mm, unit = 1 m	PTFE-EL
B	108 015	PFA Plastic tube, electrostatic conductive, black, ID = 9 mm, OD = 13 mm, unit = 1 m	PFA-EL
	106 471	PFA Piece of tube for exhaust, electrostatic conductive, unit = 100 mm	PFA-EL

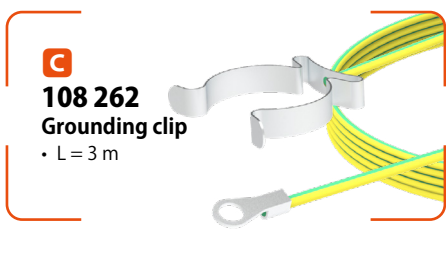
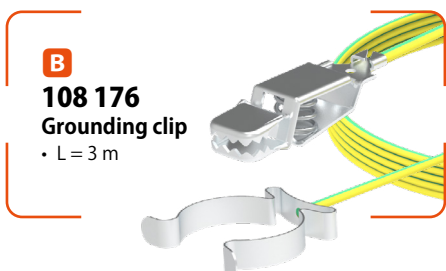
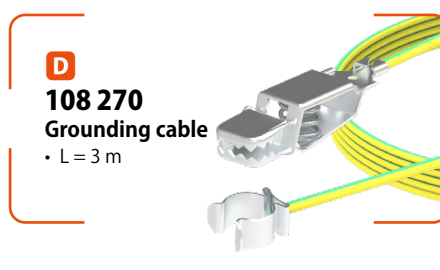
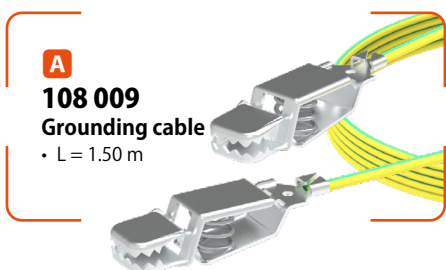
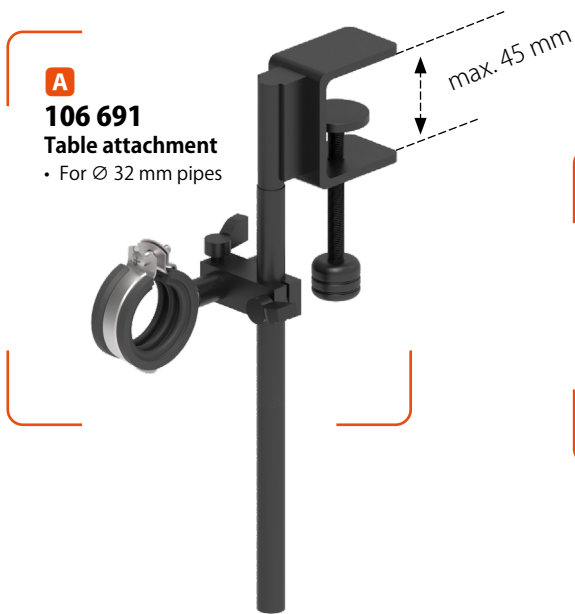


Fig.	Part No.	Description	Material
A	108 009	Grounding cable, 2x clamp	1.50 m
	108 096	Grounding strap, rigid, with grounding cable and clamp, suitable for canister 108 420	1.50 m
B	108 176	Grounding cable, 1x clip for Ø 32 mm pipe, 1x clamp	3.00 m
C	108 262	Grounding clip for Ø 32 mm pipe, with ring connector ID 5 mm	3.00 m
D	108 270	Grounding cable, 1x clip for FlexTube, 1x clamp	3.00 m
E	108 285	Grounding cable with 1x spring steel clamp and 1x ring connector ID 6 mm	1.50 m
	108 289	Grounding clip for SymLine FlexTube, 1x spring steel clamp, 1x ring connector ID 5 mm	3.00 m
	108 309	Grounding cable, 1x clip for FlexTube, 1x ring connector ID 6 mm	0.70 m
F	117 982	Grounding cable, 1x clamp, 1x ring ID 5 mm	1.50 m



Fig.	Part No.	Description	Material
A	106 415	Thread adapter, PE-HD electrostatic conductive, GL25 (m) to G1/2" (m)	PE-HD-EL
B	106 417	Thread adapter, PE-HD electrostatic conductive, GL25 (m) to GL25 (m)	PE-HD-EL
C	106 502	Thread adapter, PE-HD electrostatic conductive, NPT1/8" (f) to GL25 (f)	PE-HD-EL
D	106 523	Thread adapter, GL25 (f) to GL25 (f), PE-HD electrostatic conductive	PE-HD-EL
E	106 584	Thread adapter for sink, PTFE electrostatic conductive, GL25 (m) to G 1 1/2" (f)	PTFE-EL
F	108 293	Thread adapter, PE-HD electrostatic conductive, GL25 (m) to pipe 50 mm OD	PE-HD-EL
G	107 621	Offset adapter, extension for exhaust filter, GL14 (f) to GL14 (m)	PE-HD
H	107 622	Offset adapter 90°, long, for exhaust filter, GL14 (f) to GL14 (m)	PE-HD
I	107 624	Offset adapter 90°, for exhaust filter, GL14 (f) to GL14 (m)	PE-HD
J	107 627	Offset adapter 45°, for exhaust filter, GL14 (f) to GL14 (m)	PE-HD
K	107 610	Adapter for exhaust filter, Justrite	PE-HD
L	107 617	Adapter for exhaust filter, CPC / Justrite	PE-HD-EL



A
106 691
Table attachment
• For Ø 32 mm pipes



B
106 695
Wall attachment
• For Ø 32 mm pipes
3 Fastening options:
• Self-adhesive (mounting aid)
• Screw fastening
• Magnetic



C
106 609
Attachment
• For Ø 32 mm pipes



D
106 579
Screwing FlexTube
• GL25



E
106 591
Screwing FlexTube Pro
• GL25



F
106 558
Tube holder



G
121 211
Borehole reduction adapter
• (OD) 54 - 75 mm
• (ID) 33 mm

Fig.	Part No.	Description	Material
A	106 691	SymLine FLEX Table attachment for tabletop up to 45 mm	
B	106 695	SymLine FLEX Wall attachment	
C	106 609	Attachment for pipes, Ø = 32 mm	
D	106 579	Screwing GL25 for FlexTube, unit = 2 pc.	PTFE-EL
E	106 591	Screwing GL25 for FlexTube Pro, unit = 2 pc.	PPS /PTFE-EL
F	106 558	Tube holder for FlexTube Pro, suitable for all cabinets, material PA66 non-halogen	PA66
	106 562	Tube holder for FlexTube, suitable for all cabinets, material PA66 non-halogen	PA66
G	121 211	Borehole reduction adapter, (ID) 33 mm, (OD) 54 - 75 mm, PE-HD electrostatic conductive	PE-HD-EL

SymLine[®]

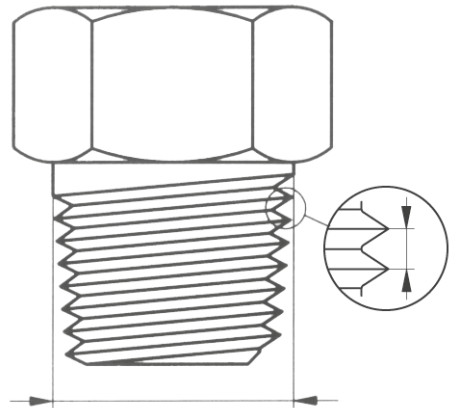
Chemical Waste Systems



Addendum

Further Informations.

- ✓ Thread identification
- ✓ Safety instructions
- ✓ Terms & conditions



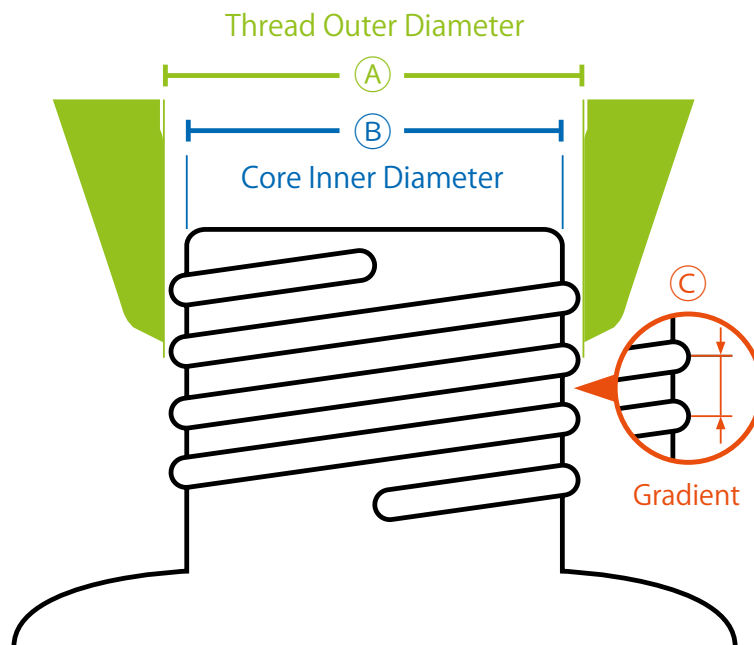
Ø A mm max.	Ø A mm min.	Ø B mm max.	Gradient C in mm	Norm
28.00	27.50	25.98	3.00	DIN 168
32.00	31.30	29.30	4.00	DIN 168
32.00	31.50	29.00	3.00	
37.49	36.88	35.10	4.23	GPI / SPI
38.00	37.50	35.00	3.00	DIN 600
38.00	37.50	35.00	3.00	DIN 600
37.49	36.88	35.10	4.23	GPI / SPI
40.00	39.30	37.30	4.00	DIN 168
41.00	39.50	37.00	3.50	DIN 600
42.00	41.50	38.00	4.00	
45.00	44.30	42.30	4.00	DIN 168
45.00	44.30	41.00	4.00	DIN 600 DIN 600

Container threads

SCAT Safety Caps are available for a wide variety of differing container threads. On the following pages you will find tables for determining thread sizes, together with a helpful overview of typical thread types. It is best to use a slide gauge.

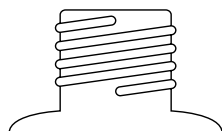
Instructions

Use the measured distances below to determine the outer diameter of the thread (A) or the core inner diameter of the container opening (B).



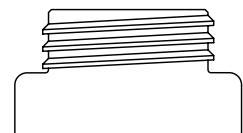
Round thread

- For example:
- Bottle thread (GL or GLS)
 - Common standard for laboratory bottles



Saw thread

- For example:
- Canisters (S-Thread)
 - Nalgene containers
 - Barrels (Mauser, Trisure, BCS-Threads)
 - GPI Standard (Glass Packaging Institute)
 - Other plastic containers

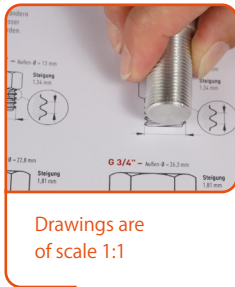


Ø A mm max.	Ø A mm min.	Ø B mm max.	Gradient C in mm	Norm	Thread	Comments (also re. brand names, trademarks)
28.00	27.50	25.98	3.00	DIN 168-1	GL 28	Chromsystems®, Recipe®, 500 ml Buffer from Sigma®
32.00	31.30	29.30	4.00	DIN 168-1	GL 32 (glass)	For containers of the brand Duran®
32.00	31.50	29.00	3.00		S 32 (plastic)	-
37.49	36.88	35.10	4.23	GPI / SPI	GL 38/ GPI 38-400 (glass) (short)	For containers of the brands Wheaton® and Nalgene®
38.00	37.50	35.00	3.00	DIN 6063-2	GL 38 short (foldable canister)	4 L BDH bottle, Fulltime® Reagents
38.00	37.50	35.00	3.00	DIN 6063-1	S 38 (plastic)	2.5 L canister from Recipe®, HPLC-P Water, 1 litre Biosolve®, Fresenius Kabi® 10 L
37.49	36.88	35.10	4.23	GPI / SPI	GPI 38-430 (glass) (long)	Wheaton®, Nalgene® 4-edge 500 ml plastic bottle
40.00	39.30	37.30	4.00	DIN 168-1	GL 40 (glass)	For containers of the brand Merck®
41.00	39.50	37.00	3.50	DIN 6063-1	S 40 / S 41 (plastic)	Due to the tolerances involved, a GL 40 cap will often fit on to an S 40 container of the brand Metrohm® / Merck®
42.00	41.50	38.00	4.00		S 42	The designation DIN42 is often written on the cap, Agro Paris Tech 51, Polimoon™, Nalgene®
45.00	44.30	42.30	4.00	DIN 168-1	GL 45	The most common thread for laboratory glass bottles
45.00	44.30	41.00	4.00	DIN 6063-1 DIN 6063-2	S 45	Due to the tolerances involved, a GL 45 cap will fit on to an S 45 thread
44.30	39.70	40.80	4.00	DIN45	DIN45	-
50.00	49.30	46.00	4.00	DIN 6063-1	S 50	Space-saving canister
51.00	49.00	47.00	4.00		S 51	Almost identical to S 50, but the outer diameter of the container thread (OD=Ø) is significantly different. The designation DIN50 is written on the cap.
54.00	53.50	47.50	6.35	53B	B 53	For containers of the brands Nalgene® and Polimoon™
53.80	53.20	49.50	5.00	DIN51	S 55	The designation 51 / DIN51 / HP51 is often written on the cap
60.00	59.20	54.00	6.00	DIN 6063-1	S 60 / S 61	The designation 61, Mauser® 13, RPC Containers® C59PP / DIN61 is often written on the cap
62.51	61.62	60.12	4.23	GPI / SPI	B 63 / GPI 63-415	For containers of the brand Nalgene®
65.00	64.30	59.00	6.00		S 65	For containers of the brand Kautex® (round canisters)
71.00	69.30	65.00	6.00	DIN71	S 70 / S 71	The designation 71, Rieke® 70 mm is often written on the cap
80.00	79.00	77.00	5.50	(DIN 168-1) short	GLS 80	Typical laboratory bottle with wide neck, short thread with 3 thread ends
89.18	88.29	79.00	12.70	83B	B 83	For containers of the brands Nalgene®, Kautex®, Foxx® and Carboy 80 mm
90.00	89.30	84.00	6.00		S 90	The designation D90 is often written on the cap
95.00	93.50	89.00	7.00		S 95	-
106.00	104.00	95.00	6.00		105x 6	Hünersdorff

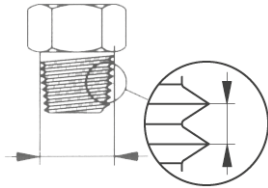
NOTE: All the measurements and values given here can vary up to 0.5 mm, dependent upon the manufacturer involved (due to manufacturing tolerances). Brand names and trademarks are the property of the respective owners. The brand names and protected trademarks mentioned here are simply of descriptive nature.

NPT (National Pipe Thread) Conical, American Tubular Thread

Very easily recognizable due to the conical outer and/or inner diameters, which are self-sealing. NPT is therefore also described as the “sealed thread” or as having a “sealed connection within the thread”.

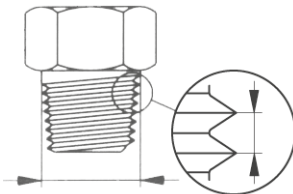


NPT 1/8" – Outer-Ø = 9.9 mm



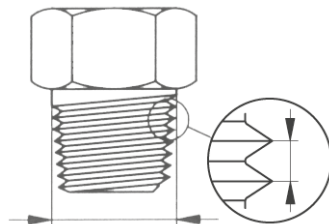
Gradient 27 on 1" = 0.94 mm

NPT 1/4" – Outer-Ø = 13.2 mm



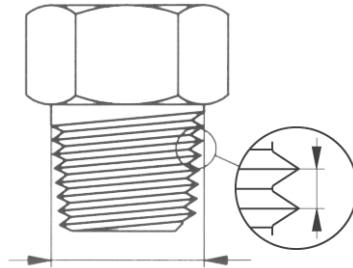
Gradient 18 on 1" = 1.41 mm

NPT 3/8" – Outer-Ø = 16.6 mm



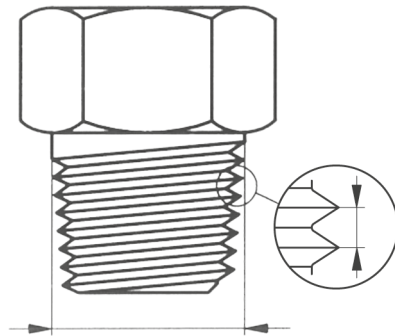
Gradient 18 on 1" = 1.41 mm

NPT 1/2" – Outer-Ø = 20.6 mm



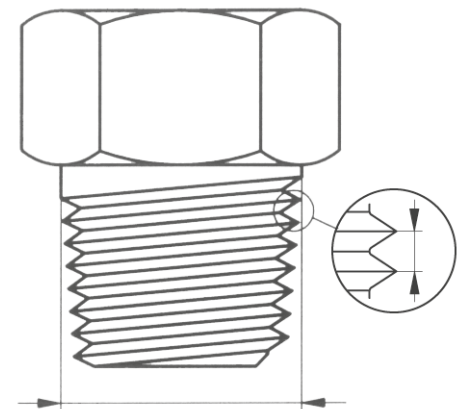
Gradient 14 on 1" = 1.81 mm

NPT 3/4" – Outer-Ø = 26 mm



Gradient 14 on 1" = 1.81 mm

NPT 1" – Outer-Ø = 32.5 mm



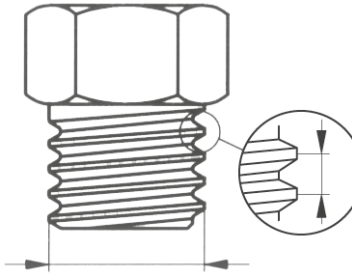
Gradient 11.5 on 1" = 2.21 mm



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

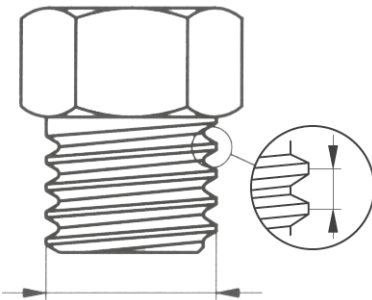
Cylindrical tubular threads are mainly used in english-speaking countries. The measurements, e.g. R 3/4", do not allow for recognition of diameters, the corresponding dimension must be obtained from tables.

G 1/2" – Outer-Ø = 20.8 mm



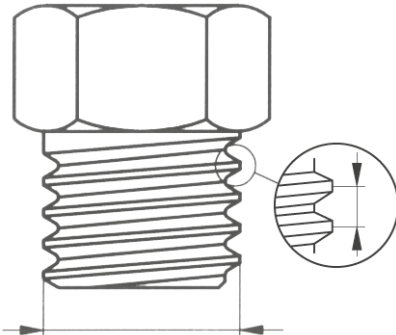
Gradient 14 on 1" = 1.81 mm

G 5/8" – Outer-Ø = 22.8 mm



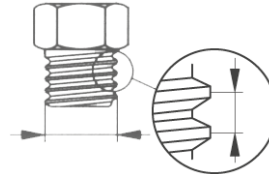
Gradient 14 on 1" = 1.81 mm

G 3/4" – Outer-Ø = 26.3 mm



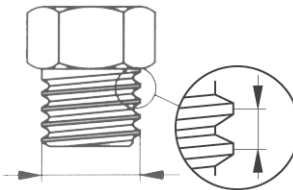
Gradient 14 on 1" = 1.81 mm

G 1/8" – Outer-Ø = 9.6 mm



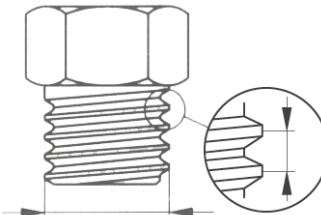
Gradient 28 on 1" = 0.91 mm

G 1/4" – Outer-Ø = 13 mm

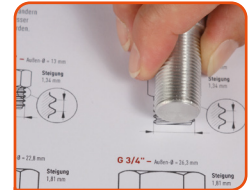


Gradient 19 on 1" = 1.34 mm

G 3/8" – Outer-Ø = 16.5 mm



Gradient 19 on 1" = 1.34 mm



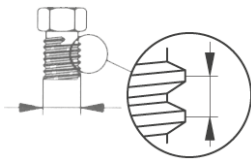
Drawings are of scale 1:1



M (Metric ISO-Thread) - Standard in the european region

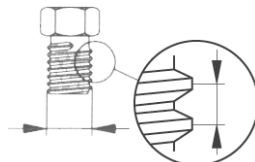
Cylindrical outer and inner diameters, accurate to the very millimetre. Forces are particularly well absorbed, due to the extremely small gradient of the metric thread. The designations begin with an „M“, followed by the nominal diameter, e.g. M 10. If there is a gradient that differs from that of the norm, this is given in an addendum, e.g. M 10 x 0.75.

M5 – Outer-Ø = 5 mm



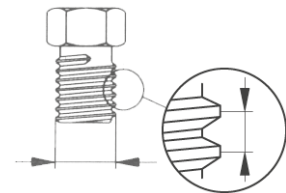
Gradient 0.80 mm

M6 – Outer-Ø = 6 mm



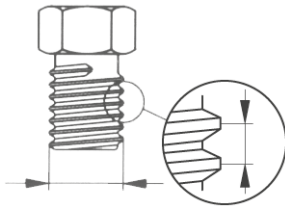
Gradient 1.00 mm

M8 – Outer-Ø = 8 mm



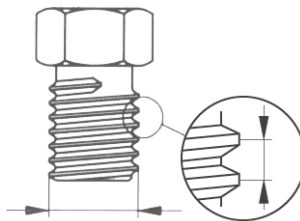
Gradient 1.25 mm

M10 – Outer-Ø = 10 mm



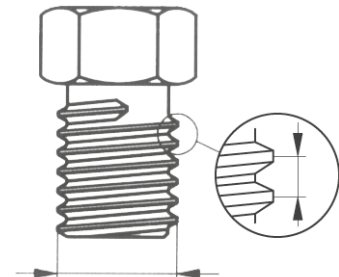
Gradient 1.50 mm

M12 – Outer-Ø = 12 mm

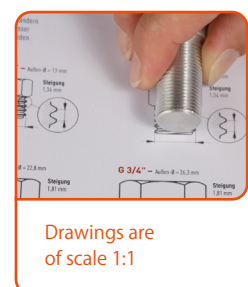


Gradient 1.75 mm

M16 – Outer-Ø = 16 mm



Gradient 2.00 mm



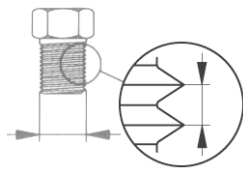
UNF 1/4"-28G

From the USA. Mainly employed in chromatography/HPLC. Standard sizes are UNF 1/4"-28G and UNF 10-32G. The numbers 28G and 32G refer to the number of thread "steps" taken, over a vertical distance of one inch (25.4 mm).

UNF 1/4"-28G kontra M6

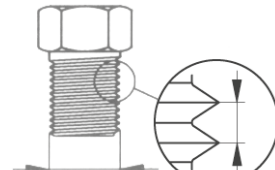
Our HPLC fittings are exclusively constructed with the most typically-used UNF 1/4"-28G HPLC-thread. There also exist fittings and dividers with the very similar thread M6. The two can only be differentiated by exact measurement of the outer diameter, or by using a special test ring or test cap. (It is e.g. therefore possible, to screw the one hollow screw type into the converse piece of the other thread type, at least for 2-3 revolutions). The UNF 1/4" thread has an outer diameter of 6.35 mm, the thread M6 has one of exactly 6.0 mm (production-related tolerances may apply). We recommend the exclusive use of the UNF thread 1/4"-28G, in order to avoid confusion, mistakes being made, or unnecessary double stocking.

UNF 1/4"-28G – Outer-Ø = 6.2 mm



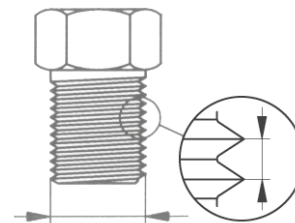
Gradient 28 on 1" = 0.91 mm

UNF 3/8"-28G – Outer-Ø = 9.4 mm



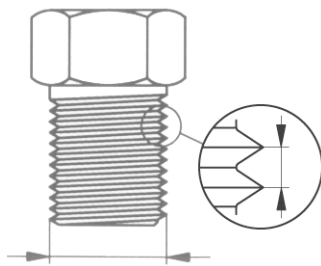
Gradient 24 on 1" = 1.06 mm

UNF 1/2"-28G – Outer-Ø = 12.6 mm



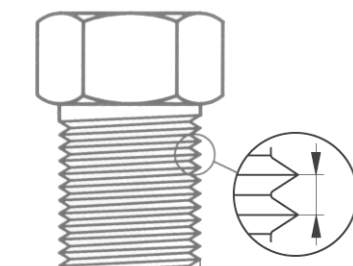
Gradient 20 on 1" = 1.27 mm

UNF 5/8"-18G – Outer-Ø = 15.7 mm



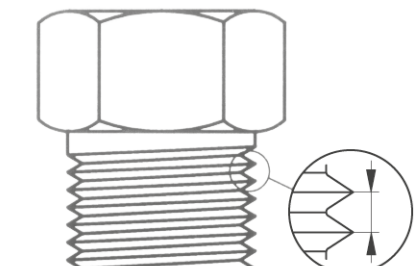
Gradient 18 on 1" = 1.41 mm

UNF 3/4"-16G – Outer-Ø = 18.9 mm

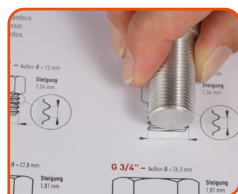


Gradient 16 on 1" = 1.59 mm

UNF 1"-12G – Outer-Ø = 25.2 mm



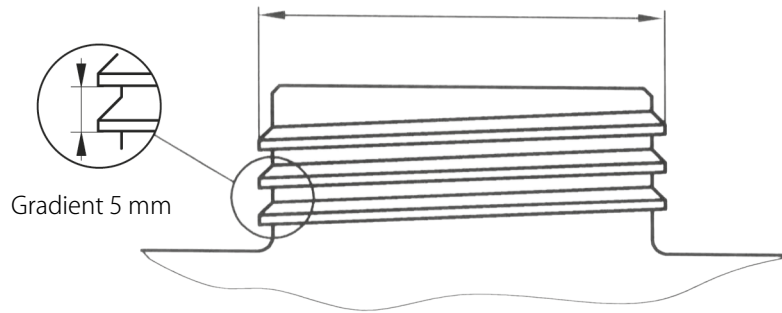
Gradient 12 on 1" = 2.12 mm



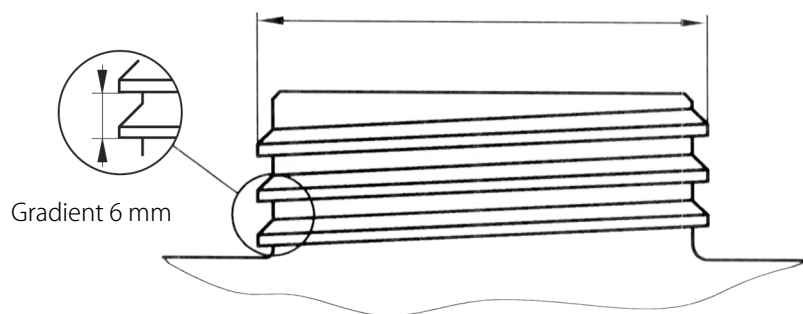
Drawings are
of scale 1:1



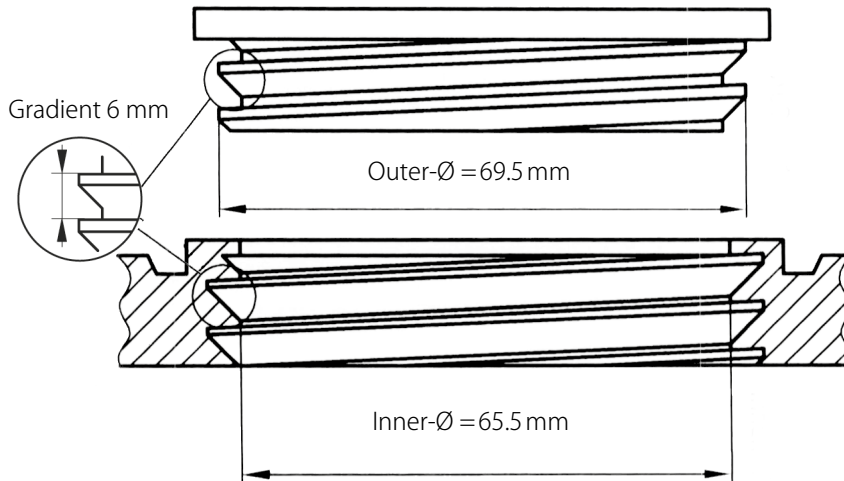
S 55 – Outer-Ø = 53.5 mm



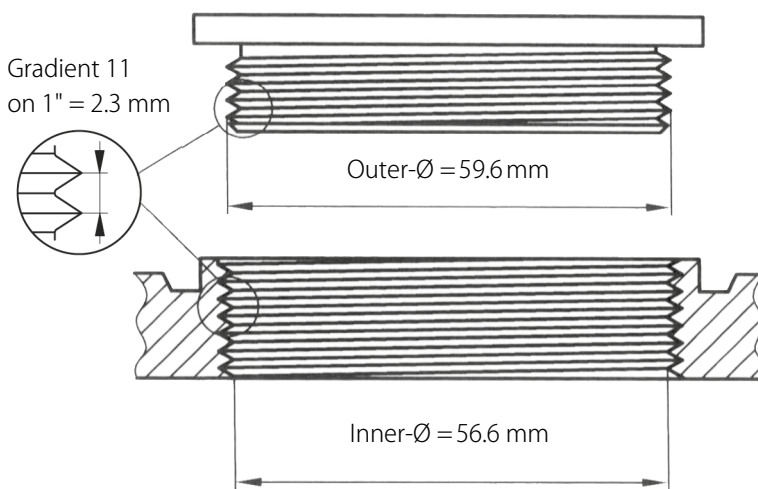
S 60 – Outer-Ø = 59.5 mm



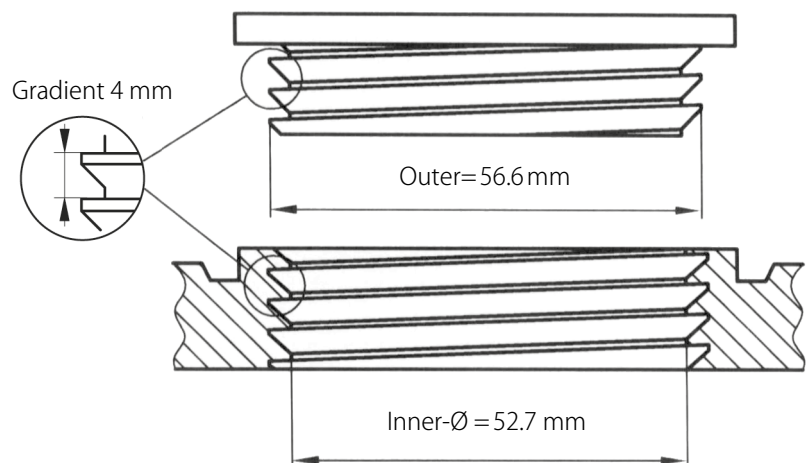
BCS 70x6 e.g. MAUSER 2"®



G2"/ R 2"/ BSP 2"



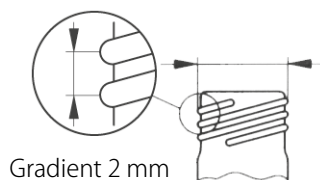
BCS 56x4 e.g. Tri Sure2"®



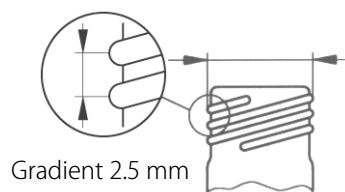
GL Threads

Glass threads are round threads, i.e. the surface of the thread lines is always rounded. The simple form and the rounded surface allow them to be easily constructed on glass bottle necks. The relatively large gradient and the wide edges give it great carrying capacity.

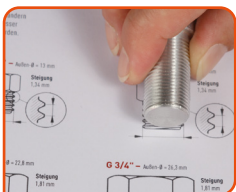
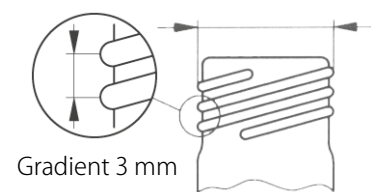
GL 12 – Outer-Ø = 12 mm



GL 14 – Outer-Ø = 14 mm

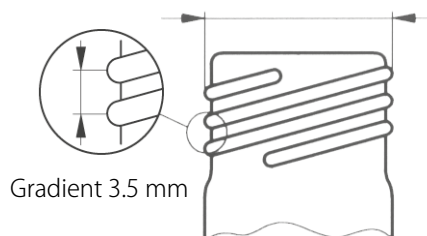


GL 18 – Outer-Ø = 18 mm

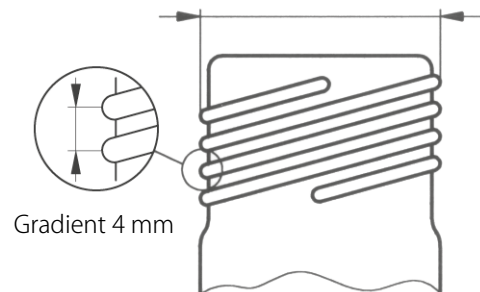


Drawings are of scale 1:1

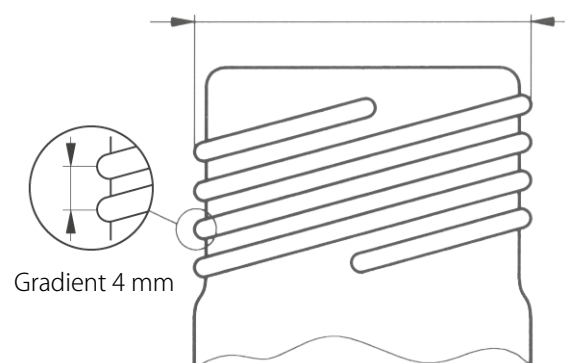
GL 25 – Outer-Ø = 25 mm

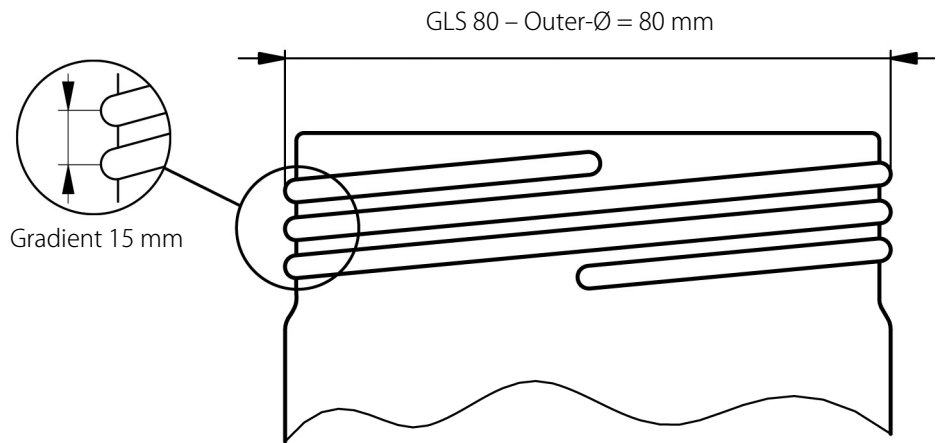


GL 32 – Outer-Ø = 32 mm



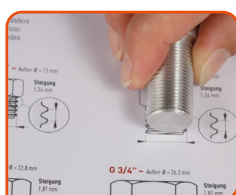
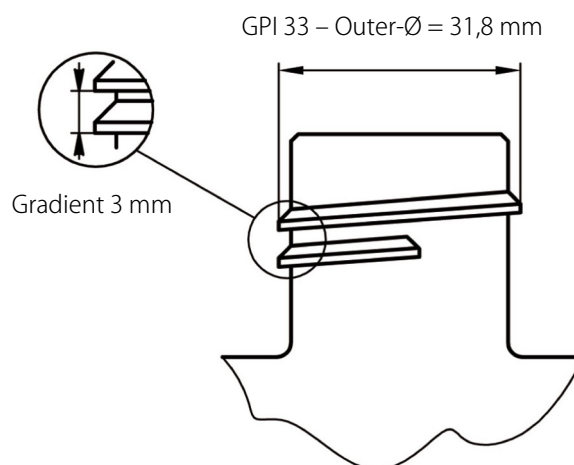
GL 45 – Outer-Ø = 45 mm





GPI Thread

The abbreviation GPI stands for Glass Packaging Institute, in which the North American manufacturers of glass bottles of every type are represented. The GPI norms are voluntary standards, which serve as the basis for compatibility and exchange regarding glass receptacles and their caps.



Drawings are of scale 1:1

Resistance to chemicals

Due to the wide variety and the different compositions of solvents and substances available on the market, we can assume no guarantee for chemical compatibility.

As per the most up-to-date information available, materials with best resistance have been selected for SCAT products, in particular with a view to satisfying the requirements of working with aggressive fluids.

You may obtain information regarding compatibility with specific substances from the manufacturer of your chemicals or other expert sources.

We would be pleased to offer you consultation during selection of suitable products for your application. The responsibility for the selection of the chemicals used lies with the end user.

SCAT Europe offers no guarantee for the results and assumes no obligation or liability concerning the use of these products as regards their chemical compatibility or their abrasive effects.

Resistance to other available chemicals upon request.

Substances (20°C/68°F)	Conc.	PTFE	PEHD	PP	PFA	V4A*
Acetaldehyde	100,00 %	A	B	C	A	A
Acetamide	100,00 %	A	A	A	A	A
Acetic acid	100,00 %	A	C	B	A	A
Acetic acid	90,00 %	A	A	A	-	A
Acetic acid allyl ester	100,00 %	A	A	C	A	A
Acetic acid butyl ester	100,00 %	A	B	C	A	A
Acetic acid-2-pentyl	100,00 %	A	B	C	A	A
Acetic anhydride	100,00 %	A	C	B	A	A
Acetone	100,00 %	A	A	A	A	A
Acetonitrile	100,00 %	A	A	A	A	A
Acetophenone	100,00 %	A	C	B	A	A
Acetyl chloride	100,00 %	A	C	B	A	B
Acetyl chloride	100,00 %	A	C	C	-	A/C
Acrylonitrile	100,00 %	A	A	A	A	A
Adipic acid	100,00 %	A	A	A	A	B
Allyl acetate	100,00 %	A	A	B	-	A
Allyl chloride	100,00 %	A	B	C	A	B
Aminoacetic acid	10,00 %	A	A	A	-	B
Aminobenzene	100,00 %	A	A	A	A	A

* V4A = Stainless steel

Meaning of the evaluations

Resistance	Meaning
A	Very good resistance after 30 days' exposure, none or only mild damage.
B	Conditional resistance: damage may occur after longer periods of exposure (e.g. hair cracks, mechanical stability affected, discolouration etc.)
C	Poor resistance: can lead to destruction, severe damage, deformation of plastic etc.
A/C	There is a risk of pitting corrosion or stress cracking.
-	Currently no information about chemical resistance available.

Substances (20°C/68°F)	Conc.	PTFE	PEHD	PP	PFA	V4A*
Aminomethane	100,00 %	A	A	A	A	A
Ammonium hydroxide	25,00 %	A	A	A	A	A
Amyl acetate	100,00 %	A	A	B	A	A
Amyl alcohol	100,00 %	A	A	A	A	A
Aniline	100,00 %	A	A	A	A	A
Anisole	100,00 %	A	B	B	A	A
Aqua regia	100,00 %	A	C	C	-	C
Aviation fuel	100,00 %	A	C	B	A	A
Benzaldehyde	100,00 %	A	B	A	A	A
Benzene	100,00 %	A	B	B	A	A
Benzenesulfonic acid	100,00 %	A	A	A	A	A
Benzoic acid	100,00 %	A	A	A	A	A
Benzoyl chloride	100,00 %	A	C	C	A	B
Benzyl alcohol	100,00 %	A	A	A	-	A
Benzyl chloride	100,00 %	A	C	C	A	B
Boric acid	100,00 %	A	A	A	A	A
Buta-1,3-diene	100,00 %	A	C	C	A	A
Butan-2-one	100,00 %	A	C	C	A	A
Butanedioic acid	100,00 %	A	A	A	-	A
Butanol	100,00 %	A	A	A	A	A
Butenedioic acid	100,00 %	A	A	A	A	A
Buthylphenol, tert.	100,00 %	A	B	B	A	A
Butyl acetate	100,00 %	A	C(B)	C	A	A

Substances (20°C/68°F)	Conc.	PTFE	PEHD	PP	PFA	V4A*
Butyl alcohol	100,00 %	A	A	A	A	A
Butyl ether	100,00 %	A	C	C	A	A
Butyric acid	100,00 %	A	C	A	A	A
Camphor	100,00 %	A	C	B	A	A
Carbolic acid	100,00 %	A	A	A	A	A
Carbon disulfide	100,00 %	A	C	C	A	A
Carbon tetrachloride	100,00 %	A	C	C	A	B
Caustic soda	85,00 %	A	A	A	A	A/B
Chloral hydrate	100,00 %	A	B	C	-	-
Chlorine	100,00 %	A	C	C	A	C
Chloroacetic acid	100,00 %	A	A	A	A	C
Chlorobenzene	100,00 %	A	C	C	A	A
Chloroethane	100,00 %	A	B	C	A	B
Chloroethanol-2	100,00 %	A	A	A	A	B
Chloroform (trichloromethane)	100,00 %	A	C	C	A	A
Chlorosulfuric acid	100,00 %	A	C	C	A	C
Chlorotoluene	100,00 %	A	C	B	A	A
Chromic acid	50,00 %	A	C	B	A	B
Chromic acid	<50,00%	A	B	B	A	B
Chromic sulfuric acid	100,00 %	A	C	C	A	B
Citric acid	10,00 %	A	A	A	A	A
Cumene	100,00 %	A	B	C	A	A
Cyclohexane	100,00 %	A	A	A	A	A
Cyclohexanol	100,00 %	A	A	A	A	A
Cyclohexanone	100,00 %	A	B	B	A	A
Decalin	100,00 %	A	B	C	A	A
Decane	100,00 %	A	C	B	A	A
Diacetone alcohol	100,00 %	A	A	A	A	A
Diaminoethane	100,00 %	A	A	A	A	A
Dibutyl ether	100,00 %	A	C	C	A	A
Dichloroacetic acid (also monochloro-)	100,00 %	A	A	A	A	-
Dichlorobenzene	100,00 %	A	B	C	A	-
Dichloroethanes	100,00 %	A	B	C	-	B
Dichloromethane (methylene chloride)	100,00 %	A	C	C	A	B
Diesel fuel	100,00 %	A	B	B	A	A
Diethyl ether	100,00 %	A	C	C	A	A

Substances (20°C/68°F)	Conc.	PTFE	PEHD	PP	PFA	V4A*
Diethyl ketone	100,00 %	A	B	B	A	A
Diethylamine	100,00 %	A	C	A	A	A
Diethylene glycol	100,00 %	A	A	A	-	A
Diethylene oxide	100,00 %	A	A	C	A	-
Dihydroxybenzene-1,3	50,00 %	A	C	B	A	-
Diisobutylketone	100,00 %	A	B	B	A	A
Dimethylformamide	100,00 %	A	A	A	A	A
Dimethyl ether	100,00 %	A	C	C	A	A
Dimethyl sulfoxide (DMSO)	100,00 %	A	A	A	-	A
Dimethylamine	100,00 %	A	B	B	A	A
Dimethylbenzenes	100,00 %	A	C	C	A	A
Dioxane	100,00 %	A	A	B	A	A
Diphenyl ether	100,00 %	A	C	C	A	A
Dipropylene glycol	100,00 %	A	A	A	-	A
Disodium tetraborate	100,00 %	A	A	A	-	-
Ethanol (ethyl alcohol)	96,00 %	A	A	A	A	A
Ethereal oils	100,00 %	A	C	C	-	A
Ethyl acetate	100,00 %	A	B/C	B/C	A	A
Ethyl acrylate	100,00 %	A	C	C	A	A
Ethyl chloride	100,00 %	A	C	C	A	A/C
Ethylbenzene	100,00 %	A	B	C	A	A
Ethylene glycol	100,00 %	A	A	A	A	A
Ethylene oxide	100,00 %	A	B	B	A	A
Ethylene chlorohydrin	100,00 %	A	A	A	A	A/C
Ethylenediamine	100,00 %	A	A	A	A	A
Ethylmethylketone	100,00 %	A	C	C	A	A
Formaldehyde, Formalin	40,00 %	A	A	A	A	A
Formamide (Methanamide)	100,00 %	A	A	A	A	A
Formic acid	100,00 %	A	A	B	A	B
Fuel oils	100,00 %	A	B	B	A	A
Furfural	100,00 %	A	B	C	A	A
Gasoline, aromatic	100,00 %	A	B	B	A	B
Glycerine	100,00 %	A	A	A	-	A
Glycine	10,00 %	A	A	A	-	A
Glycol	100,00 %	A	A	A	A	A
Glycolic acid	100,00 %	A	A	A	A	A/B

* V4A = Stainless steel

Substances (20°C/68°F)	Conc.	PTFE	PEHD	PP	PFA	V4A*
Heptane	100,00 %	A	B	B	A	A
Hexadecanol	100,00 %	A	A	A	A	A
Hexafluorosilicic acid	100,00 %	A	A	A	A	A
Hexan-1,2,6-triol	100,00 %	A	A	A	A	A
Hexane	100,00 %	A	B	B	A	A
Hexanedioic acid (Adipic acid)	100,00 %	A	A	A	A	A
Hexanol	100,00 %	A	A	A	A	A
Hydrazine hydrate	64,00 %	A	A	A	A	A/B
Hydrochloric acid	37,00 %	A	A	A	A	C
Hydrofluoric acid	45,00 %	A	A	A	A	C
Hydrogen peroxide	90,00 %	A	B	B	A	A
Hydrogen sulfide	100,00 %	A	A	A	A	A
Hydroxyacetic acid (Glycolic acid)	100,00 %	A	A	A	A	B
Isobutanol	100,00 %	A	A	A	A	A
Isooctane	100,00 %	A	B	B	A	A
Isopropanol	100,00 %	A	A	A	A	A
Isopropenyl acetate	100,00 %	A	A	A	A	-
Isopropyl acetate	100,00 %	A	A	B	-	A
Isopropyl ether	100,00 %	A	C	C	A	A
Isopropylbenzene	100,00 %	A	C	C	A	-
Kerosene	100,00 %	A	A	A	A	A
Lactic acid	90,00 %	A	A	A	A	A/B
Menthol	100,00 %	A	A	A	-	A
Methanol	100,00 %	A	A	A	A	A
Methoxybenzene	100,00 %	A	C	C	A	A
Methoxyethanol	100,00 %	A	A	C	A	A
Methyl acetate	100,00 %	A	A	A	A	A
Methyl bromide	100,00 %	A	C	C	A	A/C
Methyl ethyl ketone	100,00 %	A	B	B	A	A
Methyl isobutyl ketone	100,00 %	A	C	C	A	A
Methyl methacrylate	100,00 %	A	A	A	A	A
Methyl phenyl ether	100,00 %	A	C	C	A	A
Methylamine	100,00 %	A	A	A	A	A
Methylbenzene	100,00 %	A	C	C	A	A

Substances (20°C/68°F)	Conc.	PTFE	PEHD	PP	PFA	V4A*
Methylcyanide	100,00 %	A	A	A	A	A
Methylene chloride	100,00 %	A	C	C	A	A/C
Methyloxirane	100,00 %	A	A	A	A	A
Methylpentanone	100,00 %	A	C	C	A	A
Methylphenylketone	100,00 %	A	C	C	A	A
Mineral oil	100,00 %	A	A	B	-	A
Nitric acid	65,00 %	A	B	C	A	B
Nitrobenzene	100,00 %	A	C	B	A	A
Octane	100,00 %	A	B	B	A	A
Oleic acid	100,00 %	A	C(B)	C(B)	A	A
Oleum	100,00 %	A	C	C	A	A
Oxalic acid	100,00 %	A	A	A	A	A/B
Pentan-1-ol	100,00 %	A	A	A	A	-
Pentan-3-on	100,00 %	A	A	A	A	A
Pentylacetate	100,00 %	A	A	C	A	A
Perchloroethylene	100,00 %	A	C	C	A	-
Perchloric acid	100,00 %	A	B	C	A	-
Petroleum	100,00 %	A	B	B	A	A
Phenol	100,00 %	A	A	A	A	A
Phenylamine	100,00 %	A	A	A	A	A
Phosphoric acid	85,00 %	A	B	A	A	A/B
Phosphorus trichloride	100,00 %	A	B	B	A	-
Potassium hydroxide	100,00 %	A	A	A	A	A
Potassium hypochlorite	20,00 %	A	B	B	A	B
Potassium perchlorate	25,00 %	A	A	A	A	A
Propan-2-ol	100,00 %	A	A	A	A	A
Propane-1,2-diol	100,00 %	A	A	A	A	A
Propionic acid	100,00 %	A	A	A	A	A
Propylene oxide	100,00 %	A	A	A	A	A
Pyridine	100,00 %	A	B	B	A	A
Resorcinol	50,00 %	A	B	A	A	-
Salicylic acid	100,00 %	A	A	A	A	A
Silicone oils	100,00 %	A	A	A	-	A
Silver acetate	100,00 %	A	A	A	-	-
Sodium hydroxide	85,00 %	A	A	A	A	A/B

* V4A = Stainless steel

Substances (20°C/68°F)	Conc.	PTFE	PEHD	PP	PFA	V4A*
Sodium persulfate	25,00 %	A	A	B	A	A
Sodium persulfate	100,00 %	A	A	A	A	A
Styrene	100,00 %	A	C	C	A	A
Succinic acid	100,00 %	A	A	A	A	A
Sulfuric acid	80,00 %	A	A	A	A	B/C
Sulfuric acid, fuming	100,00 %	A	C	C	A	A
Tartaric acid	100,00 %	A	A	A	A	A
Tetrachlorethylene	100,00 %	A	C	C	A	-
Tetrachloroethane	100,00 %	A	B	C	A	-
Tetrahydrofuran (THF)	100,00 %	A	C	C	A	A
Tetrahydronaphthalene	100,00 %	A	C	C	A	A
Tetralin	100,00 %	A	C	C	A	A
Thionyl chloride	100,00 %	A	C	C	A	-
Toluene	100,00 %	A	C	C	A	A
Trichloroacetic acid	100,00 %	A	B	A	A	B
Trichlorobenzenes	100,00 %	A	C	C	A	-
Trichloroethylene	100,00 %	A	C	C	A	B
Triethanolamine	100,00 %	A	A	A	-	A
Triethylene glycol	100,00 %	A	A	A	A	A
Turpentine	100,00 %	A	B	C	A	A
Urea	100,00 %	A	A	A	A	A
Uric acid	100,00 %	A	A	A	-	A

Substances (20°C/68°F)	Conc.	PTFE	PEHD	PP	PFA	V4A*
Vinyl acetate	100,00 %	A	A	B	A	A
Vinyl chloride	100,00 %	A	A	C	A	-
Vinyl cyanide	100,00 %	A	A	A	A	A
Vinylbenzene, Styrene	100,00 %	A	C	C	A	A
Vinylidene chloride	100,00 %	A	C	C	A	-
Waterglass	100,00 %	A	A	A	-	A
Xylenes	100,00 %	A	C	C	A	A

* V4A = Stainless steel

Warranty/Safety of our products

Strict quality control ensures you receive faultless, high-quality products from us. However, if a product is defective, we will, of course, replace it free of charge. Since these are technically sophisticated components, we cannot provide warranty for any articles which have been technically modified or damaged by the user.

Customised products

The same applies to customised products which have been manufactured according to the specifications made by our customers. It is the responsibility of the user to check whether these products meet their technical requirements. We accept no liability for events or accidents caused by incorrect handling or technical modifications to our products by the user.

Health & safety

Pay special attention to hazard pictograms (including H and P statements) on Safety Data Sheets (SDS) in your company and on the packaging of your chemicals. When handling substances labelled as hazardous, always wear personal protective equipment (PPE) as specified.

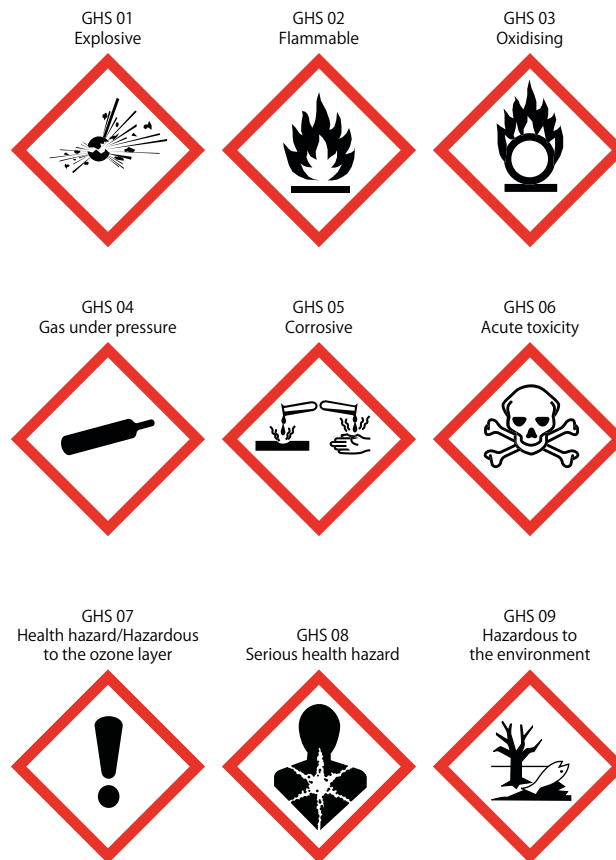
Chemical compatibility

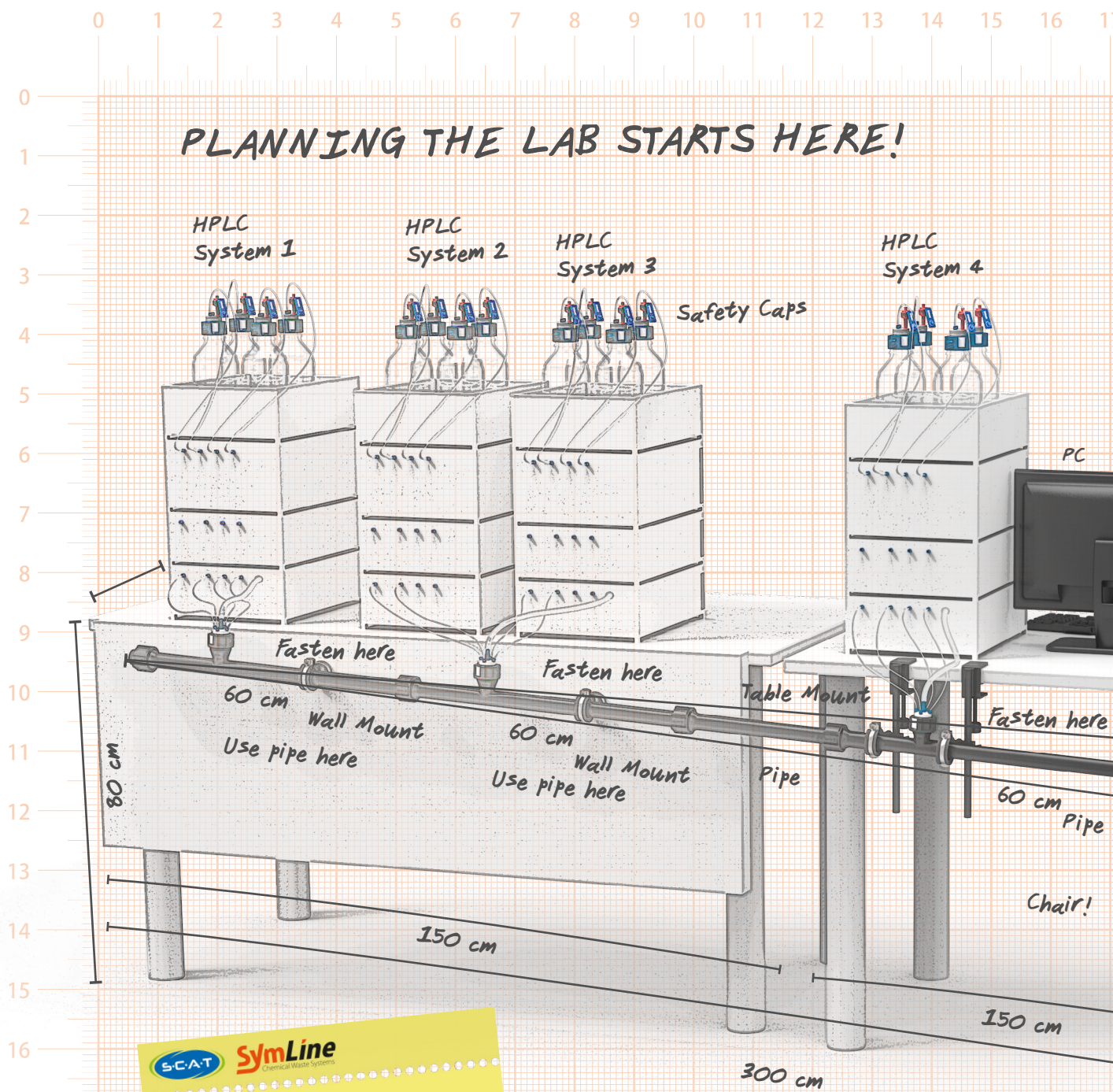
Due to the variety and different composition of solvents and substances available on the market, we cannot provide warranty for chemical compatibility. State-of-the-art resistant materials have been used for SymLine[®] products, with special focus on requirements relating to work with aggressive liquids. You can obtain information on compatibility with specific substances from your chemical manufacturers or other specialist sources. We can provide support in selecting the appropriate for your application. However, the end user is responsible for the selection of chemicals used. SymLine[®] does neither provide warranty for results nor does it assume any obligation or liability in connection with the use of such products as far as their chemical compatibility or abrasive effects are regarded.

Grounding and antistatics

Our products for safe grounding of containers and vessels are suitable for connection to current-free and zero potential installations. Connection to power-driven installations or live components must be executed by qualified electricians only!

Please observe the internal safety instructions of your company. A wide range of information is available for you to download from the SymLine[®] online site. For example, the continuously updated table: 'Plastics – Chemical Resistance to Chemicals' or safety instructions relating to SymLine[®] products. Visit us at: www.SymLine.de





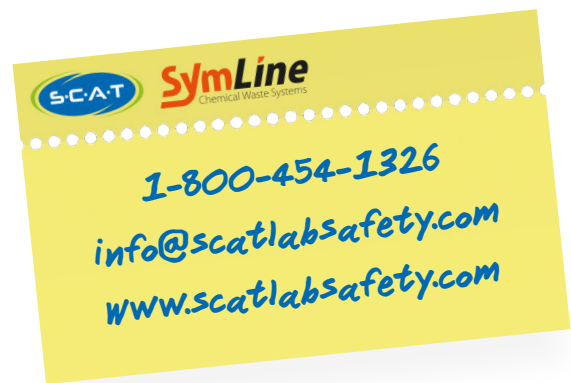
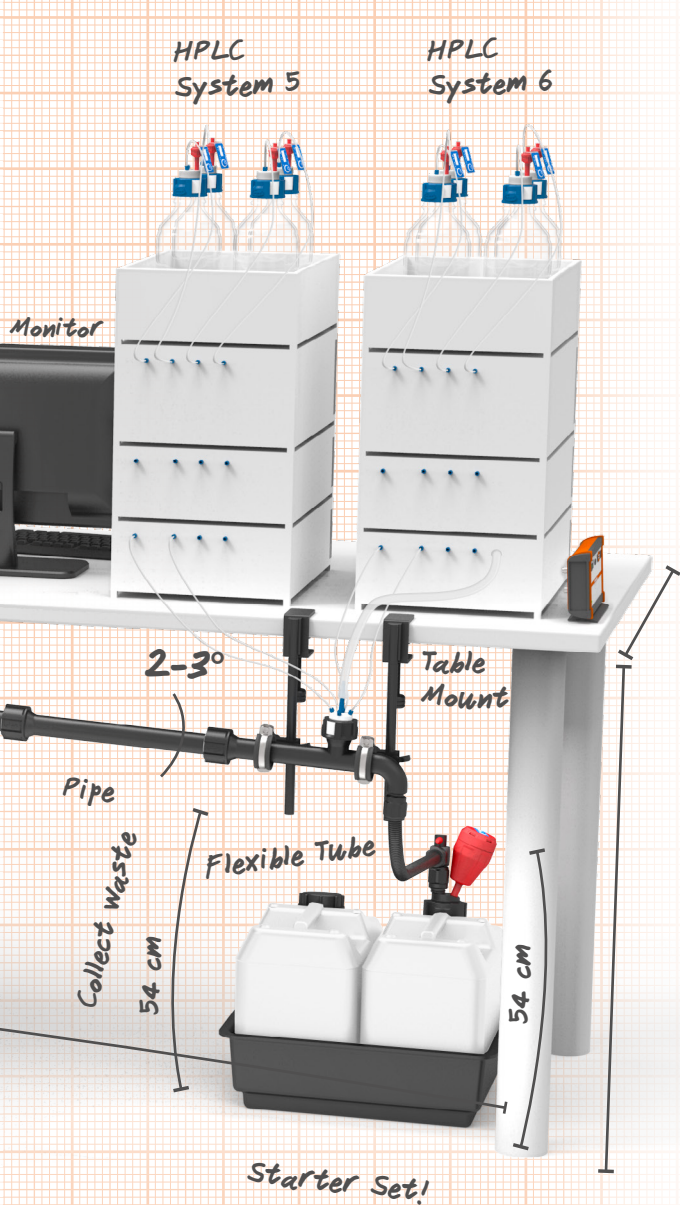
SCAT SymLine
Chemical Waste Systems

We provide BIM data!
Building Information Modeling (BIM).
We provide BIM data for your
technical department. Contact our
SymLine team for a download link.

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