

# Extraction systems

## How do you extract your solvents?

The first and foremost concern is chromatography and secondly, safe handling of solvents is taken into consideration. It is remarkable how little attention is given to one's own health protection. Everyone who works in the laboratory should be aware of the high level risk potential through hazardous solvent vapors. There are still numerous risky types of closures for solvent bottles in use.

The inadequate handling during extraction of solvents also has consequences on your work results. The extraction capillaries can slide out of the solvent bottle because they are not screwed on tightly. This can cause air to be sucked in and HPLC equipment down times are thus "permanently calculated."

In addition, the mobile phase gets contaminated by dust particles in the air. Similarly, evaporation loss of light volatile solvents can occur and change the mixing ratio of solvent compounds - so the results are distorted. This plays a particular role with UHPLC. Solvent filtration and precisely prepared mobile solvents, with constant mixing ratios throughout the entire term, are a must with UHPLC!

In addition, solvent exchange with common screw caps is difficult to handle. Often, the well-known "tangled capillaries" occur, when supply bottles have to be exchanged.

**Trust the market leader:  
S.C.A.T. - SafetyCaps are THE safety solution!**





**Conventional closures endanger your health and the success of your work**



**Safe extraction - reliable results**



# Extraction systems

## Technology of SafetyCaps

The new, improved air valve combines valve and filter functions. As usual, ventilation occurs during extraction; harmful solvent vapors are blocked. At the same time, the valve membrane absorbs dust and contaminant particles from the incoming air. The valve also fits your existing S.C.A.T SafetyCaps without any technical modification.

Capillary

Air valve

Fittings

PTFE body  
360° freely rotatable

Screw cap

Change after  
6 months

Installation Date:

Air valve (1) Part No. 117 010  
Air valves (10) Part No. 197 010



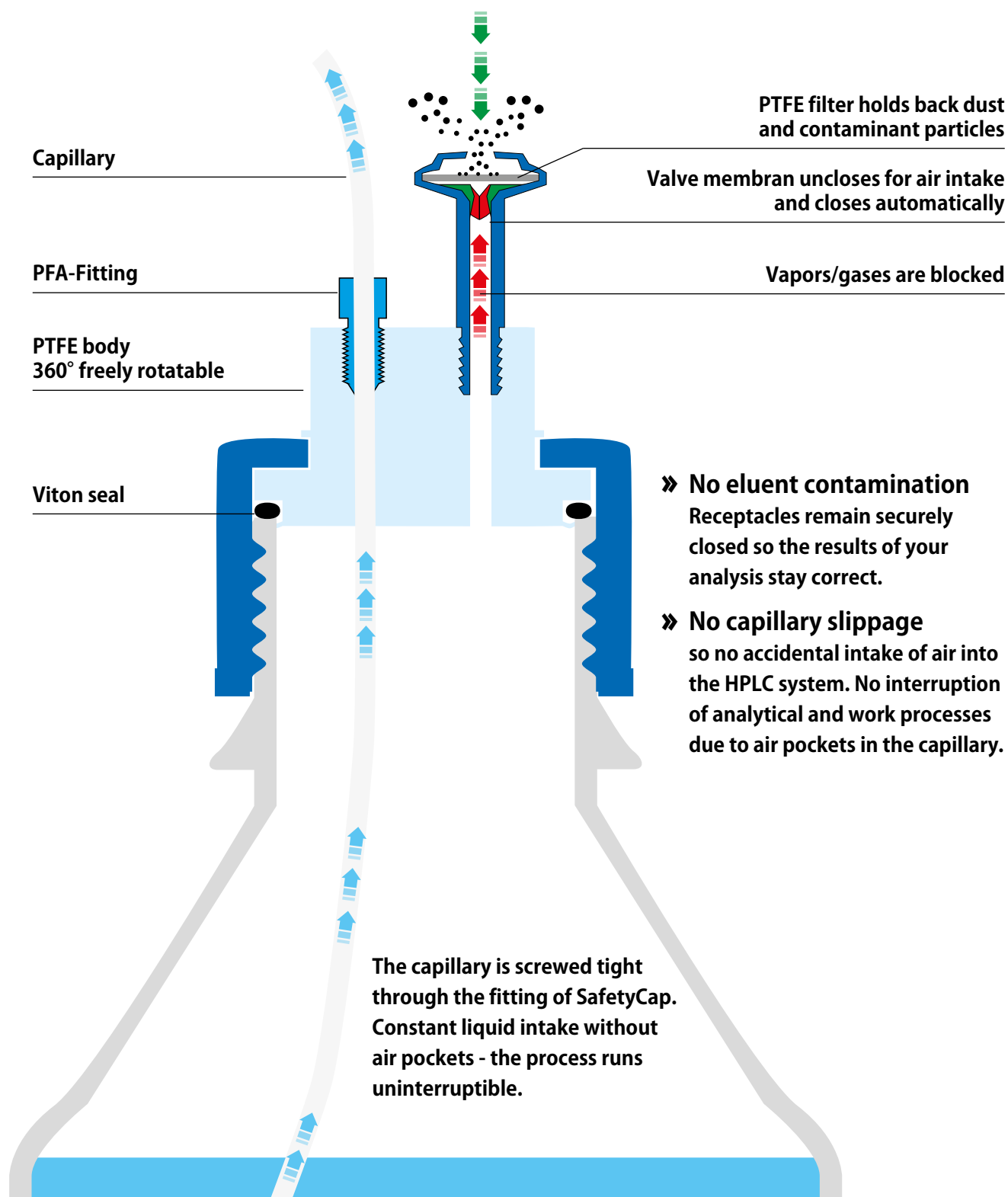
Change-advice-label

- » No more harmful vapors thanks to the integrated air valve.
- » Confidence during audits  
With S.C.A.T. systems, you pass quality and safety inspections with confidence.
- » Easy container changes thanks to freely rotatable cap even with capillaries installed.  
Without twisting or "tangled capillaries".

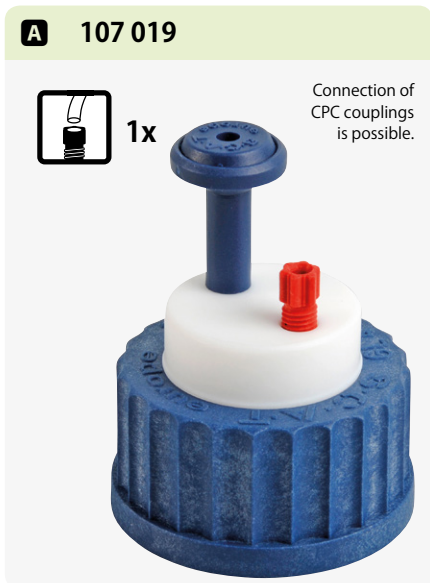
- » Change every 6 months  
Since the filter membrane absorbs contaminants from the surrounding air, it is necessary that the valve be replaced every 6 months in order to ensure flawless operation.



## The air valve ensures pressure equalisation during the extraction



# SafetyCaps Thread GL 45



## What is included in the scope of delivery?

The shown pictures accord to the scope of delivery.

The air valve with writable change-advice-label and fittings are included.



## Easy to install

Thanks to the freely-rotatable cap there are no twistet or tangled capillaries. The PTFE-body stays in position - the change of solvent bottles has never been easier!



## Change every 6 months

Since the filter membrane absorbs contaminants from the surrounding air, it is necessary that the valve be replaced every 6 months in order to ensure flawless operation.

# GL 45 SafetyCap


**D 107 410**

 **4x**


Connection of CPC couplings is possible.



**E 107 520**

 **6x**

Connection of CPC couplings is possible.




**Inclined!**  
SafetyCaps with more than 3 connectors have an inclined body, for barrier-free installation of CPC quick disconnect couplings. (Accessories on page 112.)

**F 117 010**

 **6 Months**



**Up to 150 ml/min.**

**G 197 010 Stock!**

 **6 Months**

**10 x**



**Up to 150 ml/min.**



**H 160 501**

Easily close of unused connectors.



**10 x**

**Blind plug**

Fig.	Part No.	Description	 Thread size	 Connector Ø 3.2mm OD
<b>A</b>	107 019	SafetyCap I	GL 45	1x
<b>B</b>	107 909	SafetyCap II	GL 45	2x
<b>C</b>	107 910	SafetyCap III	GL 45	3x
<b>D</b>	107 410	SafetyCap IV	GL 45	4x
<b>E</b>	107 520	SafetyCap VI	GL 45	6x
<b>F</b>	117 010	Air valve for SafetyCaps	UNF 1/4" 28G	-
<b>G</b>	197 010	Air valve for SafetyCaps (10 pc./unit)	UNF 1/4" 28G	-
<b>H</b>	160 501	Blind plug (10 pc./unit)	UNF 1/4" 28G	-

# SafetyCaps Thread GL 45 for the preparative HPLC

**A** 107 007



1x



**B** 107 008



2x



**C** 107 009



2x



**D** 109 032



2x



**E** 110 032



3x



» Connectors for larger extraction tubes with up to  $\varnothing$  6.35 mm outer diameter.

## What is included in the scope of delivery?

The shown pictures accord to the scope of delivery.  
The air valve with change-advice-label and fittings are included.

**E** 117 011



6 Months



Up to 400 ml/min.



## No halfway measures!

The red air valve is specially designed for preparative HPLC operation and easily delivers supply amount of up to 400 ml/min (Blue air valve up to 150 ml/min). The connectors have a correspondingly larger diameter for typical tube sizes in the preparative HPLC. For special applications, individual **connectors can be closed with blind plugs (Page 105)**.

We would also be happy to produce individual solutions for you.

### Change every 6 months

Since the filter membrane absorbs contaminants from the surrounding air, it is necessary that the valve be replaced every 6 months in order to ensure flawless operation.

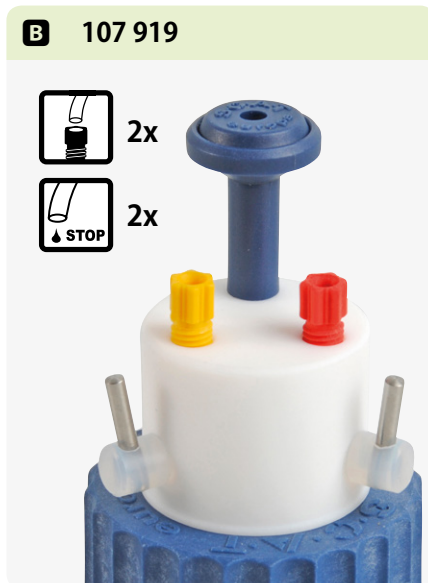
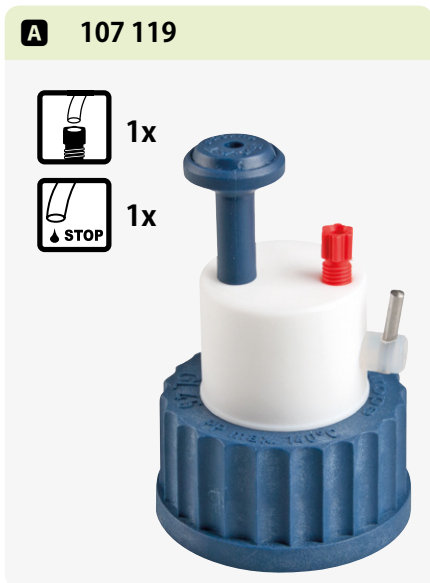
	Thread size	Connector Ø 3.2 mm OD (1/8")	Connector Ø 4.76 mm OD (3/16")	Connector Ø 6.35 mm OD (1/4")
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Fig.	Part No.	Description	Thread size	Connector Ø 3.2 mm OD (1/8")	Connector Ø 4.76 mm OD (3/16")	Connector Ø 6.35 mm OD (1/4")
<b>A</b>	107 007	SafetyCap I (1/4")	GL 45	-	-	1x
<b>B</b>	107 008	SafetyCap II (1/4")	GL 45	-	-	2x
<b>C</b>	107 009	SafetyCap II (1/8" + 1/4")	GL 45	1x	-	1x
-	108 032	SafetyCap I (3/16")	GL 45	-	1x	-
<b>D</b>	109 032	SafetyCap II (3/16")	GL 45	-	2x	-
<b>E</b>	110 032	SafetyCap III (3/16")	GL 45	-	3x	-
<b>F</b>	117 011	Air valve (preparative) up to 400ml/min.	UNF 1/4" 28G	-	-	-

Fittings for capillary sizes with up to Ø 6.35 mm outer diameter				↑ Connector	↑ Connector	↑ Connector
-	107 064	PFA Fitting 3.2 mm Ø (1/8")	UNF 1/4" 28G	↑	-	-
-	107 047	PTFE Fitting 4.00 mm Ø	UNF 5/16" -24	-	↑	-
-	107 045	PTFE Fitting 4.76 mm Ø (3/16")	UNF 5/16" -24	-	↑	-
-	107 046	PTFE Fitting 6.00 mm Ø	NPT 1/8"	-	-	↑
-	107 044	PTFE Fitting 6.35 mm Ø (1/4")	NPT 1/8"	-	-	↑



# SafetyCaps Thread GL 45 with shut-off



## Simplified change of bottles

### No air entrapment in capillaries

After the supply container is changed, the current analysis can be continued without interruption.

### Ready for use again - quickly

During repairs on HPLC pumps, the shut-off on the SafetyCaps can be closed so the capillaries and solvent filter remain in the solvent. Thus the pump can be quickly and easily flushed when returning to operation after repairs.



# GL 45 with shut-off

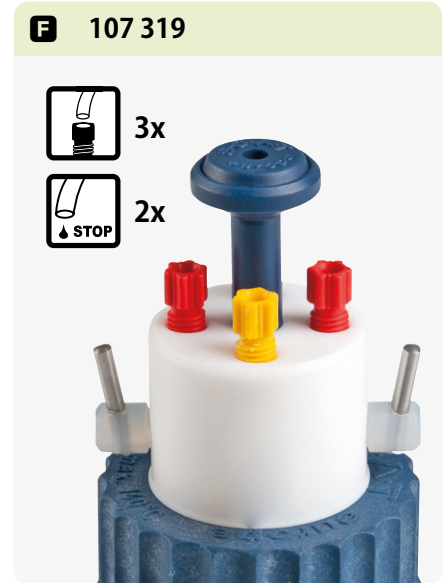
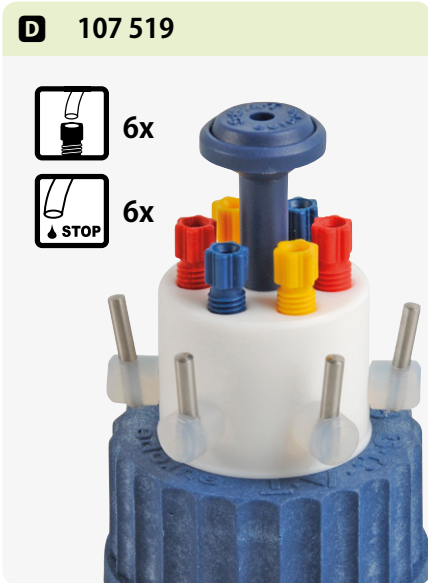


Fig.	Part No.	Description	Thread size	Connector Ø 3.2 mm OD	of which with shut-off
<b>A</b>	107 119	SafetyCap I with shut-off	GL 45	1x	1x
<b>B</b>	107 919	SafetyCap II with shut-off	GL 45	2x	2x
<b>C</b>	107 920	SafetyCap III with shut-off	GL 45	3x	3x
<b>D</b>	107 519	SafetyCap VI with shut-off	GL 45	6x	6x
<b>E</b>	107 219	SafetyCap II with shut-off <b>(combined)</b>	GL 45	<b>2x</b>	<b>1x</b>
<b>F</b>	107 319	SafetyCap III with shut-off <b>(combined)</b>	GL 45	<b>3x</b>	<b>2x</b>
<b>G</b>	117 010	Air valve for SafetyCaps	UNF 1/4" 28G	-	-
<b>H</b>	197 010	Air valve for SafetyCaps (10 pc./unit)	UNF 1/4" 28G	-	-

# SafetyCaps Thread GL 45 – angled



## At a squeeze!

### Space-saving!

Especially where laboratory space is limited, you gain a major advantage with our angled SafetyCaps. Even when extraction bottles are stored above the HPLC system, you can easily reach all the connectors because they are attached on the side.

**A** 199 019



1x



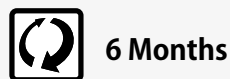
**B** 199 909



2x



**C** 117 010



6 Months



Up to 150 ml/min.

**D** 160 501

Easily close of unused connectors.

10 x



Blind plug

Fig.	Part No.	Description	Thread size	Connector Ø 3.2 mm OD
<b>A</b>	199 019	SafetyCap I (angled)	GL 45	1x
<b>B</b>	199 909	SafetyCap II (angled)	GL 45	2x
<b>C</b>	117 010	Air valve for SafetyCaps	UNF 1/4" 28G	-
<b>D</b>	160 501	Blind plug (10 pc./unit)	UNF 1/4" 28G	-



# SafetyCaps for ground neck bottles



## Simple loosening & opening with the locknut

Everybody is familiar with stuck ground neck stoppers: Dried fluids and sticky substances build up on the ground glass; the stopper will not budge. S.C.A.T. closures with locknut allow the stopper to be easily loosened and removed, even after long usage.



Fig.	Part No.	Description	 Thread size	 Connector Ø 3.2 mm OD
<b>A</b>	107 607	SafetyCap II for ground neck bottles (with locknut)	Ground neck 29/32 mm	2x
<b>B</b>	107 507	Blind plug for ground neck bottles (with locknut)	Ground neck 29/32 mm	-
<b>C</b>	107 508	Ground neck adapter for GL 45 threaded bottles	Top: Ground neck 29/32 mm (f) Bottom: GL 45 (f)	-
<b>D</b>	107 509	GL 45 adapter for ground neck bottles	Top: GL 45 (m) Bottom: Ground neck 29/32 mm (m)	-
<b>E</b>	107 506	Replacement locknuts for SafetyCaps	Ground neck 29/32 mm	-
<b>F</b>	117 010	Air valve for SafetyCaps	UNF 1/4" 28G	-

# SafetyCaps Special threads

**A** 107 005



1x



GL 28

**B** 107 006



2x



GL 28

**C** 107 100



1x



S 40 / GL 40

**D** 107 101



2x



S 40 / GL 40

**E** 107 105



1x



1x

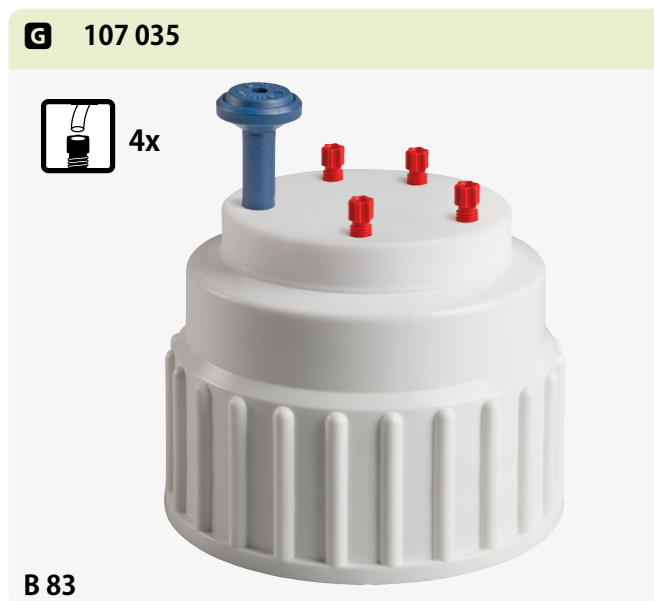


S 40 / GL 40

## Thread S 40




Now you can use our proven safety system without an adapter, directly on supply bottles with thread sizes S 40 and GL 40. Many solvents are already delivered in such containers. With the new sealing system, you can connect the containers directly to the HPLC system, without decanting or thread adapters.





### Include the suitable container to your order

The chapter "containers", starting from page 87, shows all suitable canisters and lab bottles for SafetyCaps.

Fig.	Part No.	Description	 Thread size	 Connector Ø 3.2 mm OD	 of which with shut-off
<b>A</b>	107 005	SafetyCap I (GL 28)	GL 28	1x	-
<b>B</b>	107 006	SafetyCap II (GL 28)	GL 28	2x	-
-	107 512	SafetyCap III (GL 38)	GL 38	3x	-
<b>C</b>	107 100	SafetyCap I (S 40)	S 40 / GL 40	1x	-
<b>D</b>	107 101	SafetyCap II (S 40)	S 40 / GL 40	2x	-
-	107 742	SafetyCap III (S 40)	S 40 / GL 40	3x	-
<b>E</b>	107 105	SafetyCap I (S 40) with shut-off	S 40 / GL 40	1x	1x
-	107 030	SafetyCap I (GLS 80)	GLS 80	1x	-
-	107 031	SafetyCap II (GLS 80)	GLS 80	2x	-
<b>F</b>	107 032	SafetyCap III (GLS 80)	GLS 80	3x	-
<b>G</b>	107 035	SafetyCap IV (B 83)	B 83	4x	-

# SafetyCaps HPLC sets with bottle

**A** 107 300



**B** 107 312



**C** 107 345



**D** 107 363





## Plug and play - easy, quick and safe!

The S.C.A.T. extraction systems as complete set delivered directly to your lab. You only need one single article number for the comprehensive safety system. There is no time-consuming compilation of configurations necessary.

- » The extraction system in a complete set, ready to connect.
- » Only one article number for the comprehensive safety system.
- » No time-consuming compilation of a configuration.
- » The delivery is made complete and can be used immediately.

### What is included in the scope of delivery?

The shown pictures accord to the scope of delivery.  
Glass bottle, SafetyCap, fittings, air valve, PTFE suction filter and 1.5 m capillaries for each connector.

Fig.	Part No.	Description	 Connections incl. 1.5 m capillary Ø 3.2 mm OD	 of which with shut-off	Suction filter (PTFE)	Bottle	Form	Volume
<b>A</b>	107 300	SafetySet HPLC	1x	-	1x	<b>DURAN® clear glass</b>	round	1 liter
-	107 303	SafetySet HPLC	2x	-	2x	<b>DURAN® clear glass</b>	round	1 liter
-	107 304	SafetySet HPLC	3x	-	3x	<b>DURAN® clear glass</b>	round	1 liter
-	107 348	SafetySet HPLC	1x	1x	1x	<b>DURAN® clear glass</b>	round	1 liter
-	107 349	SafetySet HPLC	2x	2x	2x	<b>DURAN® clear glass</b>	round	1 liter
<b>B</b>	107 312	SafetySet HPLC	1x	-	1x	DURAN® brown glass	round	1 liter
-	107 313	SafetySet HPLC	2x	-	2x	DURAN® brown glass	round	1 liter
-	107 314	SafetySet HPLC	3x	-	3x	DURAN® brown glass	round	1 liter
-	107 353	SafetySet HPLC	1x	1x	1x	DURAN® brown glass	round	1 liter
-	107 354	SafetySet HPLC	2x	2x	2x	DURAN® brown glass	round	1 liter
<b>C</b>	107 345	SafetySet HPLC	1x	-	1x	<b>DURAN® YOUTILITY</b>	ergo	1 liter
-	107 346	SafetySet HPLC	2x	-	2x	<b>DURAN® YOUTILITY</b>	ergo	1 liter
-	107 347	SafetySet HPLC	3x	-	3x	<b>DURAN® YOUTILITY</b>	ergo	1 liter
-	107 362	SafetySet HPLC	1x	1x	1x	<b>DURAN® YOUTILITY</b>	ergo	1 liter
<b>D</b>	107 363	SafetySet HPLC	2x	2x	2x	<b>DURAN® YOUTILITY</b>	ergo	1 liter



# SafetyCaps HPLC Starter Kits

EXTRACTION SYSTEMS



## Initial equipment for your HPLC system - Safe extraction of solvents.

- » Price advantage compared to ordering piece by piece.
- » Suitable for all current HPLC systems.
- » Unused connectors can be closed by the blind screws delivered with the set. This makes the system universally applicable, even when less connectors are needed for a time.



Fig.	Part No.	Description	Content
<b>A</b>	199 200	HPLC Starter Kit 1	3x SafetyCap I (107 019) 1x SafetyCap II (107 909) 1x Blind plug (160 501) (10 pc./unit)
<b>B</b>	199 201	HPLC Starter Kit 2	4x SafetyCap II (107 909) 4x Blind plug (160 501) (10 pc./unit)
<b>C</b>	199 210	HPLC Starter Kit 3 ( <b>fire-resistant</b> )	3x SafetyCap I fire-resistant (112 019) 1x SafetyCap II fire-resistant (112 909) 1x Blind plug (160 501) (10 pc./unit)

# SafetyCaps HPLC Safety Set

**A** 107 337



HPLC system, capillaries and the tube are not included in the scope of delivery.

- » One single set for solvent supply and waste.
- » 107 337 - One part no. for the complete set.
- » For use with all HPLC systems.

Fig.	Part No.	Description	Content
<b>A</b>	107 337	HPLC Safety Set	See page 20

## HPLC Safety Set includes

<p><b>107 910</b></p> <p>SafetyCap III GL 45</p>  <p><b>4x</b></p>	<p><b>117 010</b></p> <p>Air valve*</p>  <p><b>(4x)*</b></p>	<p><b>501 113</b></p> <p>Laboratory bottle 1 liter GL 45 Clear glass</p>  <p><b>4x</b></p>	<p><b>160 501</b></p> <p>Blind plug for capillary connection PU = 10</p>  <p><b>1x</b></p>
<p><b>108 921</b></p> <p>SafetyWasteCap GL 45</p>  <p><b>1x</b></p>	<p><b>117 808</b></p> <p>Tube fitting, curved 6.4 - 9 mm</p>  <p><b>1x</b></p>	<p><b>117 816</b></p> <p>Tube fitting, straight 6 - 8 mm</p>  <p><b>2x</b></p>	<p><b>107 810</b></p> <p>Tube fitting, angled 9.5 - 10 mm</p>  <p><b>1x</b></p>
<p><b>610 535</b></p> <p>Exhaust filter size M</p>  <p><b>1x</b></p>	<p><b>107 951</b></p> <p>Canister 5 liter GL 45 PE-HD</p>  <p><b>1x</b></p>	<p><b>107 062</b></p> <p>Fitting Ø 2.3 mm grey PU = 5</p>  <p><b>1x</b></p>	<p><b>107 063</b></p> <p>Fitting Ø 3.2 mm blue PU = 5</p>  <p><b>1x</b></p>
<p><b>107 064</b></p> <p>Fitting Ø 3.2 mm red PU = 5</p>  <p><b>1x</b></p>	<p><b>107 065</b></p> <p>Fitting Ø 3.2 mm yellow PU = 5</p>  <p><b>1x</b></p>	<p><b>107 061</b></p> <p>Fitting Ø 1.6 mm green PU = 5</p>  <p><b>1x</b></p>	<p>* Concerning to the air valve, part number 117 010. This part number stands for individual orders and re-orders. The air valves are already included in the scope of delivery of the 4 SafetyCaps or rather included in this complete set.</p>

PU = Packaging Unit

# SafetyCaps made from fire-resistant material



### Self-extinguishing

In case of fire, the worldwide unique flame protection material is an insulating layer acting to brake heat. The foaming mass prevents oxygen supply and therefore the spread of flames.



### Optimal protection

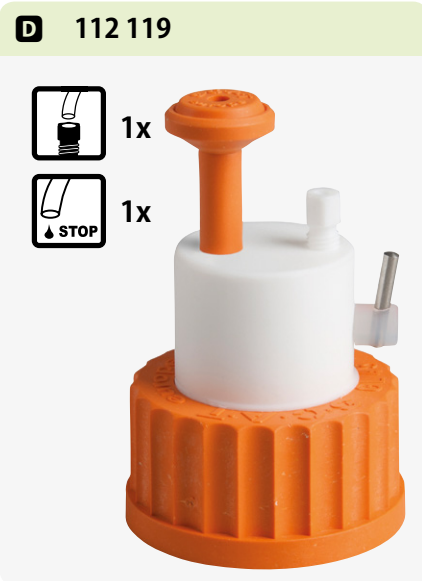
Naturally the closures offer all the proven S.C.A.T. quality features to protect the user and the environment. The air valve blocks combustible solvent vapors and cleans dust and contaminant particles from the incoming air.



### All limit values were fallen well below

During tests in the firing chamber, SafetyCaps attained the highest fire class V0 and were significantly below all UL-94 test criteria.

Fig.	Part No.	Description	Thread size	Connectors Ø 3.2 mm OD (1/8")	Connectors Ø 4.76 mm OD (3/16")	Connectors Ø 6.35 mm OD (1/4")
<b>A</b>	112 019	SafetyCap I (fire-resistant)	GL 45	1x	-	-
-	112 909	SafetyCap II (fire-resistant)	GL 45	2x	-	-
-	112 910	SafetyCap III (fire-resistant)	GL 45	3x	-	-
-	112 410	SafetyCap IV (fire-resistant)	GL 45	4x	-	-
<b>B</b>	112 520	SafetyCap VI (fire-resistant)	GL 45	6x	-	-
-	112 112	SafetyCap I (fire-resistant) 3/16"	GL 45	-	1x	-
-	112 212	SafetyCap II (fire-resistant) 3/16"	GL 45	-	2x	-
<b>C</b>	112 312	SafetyCap III (fire-resistant) 3/16"	GL 45	-	3x	-
-	112 007	SafetyCap I (fire-resistant) 1/4"	GL 45	-	-	1x
-	112 008	SafetyCap II (fire-resistant) 1/4"	GL 45	-	-	2x
-	112 009	SafetyCap II (fire-resistant) 1/4" + 1/8"	GL 45	1x	-	1x



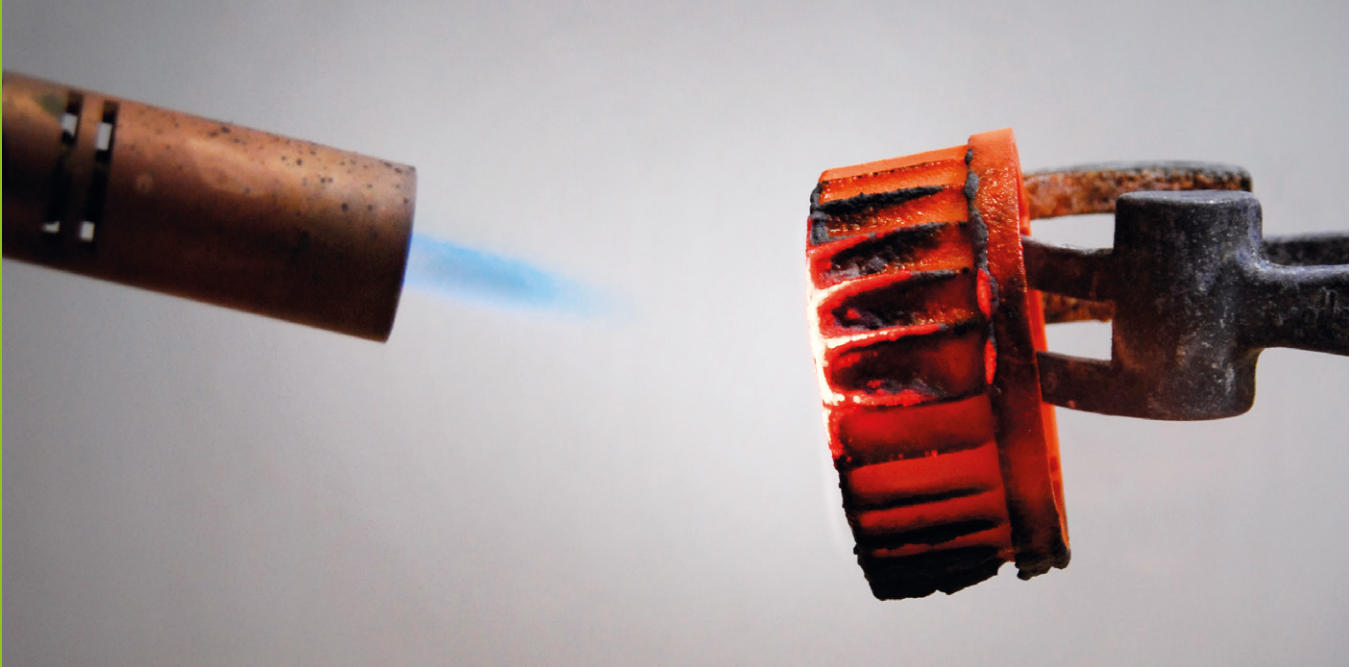
### Change every 6 months

Since the filter membrane absorbs contaminants from the surrounding air, it is necessary that the valve be replaced every 6 months in order to ensure flawless operation.



Fig.	Part No.	Description	Thread size	Connectors Ø 3.2 mm OD	of which with shut-off
<b>D</b>	112 119	SafetyCap I (fire-resistant) with shut-off	GL 45	1x	1x
-	112 919	SafetyCap II (fire-resistant) with shut-off	GL 45	2x	2x
-	112 920	SafetyCap III (fire-resistant) with shut-off	GL 45	3x	3x
-	112 419	SafetyCap IV (fire-resistant) with shut-off	GL 45	4x	4x
-	112 519	SafetyCap VI (fire-resistant) with shut-off	GL 45	6x	6x
-	112 219	SafetyCap II (fire-resistant) with shut-off <b>(combined)</b>	GL 45	<b>2x</b>	<b>1x</b>
-	112 319	SafetyCap III (fire-resistant) with shut-off <b>(combined)</b>	GL 45	<b>3x</b>	<b>2x</b>
<b>E</b>	112 010	Air valve (fire-resistant) for SafetyCaps	UNF 1/4" 28G	-	-

# Fire-resistant



**In order to assess burning characteristics, Underwriters Laboratories Inc. (USA), the most significant and internationally recognized test organization in the USA, has developed the UL-94 test as standard.**

The flammability of polymer materials was subject to UL-94 and other tests. Here, V0 is the highest and best ranked fire class.

Fire resistant S.C.A.T. Products were exposed to flame under standardized test conditions while easily combustible material (e.g. cotton batting) was placed beneath the test sample. Whether or not the cotton was ignited by drips of burning material was observed.

The test series was conducted with both the closure caps and the filter housings of the SafetyWasteCaps.

The decisive criteria was flame persistence time between removal of the burner and extinguishing of the sample. To attain the ranking V0, the cotton must not be ignited and the flame persistence duration for each exposure to flame must be less than 10 seconds.

On all samples, the flame persistence times of 2 or 3 seconds were very low and well below the limit values. No drips fell from the sample in any of the tests and the cotton batting was never ignited.

Under extreme load, the samples of the covers exhibited only a slight glow and a good surface intumescence. Even at higher energies, none of the flames had an affect on the test sample.

In addition, none of the samples sustained interior damage at the places the flame was applied to.

## Self-extinguishing

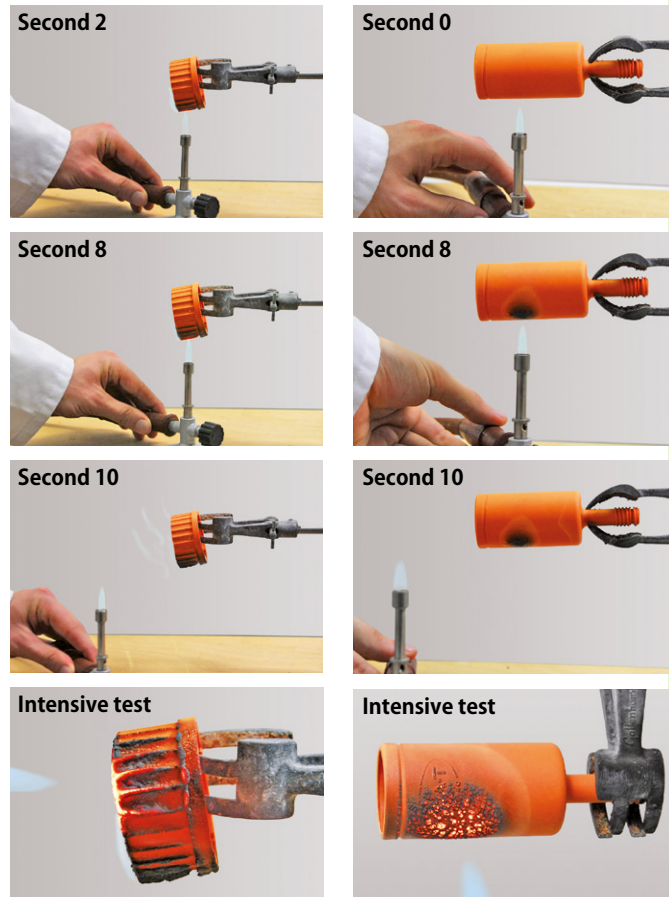
In case of fire, the worldwide unique flame protection material is an insulating layer acting to brake heat. The foaming mass prevents oxygen supply and therefore the spread of flames.

## Optimal protection

Naturally the closures offer all the proven S.C.A.T. quality features to protect the user and the environment. The air valve blocks combustibile solvent vapors and cleans dust and contaminant particles from the incoming air.

## All limit values were fallen well below

During tests in the firing chamber, SafetyCaps attained the highest fire class V0 and were significantly below all UL-94 test criteria.



UL 94 test criteria	Nominal V0	Actual V0 SafetyCaps	Actual V0 Exhaust filter housing
Flame persistence time of the test sample after first exposure to flame	10	0	0
Flame persistence time of the test sample after second exposure to flame	30	1	1
Sum of all flame persistence times	50	2	3
Combustion of the cotton batting	No	No	No

