Unichrome®

S·C·A·T europe®

Safety Solutions

for Laboratory and Production

EXTRACTION SYSTEMS

COLLECTION SYSTEMS

WASTE-MANAGEMENT

LEVEL CONTROL

Unichrome®

S·C·A·T® europe

SAFETY
every day in the laboratory

SGS Institut Fresenius was commissioned by S.C.A.T. Europe GmbH to investigate reduction of emissions achieved by use of S.C.A.T. SafetyCaps In this respect, 1000 ml solvent bottles with and without SafetyCaps were used and the emissions over a period of 28 days compared.

Then test chamber tests were conducted over a period of 7 days, during which the level of emissions in atmosphere were regularly monitored. The solvent components tested as examples were the tested compounds methanol/water (ratio: 80/20), acetonitrile and methanol.

Determining the changes in density and volume

SGS Institut Fresenius GmbH was commissioned by S.C.A.T. Europe GmbH to evaluate the effectiveness of their S.C.A.T. SafetyCaps in comparison to a solvent bottle without S.C.A.T. SafetyCaps. Changes in density of a methanol/water mixture were examined to determine if use of the S.C.A.T. SafetyCap could prevent a change in the mixture over an longer time of 8 days.

www.scat-europe.com

A comparison of the measured results shows that in a bottle fitted with the S.C.A.T. SafetyCap no change in density occurs, the initial density of 0.855 g/cm³ stayed constant throughout the entire 8 days of the test.

In contrast to this, the solvent bottle without a S.C.A.T. SafetyCap displayed a demonstrable change in density so that the initial value of 0.855 g/cm³ of the solvent mixture rose to a density of 0.858 g/cm³ (Fig.1). An increase in density indicates that there has been a greater loss of methanol than of water from the mixture. This loss did not occur in the same mixture ratio.

Therefore a change in the composition of the methanol/water mixture can be assumed, which then could result in errors in measured values under laboratory conditions. In contrast to this, in the solvent bottle with the S.C.A.T. SafetyCap, no change in the mixture ratio was found so that errors in measured values due to a change in the solvent mixture can be excluded.

Characterization of the change in volume in methanol and acetonitrile

The first step in this test was to determine change in volume by

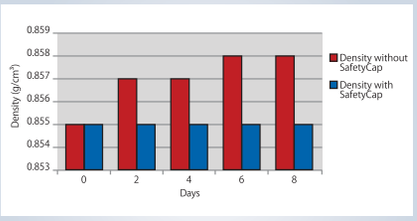


Fig. 1 Changes in the density of a methanol/water mixture

means of differential weighing over the 28 day pilot study in which both acetonitrile and methanol were specified as solvents. These two solvents were used to generate the best possible comparison with real on-site conditions in a HPLC laboratory. Based on the measurement results it is evident that in both series of trials with the S.C.A.T. SafetyCap, scarcely any change in volume over the period of 28 days was observed. In comparison to this, without the S.C.A.T. SafetyCap, a significant reduction in the given volume of 1 liter was found within the period of the trial (Fig. 2).

In the acetonitrile bottle without a SafetyCap, a reduction in volume of almost 10 % occurred so that after 28 days, only 90 % of the initial volume remained in the solvent bottle. Consequently, after 4 weeks, almost 10 % of the solvent quantity was lost, having escaped unfiltered into the atmosphere.

During differential weighting to determine the change in volume of methanol, it was evident that an even more significant reduction had occurred in the solvent bottle not fitted with a S.C.A.T. SafetyCap: After 28 days, only 87.8 % of the initial volume remained in the open solvent bottle, compared with 100 % of the initial volume remaining in the solvent bottle equipped with the S.C.A.T. SafetyCap. It is obvious that almost 13 % of the solvent quantity used are lost, having escaped into the atmosphere from the solvent bottle not fitted with a S.C.A.T. SafetyCap.

Characterization of the atmospheric concentration by test chamber investigations

In order to investigate the atmospheric emissions caused by open solvent bottles in comparison to a solvent bottle with S.C.A.T. SafetyCap, one of each solvent bottles were placed in a test chamber and their respective methanol or acetonitrile emissions were tested after 1, 3 and 7 days (fig. 3).

It was evident that within the test chamber, despite continuous air exchange a methanol concentration of 630 – 660 mg/m³ could be determined for the solvent bottle without SafetyCap, whereas a concentration of 1 – 2 mg/m³ was analyzed for a solvent bottle with S.C.A.T. SafetyCap.

This clearly documents that with the S.C.A.T. SafetyCap an evident reduction in the methanol concentration in the test chamber to nearly 0 was achieved, so the workplace limit value of 270 mg/m³ specified by TRGS 900 was fallen well below.

In contrast to this, without SafetyCap the concentration of 630 – 660 mg/m³ clearly exceeds the workplace limit value to constitute a background exposure which can lead to impairment of employees' health in the laboratory.

A similar picture also results from the test chamber investigation with acetonitrile, in which a concentration of 1 – 5 mg/m³ was determined safety cap, as opposed to an atmospheric concentration of 730 – 800 mg/m³ without the S.C.A.T. safety cap, despite continuous air exchange (Fig. 3).

Comparison of the detected test chamber emissions with the acetonitrile limit values of 34 mg/m³ specified by TRGS 900 showed that without the S.C.A.T. SafetyCap, the workplace limit value was evidently exceeded. In contrast to this, with the S.C.A.T. on the bottle a distinct minimization of the acetonitrile concentration was determined, which was well below the workplace limit value of 34 mg/m³ specified by TRGS 900 (fig. 4).

Conclusion

In conclusion, it is evident that solvent emissions could be significantly reduced by the S.C.A.T. SafetyCaps. In this respect, the use of S.C.A.T. SafetyCaps can be expected to lead to a clear reduction of the exposure to solvents in the air in a laboratory.

In this connection the reduction in the solvent concentration in the air can be assumed to be of a similar proportion as was described previously, leading to significantly lower health risk for the employees concerned.

www.scat-europe.com

Furthermore, S.C.A.T. technology significantly minimizes the risk of contamination of solvent-free blank samples in laboratories, so the use of S.C.A.T. SafetyCaps can also be considered a measure of quality assurance.

www.scat-europe.com

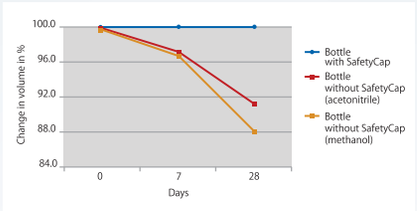


Fig. 2 Changes in volume of methanol and acetonitrile.

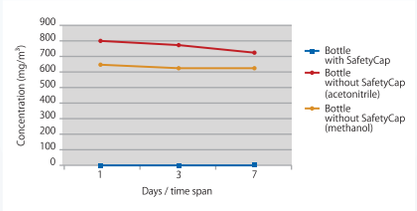


Fig. 3 Methanol emissions and acetonitrile emissions in the test chamber.

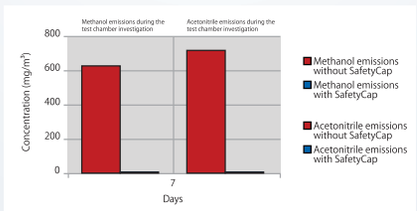


Fig. 4 Methanol emissions & acetonitrile emissions in the test chamber

www.scat-europe.com

Unichrome®

S·C·A·T europe®

How do you extract your solvents?

DANGEROUS

Solvent extraction with S.C.A.T.

SAFE

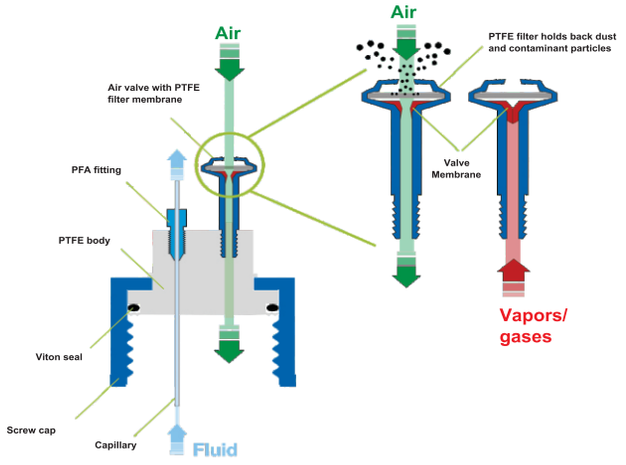
Unichrome®

S·C·A·T europe®

EXTRACTION SYSTEMS

SafetyCaps – The technology

Thenew,improvedairvalvecombinesvalveandfilterfunctions.Asusual,ventilationoccurs duringremoval;harmfulsolventvaporsareblocked.Atthesametime,thevalvemembraneabsorbs dustandcontaminantparticlesfromtheincomingair.Thevalvealsofitsyourexistin gS.C.A.TSafetyCaps withoutanytechnicalmodification.**Since the filter membrane absorbs contaminants from the surrounding air, it is recommended that the valve be replaced every 6 months in order to ensure flawless operation.**



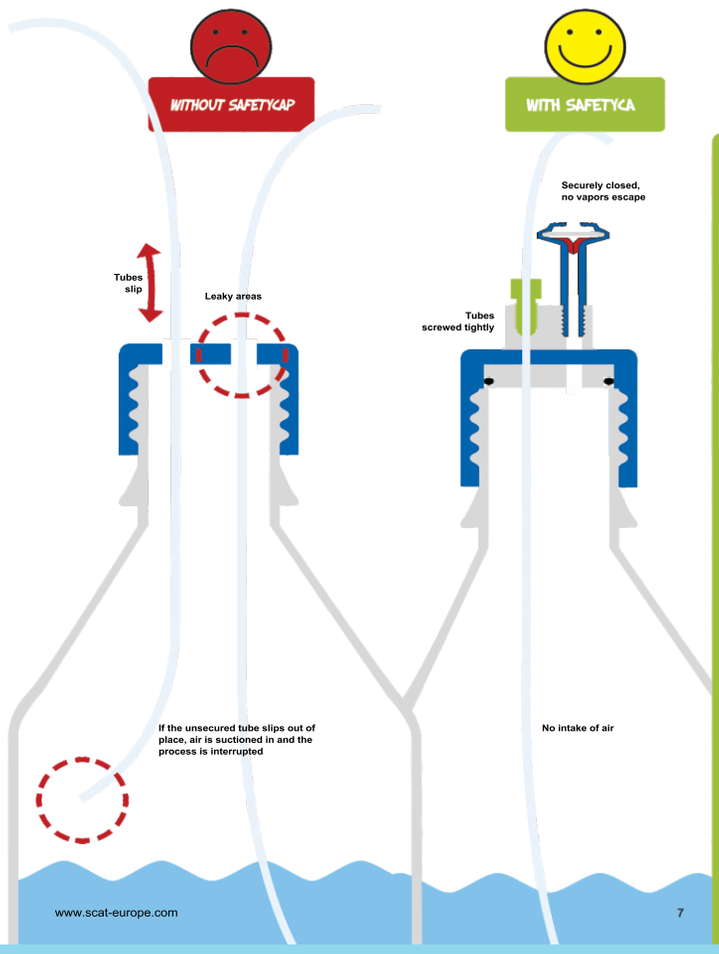
» **No more harmful vapors**
thankstotheintegratedairvalve.

» **No eluent contamination**
Receptaclesremainsecurelyclosedso theresultsofyouranalyesstaycorrect.

» **No tube slippage**
...sonoaccidentialintakeofairintothe HPLCsystem.Nointerruptionofanalytical andworkprocessesduetoairpocketsin thetube.

» **Easy container changes**
thankstoafreely-rotatablecap,even withtubesinstalled.Withouttwistingor "tangledtubes".

» **Confidence during audits**
WithS.C.A.T.systems,youpassquality andsafetyinspectionswithconfidence.



SafetyCaps
Thread GL 45
for the preparative HPLC

NO HALFWAY MEASURES

The red air valve is specially designed for preparative HPLC operation and easily delivers supply amount of up to 400ml/min (Blue air valve up to 150ml/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 161). We would also be happy to produce individual solutions for you.

Fig.	Part No.	Description	Thread size	Connector ∅ 3.2 mm OD (1/8 Zoll)	Connector ∅ 4,76 mm OD (3/16")	Connector ∅ 6,35 mm OD (1/4")
A	107 007	SafetyCap I (1/4")	GL 45	-	-	1x
B	107 008	SafetyCap II (1/4")	GL 45	-	-	2x
C	107 009	SafetyCap II (1/8" + 1/4")	GL 45	1x	-	1x
D	108 032	SafetyCap I (3/16")	GL 45	-	1x	-
E	109 032	SafetyCap II (3/16")	GL 45	-	2x	-
F	110 032	SafetyCap III (3/16")	GL 45	-	3x	-
G	117 011	Air valve (preparative) up to 400 ml/min.	UNF 1/4" 28G	-	-	-
-	107 064	PFA fitting 3,2mm ∅ (1/8")	UNF 1/4" 28G	-	-	-
-	107 045	PTFE fitting 4,76mm ∅ (3/16")	UNF 5/16" -24	-	-	-
-	107 044	PTFE fitting 6,35mm ∅ (1/4")	M 10x1	-	-	-

» **Valve power**
Redairvalveforhigher supplyvolumesupto 400ml/min.

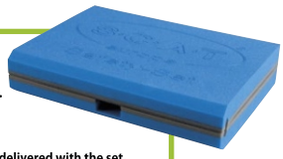
» **No halfway measures**
Connectorsforlarger extractiontubeswithupto ∅6.35mmouterdiameter.

SCOPE OF DELIVERY
Air valve and fittings are included in the scope of delivery.

www.scat-europe.com

EXTRACTION SYSTEMS

SafetyCaps
Thread GL 45
HPLC starter kits



» **Extraction initial equipment for a HPLC system.**

» **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.**

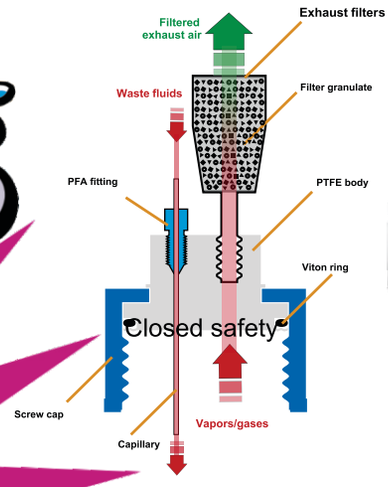
Fig.	Part No.	Description	Inhalt
A	199 200	HPLC SafetySet 1	3x SafetyCap I (107 019) 1x SafetyCap II (107 909) 1x blind plug (160 501)
B	199 201	HPLC SafetySet 2	4x SafetyCap II (107 909) 4x blind plug (160 501)
C	199 210	HPLC SafetySet 3 (fire resistant)	3x SafetyCap I fire resistant (112 019) 1x SafetyCap II fire resistant (112 909) 1x blind plug (160 501)

www.scat-europe.com

WASTE SYSTEMS

SafetyWasteCaps – The concept

The fluids in the waste containers in the laboratory are overwhelmingly poisonous– the use roften does not know which mixture can emerge in the canisters. systems from S.C.A.T. Europe offer reassuring protection and also guarantee efficient work in the laboratory.



» **Filter systems against harmful vapors**
You will find exhaust filters in different sizes

» **Different thread sizes**
Use Safety Waste Capson your availablec ontainers, or order the appropriate canisters at the same time!

» **Resistant against aggresive media**
Because they are made of pur ePTFE and PE-HD, SafetyWasteCaps are resistant against organic solvents, acids and lyes.

SafetyWasteCaps
Equipment features

The exhaust filter

Exhaust filters keep your workspace safe clean. The exhaust filter is an essential component of the S.C.A.T. safety system. It cleans solvent vapors from the exhaust air and is available in different sizes.

With a specific surface of 1,200m²/g, our multi-component granulate is the optimum filter media for nearly all solvent vapors. It is based on active charcoal and contains additional components which prevent sticking or clump formation and so prevents restriction of the filter performance. 99% of the volatile substances

» **Up to 120,000 m² filter surface**
» **Multi-component granulate prevents clumping**
» **You will find filters in different sizes**

Exhaust filter with change indicator

Exhaust filters are permanently exposed to vapours, dust particles and pollutants. Exchange saturated filters within their service life to maintain your workspace safety. With the useful **change indicator** the inspection is easier than everbefore.

Install the exhaust filter as usual on your solvent reservoir. The filters fit to all S.C.A.T.waste systems. By pushing the button the activation is done. The change indicator shows the elapsed service life clearly andiseasytoobserve.

Size S
Part No. 610 534
Service life
3 months

Size M
Part No. 610 535
Service life
6 months

» **Safety at the push of a button!**

» **Easy to activate and to change at the right time**

SAFETY FUNNELS

Together with our users, we have further optimized the S.C.A.T. safety funnels. The new design is optimized for areas with low ceilings. The PE-HD filters are suitable for all types of chemicals. The models in black are electrically conductive as well and are delivered with a grounding clamp.

Filters with integrated ball valve make sure that the containers remain securely closed after filling. The screw cap rotates freely, making it easier to unscrew the funnel.

» Optimal protection when collecting waste fluids in laboratories and technical schools

» What does disposal of waste fluids look like?

Even laboratories often have archaic conditions for this. Open canisters and funnels, often without collecting tray – in the rarest cases, positioned under the exhaust – this is what the tragic reality looks like. But now there are closure systems corresponding to nearly all current waste containers, so retrofitting is easy to carry out without sacrificing flexibility.

» Conclusion

Those who want to get their waste disposal under control and to create ideal solvent conditions for their HPLC need a coherent concept. And S.C.A.T. Europe can provide this. More protection for humans and the environment: Our safety funnels are a one-time investment for many years of health and safety.

- » Made of high quality PE-HD
- » For all types of chemicals
- » Different thread sizes
- » Adapters for barrels available
- » All models with sieve
- » Low design – also fits beneath low work surfaces
- » Sieve can be removed for cleaning
- » Electrically conductive version also available

- » New design
- » Improved handling
- » Optimized application possibilities
- » Worldwide unique

Safety»funnels With»ball»valve

» Useful angle adapter on Page 171: Just place your laboratory bottles on the sieve and let them drip down.

CONTAINERS WITH LEVEL CONTROL STARTING FROM

» Sieve
For trapping stirrers or larger contaminant particles. Now made of PE-HD instead of stainless steel, so no corrosion by acids or lyes.

» Splash protection
For uniform discharge without splashes.

» Ball»valve
The ball floats and automatically closes after filling. For the disposal of small quantities and sticky liquid waste into the container, we recommend to rinse enough with water after using the funnel with ball valve, to prevent a potential sticking or stucking of the ball valve.

» Freely rotatable cap
In different thread sizes for a wide variety of containers You will find suitable canisters starting from Page 144.

» Safety lance
Ensures clean outflow without contaminating the container opening. With electrically con ductive funnels (black), the lance facilitates a safe additional grounding of the contents.

» Electrically conductive PE-HD
Models in black are made of electrically con ductive PE-HD and have a ground connection to prevent sparking hazards.