

The next Level!

Mac-Mod Safety **Waste** Caps

Collect HPLC / UHPLC Waste safely

2.0



Mac-Mod SafetyWasteCaps 2.0

The next Level!



NEW: Exhaust Filter available in 2 versions:



NEW: With label

Fill in the date of expiry by hand



With change indicator

Press the button to activate the countdown for the service life.



NEW: PFA Fittings

Improved design for easy tubing connection
Excellent chemical resistance
Flammability classification V-0 (UL-94)

NEW: Medical Grade PTFE

Excellent chemical resistance
Food safe
FDA compliant
Flammability classification V-0 (UL-94)

NEW: Insertion Label

Mark your bottles with individual descriptions



NEW: PPS Screw Cap

Autoclavable / sterilisable up to 200 °C
Flammability classification V-0 (UL-94)

NEW: Ergonomic Design

Enhanced stability and construction
Improved handling
Easy installation
Smart exchange



Fire Protection / Flammability Classification according to UL-94

In case of fire, each second counts. Flame resistant materials can save lives and provide rescue teams with more time to react in case of an emergency.

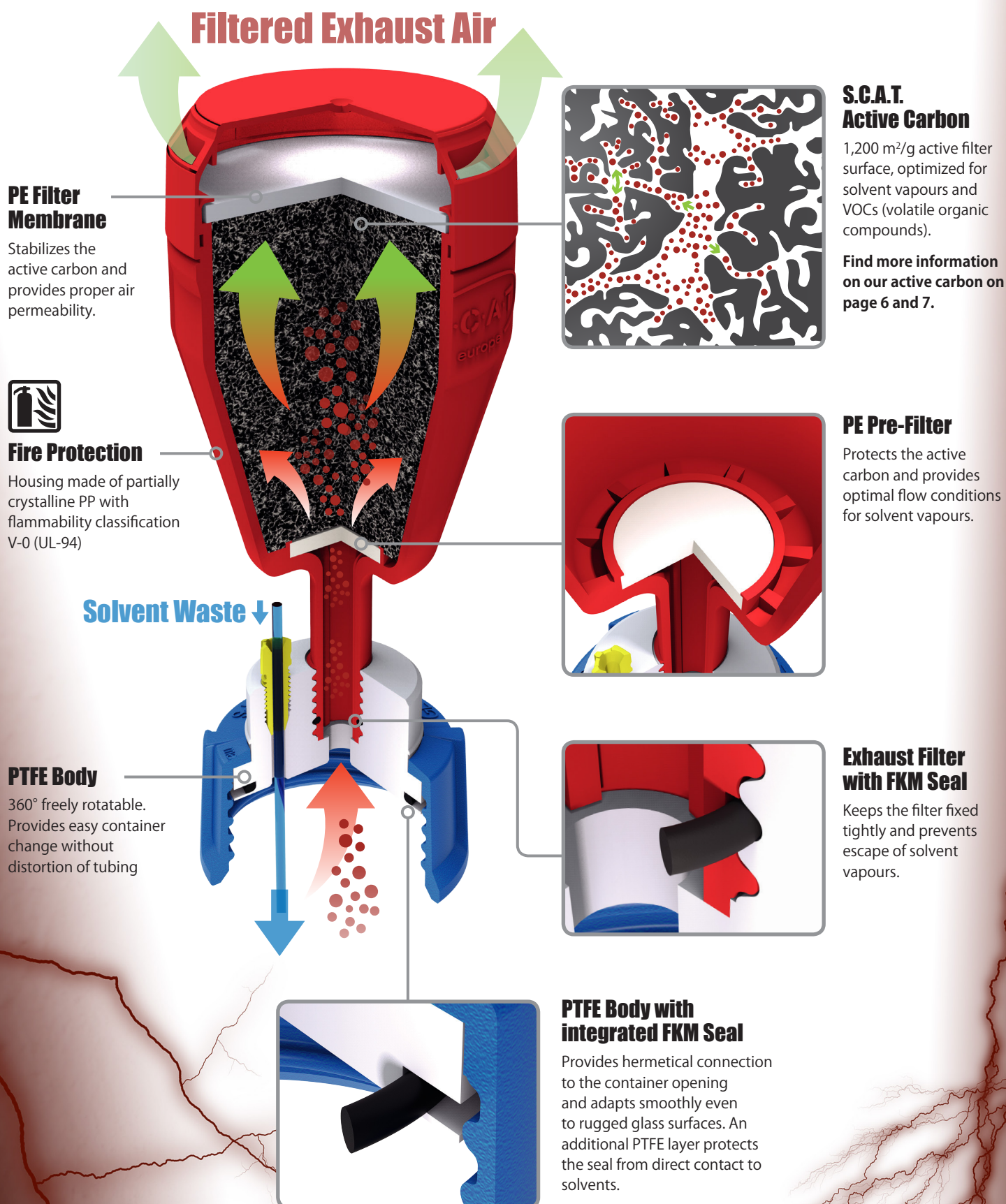
UL-94 is an international standard to classify the flammability of plastics. UL-94 can also be found in IEC/DIN EN 60695-11-10 and -20.

V-0 is the highest classification with the following requirements to the plastic material:

- Burning stops within 10 seconds on a vertically fixed specimen.
- No drips of inflamed particles allowed.
- Maximum afterglow of 30 seconds.

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GL 45 Thread



Standard connections for HPLC tubing with 2.3 and 3.2 mm outer diameter.

Each cap comes with fittings for both tubing sizes.



Connections for larger tubing with 6.4 - 9 mm inner diameter. The tube connector is included in delivery.



Thread size of the screw caps: GL45 is the most common thread for solvent supply and waste bottles in laboratories. Find adapters for other thread sizes at:

www.mac-mod.com



Fig.	Part No.	Description	Thread size	Connections for Ø 2.3 / 3.2 mm OD tubing	Connections for Ø 6.4 - 9 mm ID tubing	Blind plugs for tubing connection	Service life (in months)	Unit
A	MMSAFEW23	SafetyWasteCap GL 45, V2.0	GL 45	3 x	-	1 x	-	1
B	MMSAFEW24	SafetyWasteCap GL 45, V2.0	GL 45	2 x	1 x	2 x	-	1
C	MMSAFEW26	SafetyWasteCap GL 45, V2.0	GL 45	4 x	1 x	2 x	-	1
D	MMEFMV2	Exhaust filter size M, V2.0, with splash protection and label	GL 14	-	-		6	1
E	MMEFMV2E	Exhaust filter size M, V2.0, with splash protection and label Economy package	GL 14	-	-		2x 6	2
F	MMSCEF2	Exhaust filter size M, V2.0, with splash protection and change indicator	GL 14	-	-		6	1
G	MMSCEF3	Exhaust filter size M, V2.0, with splash protection and change indicator Economy package	GL 14	-	-		2x 6	2

Mac-Mod SafetyWasteCaps 2.0 Exhaust Filters



Recommended service life when using LC-typical organic solvents and solvent mixtures.

MMEFMV2

D



6 months

With label



MMEFMV2E

E



Economy package
2x 6 months



MMSCEF2

F



6 months

With change indicator



MMSCEF3

G

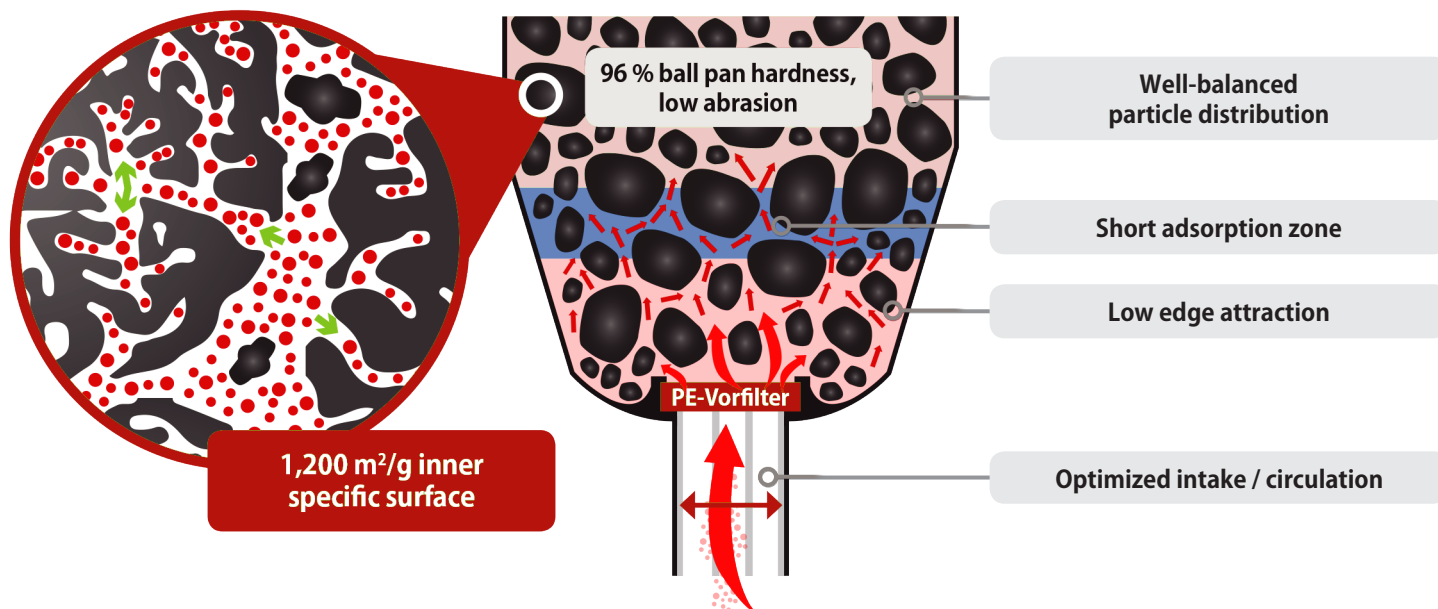


Economy package
2x 6 months



Active Carbon Important Facts

(Schematic view - not true to scale)



Specifications

S.C.A.T. active carbon is a steam-activated, cylindrically shaped charcoal, based on mineral coal, with excellent hardness and mechanical abrasion resistance. It provides a particular pore structure and can be regenerated with steam or hot gas. It is usually applied for solvent recovery and exhaust air purification for the separation of organic substances.

Edge attraction and bulk density

Due to their flow behaviour, solvent vapours and gases take the line of the least resistance when passing the filter. Active carbon with undersized particles (e.g. powder) or inappropriate density would lead to improperly high resistance.

Clumping and agglutination of improper active carbon particles causes gaps between filter housing and active carbon filling, resulting in unfiltered escape of vapours. This is commonly described as edge attraction.

Particle size, density and particle distribution of S.C.A.T. active carbon provide the best possible flow characteristics for solvent vapours, and minimize edge attraction as well as risks of air pollution. The filter design supports optimal vapour distribution for maximum filter performance.

Inner specific surface

The inner specific surface is one of the most important indicators for active carbon filter performance. Higher inner specific surface means more available space and performance for adsorption of solvent vapours.

Common types of active carbon (e.g. powder) provide an inner specific surface of 500 - 600 m²/g. S.C.A.T. active carbon provides 1,200 m²/g and sets the benchmark for filtration of organic solvent vapours in the field of instrumental analytics.

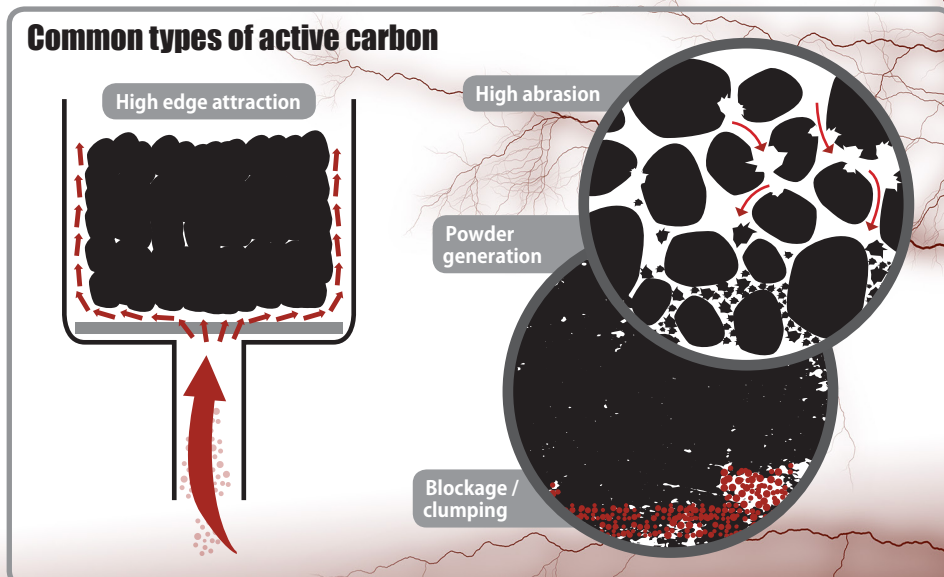
Abrasion and ballpan hardness

External motion impact (e.g. during transport) causes pressure and friction of active carbon particles to each other. This leads to abrasion and precipitation of smallest particles (powder).

Higher abrasion leads to blockage and clumping, resulting in lower filter performance and high edge attraction of solvent vapours.

Particles with high ball pan hardness provide higher resistance to abrasion, and ensure constant filter performance.

Common types of active carbon



Active Carbon Important Facts

		Test method
Bulk density	410 ± 30 kg/m ³	ASTM D 2854
Specific humidity (% of weight)	< 5 %	ASTM D 2867
Benzene adsorption (% of weight) out of air at 20 °C <small>* p/p_s = relative saturation (Saturation concentration at 20 °C, 320 g/m³)</small>	p/p_s*	Value
	0.9	45 ± 2 %
	0.1	36 ± 2 %
	0.01	28 ± 2 %
	0.001	17 ± 2 %
Inner specific surface	1,200 m ² /g	DIN ISO 9277
Particle diameter	2 - 4 mm	ASTM D 2862
Ash content (% of weight)	< 10 %	ASTM D 2866
CCl₄-adsorption (% of weight)	70 %	ASTM D 5742
Ball pan hardness (% of weight)	98 - 99 %	ASTM D 3802



The specifications are based on the active carbon in its original condition. Test methods according to ASTM standards have been applied and are available on demand

Adsorption zone

Adsorption of solvent vapours starts at the filter's bottom (intake), the area of the first contact to the active carbon filling. After the particles in this area have become saturated, the vapours push along through the filter, until they meet unsaturated particles to adsorb them.

The area between saturated and unsaturated particles is commonly described as adsorption zone. A short adsorption zone protects the particles in the upper filter part from early saturation. Therefore, it takes longer time to filter breakthrough and unfiltered escape of solvent vapours.

Particle Diameter / Grain Size

In addition to its other characteristics, an appropriate particle size of the active carbon provides better flow and adsorption of solvent vapours.

Undersized particles interfere the vapour flow and cause filter blockage. Oversized particles lead to gaps, permitting solvent vapours to escape without being adsorbed.

S.C.A.T. active carbon particles are perfectly balanced for low flow resistance and high filter performance.

Ash content

The ash content is an indicator for the purity of active carbon. It specifies the content of foreign substances or elements, remaining in residual amounts after production of the active carbon.

This does not affect the basic function of the active carbon, although higher ash content can affect filter performance.

Water content

Active carbon also adsorbs moisture besides solvent vapours. The water content significantly depends on environmental conditions, such as air humidity, temperature, air circulation etc.

S.C.A.T. active carbon holds a water content of less than 5% in its original condition.

CCl₄ Adsorption / Butane Activity

The carbon tetrachloride activity specifies the active carbon's charge with CCl₄ per cent by weight. It is an indicator of the pore volume.

Due to toxicity and hazardousness of CCl₄ to human health and environment, the carbon tetrachloride activity has been replaced by the butane activity. Butane activity is a derivative of the CCl₄ activity, and can be converted as follows:

Butane activity = CCl₄ activity / 2.55



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