

Weber cooling water filters for engines



Why Weber water filters?

Weber water filters

- reduce operating costs
- prolong the lifetime of engines/ hot water systems

What are the filter features?

Weber filters help to achieve optimum protection by

1) Mechanical Filtration

Particles such as foundry sand and oxidation products get filtered -abrasion at high water speeds, blockages and sludge deposits are avoided.

2) Reduction of Corrosion and Cavitation

All metal surfaces - including aluminium- are protected by chemical inhibitors which improve protection against corrosion and cavitation.

3) Prevention of Scale

Water-hardening minerals are filtered to prevent scale formation, thereby avoiding damage due to overheating.

4) pH Control

Buffer chemicals maintain the pH value of the coolant at a weak alkaline level. This protects the engine against corrosion caused by acidic or extremely alkaline water.

5) Reduction of Electrolysis

Chemical inhibitors form a protective film which insulates the metal surface and reduces galvanic corrosion. No negative impact on heat transfer.

Where are Weber water filters used?

- Weber water filters are suitable for all water-cooled engines used in light or heavy vehicles, ships or for power generation (20 - 5,000 liters of cooling water capacity)
- Weber water filters can be used for any closed (hot) water system - including heating or industrial applications (up to 42 m³ of water capacity)
- As bypass installation the filters confirm in constant tests their effectiveness at
 - working pressures up to 4 bar (burst pressure: 16 bar)
 - temperatures up to 125°C



Cylinder liner of an engine with anti-corrosive agents

Cylinder liner of an engine without anti-corrosive agents

„For water cooled engines 40% of all troubles are caused by the cooling system“ (Allianz AG, 1980)

Weber Pot Filters



Weber Pot Filters can be used in water systems of 50 - 5,000 liters in capacity. Their main advantage is the modular design which enables a quick filter cartridge replacement without disposal of the housing. Thereby, costs and environmental impact are kept at minimum levels.

Weber Pot Filters are delivered with housing, filter cartridge, sacrificial anode and connection pieces for installation. Mounting kits including hose or steel pipe can be purchased separately. Replacement parts are listed under „Maintenance“.

Water Quality

Drinking water or desalted water should be used for cooling, with chloride and sulphate ions together not exceeding 200 mg/l.

The following points concerning water hardness must be observed:

- 0 – 15° dGH: may be used without restrictions
- 16 –30° dGH: change filter after the first 100 operating hours if extensive fresh water amounts have been filled
- > 30° dGH: the water must be softened or mixed with soft water in order to reduce hardness to below 15° dGH

Types overview of Weber pot filters

System-capacity/liters	with anti-corrosive agents		without anti-corrosive agents		Part No.Mounting Kit	
	Filter type	Part No.	Filter type	Part No.	with hose	w.steel pipe
50 - 125	BT 100	421701	BTOC 200	422802	422832	422834
125 - 250	BT 200	421702	BTOC 200	422802	422832	422834
250 - 500	BT 400	421703	BTOC 400	422803	422832	422834
400 - 750	BT 750	421308	BTOC 750	422803	422832	422834
750 - 1500	BT 1500	421309	BTOC 1500	422809	422832	422834
1500 - 2250	BT 2250	421225	BTOC 2250	422810	422832	422834
2250 - 3000	2xBT 1500	421309	2xBTOC 1500	422809	422833	422835
3000 - 5000	2xBT 2250	421225	2xBTOC 2250	422810	422833	422835
>5000	on request					

Weber Filter Cartridges



Types overview of Weber filter cartridges

System-capacity/liters	with anti-corrosive agents			without ant-corrosive agents		
	Filter type	Cartridge type	Part No.	Filter type	Cartridge type	Part No.
50 - 125	BT 100	WE 100	421705	BTOC 200	WOC 200	421855
125 - 250	BT 200	WE 200	421706	BTOC 200	WOC 200	421855
250 - 500	BT 400	2xWE 200	2x421706	BTOC 400	2xWOC 200	2x421855
400 - 750	BT 750	WE 750	421310	BTOC 750	WOC 750	421858
750 - 1500	BT 1500	2xWE 750	2x421310	BTOC 1500	2xWOC 750	2x421858
1500 - 2250	BT 2250	3xWE 750	3x421310	BTOC 2250	3xWOC 2000	3x421000
2250 - 3000	2xBT 1500	4xWE 750	4x421310	2xBTOC 1500	4x WOC 750	4x421858
3000 - 5000	2xBT 2250	6xWE 750	6x421310	2xBTOC 2250	6xWOC 2000	6x421000
>5000	on request					

Weber Filter Cartridges are the core element of the **Weber Pot Filter** systems. They are high quality products that work effectively in cold and hot temperature ranges and operate at standard working pressures for cooling/ heating systems.

The choice between cartridge types **WE** and **WOC** depends on the type and amount of chemicals used for water treatment. The application of multiple anti-corrosive agents should be avoided.

Weber Filter Cartridges are designed for Weber filter housings but also fit into comparable filter systems of other suppliers. Please contact us for more detailed information.

Weber Filter Cartridges should be changed before their protective function gets lost. Therefore, engine manufacturers often issue instructions for maintaining cooling systems and filters. If no other information is available, please follow the **minimum requirement for replacement**:

- every 60,000 km or
- every 3500 operating hours or
- every 6 months

Weber Spin-On Filters



Weber Spin-On Filters are easy in handling and are used for water treatment in closed (hot) water systems. Application examples include engine cooling for heavy trucks and power generation.

Weber Spin-On Filters are delivered with anti-corrosive agents which dissolve within 10 hours after installation. Filters should be used in combination with **Weber Liquid BL1**. Mounting-kits including hoses or steel pipes can be purchased separately. **Weber Spin-On Filters** get completely replaced following standard maintenance guidelines (page 8). No tools are needed for replacement.

Types overview of Weber Spin-on filters

System-capacity/liters	with anti-corrosive agents		without anti-corrosive agents		Part No. Mounting Kit	
	Filter type	Part No.	Filter type	Part No.	with hose	w.steel pipe
10 - 20	BS 20	421241	-	-	421925	422830
20 - 40	BS 40	421247	BOC 40	421362	421925	422830
40 - 60	BS 60	421243	-	-	421925	422830
	BS 61M 1)	421245	-	-	421925	422830
60 - 80	BS 80	421249	BOC 80	421361	421925	422830
80 - 100	BS 100	421248	BOC 100	421360	421925	422830
100 - 150	BS 150	421252	-	-	421925	422830
150 - 200	2xBS 100	2x421248	-	-	on request	on request
200 - 300	2xBS 150	2x421252	-	-	on request	on request

1) BS 60 housing with M16 x 1,5 metric thread

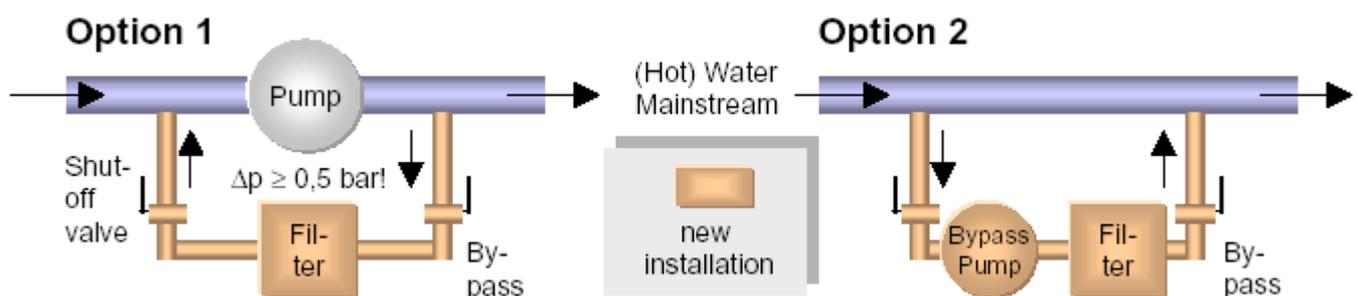
Environmental Safety Requirements:

Weber Liquid BL 1 chemicals will not adversely affect oil separation and no emulsification takes place.

Water containing **Weber Liquid BL 1** must be disposed of in the proper way, i.e. via a sewage system with treatment facility. Moreover, local legislation on water economy must also be observed.

Weber Liquid BL 1 is alkaline. Avoid contact with your skin. Any splashes should be washed off immediately with soap and water. Wash eyes with plenty of water. If irritation persists, consult your doctor. If swallowed, consult your doctor immediately. **Keep out of the reach of children.**

Installation



Important Guidelines:

- 1) The filter should be mounted in a position which is **readily accessible** for maintenance and cleaning.
- 2) The filter must be in a position which is lower than the expansion tank.
- 3) The inlet and outlet lines for the filter (bypass lines) should be connected immediately behind the outlet and before the inlet of the water pump.
- 4) When selecting the points of connection for the hoses/ pipes from and to the filter a pressure difference of at least 0.5 bar must be given while the engine is running at its rated speed.
- 5) Inlet and outlet hoses/ pipes of the bypass installation should be kept as short as possible.
- 6) The inlet and outlet hoses/ pipes must be fitted with shut-off valves.
- 7) Weber filters are normally connected to the engine with hoses; the Weber pressure hose which is rated for a working pressure of 14 bar and has a bursting pressure of over 30 bar guarantees a high degree of safety. Installation using steel pipes is in accordance with the rules of the classification societies and guarantees an even higher degree of safety.

For first time installation add 4% of Weber Liquid BL1 for optimum protection against corrosion

Additional information:

- For installation we recommend to use Weber fittings. These parts have an amply rated cross-sectional area, thus ensuring optimum filtration.
- The connection threads on Weber Pot Filters are 3/8" NPT. Adapters for all sizes of thread are available.
- The higher the pressure difference for the bypass the more efficient will be the filtration effect, as more water passes through the filter.
- 2%-3% of the circulating water flows permanently through the bypass. Thereby, approximately 90% get filtered within 40 working hours.
- The built-in restrictor in the filter limits the rate of water flow, avoiding to adversely affect the process of heat exchange in the engine.
- Winter operations: Weber filter chemicals may only be used in conjunction with pure ethylene or propylene glycol.

Maintenance and Testing

For filters containing anti-corrosive agents the chemical will dissolve within the first 10 operating hours to become fully effective. To guarantee optimum protection the concentration of the filter chemical has to be checked regularly. For low concentrations the chemical has to be replenished. In addition, clogging of the filter bypass has to be avoided. Please follow the maintenance instructions issued by the engine manufacturer. If they are not contradictory you may proceed as follows.

We suggest water checks using the **Weber Test Box** or the **Weber Test Strips**

- for extensive water losses: **weekly Filter replacement** if concentration of anticorrosive agent is too low (<4%)
- for light water losses: **monthly Filter replacement** if concentration of anticorrosive agent is too low (<4%)

Minimum requirements:

Change of all filters:

Every 60 000Km or every 3500 operating hours or at least every 6 months
Every 12 months(for emergency systems with 100-200 h/a operating time)

Change of WE/BS filters, fresh water should contain 4% of Weber BL1

Complete water/coolant change
System has been replenished with >40% of fresh water

- Any water losses of up to 20% may be compensated by topping up with drinking water
- Concentration levels up to 10% will not cause any damage or heat exchange problems
- Weber filter chemicals may not be used in conjunction with any other anti-corrosive agents
- For cleaning the water system do not use any chemical cleansing agents.

Types overview of replacement parts

Filter type	Filter Cartridge	Cover Gasket	Sacrificial Anode	Service kit
	Part No.	Part No.	Part No.	Part No.
BT 100	421705	421707	1x421240	421718
BT 200	1x421706		1x421240	421719
BT 400	2x421706		2x421240	421720
BT750	1x421310	421238	1x421240	421442
BT 1500	2x421310		2x421240	421445
BT 2250	3x421310		3x421240	421448
BTOC 200	1x421855	421707	1x421240	421721
BTOC 400	2x421855		2x421240	421722
BTOC 750	1x421858	421238	1x421240	421723
BTOC 1500	2x421858		2x421240	421724
BTOC 2250	3x421858		2x421240	421725

with chemicals

without chemicals

Service kit

- Filter cartridge
- Cover gasket
- Sacrificial anode
- Test strips



Frequently asked questions

Do Weber Filter Cartridges fit into Perry filter housings?

Yes, the Weber Filter Cartridges WE 450 and WOC 450 are designed to fit Perry M100, M200 and M300 filter housings

Weber Filter Cartridge	Part No.
WE 450 (with filter chemical)	421 342
WOC 450 (without filter chemical)	421 857

May Weber Filter Systems be used for applications other than engine cooling?

Although **Weber Filter Systems** have proven to be very protective for engines in ships, trucks or small power stations they fit perfectly into any closed water system which is used for heating or cooling, with operating pressures up to 4 bar and temperatures up to 125 °C.

Do Weber Filter Systems have any negative impact on heat transfer rates?

Since **Weber Filter Systems** operate as by-pass installations only, no more than 2-3% of the circulating water flows permanently through the filter. Therefore, no negative impact on heat transfer rates is known.

May Weber Pot Filters or Weber Spin-On Filters be installed in parallel?

Yes, by using standard mounting parts filters can be installed side-by-side, thereby doubling the capacity. No more than 2 filters should operate in parallel, though.

Does water quality make any difference for Weber Filter Systems?

Yes, the softer the water the better in terms of scale prevention and life time. Prior water treatment is needed only if hardness exceeds 30° dGH (please refer to product brochure).

Desalted water and water with ethylene/ propylene glycol is more protective in combination with **Weber Anti-Corrosive Agents** than standard drinking water.

Does installation impact the effectiveness of Weber Filter Systems?

Yes, the higher the pressure difference between inlet and outlet the better the performance

- a by-pass pump can be installed if necessary. Pressure losses caused by long hoses, pipes or 90° connections should be minimized. The outlet of Weber Pot Filters should be at the bottom.

What is the Weber filter maintenance interval for utility vehicles such as tractors?

The Weber filter maintenance interval for utility vehicles such as tractors is defined at 500 operating hours, based on a six month service period and 1000 hours running time per year.

Technical Data

Weber Spin-On Filters BS

Filter type	Part No.	Diameter/mm	Height/mm	Vol/t(Dp=1 bar)	Test Pressure
BS 20	421241	93	112+2	8,00L/min	16 bar
BS 40	421247	93	112+2	8,78L/min	16 bar
BS 60	421243	93	141+2	8,75L/min	16 bar
BS 80	421249	93	141+2	8,65L/min	16 bar
BS 100	421248	93	175+2	8,48L/min	16 bar
BS 150	421252	93	209+2	8,78L/min	16 bar

Weber Spin-On Filters BOC

Filter type	Part No.	Diameter/mm	Height/mm	Vol/t(Dp=1 bar)	Test Pressure
BOC 40	421362	93	85	8,78L/min	16 bar
BOC 80	421361	93	114	8,65L/min	16 bar
BOC 100	421360	93	141	8,48L/min	16 bar

Weber Pot Filters BT

Filter type	Part No.	Diameter/mm	Height/mm	Vol/t(Dp=1 bar)	Test Pressure
BT 100	421701	177	249	-	-
BT 200	421702	177	249	-	-
BT 400	421703	177	365	-	-
BT 750	421308	267	229	-	-
BT 1500	421309	267	349	-	-
BT 2250	421225	267	469	-	-

Weber Pot Filters BTOC

Filter type	Part No.	Diameter/mm	Height/mm	Vol/t(Dp=1 bar)	Test Pressure
BTOC 200	422802	177	249	-	-
BTOC 400	422803	177	365	-	-
BTOC 750	422808	267	229	-	-
BTOC 1500	422809	267	349	-	-
BTOC 2250	422810	267	469	-	-