

# Horizontal Pressure Leaf Filter Systems

## LIQUID SULPHUR FILTRATION

**Amafilter® specializes in providing effective filtration solutions for the mines & minerals market.**

Amafilter® have been designing and manufacturing horizontal pressure leaf filter systems for the liquid sulphur industry for over 90 years. The amafilter® horizontal pressure leaf filter system is a closed system ideally suited for both main and safety/polishing filtration of molten sulphur applications.

In the sulphur industry, horizontal pressure leaf filter systems are generally used for the filtration of liquid sulphur, as they efficiently remove ash and other filterable impurities. After filtration, the maintenance interval of the sulphur burners, catalyst beds and pipe reactors is significantly improved, resulting in lower maintenance costs. A molten sulphur filter system typically consists of a two stage filtration system. This system consists of a horizontal pressure leaf filter system followed by a polishing/safety cartridge filter. Amafilter® design and manufacture horizontal pressure leaf filter systems, also described as a Retractable Bundle or Shell type filter system.

The Amafilter® pressure filter leaf systems is also available as an advanced modularized pre-assembled mobile filtration system which can be tailored made to customers specific requirements.

### HORIZONTAL PRESSURE LEAF FILTER SYSTEMS ADVANTAGES

- The pressure filter leaf elements have been specifically designed to provide a large filtration area.
- Produce high filtrate clarity after the clarification run. Different types of filter aids can be used in our pressure leaf filter systems to improve high filtrate quality.
- Available as tandem units to save floor space.
- A heating jacket is available in order to maintain the high process temperature.

### HORIZONTAL PRESSURE LEAF FILTER ELEMENTS ADVANTAGES

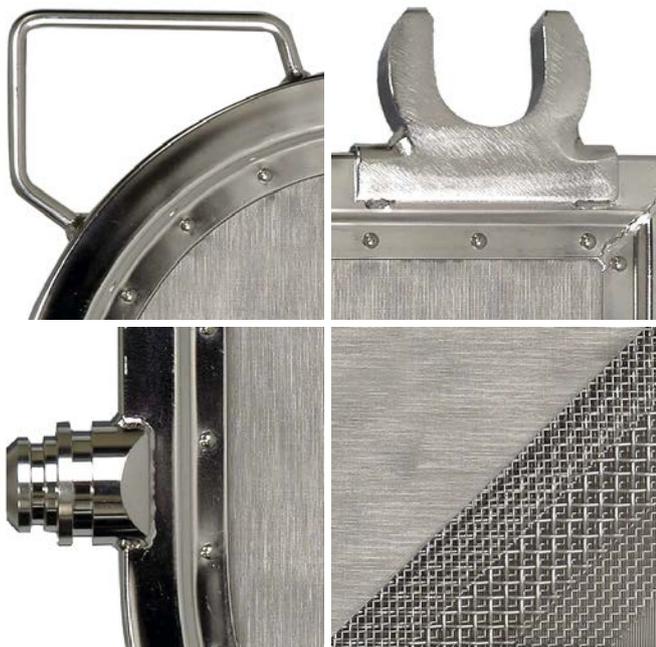
- The double sided riveted or bolted filter leaves with reinforced binding (to protect the rim during manual cake removal by tapping) are made from stainless steel. The rigid pressure filter leaves have five layers of stainless steel wire mesh.
- The pressure filter leaves are easy to clean.
- The pressure filter leaves spacing is 125 mm, to allow for pre-coat and longer filtration times.
- The pressure filter leaves are individually mounted on the central manifold, enabling the removal of any or all of the pressure filter leaves easily and quickly.



### PRESSURE LEAF FILTER SPECIFICATIONS:

- Proven technology.
- Fully automated, making it safer to operate and requiring limited maintenance, hence lowering operational costs.
- Larger filtration area due to the shape of the filter leaf elements.
- The horizontal pressure leaf filter system is a closed filtration system, making it safe to operate.
- Easy access to the filter leaves for removal of the cake.
- Shorter regeneration time between filtration cycles, lowering operating costs as the filter can filtrate for longer periods without disruptions.
- The pressure leaf filter system has no rotating parts, keeping maintenance to a minimum.
- Exchangeable inlet manifold side bars on each side of the filter elements to ensure easy access.





AUTOMATION



VALVES, INSTRUMENTATION AND AUXILIARIES

### SPECIFICATIONS:

Criteria	Detail
Tank Material	Carbon Steel
Filter Elements Material	Stainless Steel
Design Pressure	-1/6 bar(g)
Design Pressure Steam Jacket	-1/7 bar(g)
Design Temperature	0/170 °C
Max. Allowable Pressure Drop	4.5 bar
Design	ASME VIII div 1 Others upon request
Approval	PED 97/23/EC SELO 02257 (China) TR CU (EACU) Others upon request

Connections	36H	48H	60H	72H
Inlet	DN80/50	DN80/50	2xDN100/80	2xDN200/150
Outlet	DN80/50	DN80/50	DN100/80	DN250/200
Vent	DN80/50	DN80/50	DN80/50	DN125/80
Drain	DN80/50	DN125/100	2xDN150/100	2xDN150/100
Air/Steam	DN80/50	DN80/50	DN80/50	DN80/50
Steam Jacket	DN25	DN25	DN25	DN25

Model	Filter area m <sup>2</sup>	Cake volume dm <sup>3</sup>	Filter volume dm <sup>3</sup>	Leaf spacing mm	Filter leaves #	Floor space mm	Height mm
<b>36H</b>							
36H-60-S-5	5.6	225	1080	125	8	1500 x 3550	2150
36H-80-S-5	7.6	305	1320	125	11	1500 x 4300	2150
36H-110-S-5	10.4	415	1630	125	15	1500 x 5300	2150
36H-140-S-5	13.2	530	1940	125	19	1500 x 6300	2150
<b>48H</b>							
48H-190-S-5	18	710	2850	125	13	2100 x 5800	2650
48H-265-S-5	25	985	3570	125	18	2100 x 7500	2650
48H-325-S-5	30	1205	4150	125	22	2100 x 8050	2650
48H-385-S-5	36	1425	4730	125	26	2100 x 9050	2650
<b>60H</b>							
60H-330-MS-5	31	1230	5300	125	15	2400 x 7200	3400
60H-440-MS-5	41	1640	6425	125	20	2400 x 8450	3400
60H-550-MS-5	51	2050	7550	125	25	2400 x 9700	3400
60H-660-MS-5	61	2450	8675	125	30	2400 x 10950	3400
60H-770-MS-5	72	2860	9800	125	35	2400 x 12200	3400
60H-880-MS-5	82	3270	10925	125	40	2400 x 13450	3400
<b>72H</b>							
72H-945-MS-5	88	3520	11750	125	27	3000 x 10250	4100
72H-1085-MS-5	101	4040	13050	125	31	3000 x 11250	4100
72H-1395-MS-5	130	5200	15970	125	40	3000 x 13250	4100
72H-1750-MS-5	163	6520	19220	125	50	3000 x 16000	4100

Dimensions are for reference only. Amafilter® offer a range of polishing filter systems for liquid sulphur filtration. Contact us at [www.amafiltration.com](http://www.amafiltration.com) for more information.



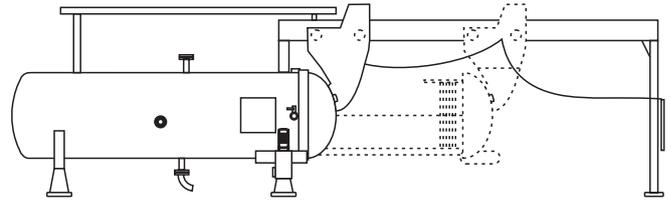
## Retractable bundle

This horizontal pressure leaf filter system has been designed with a retractable bundle.

The bundle with the installed pressure filter leaf elements can be moved in and out of the the filter body without the system being displaced.

### Features and benefits:

- The retractable bundle makes it easy and safe to access the pressure filter leaf elements for maintenance and cleaning.
- The pressure filter leaves are positioned vertically making cake discharge easy.
- The pressure filter leaf is built with reinforced binding around its full circumference to protect the rim should manual removal be required, ensuring the filter leaf durability.
- The bayonet ring allows the filter to be opened hydraulically.



*The shell doesn't move; the bundle with filter elements move in and out of the shell.*



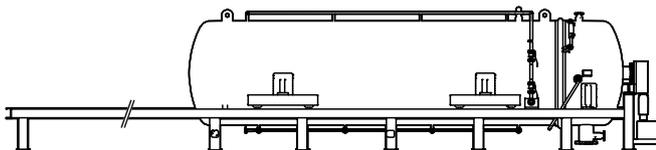
## Retractable shell

This horizontal pressure leaf filter system has been designed with a retractable shell. The bayonet ring allows the filter to be opened hydraulically.

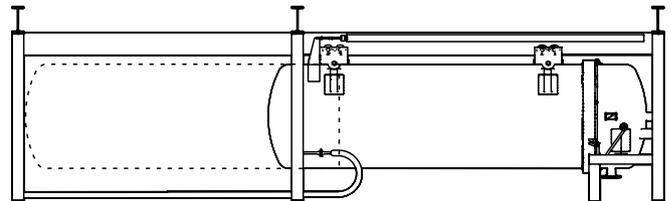
For the discharge of the cake, the internal body of the system remains in situ and the shell is moved with an electric or hydraulic control. The shell is supported by rails and moves over the bundle.

### Features and benefits:

- The retractable shell makes it easy and safe to access the pressure filter leaf for maintenance and cleaning.
- Cake discharge is easily done once the filter is opened.
- The pressure filter leaves are positioned vertically making cake discharge easy.



*Retractable shell with a lower support frame.  
The bundle does not move, the shell is supported by rails and moves over the bundle.*



*Retractable shell with an overhead suspension frame.  
The bundle does not move, the shell hangs from a support structure and moves over the bundle.*



## VC Cartridge Filter Housing

The amafilter® VC cartridge filter for molten sulphur safety/polishing filtration is used as a polishing filter for the removal of fine ash and other particles, which occasionally could find their way through (by-pass), when the main filtration is not 100% effective. The VC cartridge filter is also used as a safety filter (police) to prevent pre-coat material passing through the horizontal pressure leaf filter due to mistakes in switching valves, insufficient pre-coat and stranges in flow.

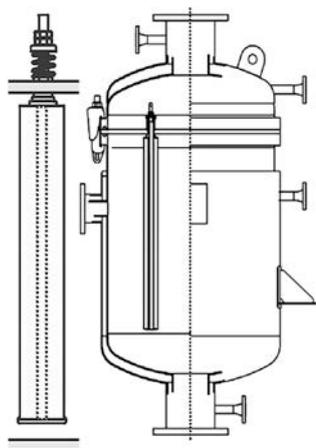
The VC cartridge filter is installed downstream the main horizontal pressure leaf filter.

### Features and benefits:

- The filter cartridges are mounted on a septum plate making it easy and quick to replace the existing filter cartridge batch with a new set, reducing servicing and minimizing downtime.
- Delivers effective polishing filtration ensuring that solid impurities are reduced from 20-30 PPM, generated by the first main filtration step, to an even lower value of 5-10 PPM. This is critical to the process as these solid impurities (contaminants) have a direct impact on the performance of the sulphur burners and catalyst converter beds (sulphuric acid production unit). They are progressively poisoned by dirt accumulation giving rise to increases in pressure drop and shorter operating durations.

The amafilter® VC polishing cartridge filter in combination with the amafilter® horizontal pressure leaf filter deliver significant benefits:

- the time between maintenance break downs (intervals) of the catalyst beds, sulphur burners and pipe reactors is considerably improved from 3-6 months to 2 years. This results in significantly lower maintenance costs.
- Improved safety as less interventions are required to optimise the system.



### STANDARD DESIGN

Criteria	Detail
Tank Material	Carbon Steel
Design Pressure	-1/6 bar(g)
Design Pressure Steam Jacket	-1/7 bar(g)
Design Temperature	0/170 °C
Max. Allowable Pressure Drop	2.5 bar
Design	ASME VIII div 1 Others upon request
Approval	PED 97/23/EC SELO 02257 (China) GOST-R (Russia) Others upon request

Model	Number of Cartridges	Inlet / Outlet	Vent	Diameter mm
20VC-72/4/2FJ-S	18	DN50	DN25	558
30VC-144/4-4FJ-S	36	DN100	DN25	812
36VC-240/4-4FJ-S	60	DN100	DN25	964
42VC-340/4-4FJ-S	85	DN100	DN25	1120
48VC-424-46FJ-S	106	DN150	DN50	1270
54VC-536/4-6FJ-S	134	DN150	DN50	1420



### The amafilter® VC cartridge filter

The Amafilter® cartridge filter for sulphur applications is normally placed after the horizontal pressure leaf filter system. Re-usable and non re-usable filter cartridges can be used with the VC cartridge filter.

As part of our product portfolio for the sulphur industry, we also offer automation, valves, auxiliaries, instrumentation, product and process support, service packages and spares parts.

### Features and benefits:

- Temperature resistant to 800 °C (can be limited by the use of gasket or sealing material)
- High corrosion resistant
- Robust mechanical characteristics
- Abrasive resistant
- Absolute filtration rating
- Easy to clean
- Proven technology
- Surface/cake filtration
- Back washable with steam
- Re-usable and as a result lower OPEX

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## Modularized advanced mobile horizontal filtration system

The amafilter® advanced modularized mobile horizontal filtration system, is a pre-assembled all-in-one automated plug & play filtration system which is tailor-made to customer specifications.

The filtration system is designed to process a daily capacity of up to 540 metric tonnes and incorporates the horizontal pressure leaf filter and cartridge filter on one skid-mounted unit. The skid includes a plug and play installation, piping, instrumentation, automation and a control panel with a programmed PLC.

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### Features & Benefits

- Plug & Play unit ready for production
- Easy to install: minimum installation required
- Cost effective: limited on-site installation costs
- Easy to connect: quick connection to utilities like air/steam/power and to molten sulphur.
- Civil works are minimised. Quick return of investment as the system can initiate production promptly once delivered
- Low transport costs as it can be transported on standard containers and flat racks system can travel on universal standard truck sizes
- Heavy Duty, design for impact resistance
- High sulphur filtrate quality removing up to a maximum of 10 ppm of solid impurities
- Exchangable inlet manifold side bars on each side give easy access to the pressure filter leavemaking maintenance easy.
- Hydraulic bayonet mechanism for ease of opening and closing system
- Piping system connection on one side of the skid for easy plug and play

