

# FILTRATION SOLUTIONS OIL AND GAS PRODUCTION



## Delivering quality filtration products...

As one of Europe's leading manufacturers of process filters, Amazon Filters is able to offer solutions for all your filtration needs.

Amazon Filters offers a comprehensive product range of filtration and separation media and its design and manufacturing expertise enables the provision of industry specific filtration systems. We manufacture a wide range of depth and pleated filters ensuring the optimum product can be supplied for the key applications found in Upstream and Downstream operations. We are able to offer both absolute and nominal rated filters with either nylon or polypropylene media. This range includes **SupaSpun II**, **SupaGard**, **SupaPleat II**, **SupaPleat FFC**, **Contour** and **VisClear** cartridges, **DuoLine** bags and **SupaMesh** metal filters. Our filters are used on many applications including Produced Water, SRP membrane protection, Amine Sweetening and Glycol streams. With operating systems positioned worldwide, Amazon Filters have built a reputation of designing high quality filter vessels to support a range of premium filters.

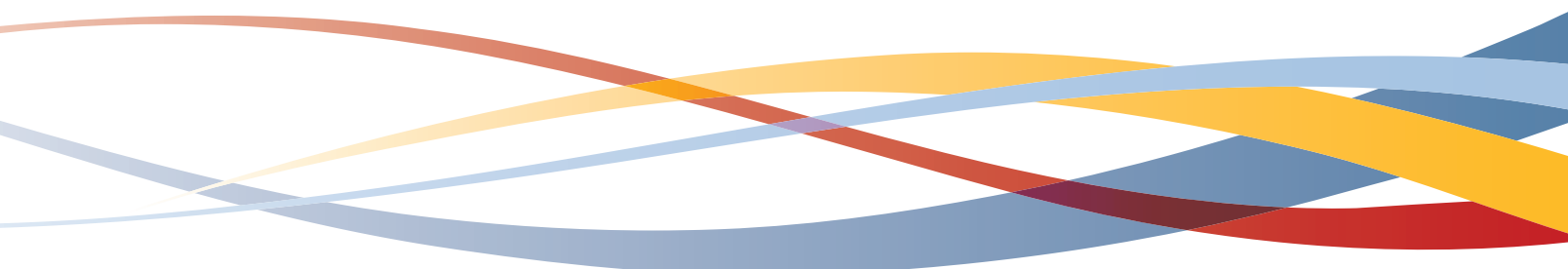
### **Customer Commitment**

Delivering quality filtration products to our customers is one of the major factors in Amazon Filters' success. Another is in providing a level of customer service that few, if any, competitors can match. Recognised as a reliable and trustworthy supplier, Amazon targets first class service performance in terms of on-time deliveries; same-day dispatch and quick response to enquiries. These are some of the factors that make Amazon stand out from the competition.

### **Quality Approval**

Amazon Filters is accredited to ISO 9001:2008 by one of the worlds most prestigious and respected accreditation bodies, the British Standards Institute. Our certificate number is FM 39584.

Our design team is fully conversant in the increasing technical demands of pressure vessel design codes including ASME VIII, PD5500 and EN13445. All our products meet the demand of ATEX and conform to the latest version of the Pressure Equipment Directive (PED) 97/23/EC.





## Upstream Applications

### Water Injection

The injection of water is often necessary to maintain reservoir pressure and increase the recovery factor in oil production, but the importance of effective water treatment is often underestimated. Water intake quality can vary tremendously due to algae and plankton blooms, silts and other sediments and this will have significant impact on the performance of the water treatment facilities. If not addressed correctly, the injected water may be of poor quality resulting in clogging of the reservoir and loss

of oil production. Amazon supplies filters designed to be used throughout the water treatment process to help ensure it functions to optimum levels. Whether the application is fixed or floating, seawater or freshwater Amazon Filters is able to provide easy operating, cost effective solutions to help maximise the production of water for injection.

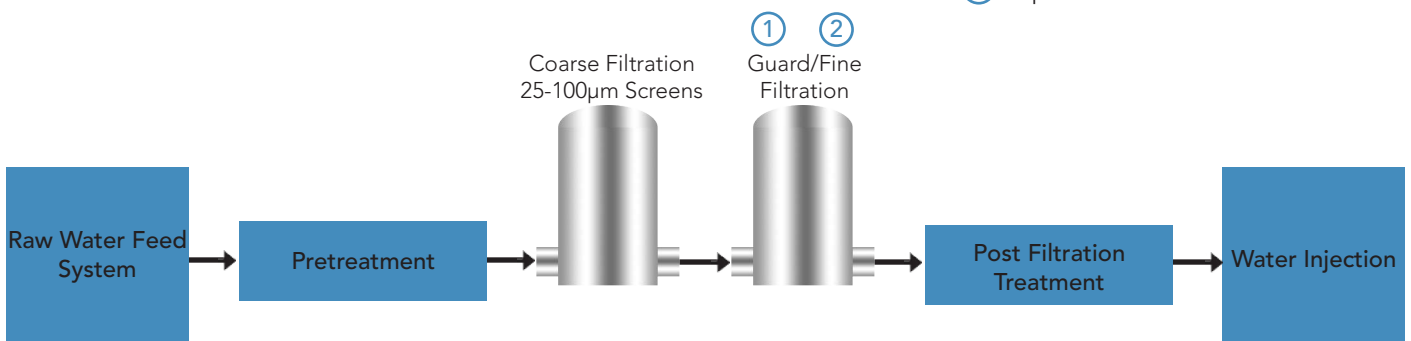
#### Coarse Filtration

Coarse filtration is an important step to ensure the critical treatment systems

downstream function effectively.

The role of coarse filtration is to remove the bulk contaminants such as sand, silt, seashell fragments etc. Amazon Filters can provide filtration systems containing wedge wire screens or candles designed to provide automated operation and backwashing. The filters are typically rated between 25 and 100  $\mu\text{m}$ . These systems provide an economical method of removing bulk contaminants and offer excellent protection for the guard/fine filtration systems that follow downstream.

### Filtration in Water Injection Process



① SupaSpun II SRP

② SupaPleat HFC SRP



### Guard/ Fine Filtration

Removal of fine particulates from water to be injected is important to avoid plugging of the reservoir and hindering oil recovery. Typically situated downstream of the Coarse Strainers or deep bed Multi Media Filters (MMF), the fine 'Guard' filters are used to remove particles ranging from 1 to 50  $\mu\text{m}$ . Protecting either the well or other water treatment processes, these filters should offer absolute retention of particulate contaminants.

Typical applications would include the protection of Sulphate Removal Processes (SRP) used on water for injection to prevent scaling of the formation caused by sulphates reacting with barium and strontium in the crude oil. Removal of the sulphates will also reduce the risk of reservoir souring. It is critical that nano-membranes used in the SRP are protected by effective prefiltration to ensure optimum operation of the system.

Amazon Filters Limited has developed two ranges of absolute rated cartridges specifically to protect the critical membranes used in the water treatment and Sulphate Removal Processes. **SupaSpun II SRP** cartridges and the large bore, high surface area **SupaPleat HFC SRP** filter have been designed to be absolute rated as, unlike low technology nominal filters, they maintain removal efficiency for contaminants throughout the life of the filter and under varying process conditions. It is typical for nominal filters to suffer reduced removal efficiency or to unload previously retained contaminants after a period of use. Therefore the use of **SupaSpun II SRP** and **SupaPleat HFC SRP** filters can maximise membrane life, reduce replacement costs and avoid unexpected interruptions to the process.

### Sea Water Reverse Osmosis (SWRO) Protection

Reverse Osmosis is typically used to produce potable water and the high purity water used in potable water makers. RO membranes require fine prefiltration to ensure long life and typically Amazon Filters supplies **SupaSpun II** rated at 5-10  $\mu\text{m}$  absolute for this application. Where required we are also able to offer **SupaPleat II** or **SupaGuard** depth filters for this application.

These are available as either standard cartridges or in the large diameter, high flow **Contour** and **SupaPleat FFC** cartridges.



### Produced Water

Contaminated produced water requires significant processing to allow reuse or disposal. This is a multi-step process and typically the system contains bulk oil separators, cyclones, degassers and polishing filtration. Amazon Filters supplies high efficiency polishing filters to help ensure the solids levels are reduced to the desired level.

We are able to offer a range of absolute and nominal rated filters for this application, including **SupaPleat II**, **SupaSpun II** and **SupaGuard** cartridges and **DuoLine** bag filters. This enables the supply of the optimum solution that exhibits both long life and reliable retention of solids.

## Downstream Applications

Oil and gas refining relies on the effective operation of complex processes and equipment. The function of these can be adversely affected by particulate contamination in the feed streams. Amazon Filters has used its knowledge of the challenges faced in refineries to develop a range of filtration systems designed to help keep the processes functioning at peak performance.

### Inlet Gas Separation

Field gas will be processed to remove solid, deformable and liquid contaminants prior to amine sweetening. This typically involves multi-stage separators, coalescers and particulate filters.

Amazon Filters has a range of products that are used as a fine filter typically located between the separators and coalescers. For this application we are able to offer a range of products manufactured with either polypropylene or nylon media to provide long operational life and good protection to the coalescer. Products offered include pleated filters such as **SupaPleat II**, polypropylene depth filters such as **SupaSpun II** and **SupaGard**, nylon **VisClear** depth filters and **DuoLine** bags. We are able to offer cartridges in the standard 65mm diameter format or as the large bore high flow **Contour** product.



### Amine Sweetening

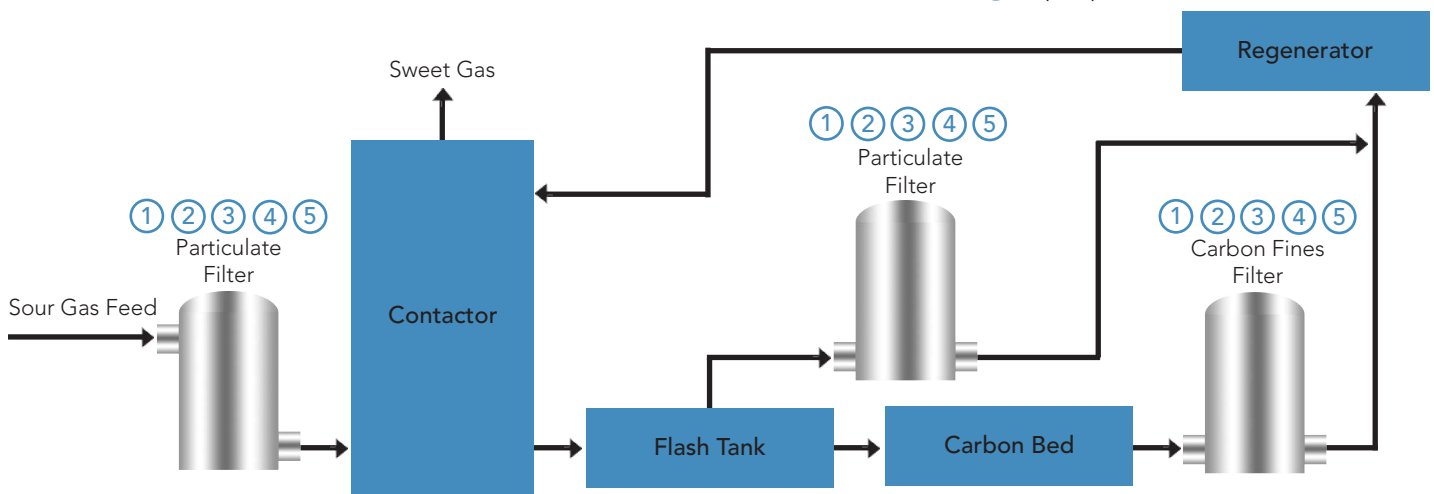
Effective control of particulates in the amine used to treat sour gas is vital to avoid foaming and fouling within the amine sweetening system. Contamination such as Iron Sulphide particles can result in reboiler tube failure, tray plugging inside the contactor and the regenerator,

exchanger failures and frequent pump seal replacements. Ideally the recirculating amine should contain < 1ppm solids and Amazon Filters is able to offer a range of cartridges to help achieve this. These include pleated filters such as **SupaPleat II**, polypropylene depth filters such as **SupaSpun II** and **SupaGard** and nylon

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### Filtration in Amine Sweetening Process

- ① SupaPleat II
- ② SupaGard
- ③ VisClear
- ④ Contour
- ⑤ SupaSpun II







**VisClear** depth filters. We are able to offer standard cartridge format or the large diameter high flow **Contour** and **SupaPleat FFC** products. Filters are available in a range of removal ratings and typically are used prior to the contactor and regeneration system and also downstream of the carbon bed to capture any carbon fines that are shed.

### Glycol Dehydration

Many problems in a glycol dehydration plant such as foaming, reboiler and exchanger fouling, tray plugging and pump failures can be traced to an excessive amount of liquid and solid contaminants present in the process stream. The presence of high levels of particulates can result in reboiler tube failure, tray plugging in the contactor and the regenerator, exchanger failures and frequent pump seal replacements. Recognising that process conditions may vary widely, we supply both nylon and polypropylene media filters to ensure the optimum filter can be chosen. Typical products used are **VisClear**, **SupaGard**,

**SupaSpun II** and **Contour**. These are available in a range of removal ratings so the choice of filter can be tailored to the size of contaminating particles.

### Catalyst Beds

Catalysts beds are used through out the refining process and can be negatively impacted by particulate contamination in two main ways. Fine particles can plug the flow pathways within the catalyst bed and general particulate contamination can cause deactivation of the catalyst. The use of either polypropylene filters such as **SupaPleat II** or **SupaSpun II** or nylon filters such as **VisClear** rated at 5-10 µm are an effective method to reduce the occurrence of these problems. We also offer **SupaMesh** sintered metal and woven mesh elements for high temperature and aggressive gas processes. Often these filters are also used downstream of the catalyst bed to retain any catalyst particles that may be shed into the process stream.

## Engineering Capabilities

Amazon Filters have particular strength in the design and manufacture of filter housings for the critical demands of the Oil and Gas industry. We have extensive experience in the manufacturing of vessels in Duplex (UNS S31803), Super-Duplex (UNS S32750/60) and 316 stainless steels. We can supply carbon steel vessels lined with rubber, vinyl ester or glass flake.

We also offer the **27 Series GRP** housing specifically designed for brackish and sea water applications.

Our design team is fully conversant in the increasing technical demands of

pressure vessel design codes including ASME VIII, PD5500 and EN13445. All our products meet the demand of ATEX and conform to the latest version of the Pressure Equipment Directive (PED) 97/23/EC.

Amazon Filters has onshore and offshore installations in service all around the world. Amazon Filters accredited design and build systems have offered EPC contractors and final clients the products demanded on time, every time, making us the ideal partner of choice.



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