DEFS

by Sulphurnet

Dutch
Engineered
Filtration
Systems

Sulphurnet

Sulphurnet

With over 35 years of experience Sulphurnet became a global player providing **process engineering and dutch engineered filtration solutions** for the Chemical Process Industry.

Sulphurnet brings together the knowledge of process engineering, filtration and outstanding skills in mechanical engineering.

We offer successful process solutions. **Our solutions are custom designed for application-specific needs**, to meet all process performance requirements of our clients.

From the first contact throughout production and delivery to after-sales support, Sulphurnet clients benefit from an unrivaled combination of application knowledge, process expertise and after-sales service.

Sulphurnet is your world-leading developer and supplier of complete solid/liquid separation solutions.

In Sulphurnet, we are committed to:

- Reduce production costs;
- Improve product quality, value and consistency;
- Improve safety, health and environmental (SHE) performance;
- Improve product yields.

We have done a lot of different projects and our company experienced a strong growth over the last years: **Sulphurnet offer total solutions, w**hich are tested in your company and ensure that together we arrive at a custom-built system.

Services

- Consultancy
- Testing and Application Development
- Filtration Technology
- Mechanical and Process Design
- Training and Start Up
- Accesories, spare parts and consumables

Industries

Mining Filtration

Sulphurnet is a provider of highly automated solutions in the mining industry. From efficient recovery of the valuable very fine metals in waste streams by thickening filtration, up to demanding applications when corrosive chemical are present in the process.

Amine Filtration

The installation and operation of an appropiate filtration system is one of the key components of all amine systems. The cleaner the amine, the better the amine system operates. Filtration has proven to be the most effective and only protection system for the removal of contaminants such as solids, liquid hydrocarbons and heat stable salts. Sulphurnet's solution prevents amine foaming, reduce corrosion and fouling problems in the process and maintain the amine efficiency and plant capacity.

Edible Oil Filtration

Sulphurnet provides different solutions for various oil processing steps: crude oil, miscella, bleaching, winterising, deodorised oil and polishing filtration. The main goal is to remove undesirable particles and to maintain the quality of the oil, while the labour costs and product losses are minimised.

Sulphur Filtration

Sulphurnet has focused its activities on the design and manufacturing of liquid sulphur melting and purification plants. Our activities range from the front-end engineering design to the manufacturing and start-up of the plant. At the heart of every liquid sulphur melting and filtration plant, a liquid sulphur filter is used to remove impurities and deliver bright sulphur to the industry.

Chlor-Alkali Filtration

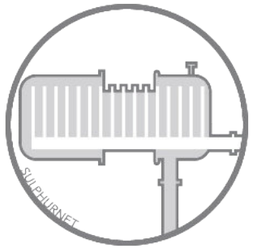
Sulphurnet offers various filtration solutions to produce sparkling clean saturated brine solution. We have developed a filtration process based on concentration technology that allows to achieve high flow rates with an effective retention to hold micron size particles. These units have small footprints, are suitable for all type of flowrates and aggressive media, have excellent chemical resistance and allows minimal product losses and brilliant filtrate clarity.

Chemical Processing Filtration

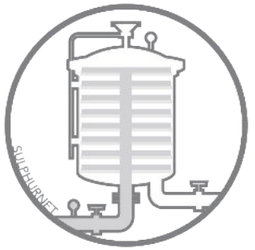
In the Chemical Process Industry, we encounter an infinite number of filtration applications. This results in a large variety of designs and sizes of filtration equipment. Sulphurnet can provide a competent recommendation and advice. This can be based on experience, but we also perform filtration tests to come to a design of a suitable filtration solution, a combination of process design with the adecuate filter medium and filter systems that successfully works together to meet your process requirements.

DEFS

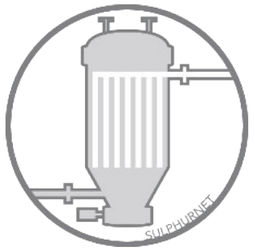
Dutch Engineered
Filtration Systems



DEFS - PRESSURE LEAF FILTERS

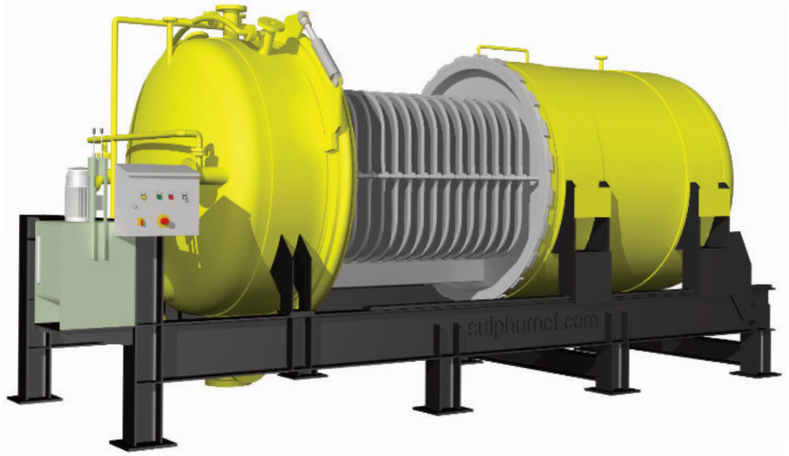


DEFS - HORIZONTAL PLATE FILTERS



DEFS - SELF-CLEANING CANDLE FILTERS

DEFS Pressure Leaf Filters



Sulphurnet offers a **full range of Dutch Engineered Pressure Leaf Filters**. These filters are high-quality systems, that can be used for numerous batch and continuous filtration processes, in accordance with **client specifications and requirements**.

The system comprises of a number of vertical filter leafs positioned in a horizontal or vertical filter tank. The fluid to be filtered is passed over the filter medium, the collected solids remain on the filter medium in the form of a filter cake and the filtered liquid flows through the filter leaf to the filtrate outlet manifold.

Proven technology

The principle of the DEFS Pressure Leaf Filters is a technology that has proven itself in a wide range of applications throughout the years. In addition to quality, reliability and financial benefits, Sulphurnet major added value is in the **manufacture of custom-built products.**

Security

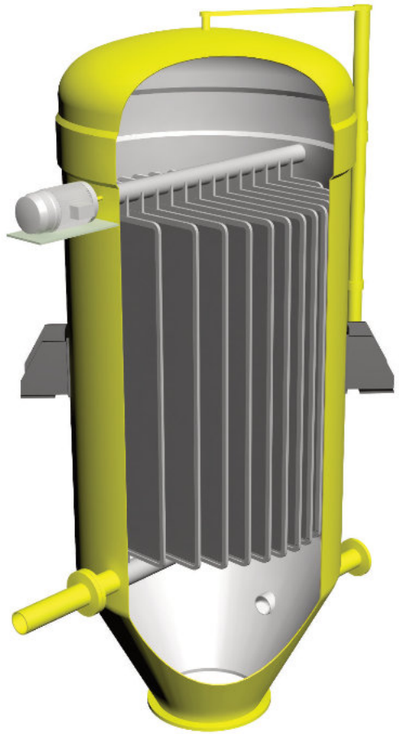
DEFS Pressure Leaf Filters **offer a large filtration area in a relatively small vessel**. Sulphurnet produces the DEFS Pressure Leaf Filter for both primary filtration involving high solid contents and polishing filtration with low solids loads.

Easy maintenance

DEFS Pressure Leaf Filters are **easy to maintain**. They contain almost no moving parts and the filter leafs can be quicky and easily removed and replaced by spares.

Flexibility in application and operation

We can supply filters with **different ratios of filtration surfaces area and cake volume**. Furthermore, the DEFS Pressure Leaf Filters can be fully automated and adapted to the specific process. These features make DEFS Pressure Leaf Filters suitable for an inmense range of application in the chemical and allied industries.



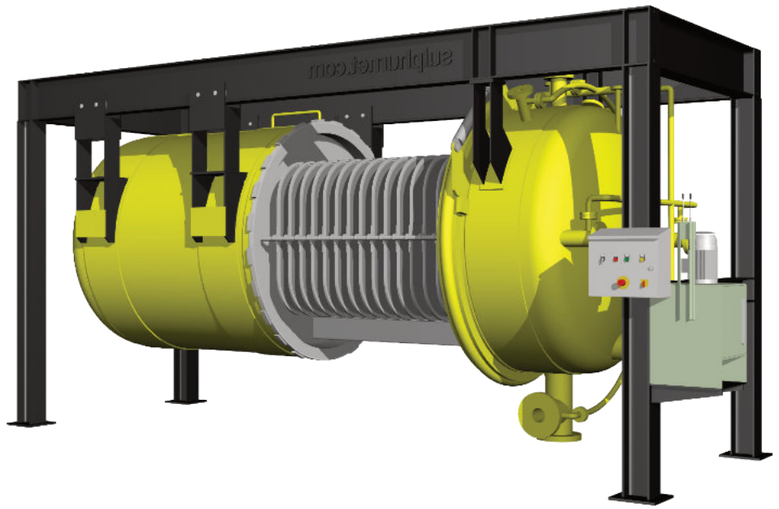
DEFS Pressure Leaf Filters

Features DEFS Pressure Leaf Filters

Labour saving	Hydraulic tank retraction and quick-opening cover
No loose connections	All piping is connected to the stationary cover and therefore not required to disconnect any piping when opening the filter
No cake disturbance when opening the filter	Cake covered filter leafs remain stationary during tank retraction
Large filtration area in one unit	Up to 200 m² of filtration area in one filter unit
Jacketed construction	Optional carbon steel tank jacket for temperature control of liquids to be filtered

Applications

- Liquid Sulphur
- Sulphuric Acid
- Mining
- Titan Oxide
- Caustic / Brine
- Catalyst Recovery
- Activated Carbon
- Food and Beverage
- Vegetable Oils



FILTER LEAFS

Good filtration performance begins with high quality filter leafs. We will help you find the perfect design for your needs to achieve better filtration performance and lower operating and maintenance cost.

Sulphurnet Filter Leafs consist of **five layers of wire mesh**. The inner layer is a coarse mesh for the discharge of the filtrate and support of the outer layers. On top of the support layer, two course drainage layers are placed and on top of these, the final filter mesh is mounted. This design allows a full flow with minimum restriction. The leafs are available in bolted or riveted construction.

Features

Rigid and durable construction

Long lifetime

Customizable designs

High filtration rate

Bolted or Riveted construction

Mesh posibilities:

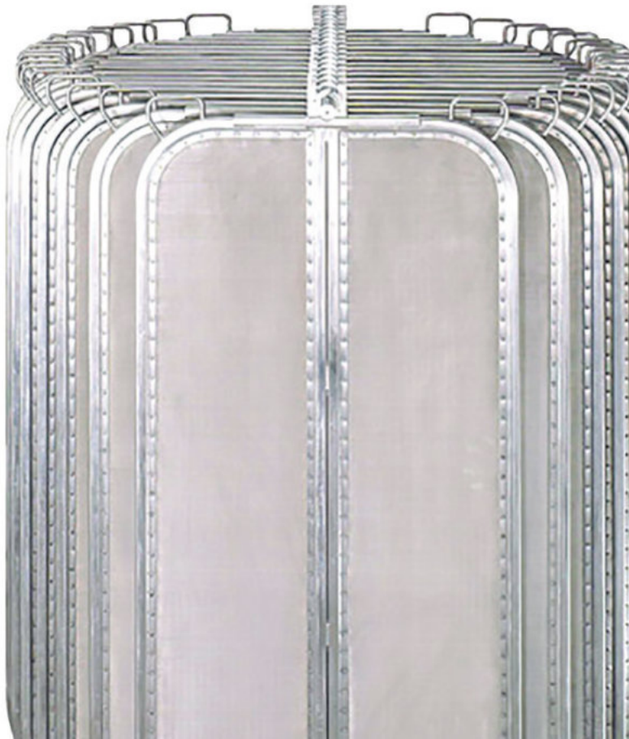
- 316L SS Standard
- 316 NSCD (higher corrosion resistance)
- 904L SS (higher corrosion resistance)

Frame construction:

- Standard: 1,6 mm
- Optional: 2,0 mm

Filter leafs are also available in:

- Polypropylene
- PVDF
- Other materials on request



DEFS Horizontal Plate Filter

Sulphurnet offers a full range of **Dutch Engineered Horizontal Plate Filters.**

DEFS Horizontal Plate Filters are high-quality systems which **can be used for numerous batch and continuous filtration processes**. The systems comprises of a vertical tank, which contains a number of horizontally positioned filter plates. The fluid to be filtered is passed over the filter medium that is positioned between the filter plates. The collected solids in the form of a filter cake remain on the filter medium and the polished liquid flows through the filter plates to the filtrate outlet.

DEFS Horizontal Plate Filters are applied in the **Chemical Process Industry for a variety of applications**, in accordance with the clients specifications and requirements. It can be applied for either primary filtrations involving relatively high solid contents or for polishing filtration operations with a low solids load.

Proven technology

The principle of DEFS Horizontal Plate Filters is a technology that has proven itself in a wide range of application. Sulphurnet can develop a DEFS Horizontal Plate Filter for any filtration process, which will meet all your specifications and requirements.

Security

Thanks to the horizontally positioned filter plates, the **cake is evenly distributed over the filter medium**. Therefore, the cake is unaffected in the event of interruption of the filtration process or pressure fluctuations. On completion of the filtration process, the filter cake can be subjeted to as many consecutive processes as required, such as washing, extraction or drying.

Easy maintenance

DEFS Horizontal Plate Filters are easy to maintain. Neither of these systems contain any moving parts, the **filter cartridges can be quickly removed and replaced** with a spare cartridge.

Flexibility in application and operation

Due to various plate depths, we can supply several variations in terms of the filtration surface and cake volume. Furthermore, all horizontal plate filters can be fitted with a wide range of filter media, from paper and textiles to stainless steel meshes. This feature makes the plate filters suitable for an **inmense range of applications in the chemicals, food and pharmaceutical industries.**

Heating posibilities

For high or low temperature operations, Sulphurnet offers the choice between **convetional heating jackets, half pipe or the Therm-Plate system**. The low volume Therm-Plate offers investment benefits when working with high pressure steam or when complete stainless steel equipment is required.

Coating and linings

When aggresive products are involved, **special corrosion resistance alloys** (hastelloy, nickel) can be applied. Alternatively a wide range of linings and coating can be used offering complete chemical inert filter sytems. Examples are various grades of rubber linings, HALAR or PFA coating, PVDF or PTFE linings.

Quick closures

To reduce the cleaning cycle we offer 2 or 3 segment quick cover closures for all filter systems. **Quick cover closures can be operated or utilized with hydraulics for automated processes**. The application of quick closures is beneficial for applications with high as well as low pressure operations.

Applications

Chemical industry: removal of activated carbon, filtration of varnishes, paints and resins, removal and recovery of catalysts, purification of chemicals, removal and recovery of precious metals.

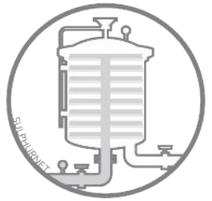
Foods and beverages industry: edible oils, juices, glucose and other sugar-manufacturing industries, etc.

Pharmaceutical industry: production lots can be registered by batch. System is also ideal for sterile and bacteriological filtration processes.

DEFS Horizontal Plate Filter

DEFS - HPF Scavenger

The DEFS-HPF Scavenger is **designed for batch-wise filtration without leaving a heel**. This is accomplishied with a specially designed scavenger plate, that filters the heel remaining in the tank at the end of a batch. In addition, complete product recovery can be obtained by washing and drying the cake.

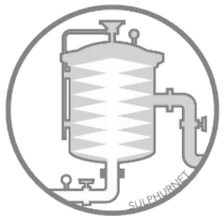


DEFS - HPF Reverse Flow

The Reverse Flow Filter **combines the advantages of horizontal plate orientation with clean filter tank operation**. In this model the contaminated fluid is pumped into the filter through the centre column, then evenly distributed to the filter plates for filtration after which the clean fluid flows into the tank and out a drain. All filter cake or solids remain inside the cartridge bundle.

DEFS - HPF Wash off

Wash Off Horizontal Plate Filters are designed for applications allowing the use of synthetic cloth or wire mesh filter media. The advantage to this filter is that the **cartridge can be cleaned without disassembling.** Cartridges are cleaned by removing them from the tank, pivoting them on a frame leaving the plates in a vertical orientation, permiting cake removal by vibration, tapping or washing.



DEFS - HPF Dual Disc

The Dual Disc offers **double filtration area compared with standard horizontal plate filters.** The large filtration area is suitable for high flow rates, with low concentration of contaminations and high efficiencies. The dual disc version is available in scavenger as well as in reverse flow filter.

DEFS Self-Cleaning Candle Filter

Sulphurnet Dutch Engineered Self-Cleaning Candle Filter Type SCCF can be applied either for **polishing filtration operations with low solid loads or preliminary filtrations with relative high solid contents** and can be utilised for manual, semiautomatic or **fully automatic** operation.

A semi-automatic or fully automatic DEFS-SCCF ensures a **smooth, economical and optimal operation**. To ensure these features a PLC controls the time between opening and closing of the different valves by signals. PLC are famous of their reliability, have a long life time and extensions are easily made. It is an enclosed filter system improving safety, health and enviromental performance.

High Quality Filtration

DEFS-SCCF is a high-tech self cleaning candle filter, consisting of vertically positioned filter candles in a vertical tank. The filter candles can be supplied in **polypropylene, stainless steel or ceramic as standard materials**. The filter medium used to cover the filter candles can be chosen such that a clear filtrate is instantly obtained. The cake can be discharged in solid or concentrated slurry form.

Widely applicable

DEFS-SCCF can be of **great service in almost any filtration process**: from high quality final fitlration of liquid with a low solid content, to the primary filtration of liquids with a relatively high solid content.

Self-Cleaning

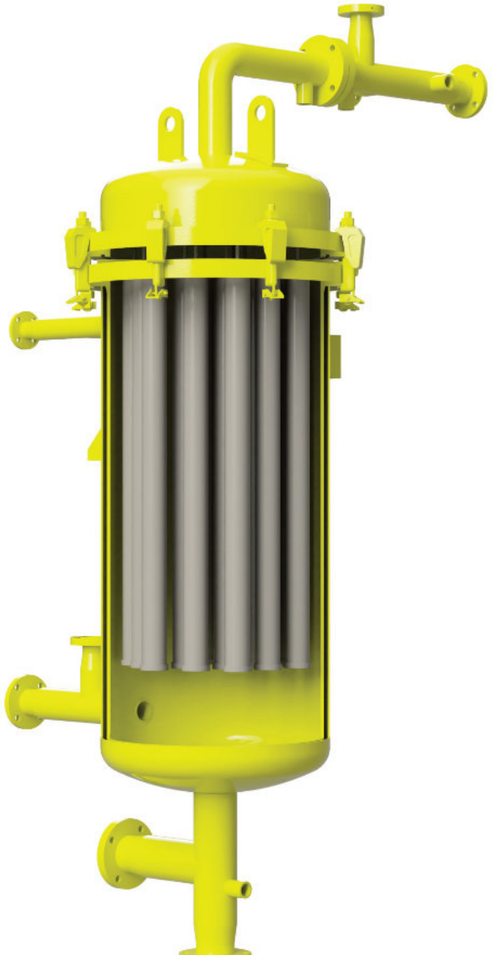
In the case of dry cake discharge, the solids are released from the filter media by means of a reverse pulse of compressed air or inert gas. The filter medium is thus separated from the supporting layer, and the **filter cake cracks and falls off.** The filter candles are positioned on separate manifolds and they can be cleaned one manifold at a time. This decreases the quantity of air or inert gas required and ensures that the cake is discharged.

Practicability

DEFS-SCCF offers an ideal solution for **enviromentally friendly filtration processes with perfect results.** Thanks to their automation, reproducibility and wide range of filter media, Sulphurnet SCCF can be used for various production processes in the chemicals, food and pharmaceutical industries.

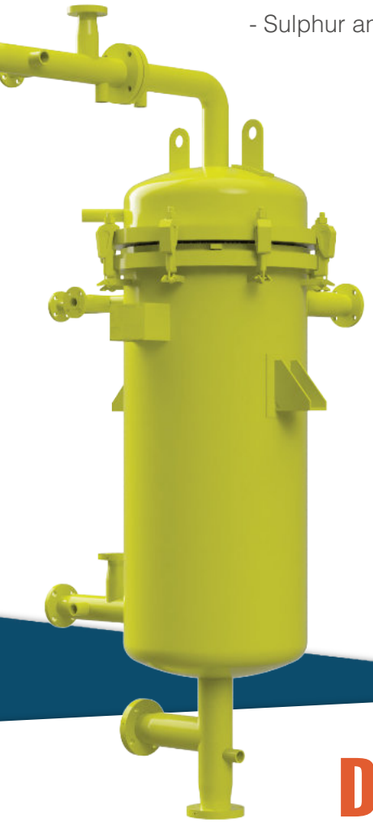
Automation: reliable and controllable

Our DEFS Self-Cleaning Candle Filter can be configured for **semi-automatic or fully automatic operation**. The application of high-quality, durable PLC systems, enables repeatable and reliable control of the process. The PLC controls the opening and closure of the valves and records all level and pressure changes. The use of an MMI (Man Machine Interface) enables real-time monitoring of the filtration process on screen.



Applications

- Edible Oil Filtrations
- Catalyst recovery
- Activated Carbon Removal
- Kielselguhr Filtration
- Chlor Alkali Production
- Gas Sweetening, Amine Treatment
- Mining application
- Chemical Filtration
- Sulphur and Sulphuric Acid



Features and benefits

Versatile operations	Can be employed for polishing application without the use of precoat
Totally enclosed systems	Operators are protected against emissions
Self Cleaning	Back blow cleaning with high pressure, but low volume
Flexibility of application	Different type of filter cloths can be used
Automatic PLC operation	Reproducible and reliable filtration process
Candles placed in manifolds	Cut off certain manifolds from filtration in case of by pass
No moving internal parts	Low maintenance costs

DEFS Self-Cleaning Candle Filter

FILTER ELEMENTS

Sulphurnet provides with our filtration systems the **best quality filter elements to achieve a high quality filtration**. Filter cartridges contain filter media to capture and retain particles in filtration systems.

In Sulphurnet, we work directly with our clients and make our filter elements according to **client specifications**, ensuring fit and high quality filtration.
We have a wide range of filter candles for all types of our Sulphurnet Dutch Engineered Self-Cleaning Candle Filters. **DEFS Candles have a very low internal pressure differential what leads to higher flow rates.**

Materials:
- 316L SS
- Polypropylene
- Ceramic (polishing filter)

Benefits of Sulphurnet Filter Elements

- Controlled pore size
- High corrosion resistant
- Strong mechanical characteristics
- Controlled porosity and permeability
- Easy cleanable
- Chemically inert
- High flow rates
- Low cost of ownership

Filtration Technology and Process Engineering

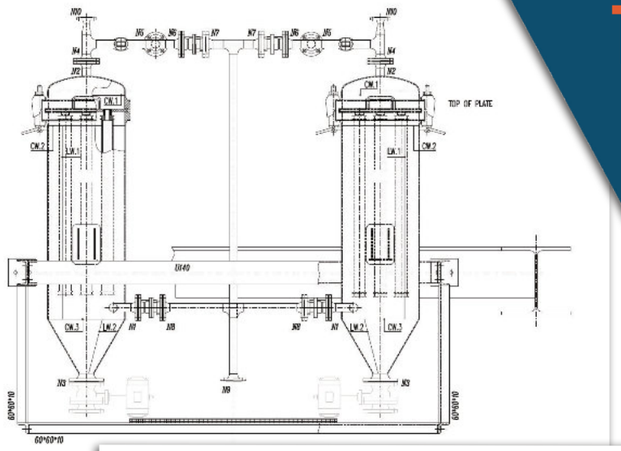
Our engineering focuses on the design of all the **special challenges and demands** you meet in filtration solutions, corrosion issues, cold spots problems, auxiliary installations such as dust collection, firefighting -all are included in our engineering package-. We carefully determine an **optimal sizing of the filtration process**, so the processes can work ideally and avoid oversizing of equipment.
We offer a complete service: basic engineering, detailed engineering, management, audits and consultancy, executions, after sales, training and maintenance support.

Basic Engineering

The basic engineering design phase is generally associated with an **economic and financial feasibility study** for one or two solutions. Details of the design are given, including the Process Flow diagrams with mass balance, piping and instrumentation diagrams, including the datasheet of the equipment. An operating description and process control philosophy helps in understanding the plant set up.

Detailed Engineering

After basic engineering, **documentation ready for construction of the plant structures and main equipment is part of the detailed engineering package**. For the remaining equipment, sourcing details of suppliers and all technical details can be engineered and supplied, ready for purchasing.
Detailed engineering can be performed for **any project size**, from small modular skid-sized units, to large-scale production, including heavy project requirements, specifications and documentation.



Dutch Engineering - Sulphurnet

Our strengths include a **skilled and dedicated team focused on filtration and process engineering.**

Sulphurnet is able to supply a **complete process concept**, with our knowledge and understanding we minimise the time from the outset to completion of projects while offering a competitive advantage to our clients.

Our network of engineers and manufacturers are experienced in planning, design and engineering of many types of complex projects.

Sulphurnet's goal is to provide clients with a single point of contact and responsibility for all project needs.

Sulphurnet understands the importance of providing clients with the highest quality of design, documentation and management services and we strive to maintain project schedules.

Certifications, manufacturer approvals

ISO 9001 / ISO 3834-2
PED (EN13445 / AD-2000)
ASME (U-Stamp, Code Section VIII Div.1)
China Stamp (A1), China License
CU TR 032/2013, Customs Union
In addition to the existing manufacturing approvals, we are experienced to perform the respective approval procedures for almost all the countries in the world.

Dutch Engineering Services

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