

# SULPHUR PROCESSING SOLUTIONS

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Recognising outdated technology, Sulphurnet was founded in 2007 with the intent of delivering custom solutions for sulphur melting and filtration plants, armed with a background of more than 30 years' expertise in industrial filtration.

From Culemborg in the Netherlands, we design, plan, manufacture, and ship filtration equipment, complete sulphur plants, and accessories to more than 200 clients all over the world.

Sulphurnet is not just about sulphur processing systems; it's about helping our customers worldwide to reduce their production costs, increasing their product quality and yields, and improve safety, health, and environmental performance.

Lately, Sulphurnet has focused its activities on the production of liquid sulphur plants. We design total sulphur melting and filtration solutions to the strictest production and environmental parameters, with a typical turnkey project covering everything from feeding the solid sulphur up to the clean sulphur storage tank.

Our activities range from cooperation during FEED (front-end engineering design) to supplying the main equipment and support during the EPC phase, and turnkey solutions for sulphur melting and purification, including control systems.

We have the technology to reduce H<sub>2</sub>S emissions in sulphur melting plants down to 3 mg/m<sup>3</sup> and we are able to design a process accordingly.



Our engineering focuses on the design of all the special challenges and demands you meet in sulphur melting and purification plants. Corrosion issues, cold spots problems, auxiliary installations such as sulphur dust collection, firefighting—all are included in our engineering package. We carefully determine an optimal sizing of melters in combination with the sulphur 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.

## SULPHURNET

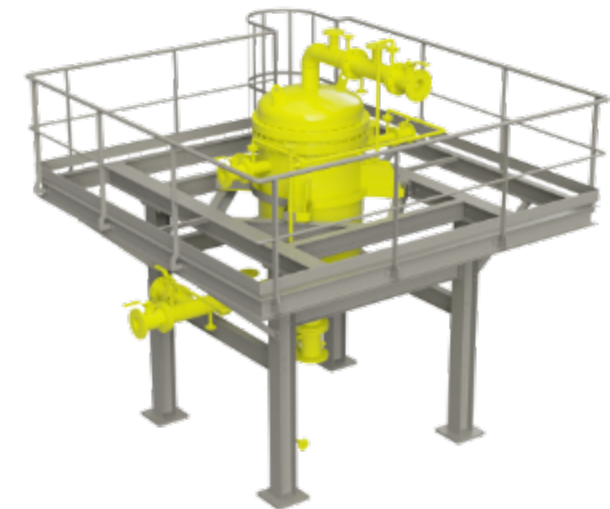
Our strengths include a skilled and dedicated team focused on sulphur processing solutions.

Sulphurnet is able to supply a complete process concept up to 2500 MTPD. 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.

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





### ENGINEERING AND SUPPLY OF PROPRIETARY EQUIPMENT

Basic Engineering  
Detailed Engineering  
Manufacturing and Procurement

### PLANT AUDITS

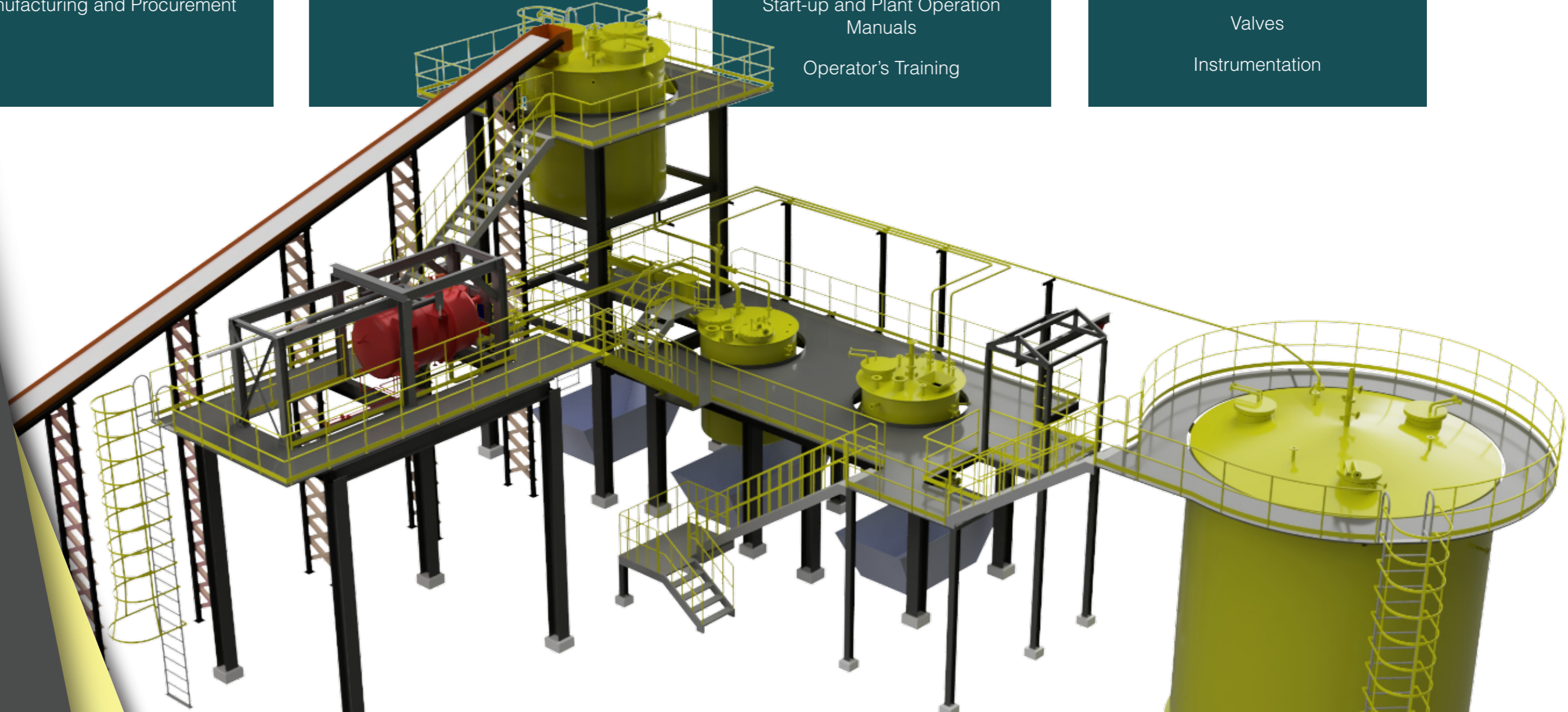
Inspections  
Maintenance Recommendations  
Plant Optimization

### CONSTRUCTION SUPPORT AND COMMISSIONING

Construction Support  
Procedures  
Start-up and Plant Operation Manuals  
Operator's Training

### SULPHUR SOLUTIONS

Sulphur Melting Tank  
Liquid Sulphur Pressure Filter  
Liquid Sulphur Polishing Filter  
Valves  
Instrumentation



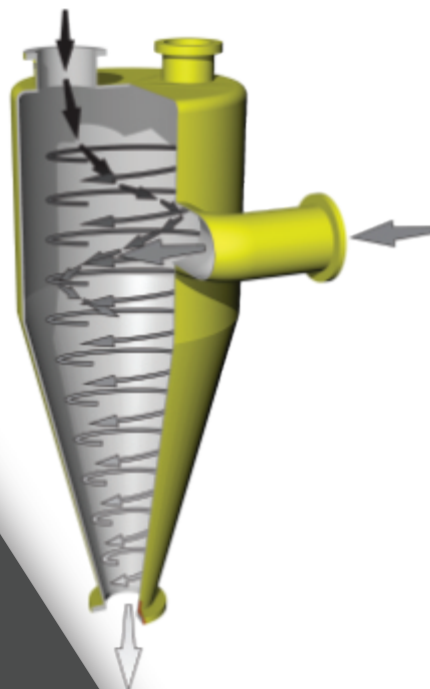
**SULPHUR  
PROCESSING  
SOLUTIONS**

## ABOVE-GROUND SULPHUR MELTER

Sulphurnet melters are above-ground tanks with steam coils, which provide the energy required for melting solid sulphur. To intensify the melting rate, the melter is fitted with an agitator that increases the velocity of the sulphur along the heating coils, keeps solids in suspension and improves neutralization by improving the contact with lime. The tank has a conical bottom with the ability to drain without stopping operation and is executed with a brick internal lining for corrosion prevention.

Benefits:

- Excellent heat transfer by good agitation
- Bottom draining while in operation
- Extended life-time due to corrosion protection
- Outstanding neutralization features
- Low H<sub>2</sub>S emissions



## FLASH SULPHUR MELTER™

Designed to increase existing plant capacity and handle sulphur with high moisture contents and/or powder sulphur.

Benefits:

- Compact design (small plot space)
- Increased capacity of existing melting plant
- No moving parts, low maintenance cost
- No internal coils, less corrosion
- Can handle sulphur with high water contents
- Less foaming issues
- Suitable for powder type of sulphur

## LIQUID SULPHUR POLISHING FILTER

The Liquid Sulphur Polishing Filter is used to remove fine particles passing the primary pressure leaf filter. Fine solids such as ashes and filter-aids are removed to a level of less than 8 ppm for particles larger than 5 microns.

Benefits:

- High efficiency filtration, reduces ash level down to 8 ppm
- Efficient self-cleaning by back flushing with steam
- Durable ceramic filter elements
- Small footprint

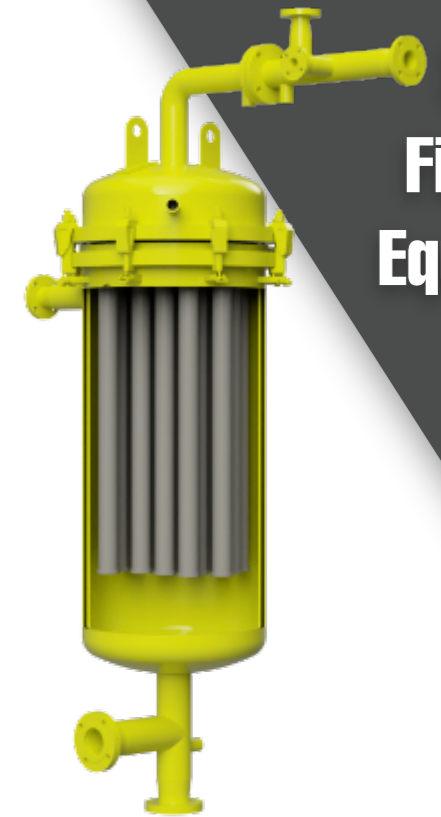


## SELF-CLEANING LIQUID SULPHUR FILTER

The primary purpose of the Self-Cleaning Liquid Sulphur Filter (SCLSF) is to achieve the most optimal filtration results and to remove any remaining contaminants from the sulphur. A filtration efficiency as low as 5 ppm can be achieved.

Benefits for Sulphuric Acid Plants:

- Automated cleaning, no operators required
- Efficient cleaning is performed by back blowing the candles
- Helps to reduce ash level and increases the lifetime of the catalyst bed
- Small plot space, can also be installed in existing plants
- Low overall investment costs
- No moving parts, low maintenance requirements



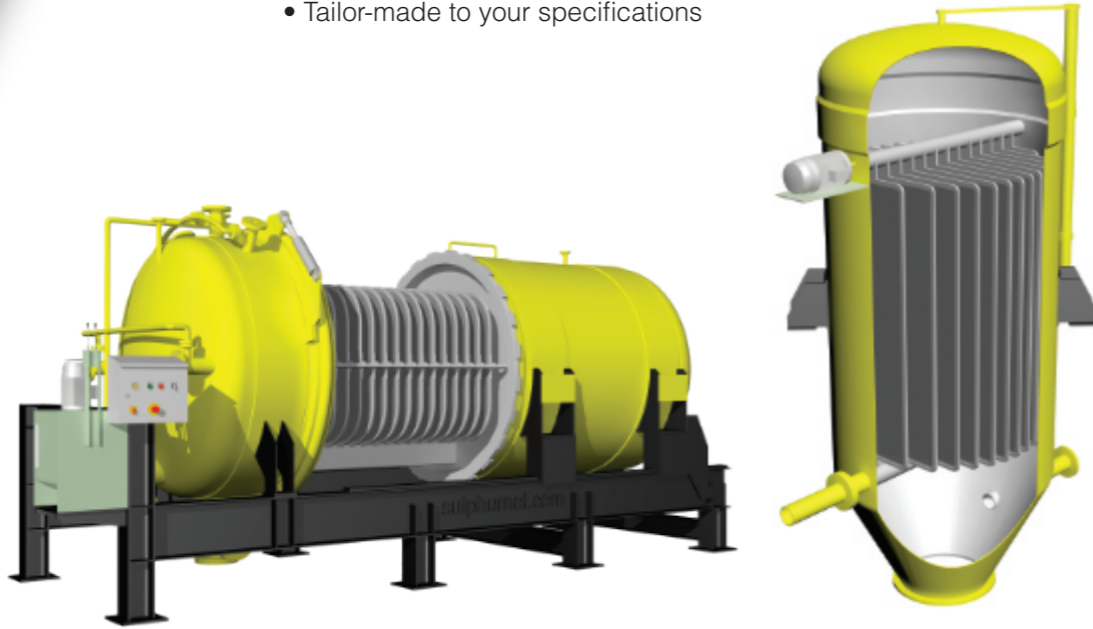


# Pressure Leafs Filtration

## LIQUID SULPHUR PRESSURE FILTER

The Pressure Leaf Sulphur Filter removes contaminants--such as ash and bitumen--can plug the catalyst mass downstream in the converter. Some of the advantages are:

- Decreased maintenance costs and improved plant operation time
- Reduction of contamination reduces the acidity of the sulphur and corrosion
- Retractable tank and fixed cover; no need to disconnect pipelines for cleaning procedures
- Filter leafs remain stationary; no cake dropping during opening
- Quick closure with long gasket lifetime
- Durable filter leafs with optional acid-resistant filtration mesh
- Fully hydraulic operation
- Tailor-made to your specifications



We make custom designed filter leafs for all filter brands

## 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.

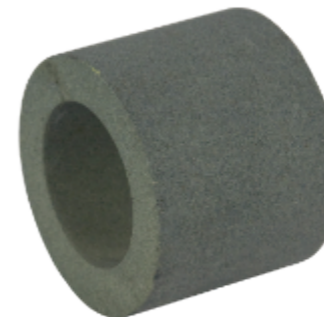
- Rigid and durable construction
- Long lifetime
- Customizable designs
- Fast filtration rate
- Sufficient drainage area
- Bolted construction
- Filter Leafs can be re-meshed on site
- Mesh possibilities:
  - 316L SS Standard
  - 316 NSCD (higher corrosion resistance)
  - 904L SS (higher corrosion resistance)



## POLISHING FILTER CARTRIDGE

Porous ceramic filters are designed especially for the polishing filtration of liquid sulphur.

These rugged porous ceramic cartridges are manufactured by fusing aluminium oxide grains, using a porcelain bond to form a strong, uniformly porous and homogeneous structure.



- Temperature resistant to 900°C
- High corrosion resistance
- Removes solids to less than 8ppm
- High mechanical strength
- Easy to clean

**Consumables**



Sulphurnet offers the full scope of its technology, including engineering and fabrication services with modular melting and filtration units. This is to ensure that our clients obtain the best possible projects, delivered on time and within budget.

We design melting and filtration solutions for various capacities. Our C-Melter can handle rates from 24 up to 80 Mton sulphur per day, whereas our melting and filtration skid can handle up to 300 Mton/day\*.

## C-MELTER

The C- Melter is a small container-sized melting system that can be combined with the filter section to make it suitable for the sulphuric acid industry. Solid sulphur is introduced in the well agitated melting chamber where it is in contact with the internal heat exchanger. A submersed pump transfers this liquid sulphur to the liquid sulphur filter where all impurities are removed. Sulphur with an ash level <10 ppm is suitable for the production of sulphuric acid, assuring a long catalyst life-time.

Benefits:

- Low investment, operational and maintenance costs
- Easy and fast installation on site
- Full automation can be implemented
- Produces high quality sulphur suitable for sulphuric acid production

\* The given capacities depend on sulphur quality and water content.

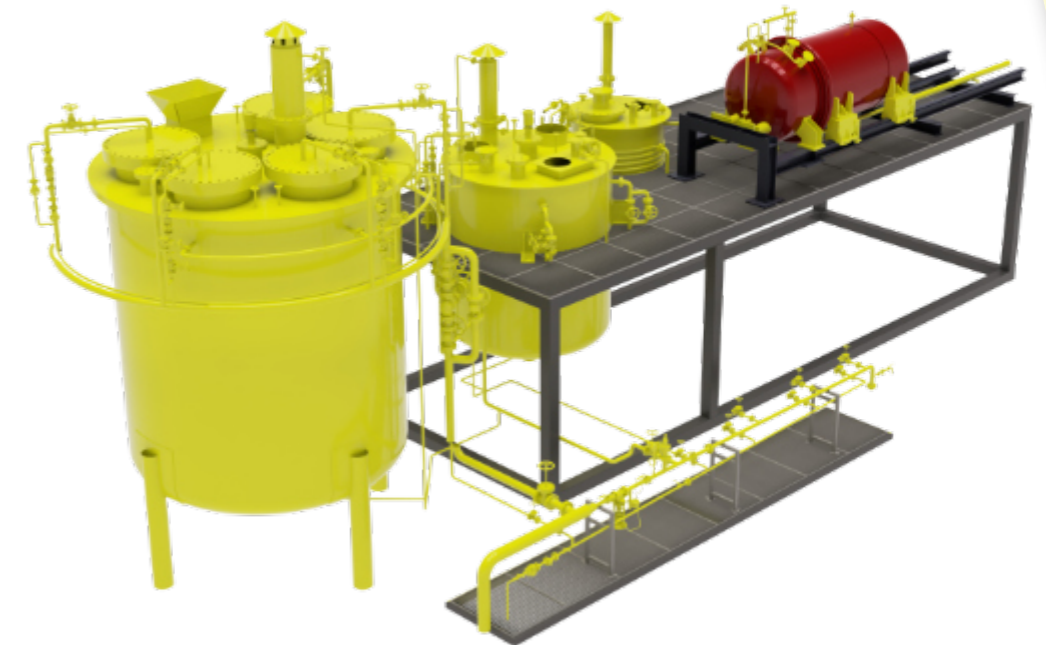
## SULPHUR MELTING AND FILTRATION MODULES

These melting skids come fully equipped with melting, precoat tank, filters, structural steel, piping, valves, pumps, instrumentation, pre-coat equipment, and much more (on-site assembly required).

Using the conveyor belt, the solid sulphur is transported to the liquid sulphur melting tank, where the sulphur is heated until its melting point to form liquid sulphur. Whereafter, the liquid sulphur flows from the melting tank into the dirty sulphur tank, from where it is pumped to the liquid sulphur filter.

It is designed with an elevated melting tank, allowing solids to be drained through the bottom without stopping the unit. The unit works with an overflow system to get to the filtration module.

The Filtration Module is intended to achieve high efficient retention and a solid concentration of 10 ppm, considering a regular quality solid sulphur input. The filtration module consists of 3 elements: the filter, the dirty pre-coat tank, and the pump. These 3 elements are connected in a way we can control, according to our best filtration process control design.



## TURBIDITY ANALYSER

An online turbidity measurement system designed to provide online, real-time control of the ash content in the sulphur filtrate line. Measures in low ppm range. The system is fitted with a jacketed measuring device and a control box with outputs to the control room.



## JACKETED RADAR LEVEL TRANSMITTER

Maintenance-free level measurement; no condensation of sulphur. For agitated vessels as well as storage tanks. Equipped with a 4-button touchscreen display and accuracy of  $\pm 3$  mm from 1 to 10 m.

## PRESSURE INDICATOR

The pressure indicators are designed for pressure and pressure differential measurements. Sulphurnet offers various forms and connections.



## JACKETED FLOW TRANSMITTER

The ultrasonic flow meter is an excellent choice for liquid sulphur due to its accuracy, robustness, and custom jacketed design.

## TEMPERATURE TRANSMITTER

Temperature indicators and temperature transmitters.



## JACKETED VALVES

Sulphurnet offers all types of valves fitted with heating jackets. Heating jackets are required where the process temperature must be maintained throughout the valve in order to keep the process media fluid at a constant temperature.

## BUBBLE TUBE

The Bubble Tube Level Measurement is a self-contained instrument for a precise level indication in a liquid sulphur melting tank. It is a low-cost system that measures the liquid level by density and pressure.

It is particularly applicable in sulphur melting tanks, where we meet:

- A sulphur flour-polluted head space that can crystallize in/on a transmitter
- Foaming environment that can blind a transmitter
- High process temperatures
- No side connections available for a flange-mounted transmitter
- A corrosive environment that should not have direct contact with the transmitter

Bubble tube systems have been utilized for decades – their simplistic operation, coupled with the latest technology in electronic instruments, makes these systems the preferred method of level measurement in the sulphur melting tank.

