



## PRODUCT SHEET

KLEERFLO AUTOMATIC SELF-CLEANING FILTER

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Kleerflo Filters are in-line, pressurised, automatic self-cleaning filters. They are used for the removal of suspended solids from water. They offer continuous flow and a strong, positive backwash action that ensures thorough cleaning of the screens.

Kleerflo's unique design with no rotating parts or close tolerance elements, very few moving parts and no electric motor ensures robust performance, proven reliability and low maintenance.

## Applications

Kleerflo Filters are installed in process lines to remove suspended solids from water. Kleerflo applications include the following:

### 1. Pre-Filtration:

- For membrane separation processes
- For treatment processes on potable water- and sewage wastewater plants
- For treatment processes on industrial process water plants

### 2. Final Filtration

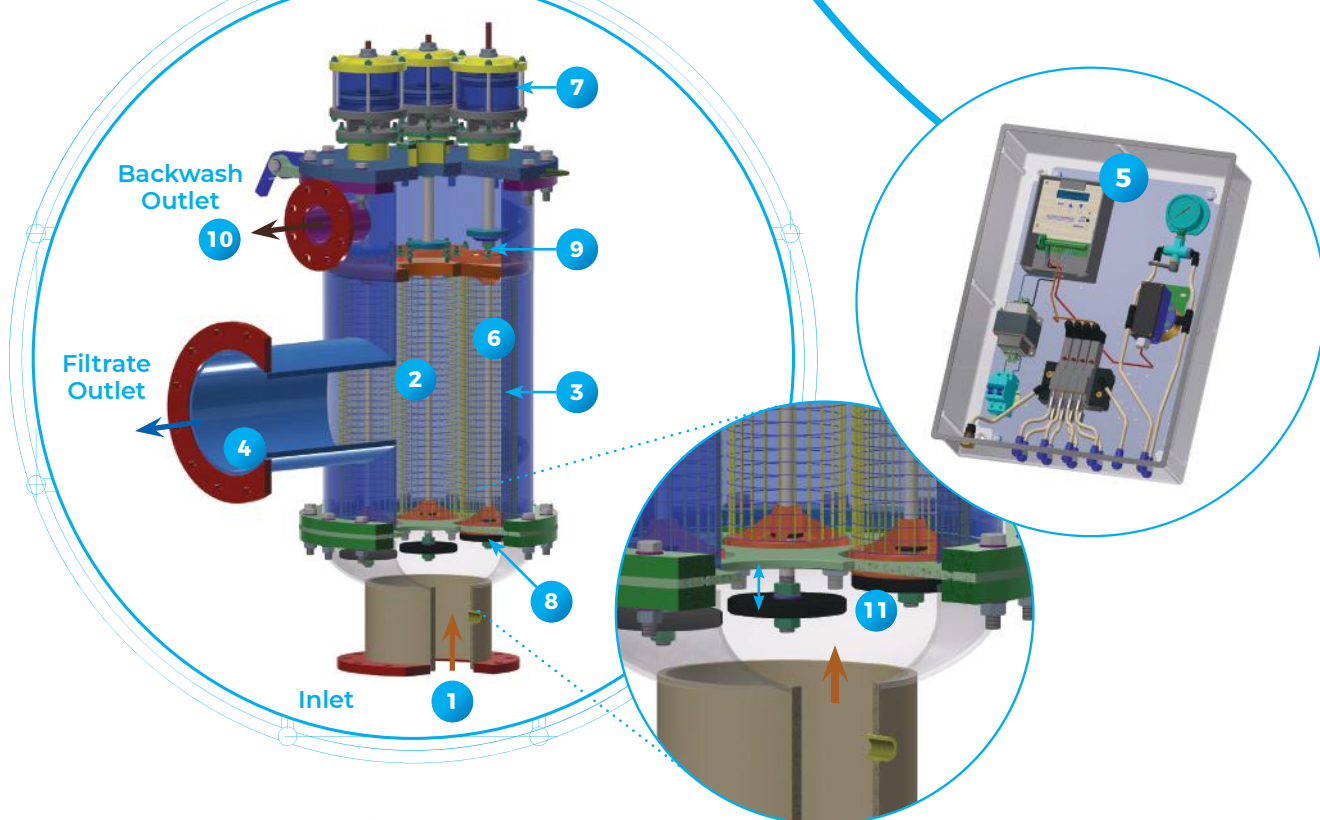
- To protect water spray systems or equipment
- Water Spray Systems
  - Dust suppression
  - Irrigation
  - Filter presses
- Equipment Protection
  - Pump glands (gland service water)
  - Measuring and metering equipment
  - Heat exchangers
- Removal of solids from water for general purpose plant re-use

## Industries

Kleerflo Filters are used extensively in all industries where water forms part of the process and where macro- and micro-particles need to be removed from suspension. These include:

- **Industrial Process Water**
  - Agricultural and Horticultural
  - Automotive
  - Brewing & Distilling
  - Food & Agri Processing
  - Nuclear
  - Pulp & Paper
  - Power Generation
  - Quarrying
  - Rubber Processing
  - Textiles
- **Mining**
- **Mineral Processing**
  - Steel Processing
- **Potable Water and Sewage Wastewater**
- **Petrochemicals**
  - Refining
  - Pharmaceutical
  - Plastics
- **Oil and Gas**





## How it Works

The inherent simplicity of the KleeFlo Automatic Self-Cleaning Filter contributes to the low operating and maintenance costs and the ease of operation.

KleeFlo only requires single phase electricity supply (to power the local controller and instrumentation) and a supply of pneumatic or water pressure (to drive the backwash cycle).

Dirty water flows (under pressure) into the KleeFlo Filter **1**. The water is then passed through several cylindrical, stainless steel wedge wire screens **2** that are installed in the main filtration chamber **3**. Flow is from the inside to the outside and clean, filtered water is delivered to service via the filtrate outlet **4**.

The screens are available in a wide range of apertures with the quantity and size of the screens dependent on the selected aperture, the flow rate and the solids load in the water.

Solids accumulate on the inside (dirty side) of the screens **2**. As it blocks the gaps in the screens, a pressure differential gradually builds up between the dirty side and the clean side. This pressure differential is ultimately relieved by initiating the backwash cycle. A signal from the control system **5** initiates the backwash cycle, either on a predetermined time interval, or when the pressure differential reaches a predetermined limit. Backwash consists of a simple back and forth shuttle movement on the one screen that is to be backwashed **6**.

The shuttle action is achieved by selectively applying and releasing pressure on the actuator **7** that controls the screen that is to be cleaned. This seals the water inlet to the filter screen **8** and simultaneously opens the top of the screen **9** to the backwash outlet **10**. The backwash outlet is open to atmosphere.

The difference between the line pressure maintained in the main filtration chamber **3** and the backwash outlet that is open to atmosphere **10** causes a reversal of flow through the screen **6**. The screens that are

not in backwash mode continue to produce filtrate. Some of the filtrate in the main filtration chamber **3** flows from the outside to the inside on the screen that is being cleaned **6** creating a strong, positive backwash that carries the dirt out to waste **10**. The remainder of the filtrate continues to flow to service **4**.

Applying pressure to the active actuator **7** opens the water inlet to the filter screen **8** and simultaneously closes the top of the screen **9** – returning the screen to filter mode. Backwash takes place sequentially, one screen at a time. The screens that are in filter mode continuously produce filtrate. Process flow is uninterrupted with minimal losses to backwash. The unique shuttle mechanism allows the processing of oversized particles without the need for a manual pre-screen **11**.

The KleeFlo design is inherently flexible and process parameters such as backwash frequency, the duration of each backwash and the dwell time between the backwash of each screen can be set independently with the local controller **5** - or written into the plant SCADA.

In addition, installation can be horizontal, vertical or at an angle, and the orientation of the inlet, outlet and backwash ports can be set independently.

Maintenance on KleeFlo Filters is easy. The strainer body does not need to be removed from the line for service. Access to the screens is allowed by removing the backwash cover plate. No heavy lifting equipment is required, and maintenance staff can be kept to a minimum.

## African Rainbow Minerals - Two Rivers Platinum – Mpumalanga, South Africa

Mines recycle process water and use some of it for **Gland Service Water (GSW)**. The recycled process water may have high suspended solids levels. The suspended solids cause damage to equipment. Specifically, dirty GSW will reduce the life of the slurry pump stuffing box components and gland packing.

African Rainbow Mineral's Two Rivers Platinum Mine installed **Kleerflo Automatic Self-Cleaning Filters** on the GSW line to protect slurry pumps. The reduction in TSS resulted in reduced wear and tear on the gland and shaft sleeves, reducing maintenance costs.

**Kleerflo** Filters are uniquely suited to the tough conditions experienced on mines. They are low in maintenance, durable and efficient in removal of suspended solids. They are self-cleaning.



## Mineral Sands Mine – Brand-se-Baai, Western Cape, South Africa

At a Mineral Sands Mine on the West Coast of Southern Africa they use sea water as process water. Biological fouling of the pipelines (including colonization from mussels) is a constant problem. The sea water is chlorinated to eliminate the fouling. As a consequence, shells and other solids dislodge into the water stream.

**Kleerflo Automatic Self-Cleaning Filters** are installed at different locations throughout the process plant to remove these suspended solids. The following processes are protected by the Kleerflo filters:

- glands on slurry pumps (**Gland Service Water**)
- **spray nozzles**
- **WHIMS** (Wet High Intensity Magnetic Separation) wash water

**Kleerflo** Filters are uniquely suited to the tough conditions at this coastal mine. They are low in maintenance, durable and efficient in removal of suspended solids. They are self-cleaning.



t: +27 11 789 4110  
e: [info@superior-filtration.com](mailto:info@superior-filtration.com)  
w: [www.superior-filtration.com](http://www.superior-filtration.com)  
Johannesburg | Cape Town | London