HANKE
Filter Appliction

Filtration Solutions for **Pulp & Paper**

We offer custom process filtration solutions including oil & gas filtration solutions, metallurgy filtration solutions, etc.

ONE-STOP
FILTRATION
SOLUTION PROVIDER

PULP & PAPER FILTRATION SOLUTIONS

The pulp & paper industries are one of the largest industries in the world. The process of paper making includes preparation of raw materials, fiber separation, bleaching process, papermaking process, etc. The best quality of paper can be defined by the best finish, coating, smoothness and thickness of the paper. Raw materials used shall be pure and free from impurities to get paper of higher quality. To this end, impurities must be removed from pulp and paper making water in the paper making process. Hanke provides you with a wide range of pulp & paper filtration solutions including starch slurry filtration solutions, coating filtration solutions and papermaking water filtration solutions.

Pulp & Paper Filtration

Part 1

Process Filtration Solutions

STARCH SLURRY FILTRATION

Background

It is very useful in making paper as it can be used as a surface sizing agent to coat the surface of the paper sheet to form a film on the paper surface, so that the fibers on the paper surface are better bonded and free from falling off easily, thus improving the printing performance of the paper. In addition, it is also used in paper coating as one of the binders for the coating formulation, which is a mixture of pigments, binders and thickeners. Coated paper has improved smoothness, hardness, whiteness and gloss, thus improving its printing characteristics.

Problem

Unfiltered starch slurry contains undissolved starch particles, dust and other impurities, which can clog nozzles and cause equipment failure; when applied on the paper surface, impurities in the starch slurry will cause uneven paper surface and poor paper quality.

Solution

Starch slurry needs to be filtered before use to remove unnecessary impurities. ***Self-cleaning filters*** are generally adopted for starch slurry filtration as they help manufacturers to obtain high quality starch slurry and eliminate large granular impurities.

Pulp & Paper Filtration

Part 2

Process Filtration Solutions

COATING FILTRATION

Background

Some types of paper require a coating on the body paper during the manufacturing process, such as publishing paper for magazines and books, and printing paper for trademarks, packaging, and catalogs.

Problem

Unfiltered paints may contain impurities such as undissolved solid particles, debris, dust entered during transportation, etc. During the papermaking process, these impurities not only clog the nozzles, but also cause uneven coating, thereby affecting the quality of the final paper products.

Solution

Bag filters are your most economic choice for filtering water-soluble paints or paints with a low viscosity (dynamic viscosity ≤ 1 mPa.s) while ***scraper self cleaning filters*** and ***pneumatic disc filters*** are recommended for paints with a high viscosity. The latter two filters can effectively remove particulate impurities from paints and improve the purity and color of coatings.

Pulp & Paper Filtration

Part 3

Process Filtration Solutions

PAPERMAKING WATER FILTRATION

Background

Manufacturers in the paper industry require a large quantity of high quality water available at a low price. For this reason, many manufacturers use rivers or lakes as water sources directly to save costs.

Problem

Water from rivers or lakes contains a large quantity of impurities such as silt, algae and dust. If used directly, these same impurities can clog the nozzles, causing equipment failure and even affecting the quality of the paper.

Solution

Water for pulp & paper mills generally requires a filter rating ranging from 50 μm to 500 μm. ***Self-cleaning filters*** are generally adopted for papermaking water filtration. As pulp & paper mills consume a large quantity of water, only self-cleaning filters can clean filter elements and remove impurities from water quickly without interrupting the ongoing filtration process.

Hanke Filter

Trustworthy Filtration

Expert & Partner

Self-Cleaning Filters—Inner Scrape Self-Cleaning Filter

Inner scraper self cleaning filter is a kind of self-cleaning filter that is designed to remove impurities on the inner surface of filter screen through scraper rotation driven by motor or air cylinder. It applies to the filtration in medium and highly viscosity liquids. Both stainless steel sheet scrapers and stainless steel brush scrapers are available.

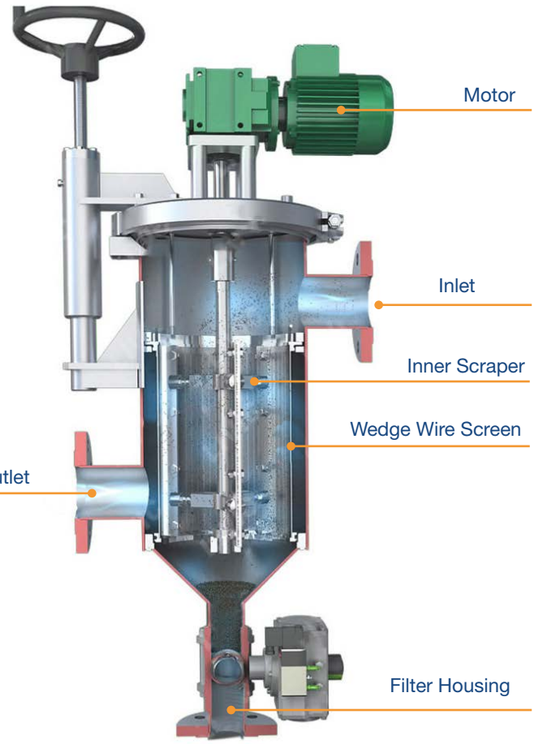
Features

- Fully automatic operation, 24-hour continuous on-line filtration;
- Automatically discharge waste liquids containing high concentration impurities that can be recycled to reduce the loss of high value materials;
- Closed filtration to prevent the leakage of hazardous materials and ensure the work safety and employee health;
- Stainless steel sheet scraper and stainless steel brush scraper are employed to offer great scraping effect, which significantly improves its impurity removal capacity and avoids crushing impurities;
- Backwash function can be added to help cleaning filter elements;
- PLC-based control system is adopted to control scraping and draining time.

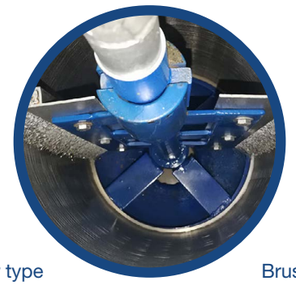
Working Principle

The liquid flows in from the inlet, flows through the filter element and then flows out from the outlet. Impurities are trapped on the inner surface of the filter element. When impurities trapped on the surface of the filter element accumulate to a certain amount, the cleaning procedure is initiated by a timer setting or triggered by a differential pressure sensor. The speed reducer or cylinder drives the scraper blades attached to the surface of the filter element to rotate and scrap off the impurities. These impurities fall into the bottom of the filter. Drain valve at the bottom of the filter shall be opened regularly to drain out the high concentration liquid for recycling.

Strainer basket inside



Scraper type



Brush type

※ Specification

Maximum flow: 1.5–110 m^3/h

Operating pressure: 0.1 MPa — 1.6 MPa (10 bar)

Inlet & outlet nominal diameter: DN 50 – DN 200

Drain outlet nominal diameter: DN 25 – DN 50

Operating temperature: → 200°C

Filter rating: 25 μm → 3000 μm

Filter area: 5600 cm^2 ↑ 2200 cm^2

Electronic control parameter: 0.37 kW, 380 V / 50 Hz / three-phase

Scraper material:
● SS304 ● SS316L ● Stainless steel wire

Filter element material:
● SS304 ● SS316L

Filter housing material:
● Carbon steel ● SS304 ● SS316L ◐ Customized.

Pneumatic drain valve:

Air supply requirements: 5 SCFM / (m^3/h):

Mini. Pressure: 0.4 MPa,

Max. Pressure: 0.8 MPa.

Control cabinet: Two-phase 220 V / 50 Hz

Self-Cleaning Filters

Outer Scraper Self -Cleaning Filter

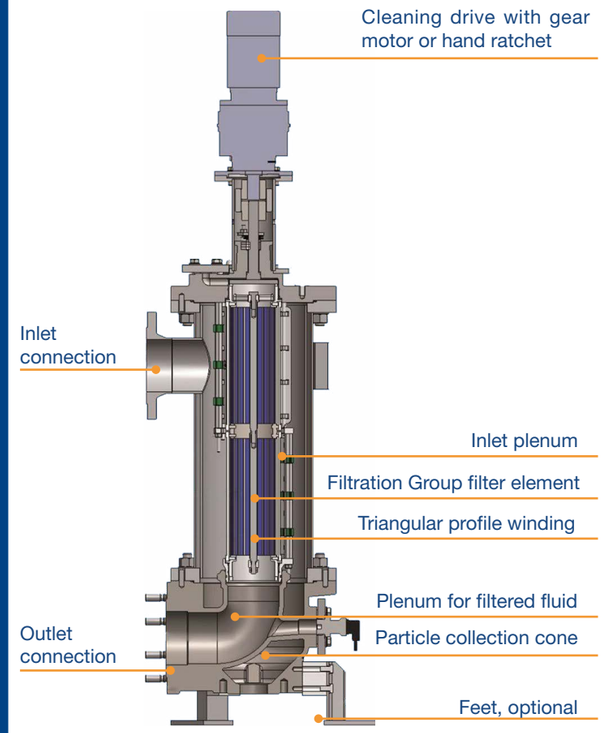
Outer scraper self cleaning filter is a kind of self-cleaning filter that is designed to remove impurities on the outer surface of filter screen through scraper rotation driven by motor. It has a filter rating of 50–500 μm and applied to highly viscosity liquid filtration with high accuracy requirements.

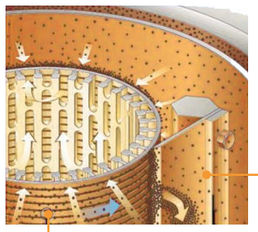
Features

- Fully automatic operation, 24-hour continuous on-line filtration;
- Automatically discharge waste liquids containing high concentration impurities that can be recycled to reduce the loss of high value materials;
- Closed filtration to prevent the leakage of hazardous materials and ensure the work safety and employee health;
- Metal sheet scraper is employed, which makes the gap between the scraper and the filer element is small. Filter elements are provided with accurate slots and extremely smooth surface, which makes it easy to clean and avoid crushing impurities;
- Backwash function can be added to help cleaning filter elements;
- PLC-based control system is adopted to control scraping and draining time;
- Pre-assembled and tested for easy installation.

Working Principle

The liquid enters the filter from the inlet and flows through the filter element surface from outside to inside. The filter element bottom is connected to the outlet, through which the liquid flows out. When impurities trapped on the surface of the filter element accumulate to a certain amount, the cleaning action is triggered by the preset time or differential pressure value. The speed reducer drives the scraper blades attached to the surface of the filter element to rotate and scrap off the impurities. The impurities move off along the blades, fall down to the filter bottom and enters the particle collection cone. These impurities are collected at the filter bottom. Drain valve at the bottom of the filter shall be opened regularly to drain out waste liquid with high impurity concentration. Discharged waste liquid can be recycled if necessary.





Specification

Operating pressure: 1.0 MPa

Inlet & outlet nominal diameter: DN 50 – DN 200

Drain outlet nominal diameter: DN 40

Operating temperature: 200°C

Filter rating: 50 μm → 500 μm

Filter area: 13600 cm^2 / 1100 cm^2

Applicable liquid: Water and viscous liquid (< 80,000 mPa.s), Impurity < 1000 ppm

Clean differential pressure: 0.05 MPa (depends on the liquid viscosity)

Differential pressure instrument: Differential pressure transmitter (DPT), differential pressure switch (DPS)

Drain valve: Pneumatic ball valve, protection class IP65

Gear motor: 180W, three-phase, 380V, IP55, worm reduction gear motor

Supply facility requirement: Control system 380 V AC, 0.4–0.6 MPa clean and dry compressed air

Filter housing material:
Carbon steel · SS304 · SS316L · Customized.

Scraping blade material:
SS304 · SS316L

Seal material:
NBR (standard), VITON

Filter element type:
V-slot slotted metal filter element, SS316L

Self-Cleaning Filters—Pneumatic Disc Filter

Pneumatic disc filter is designed to remove impurities on the inner surface of filter screen through vertical movement of scraper driven by air cylinder. It adopts a PTFE ring scraper and applies to filtration in highly viscosity liquids, corrosive, inflammable and explosive environments.

Features

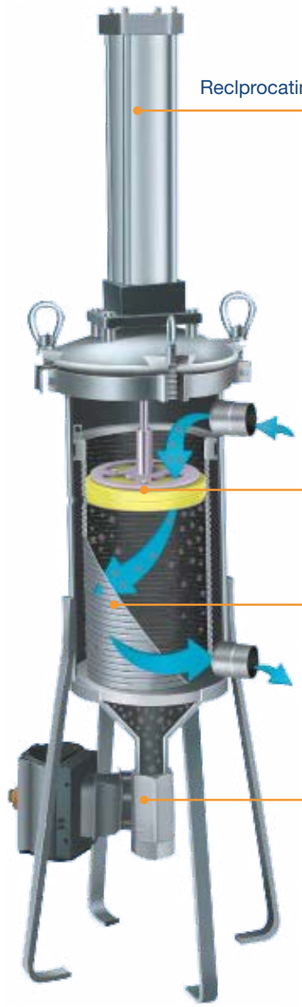
- Fully automatic operation, 24-hour continuous on-line filtration;
- Automatically discharge waste liquids containing high concentration impurities that can be recycled to reduce the loss of high value materials;
- Closed filtration to prevent the leakage of hazardous materials and ensure the work safety and employee health;
- Unique PTFE ring scraper are employed to remove impurities and applies to filtering viscous liquids.
- A variety of control systems are available to offer powerful and efficient operation and meet customers' requirements.
- Pre-assembled and tested for easy installation.

Working Principle

When the unfiltered liquid flows into the filter from the inlet, solid impurities are filtered out and deposited on the inner surface of the filter screen. The filtered liquid flows out from the outlet. When the filter screen needs cleaning, the cleaning procedure is initiated by a timer setting or triggered by a differential pressure sensor. A spring-tightened clean disc tightened with spring continuously scrapes the inner surface of the filter screen back and forth and removes the solids deposits. These impurities fall off and are discharged through the drain outlet.

Air cylinder at the top

Filter basket inside



Specification

Operating pressure: 1.0 MPa

Inlet & outlet nominal diameter: DN 50 – DN 200

Drain outlet nominal diameter: DN 40

Operating temperature: 200°C

Filter rating: 50 μm → 2000 μm

Filter area: 2480 cm^2 / 700 cm^2

Applicable liquid: Water and viscous liquid (< 80,000 mPa.s), impurity < 1000 ppm

Clean differential pressure: 50–100 KPa (depends on the liquid viscosity)

Differential pressure instrument: Pressure transmitter, differential pressure transmitter (DPT)

Drain valve: Full-port pneumatic ball valve, single or double acting type, SS304/316

Supply facility requirement: Control system 220V AC, 0.4–0.6 MPa clean and dry compressed air

Filter housing material:
SS304 SS316L Carbon Steel Customized.

Piston rod material: 316L
Piston rod seal materials: NBR/PU/VITON

Scraping blade material: PTFE

Housing seal material & Filter element seal material:
NBR/EPDM/VITON/silicone rubber/FEP covered silicone rubber

Self-Cleaning Filters—Automatic Backwash Filter

Automatic backwash filter is a kind of self-cleaning filter that consists of multiple stainless steel filer elements and can continuously perform filtration for 24 hours. It can effectively filter out solid particle contaminants from various water and low-viscosity liquids like rolling emulsions to make the liquid cleanliness meet the system operation and downstream process requirements and protect key downstream equipment. It is widely used in oil & gas, metallurgy, marine filtration systems, water treatment, Pulp & paper and other industries.

Features

- Automatic online continuous filtration, continuous filtration during backwashing to reduce downtime and maintenance costs.
- The control system can be tailored to monitor pressure and time settings for various fluids.
- Gap type high performance filter is adopted, which features high precision, large effective filter area, small pressure drop and high backwash efficiency.
- Compact design ensures that installation requires minimal space and is easy to install. The inlet and outlet ports are adjustable according to end users' requirements.
- Filter rating 50–2000 μm, suitable for the filtration of all kinds of raw water, cooling water, process water and low viscosity fluids with a viscosity of less than 40 mPa.s and impurity content less than 300 ppm.

Specification

Applicable liquid: Raw water, cooling water, process water and low viscous liquid (< 40 mPa.s), impurity < 300 ppm

Filter Rating: 50 μm → 2000 μm

Flow rate range: 10560 m³/h / 17 m³/h

Inlet & outlet size: 2"– 24"/DN 50 – DN 1000

Fluid working temperature: 0°C → 95 °C

Standard design pressure: 0.7 MPa — 1.0 MPa

Self-cleaning differential pressure: 0.05 MPa — 0.07 MPa

Minimum operating differential pressure:

Differential pressure between the outlet and back-flushing outlet ＞ 0.15 MPa

Control system: Based on SIMENS controller, parallel control mode of differential pressure and time

Gear motor: 180W/370W, 3-phases, 380V, protection class IP55, CCWU

Valve actuator: Pneumatic or electric, IP65

Back-flushing valve: Wafer butterfly valve/full-port ball valve

Supply facility requirement: 0.4–0.6 MPa clean and dry air, 380V AC

Filter element type:
V-slot slotted metal filter element,
● SS304 ● SS316L

Filter housing material:
● SS304 ● SS316L ● Carbon steel ◑ Customized.

Inner corrosion protection:
Epoxy paint, PA11 or rubber Lining for sea water resistance

Housing seal material:
NBR/EPDM/VITON

Bag Filters—Single Bag Filter

Single bag filter consists of a filter housing, a support basket and a filter bag and is suitable for solid filtration applications at low flow velocity range.

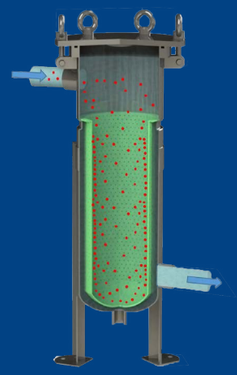
Features

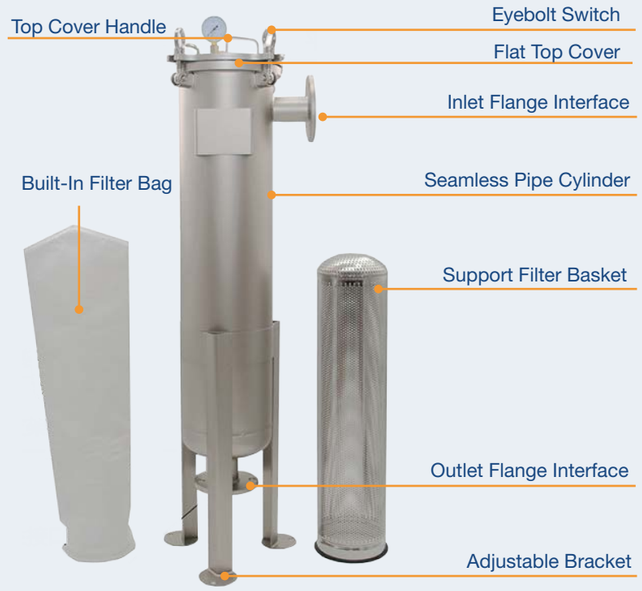
- Carbon steel, SS304, SS316 filter housing, special materials are available upon request.
- Single filter bag structure, PE, PP, PA, PTFE and stainless steel filter bags for your option.
- Filter rating up to 0.5 – 1000 μm, flow rate up to 250 GPM
- An adjustable bracket is provided, as a result, the height of the filter is adjustable.

Working Principle

The position of the single bag filter inlet is higher than that of the filter bag. Filter medium flows into the filter bag from the inlet. After filtration, the impurities are trapped in the filter bag, and the clean filtrate flows out from the outlet along the fixed metal basket wall.

The filter bag needs to be replaced when the impurities on the filter bag build up into a filter cake and the differential pressure reaches 0.05-0.1 MPa. When replacing the filter bag, the filter system must be shut down for a period of time, open the pressure relief valve and filter cover, and reinstall the filter after replacing the filter bag. Filter bags can be reused after cleaning, but need to be replaced when damaged to a certain extent. Filter bags can be reused after cleaning, but need to be replaced when being damaged to a certain extent.





Specification

Housing material: Carbon steel · SS304 · SS316

Support basket material: Stainless steel woven wire mesh · Stainless steel perforated metal mesh

Filter rating: 0.5 μm → 1000 μm

Operating pressure: 0 — 1.5 MPa

Bag type: Stainless steel, PE, PP, nylon or PTFE filter bags.

Surface treatment: Mirror polishing

Gasket: EPDM, NBR, Viton, PEFE, silica gel, etc.

Configurations: Side-in/side out and side-in/bottom-out.

Housing and cover connection: Eyebolt, eyebolt topline, V clamp

Installation: Flange connection, butt weld connection and threaded connection.

Operating temperature:

250°F (120°C)

Installation Instructions

step.1

Open the lid to the fullest extent.

step.2

Restrainer baskets should be positioned in the housing.

step.3

Bag inserted into the holders and molded flush with the holder for complete support.

step.4

Center the collar of the bag on the holder rim to achieve a tight seal.

Maintenance

- The filter bag needs to be replaced when the impurities on the filter bag build up into a filter cake and the differential pressure reaches 0.05-0.1 MPa.
- As bag filters are frequently used, trapping a large quantity of impurities, as a result, regular inspection, maintenance and repair are required even the differential pressure is small.
- If the gasket is deformed, replace with a new one immediately.

Bag Filters—Multi Bag Filter

Multi bag filter consists of a filter housing, multiple fixed baskets and multiple filter bags and is suitable for high flow fluid filtration with a flow rate of up to 2400 GPM.

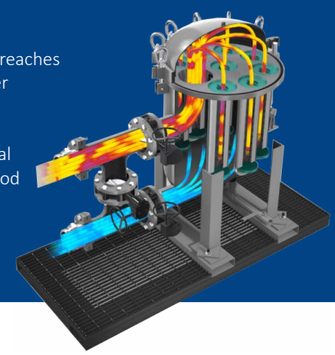
Features

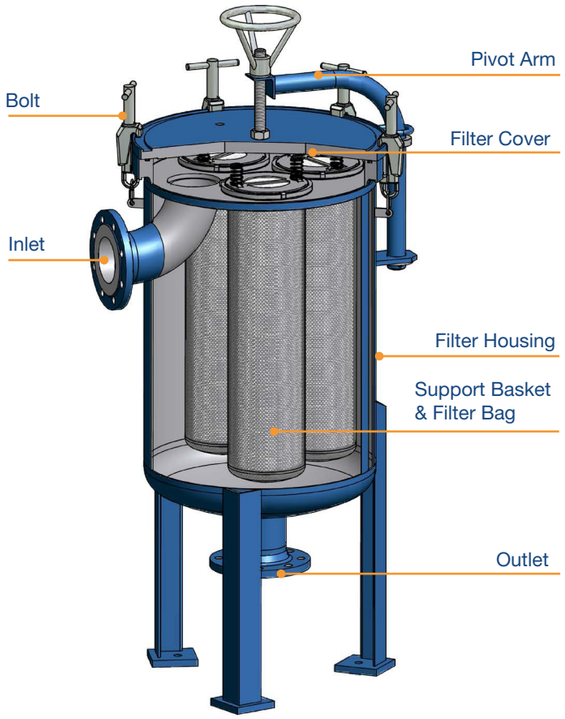
- Material: carbon steel, SS 304, SS316, special materials are available upon request.
- Muti bag structure, PE, PP, PA, PTFE and stainless steel filter bags for your option.
- Filter rating up to 0.5 – 1000 μm, flow rate up to 2400 GPM

Working Principle

The position of the multi bag filter inlet is lower than that of filter bags. Filter medium enters from the inlet, reaches the top part of the housing above filter bags, flows downward and goes through filter bags for filtration. After filtration, impurities are trapped in filter bags, and the clean filtrate flows out from the outlet.

Filter bags need to be replaced when the impurities on filter bags build up into filter cakes and the differential pressure reaches 0.14–0.17 MPa. When replacing filter bags, you must shut down the filter system for a period of time, open the pressure relief valve and filter cover, and reinstall the filter after replacing filter bags.
Filter bags can be reused after cleaning, but need to be replaced when damaged to a certain extent.
Filter bags can be reused after cleaning, but need to be replaced when being damaged to a certain extent.





Specification

We offer both standard and custom multi bag filters. Standard multi bag filter is provided with 2—24 filter bags while custom multi bag filter can accommodate up to 40 filter bags. For filters with a few filter bags, a handwheel and a swivel arm with standard bearings are provided to make filters easy to open and operate. For filters with 12 filter bags and above, pneumatic cylinders or hydraulic auxiliary devices may be selected as it makes filters open and close require one operator only. auxiliary devices include pressure relief valves, positioning pins, etc., to effectively ensure the safe operation of the equipment.

Housing material: Carbon steel · SS304 · SS316

Support basket material: Stainless steel woven wire mesh · Stainless steel perforated metal mesh

Filter rating: 0.5 μm → 1000 μm

Operating pressure: 0 — 1.5 MPa

Bag type: Stainless steel, PE, PP, nylon or PTFE filter bags.

Surface treatment: Mirror polishing

Gasket: EPDM, NBR, Viton, PEFE, silica gel, etc.

Configurations: Side-in/side out and side-in/bottom-out.

Housing and cover connection: Eyebolt, flange and quick opening

Installation: Flange connection, butt weld connection and threaded connection.

Operating temperature:

250°F (120°C)

Maintenance

- The filter bag needs to be replaced when the impurities on the filter bag build up into a filter cake and the differential pressure reaches 0.14-0.17 MPa.
- As bag filters are frequently used, trapping a large quantity of impurities, as a result, regular inspection, maintenance and repair are required even the differential pressure is small.
- If the gasket is deformed, replace with a new one immediately.

Bag Filters—Duplex Bag Filter

Duplex bag filter is a kind of filter that consists of 2 single bag filters and their inlets and outlets are connected together via butterfly valve and ball valves. This special design allows one bag filter to maintaining running when the other bag filter is in maintenance, thereby reducing the overall operating costs.

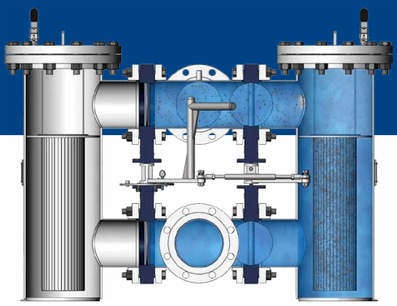
Features

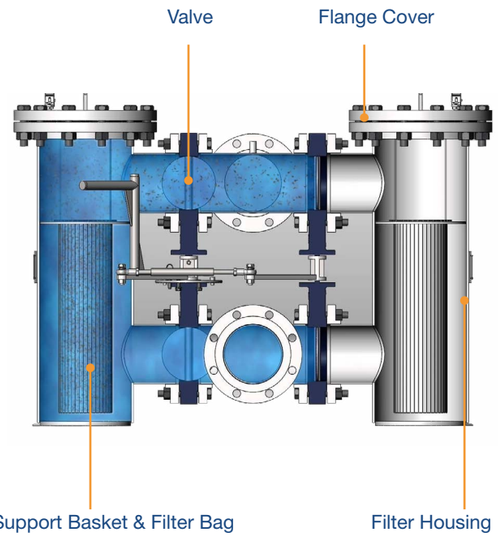
- Allow continuous operation and reduce downtime.
- Filter rating: 0.5–800 μm
- Easy to install and replace filter bags, easy to operate
- An adjustable bracket is provided, as a result, the height of the filter is adjustable.
- Special materials and sizes are available upon request.

Working Principle

Duplex bag filter consists of 2 single bag filters connected together via valves. During the filtration, generally, one bag filter performs filtration and the other one works as a standby. The position of the inlet is higher than that of filter bags. Filter medium flows into the filter bag in service from the inlet. After filtration, the impurities are trapped in the filter bag, and the clean filtrate flows out from the outlet along the fixed metal basket wall.

When replacing the filter bag, you may close the filter on the side the filter bag needs to be replaced and open the standby filter for filtration. In this way, it ensures the system performs continuous filtration and reduces costly downtime.





Specification

Housing material: Carbon steel SS304 SS316

Support basket material: Stainless steel woven wire mesh Stainless steel perforated metal mesh

Filter Rating: 0.5 μm → 800 μm

Operating pressure: 0 — 150 MPa (10 bar)

Number of bags: Two bags

Operating temperature: 250°F (120°C)

Bag type: Stainless steel, PE, PP, nylon or PTFE filter bags.

Gasket: EPDM, NBR, Viton, PEFE, silica gel, etc.

Surface treatment: Mirror polishing

Housing weight: 240 lb. (109 kg)

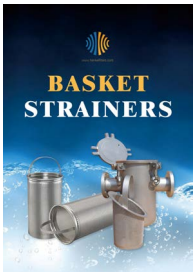
Capacity: *(50 gpm – 200 gpm per bag)*

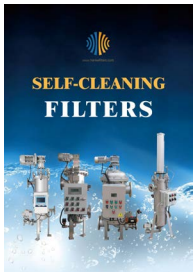
Replacement

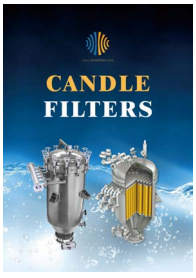
1. Cut off the water flow into the filter bag that needs to be replaced and drain it out.
2. Remove the filter cover and take out the dirty bag. It is recommended to check the filter basket and clean it as needed. Put the cleaned basket and new bag back into the filter.
3. Check the O-ring at the top of the housing and apply food grade grease to prevent it from drying out. Be sure the chemical properties of the grease are compatible with the O-ring and then reinstall the filter and make it access to the system.

10+ years
est. 2011

BASKET STRAINERS,
BAG FILTERS,
SELF-CLEANING FILTERS,
CANDLE FILTERS,
PRESSURE LEAF FILTERS,
FILTER CARTRIDGES







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