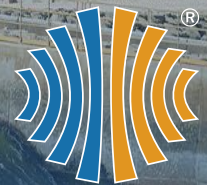


HANKE

Filter Application

Filtration Solutions for **Marine Filtration**

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



ONE-STOP
FILTRATION
SOLUTION PROVIDER

MARINE FILTRATION SYSTEM SOLUTIONS

Seawater is a very important resource on this planet. Ships sailing on the ocean require a large amount of seawater as ballast water to ensure the balance of the ship; areas with a shortage of fresh water require large amounts of seawater to make fresh water for drinking and irrigation. However, seawater is not directly usable as it contains a lot of plankton, stones, debris and other impurities and needs to be filtered before use. Hanke is equipped with a professional technical team to provide you with customized marine filtration system solutions.

Fine Chemical
Filtration

Part 1

Process Filtration Solutions



BALLAST WATER FILTRATION

Ballast water is water specially injected to maintain the balance of the ship. It is an important guarantee for the safe navigation of ships, especially for those do not carry the right amount of goods. The right amount of ballast water ensures that the ship's propeller has sufficient draft to minimize the hull vibration caused by the ship's wake, and maintain the propulsion efficiency.

? Background

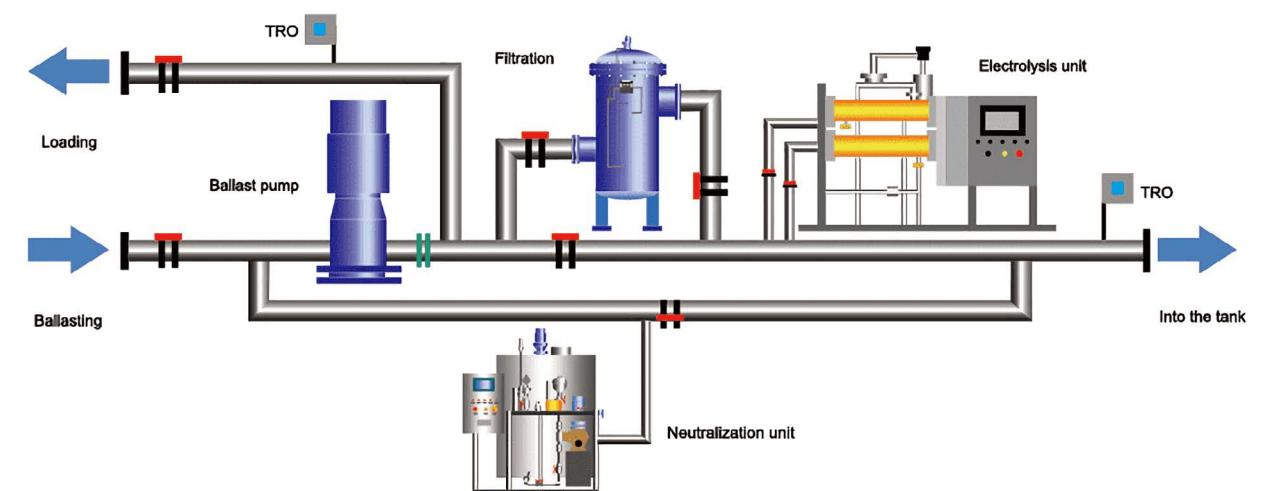
The discharge of untreated ship ballast water will cause environment pollution while harmful aquatic organisms from the ballast water may pose a threat to human health. The risk of introducing harmful aquatic organisms, pathogens and associated sediments from ship's ballast water should be minimized. Therefore, the International Maritime Organization (IMO) formulated the *International Convention for the Control and Management of Ship's Ballast Water and Sediments* in 2004. The filtered ballast water shall conform to IMO standards.

💬 Problem

Ballast water contains a large number of organisms, such as bacteria, plankton, viruses, small fishes, crabs or jellyfishes, which not only clog the downstream pipes and other equipment, but also expose local ecosystems to threats from alien species when they are brought to and discharged at the port of destination.

✓ Solution

Automatic backwash filters with a filter rating of 50 μm are generally adopted for ballast water filtration. When the ballast water passes through the filter, the filter automatically removes marine organisms larger than 50 μm and returns them to local waters, and filters out particulate impurities that may clog pipes and damage downstream equipment.



SEAWATER DESALINATION FILTRATION SOLUTIONS

Seawater desalination is a process of water filtration that removes salts and other minerals from salt water. The desalination process makes saline water available for drinking and irrigation. Desalination systems are commonly used in bench hotels, resorts, vessels and other commercial or industrial applications. Desalination filtration systems are the only source of pure water in areas where traditional drinking water supplies are not available or where clean water sources have been depleted.

Seawater
Desalination

Part 2

Process Filtration Solutions

Seawater
Desalination

Part 1

Process Filtration Solutions

ULTRAFILTRATION

? Background

In difficult waters, ultrafiltration has proven to be the best technology as the final treatment step before reverse osmosis filtration. It separates the solution by pressure or concentration gradients to remove suspended solids, endotoxins, bacteria, viruses and other pathogens, and get prepared for further membrane desalination systems.

💬 Problem

Ultrafiltration equipment is very expensive. When the solution contains large particulate impurities, these impurities can cause damage to the ultrafiltration membrane, leading to equipment failure and increased maintenance costs.

✅ Solution

To protect expensive ultrafiltration equipment, automatic backwash filters are generally installed before ultrafiltration equipment to remove large particulate impurities, such as organic wastes, plastic wastes, bacteria and silt.



REVERSE OSMOSIS FILTRATION

? Background

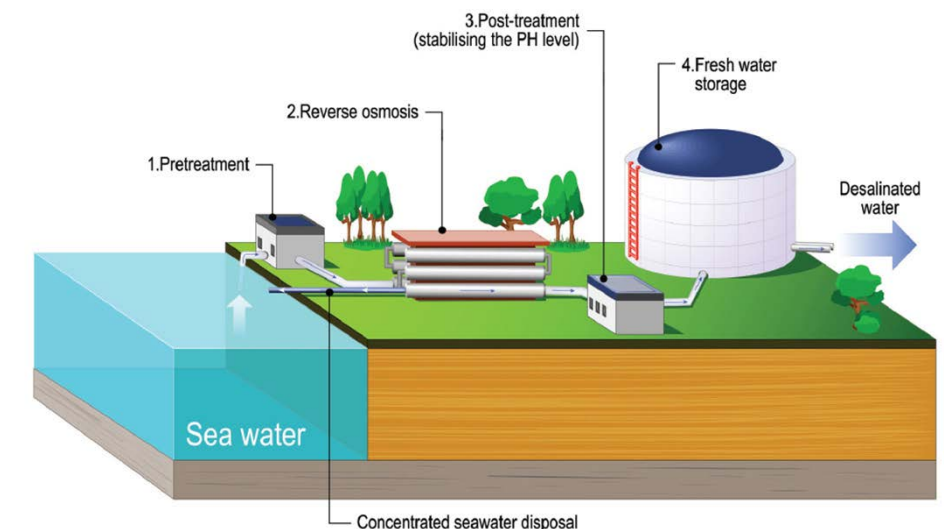
In the desalination process, reverse osmosis (RO) filtration is often used in conjunction with ultrafiltration. RO filtration generally performs after ultrafiltration. It is more sophisticated than ultrafiltration equipment, and can remove harmful metal ions that cannot be removed by ultrafiltration equipment and obtain more purer water.

💬 Problem

RO membranes are also very expensive. Impurities in the seawater leads to a shorter RO membrane life, a short operation period and high maintenance costs.

✅ Solution

Prefiltration is performed before conducting reverse osmosis filtration as it can protect the RO membrane and keep it working efficiently for a longer period. Cartridge filters are generally adopted for RO pretreatment as they can effectively remove particles with a diameter of 5 µm and above to protect RO equipment.





Trustworthy Filtration

Expert & Partner



Self-Cleaning Filters—Automatic Backwash Filter



Automatic backwash filter is a kind of self-cleaning filter that consists of multiple stainless steel filter 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:  \rightarrow  **Flow rate range:** 

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

Fluid working temperature:  0°C \rightarrow 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

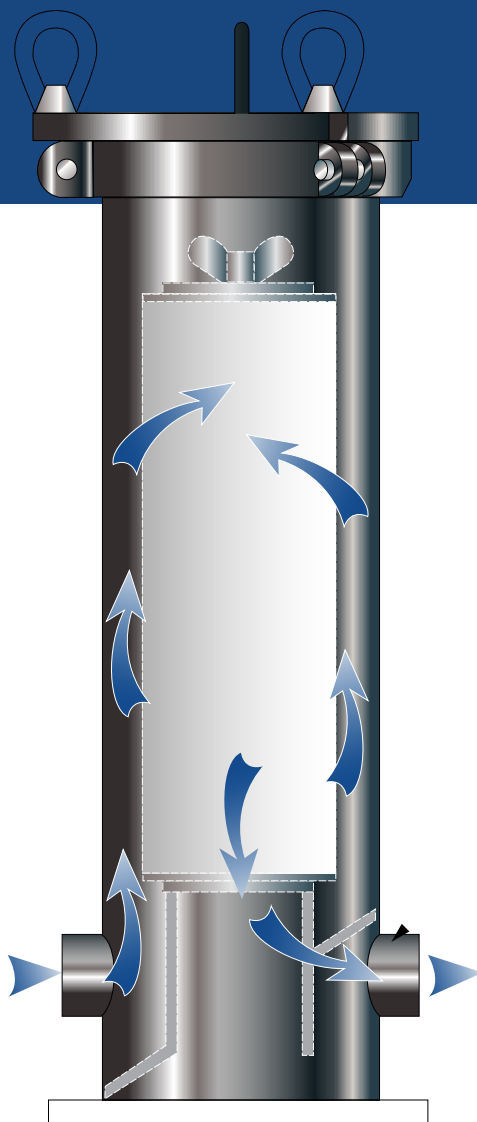
Cartridge Filters

Single Cartridge Filter

Single cartridge filter requires only one filter cartridge inside. Compared with multi cartridge filter, it requires a smaller footprint and filters a smaller area, as a result, it is suitable for applications with low flow rates in limited space.

Features

- V-bands or swing-bolt closures are provided for quick filter cartridge replacement.
- Suitable for accommodating filter cartridges with a length of 10", 20" or 30"
- Suitable for DOE and SOE filter cartridges
- Removable filter cartridges, easy to clean and replace.
- Suitable for filtering fluids in low flow at low flow rates.
- Cartridge filters in special specifications are available upon request.



Working Principle

First, precoat is applied before filtering. Agitate precoat tank containing filtrate and filter aid (diatomaceous earth, perlite, etc.) for around 10 minutes. Then, fill the vessel with the mixture, empty all the air, and pressurize the vessel. The precoat runs for 15 minutes at a fluid rate around 30–60 gallons per square foot per hour.

✖ Specification

Optional cartridge:

PP melt blown, string wound PP cartridge, PP pleated cartridges, ceramic cartridges and stainless steel wire cartridges

Cartridge size (length): 10", 20", 30"

Cartridge end cap: DOE, SOE (222)

Housing material: SS304, SS316L, carbon steel

Operating pressure: 150 psi (10.3 bars) max

Operating temperature:



Model	Cartridge Size	Inlet Size	Flow Rate (GPM)	Drain Size (NPT)
1	10"	3/4" – 1"	6	1/4"
2	20"	3/4" – 1"	12	1/4"
3	30"	3/4" – 1"	18	1/4"

Multi Cartridge Filter

Multi cartridge filter consist of a stainless steel filter housing and multiple filter cartridges like filter PP filter cartridge inside. It is mainly used after multi-medium pretreatment filtration and before membrane filtration equipment such as reverse osmosis and ultrafiltration to ensure the water filtration rating and protect membrane filter elements from large particles.

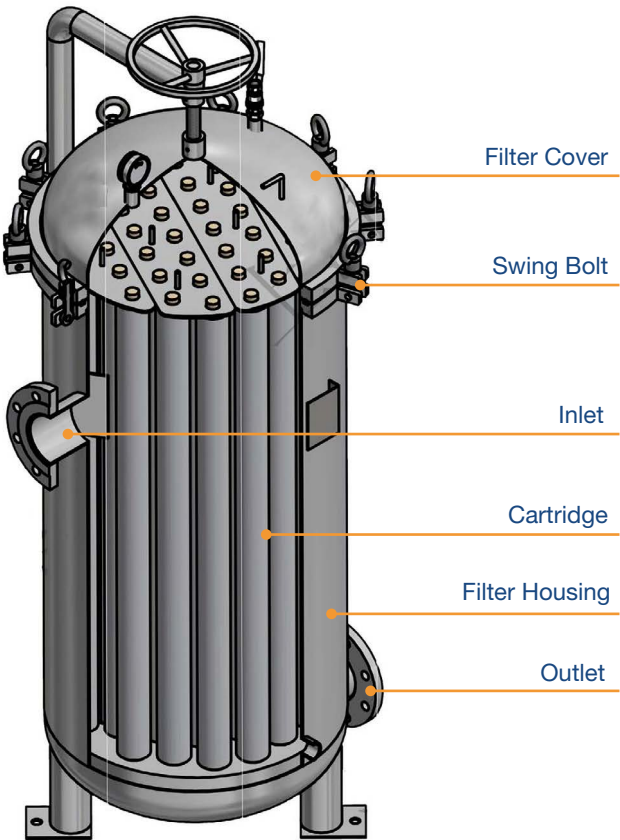
Features

- V-bands or swing-bolt closures are provided for quick filter cartridge replacement.
- Suitable for accommodating filter cartridges with a length of 10", 20", 30" or 40".
- Suitable for DOE and SOE filter cartridges.
- Removable filter cartridges, easy to clean and replace.
- Suitable for filtering fluids in high flow at various flow rates.
- Other specifications are available upon request.

Working Principle

The unfiltered liquid flows into the filter from the inlet, flows through the cartridge from outside to inside and becomes clean. Impurities are trapped in the deep layer or on the surface of the cartridge and clean fluid flows out from the outlet.

When the differential pressure upstream and downstream is more than 0.2MPa and the flow rate of the liquid is 30% less than before, it is time to change the filter cartridge to prevent system clogging.



✧ Specification

Optional cartridge:

PP melt blown, string wound PP cartridge, PP pleated cartridges, ceramic cartridges and stainless steel wire cartridges

Rated value: 0.05–200 µm

Cartridge size (length): 1–200

Cartridge end cap: DOE, SOE (Fin/ 222, Fin/ 226, Flat/ 222, Flat/ 226)

Housing material: SS304, SS316L, carbon steel

Surface treatment: Sandblasting, mechanical polishing, electrolytic polishing

Operating temperature:



Inlet/outlet: BSP, Tri-cover, ANST flange

Applicable viscosity (cp): 1–500

Design pressure: 0.6 MPa, 1.0 Mpa

Cover connection: V-band, swing-bolt

Model #	Cartridge Requirements	Pipe Size (flange)	Max. Flow Rate (GPM)	Drain Size (NPT)
1	(4) of 10"	2"	24	1/2"
2	(4) of 20"	2"	48	1/2"
3	(4) of 30"	2"	72	1/2"
4	(4) of 40"	2"	96	1/2"
5	(5) of 10"	2"	30	1/2"
6	(5) of 20"	2"	60	1/2"
7	(5) of 30"	2"	90	1/2"
8	(5) of 40"	2"	120	1/2"
9	(6) of 40"	3"	144	1/2"
10	(7) of 20"	2"	84	1/2"
11	(7) of 30"	2"	126	1/2"
12	(7) of 40"	3"	168	1/2"
13	(9) of 40"	3"	216	1/2"
14	(12) of 40"	4"	288	1/2"
15	(22) of 30"	4"	396	1/2"
16	(22) of 40"	6"	528	1/2"
17	(27) of 40"	6"	660	1/2"
18	(36) of 40"	6"	720	1/2"
19	(42) of 40"	6"	1,008	1/2"
20	(55) of 40"	8"	1,320	1/2"
21	(61) of 40"	8"	1,464	1/2"
22	(73) of 40"	8"	1,752	1/2"
23	(98) of 40"	10"	2,340	1/2"
24	(120) of 40"	10"	2,880	1/2"
25	(150) of 40"	10"	3,000	1/2"

10⁺
years
est. 2011



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



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