



SXF -W DEOILING HYDROCYCLONE



DALIAN CREST FLUID EQUIPMENT CO., LTD.



Product Introduction

In oil-water separation processes, traditional gravity settling equipment requires a large footprint and long residence times. Centrifuges have high energy consumption and maintenance costs, while filters require frequent maintenance that disrupts continuous production.

The deoiling hydrocyclone, through its tangential swirl structure, converts pressure energy into a high-intensity centrifugal force field, enabling millisecond-level efficient separation and fundamentally enhancing separation efficiency and response speed.

As a key unit for process intensification and plant compactness, this equipment achieves high efficiency, low energy consumption, and low-maintenance continuous operation with its compact structure, providing a reliable separation solution for modern industries.

Key Advantages & Features

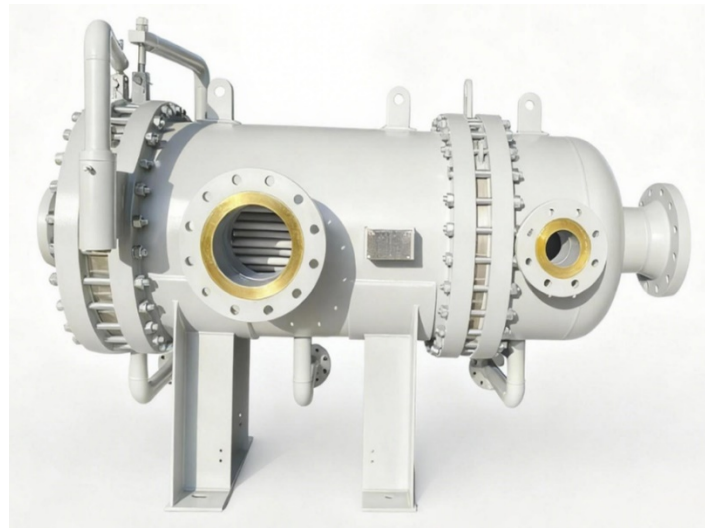
- ✧ **High Separation Precision, Adaptable to Fluctuating Conditions**
Optimized hydrocyclone liner and flow path design ensure stable separation performance within flow and pressure fluctuations. A single unit achieves **Oil Content in Water Outlet $\leq 50\sim 100$ ppm**, meeting stringent requirements.
- ✧ **Compact Structure, Flexible Installation**
Compact design with a small footprint allows flexible layout per site conditions. Suitable for both new projects and retrofits, with no major civil work required.
- ✧ **Static Separation, Maintenance-free**
No moving parts or consumables in the core separation unit. With no abnormal corrosion or wear, the equipment offers a long service life, significantly reducing operating costs.
- ✧ **High-pressure Tolerance, Zero-energy Operation**
Integral metal pressure-bearing structure designed to withstand high pressure, suitable for deep-sea and high-pressure oil & gas fields. Separation is driven solely by inlet pressure, requiring no additional power.

Working Principle

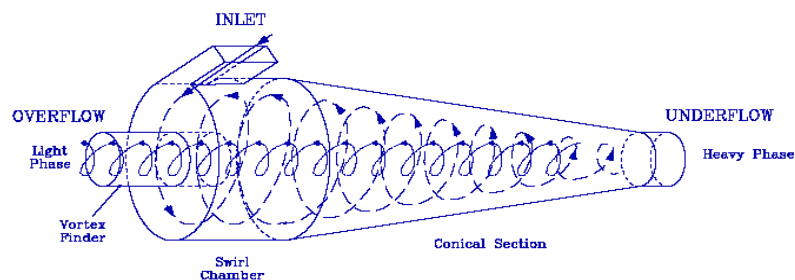
The hydrocyclone system consists of multiple hydrocyclone liners arranged in parallel within a common vessel. This multi-liner configuration is necessary because each individual liner has a fixed internal geometry optimized for separation performance and cannot be scaled to accommodate varying flow capacities. Operating multiple liners in parallel provides the required capacity while maintaining separation efficiency.

In a typical commercial system, the liners are manifolded inside a pressure vessel fitted with two internal support plates, dividing the vessel into three separate chambers: the feed (oily water) inlet chamber, the clean water outlet chamber, and the reject oil collection chamber.

The core of the deoiling hydrocyclone is its internally integrated multiple hydrocyclone liners, which are designed through computational fluid dynamics (CFD) optimization to achieve maximum separation efficiency. Each liner is a static device with no moving parts, ensuring high reliability and low maintenance.



Separation is driven by high-intensity centrifugal forces generated within each liner. The oily wastewater enters the feed chamber and flows tangentially into each hydrocyclone liner under pressure. The tangential entry induces a high-velocity spinning motion inside the liner, creating a centrifugal force hundreds of times stronger than gravity. This forces the heavier water phase outward to the liner wall, while the lighter oil phase migrates toward the central axis. The water is then accelerated through the conical section and exits from the underflow (apex) of each liner, collecting in the clean water chamber for discharge through the water outlet. The separated oil, forming a slender oil core along the axis, is discharged from the overflow (reject) end into the oil collection chamber and removed through the oil reject outlet.



Principle of Hydrocyclone Liner

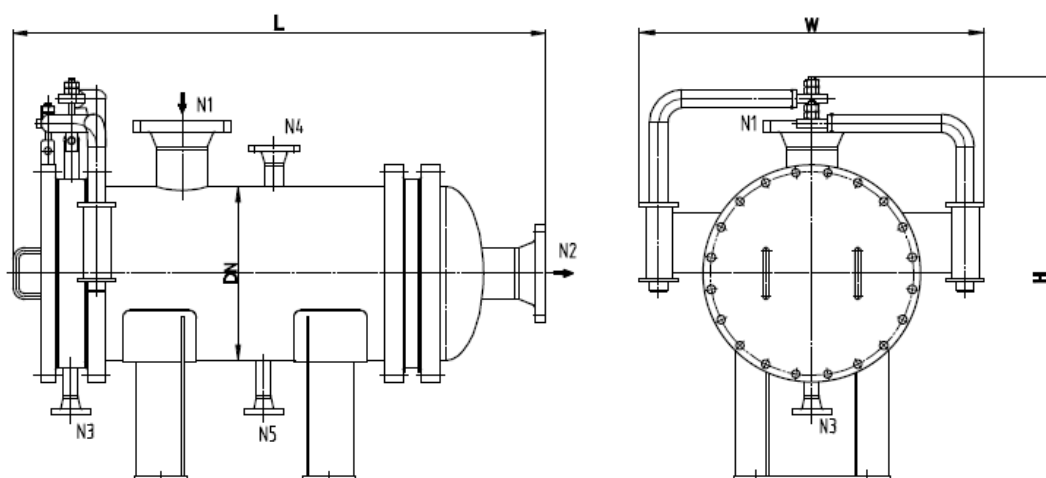
Core Component



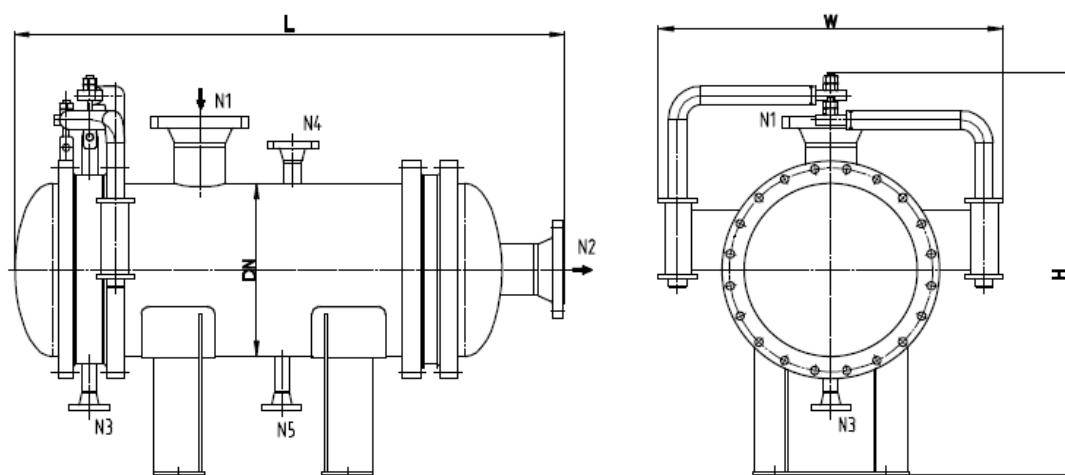
Hydrocyclone Liners

Technical Specifications

Parameter	Specification
Applicable Medium	Oily Wastewater ^①
Capacity per Unit	0~550 m ³ /h
Inlet Oil Concentration	≤2000 ppm
Water Outlet Oil Concentration	≤100 ppm
Suspended Oil Droplet Separation Size	≥10 μm
Operating Pressure	≥0.56 MPa(G)
Operating Temperature	0~99 °C
Design Pressure	1.6 MPa(G), or Specified
Design Temperature	<100 °C
Overflow Ratio	≤3%
Differential Pressure Ratio	1.75~2
Vessel Material	Carbon Steel, SS304, SS316, DSS or Specified
Liner Material	SS304, SS316, DSS or Specified
Note: ①For liquid-liquid heterogeneous mixtures, a density difference between the dispersed phase and the continuous phase of ≥ 50 kg/m ³ is required.	



For Vessel Diameter $\leq 500\text{mm}$



For Vessel Diameter $> 500\text{mm}$

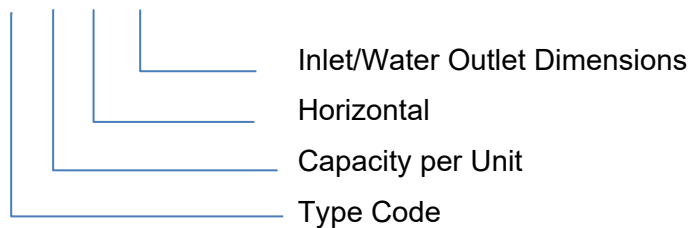
Model and Specification

Model	SXF20- W.50	SXF40- W.80	SXF75- W.100	SXF125- W.150	SXF195- W.200	SXF270- W.200	SXF370- W.250	SXF450- W.250	SXF550- W.300
Applicable Capacity m³/h	≤20	20~40	40~75	75~125	125~195	195~270	270~370	370~460	460~550
Vessel Diameter mm	DN250	DN300	DN400	DN500	DN600	DN700	DN800	DN900	DN1000
Main Connection Dimensions (mm)									
Inlet N1	DN50	DN80	DN100	DN150	DN200	DN200	DN250	DN250	DN300
Water Outlet N2	DN50	DN80	DN100	DN150	DN200	DN200	DN250	DN250	DN300
Oil Reject N3	DN15	DN20	DN25	DN40	DN40	DN50	DN50	DN50	DN80
L	1520	1580	1600	1700	1900	2000	2100	2200	2300
W	680	700	800	940	1050	1170	1270	1370	1470
H	1000	1050	1200	1300	1400	1650	1750	1900	2000

Note:

① The above are the parameters of the standard product. Customization is available.

② Model description: SXF□□-W.□□



Typical Applications

The Liquid-liquid Hydrocyclone can perform multiple operations such as liquid purification, concentration, and classification. It is applied in industries including petrochemical, fine chemical, food processing, pharmaceutical, and environmental protection.

- ✧ Hydrocyclone deoiling of produced water on offshore platforms: It is used for cyclonic oil removal from produced water in oilfield extraction with an oil concentration $\leq 2000\text{mg/L}$. The treated water can meet the 50-100mg/L discharge requirement
- ✧ Hydrocyclone deoiling for oily wastewater treatment in petrochemical plants
- ✧ Hydrocyclone deoiling in the coking unit cooling water treatment system for needle coke projects
- ✧ Hydrocyclone separation of two immiscible liquids in the chemical industry

Some Products in Factory



Deoiling Hydrocyclone Tester



Some Products in Application Fields

