

# CYCLOTECH B Series

## Deoiling hydrocyclone technologies

### APPLICATIONS

- Produced water deoiling
- Liquid-liquid separation
- Onshore and offshore production operations

### ADVANTAGES

- No moving parts and wear-resistant material enhance reliability
- Global presence of maintenance facilities
- Compact footprint saves space
- Retrofit capability increases capacity and improves separation performance



*B Series technologies provide market-leading liner packing efficiency and maximized processing capabilities.*

CYCLOTECH® B Series\* deoiling hydrocyclone technologies represent the state of the art in produced water treatment technology, a third-generation geometry optimizing the critical balance between oil-removal efficiency and capacity. Leveraging a globally installed base on both onshore and offshore facilities, the technologies ensure that peak separation is achieved in the most cost-effective and space-efficient manner.

B Series technologies treat water streams containing 2,000 mg/L of oil to meet a discharge water oil content of 30 mg/L, or more commonly, to stretch targets of as low as 15 mg/L. For demanding process requirements, B Series technologies can be used with CYCLOTECH PECT-F\* performance-enhancing fiber-based coalescence technology and with EPCON CFU\* compact flotation unit technology.

### Principle of operation

Operating with no moving parts, B Series technologies achieve liquid-liquid separation using a pressure drop across the unit. Oily water is forced under pressure into the inlet section of the liner via a tangential inlet port. This pressure, together with narrow cyclone diameter, causes the fluid to spin at high velocity, creating a high gradial acceleration field. Oil, the less-dense liquid, is forced to the axial center of the hydrocyclone to form a thin oil core. Through internal hydrodynamic forces and external differential pressure control, this oil core is removed via the reject ports of the hydrocyclone liners; the clean water flow is discharged from the cyclone underflow.

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## Hydrocyclone liner design

The hydrocyclone geometry is critical to achieving optimal separation performance. Because deoiling hydrocyclone geometries cannot be scaled up without impacting performance, B Series technologies are manifolded together in a common vessel to meet the required system flow rate. The ultraslim external dimensions of the technologies provide market-leading liner packing efficiency to maximize process throughput within a given vessel without compromising performance.

The technologies are most commonly manufactured in duplex stainless steel. For erosive applications, Schlumberger offers liners manufactured from a range of wear-resistant materials. These include Stellite® 6 cobalt alloy, tungsten carbide, and reaction-bonded silicon carbide, an advanced ceramic with a wear life up to 10 times that of a standard duplex stainless steel liner.

## Retrofits

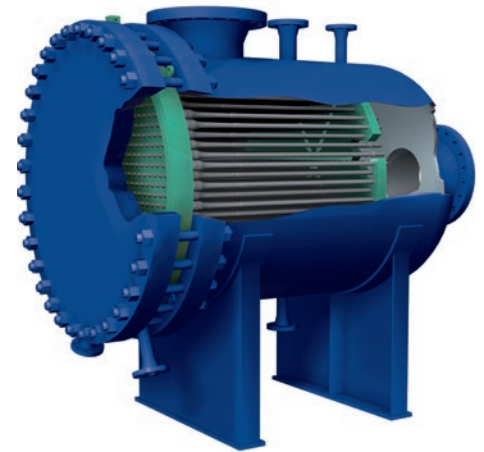
The capacity and performance of existing hydrocyclone technologies can be increased by 80% while also improving separation performance by 50% by retrofitting B Series technologies. These technologies can be adapted to retrofit all existing third-party hydrocyclone vessel designs without the addition of extra hydrocyclone vessels, hot work, or modification to existing pipes.

## Hydrocyclone spares

Schlumberger supplies spare hydrocyclone liners and seal kits for third-party systems. B Series technologies can fit directly into all third-party vessels usually without the requirement for any modification to the existing vessel. Advantages include improved performance, more wear-resistant material options, and greater cost effectiveness. Schlumberger now has call-off contracts in place, providing a single point of contact for all hydrocyclone spares requirements.

## Technical viability testing

Schlumberger has a range of single-liner test units that can be used to determine B Series technologies' separation performance on live fluids. These test units are compact, require no utilities, and come complete with all required valving, instrumentation, and hosing. Schlumberger produced water and sand management experts can also perform a full oil-drop-size characterization of the existing produced water treatment as part of these performance trials.



*Field-proven B Series technologies have no moving parts and can meet oil-in-water content requirements down to 30 mg/L and stretch targets as low as 15 mg/L.*



*Schlumberger deoiling hydrocyclone liners are commonly manufactured in duplex stainless steel. For erosive applications, liners are available with all inlet and tapered internal surfaces manufactured from a range of wear-resistant materials.*

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