TYPHONIX PUMP

We deliver
low shear
process solutions

typhonix
cleaner production

AREAS WITH LOW SHEAR OPTIMIZED PRODUCTION

This map shows areas where fields have adopted Typhonix low shear equipment as of 2026.

LOW SHEAR

Low shear process equipment is well established as a cost-effective solution all over the world.

Low shear pumps and valves are effective ways to debottleneck the separation and produced water treatment systems without additional equipment or chemicals; simply replace the existing components with the more separation friendly low shear alternatives.

Strategic use of low shear pumps and valves will reduce the economic impact of challenges related to late life field production and tiebacks. Increasing the efficiency of the separators increases the liquid handling capacity without the need for expensive separator modifications, allowing a mature field to stay in production longer.

Low shear pumps and valves reduce emulsions, meaning that the need for chemicals and heating is reduced. This has a direct impact on OPEX and CO2 emissions. With minimal upgrading of the existing facilities, the use of low shear pumps and valves makes oil production cleaner and more efficient.

REFERENCE CASES

THE DEVELOPMENT

The basis for the Typhonix Pump was developed through a series of Joint Industry Projects together with leading operators and the Research Council of Norway.

The target was to develop a pump type that combines low shear with a robust and reliable design. In addition to this, our low shear design also has low NPSHr, noise and vibrations. The following cases showcase applications utilizing the technology.

ConocoPhillips | equinor | NEPTUNE ENERGY | vår energi | Funded by The Research Council of Norway

CASE A

The Typhonix Pump was installed on a brownfield to feed hydrocyclones, either from the 1st stage separator or the 2nd stage separator.

In addition to the optimized low shear performance, the Typhonix Pump was chosen because of its high reliability and low maintenance load. The Typhonix Pump was supplied in BB4 configuration with seal support system on a separate skid.

TECHNICAL INFO

Operating range:
410 m^3/h 40 to 125 m head

High efficiency:
> 75 %

Low noise:
< 65 dBA, complete unit 78 dBA

Low vibration:
< 1.2 mm/s RMS

Low NPSHr (3 %):
< 4 m

CASE B

This brownfield required two low shear pumps to feed the new filter package. Typhonix Pump was chosen because of the client's high focus on reliability and long maintenance intervals.

Excellent low shear pumping is critical to maintain high performance of the filters. Third party field measurements showed that the coalescing capabilities of the pump increased droplet size by more than 50 %.

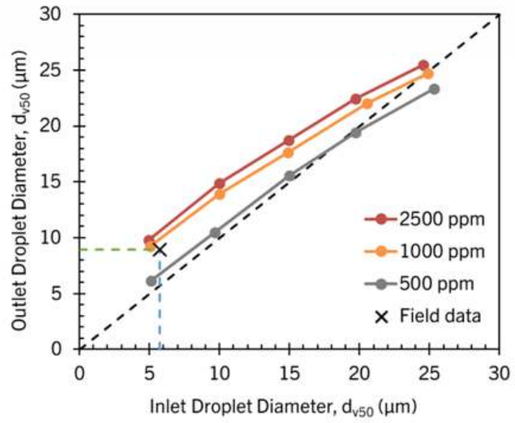
TECHNICAL INFO

Operating range:
37 m^3/h 37 m head

Low vibration:
< 0.4 mm/s RMS

Low NPSHr (3 %):
< 1.4 m

Oil concentration:
600 ppm (200 – 1000 ppm)



x-axis: droplet size at pump inlet
y-axis: droplet size at pump outlet

In the plot, the black X represents the inlet and outlet median droplet size, measured in the field by the third party.
At the pump inlet, the d_{v50} = 5.7 µm, while at the pump outlet d_{v50} = 8.9 µm. This means that the Typhonix Pump increased the typical droplet size by more than 50 %, which is crucial for optimal performance of the downstream separation equipment.

In addition to the field results, the plot shows results from a droplet performance test performed at Typhonix Test Center.

USER BENEFITS

- Typhonix Pump improves the efficiency of produced water treatment equipment.
- Typhonix Pump has a robust design in accordance with API 610 and therefore has a lower OPEX and longer MTBF compared to positive displacement pumps.
- Typhonix Pump does not require blocked outlet protection (e.g., a PSV), contrary to positive displacement pumps.
- Typhonix Pump improves separation efficiency without resorting to chemicals or additional treatment equipment, reducing oil and chemical discharges.
- Typhonix Pump contributes to a cost-effective and environmentally friendly separation process.
- Typhonix Pump increases produced water treatment system robustness through coalescence.
- Typhonix Pump contributes to reduced size and footprint of greenfield process plants by increasing separation efficiency.
- Typhonix Pump increases the process' ability to handle upsets, and fluid and flow instabilities.

LOW SHEAR TRIM

Typhonix Pump is a low shear centrifugal pump developed primarily for produced water applications.

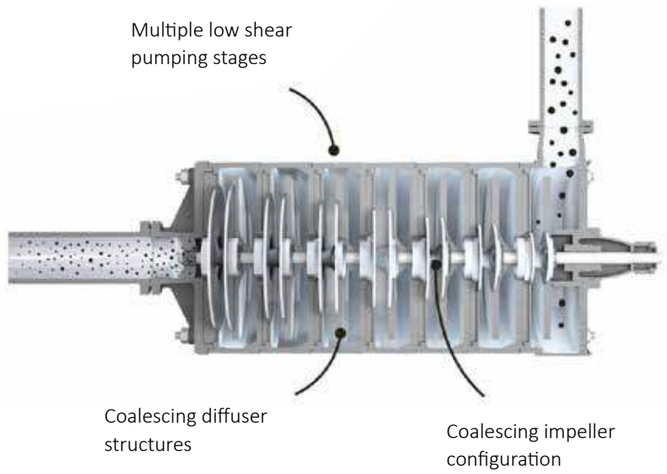
Due to the robust design in accordance with API 610 and NORSOK, the pump has large OPEX benefits compared to positive displacement pumps.

The patented Low Shear Trim internals minimize oil droplet breakup. With sufficient oil concentration, the trim also promotes droplet-droplet coalescence (see Case B).

The Low Shear Trim internals are specially engineered for each individual application, considering factors such as the head requirements, crude viscosity and produced water treatment system requirements.

Typhonix Pump is available in horizontal and vertical BB4 configuration. Other configurations may be possible at special request.

Typhonix Pump is built by well-established pump manufacturer Dickow Pumps, with years of experience and thousands of references. Typhonix Pump utilizes their standard BB4 design and our patented Low Shear Trim.



CASE C

For this greenfield, two Typhonix Pumps were part of a larger pump package delivered together with a partner. The low shear pumps are used to feed hydrocyclones with water coming from a coalescer.

The Typhonix Pumps were supplied in BB4 configuration with the plan 53B seal support system on the skid.

TECHNICAL INFO

Operating range:
40 m^3/h 58 m head

High efficiency:
70 %

Low noise:
< 65 dBA

Low vibration:
< 0.3 mm/s RMS

Low NPSHr (3 %):
< 2.3 m

CASE D

In this case, three Typhonix Pumps were part of a major upgrade of a brownfield platform, replacing positive displacement pumps. The Typhonix Pumps were delivered with soft starters and low shear recirculation valves.

The low shear recycle valves were installed downstream of the hydrocyclones to reduce droplet breakup to a minimum (see page 11).

The pumps were in BB4 configuration with a plan 65A seal leakage detection system.

TECHNICAL INFO

Operating range:
375 m^3/h 112 m head

High efficiency:
> 72 %

Low noise:
< 66 dBA, complete unit < 76 dBA

Low vibration:
< 1.4 mm/s RMS

Low NPSHr (3 %):
< 4 m

CASE E

Two Typhonix Pumps were installed on a brownfield to feed hydrocyclones. The water is pumped from the reject collection tank. In addition to upgrading the pump, also the recirculation valves were upgraded to low shear valves.

The Typhonix Pumps replaced the existing positive displacement pumps. The baseplates are designed to fit on the same footprint as the original pumps. In addition to their robustness and low maintenance requirements, the Typhonix Pumps were chosen due to the optimized low shear performance. The Typhonix Pump was supplied in BB4 configuration with upgraded air-cooled plan 53B seal support system.

TECHNICAL INFO

Operating range:
75 m^3/h 115 m head

TECHNICAL DESIGN

Typhonix Pump is in BB4 configuration (other configurations may be possible at special request).
For most produced water applications, the BB4 configuration is the most cost-effective solution.
Typhonix Pump can be supplied as part of a larger pump package. For this, we collaborate with partners that can offer our pumps in packages with other pump types that do not require low shear trim.

BB4

The BB4 pump configuration has normally end suction, but top-top design is also available. The end suction design has been developed for operating conditions with low NPSHa-values.

With an end suction there is no need for a second mechanical seal. This reduces both capital expenditure and maintenance costs and improves overall reliability.

On the suction side, the pump shaft is carried by a sleeve bearing unit. The stationary sleeve bearing and the rotating shaft sleeve are made of wear resistant and corrosion proof SiC material.

Our BB4 pumps are supplied in collaboration with Dickow Pumps.

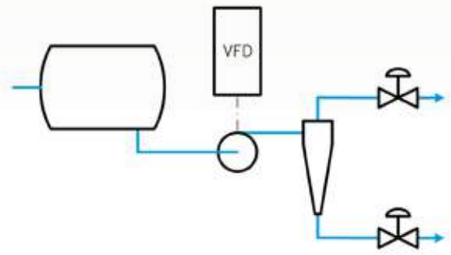
CAPACITIES

20 to 450 m^3/h
20 to 250 m head

FAQ

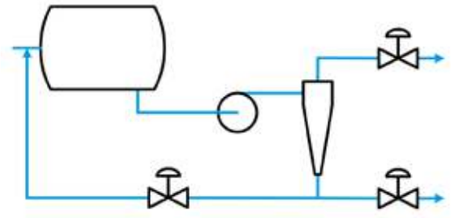
Is there a need for variable speed / frequency drive?

No, but it is highly recommended. For low shear pumping, VFD is the optimal way to handle turndowns. This is to avoid recycling oil and chemicals.



My process layout requires a fixed speed solution. How can I make this as low shear as possible?

A fixed speed solution generally requires a recycle line to handle varying water rates. It is highly recommended to install the recycle line downstream of the first produced water treatment stage, rather than directly downstream of the pump. This setup reduces the amount of oil that is recycled back upstream. It also reduces the pressure drop across the recycle valve, thereby reducing the shearing potential. To further reduce droplet breakup, it is recommended to use a low shear Typhoon® Valve System.



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