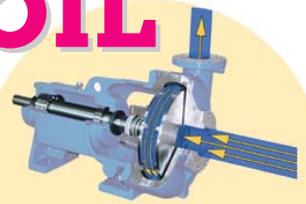


DISC PUMPS IN THE OIL AND GAS INDUSTRY



Discflo's Disc Pump excels in tough pumping installations and harsh environments, and is ideal for shear sensitive applications.



NEWS - Discflo Pumps for Offshore Maersk Innovator Project - NEWS

Discflo Disc Pumps are operating in some of the toughest applications on the Maersk Innovator I offshore platform. Commissioned earlier this year, the pumps are installed in de-silting, mud charging and mud mixing operations.

Each pump (Discflo model 806-14-2HHD) is rated to move up to 1000 GPM with a TDH of 150 ft. The drilling fluid itself has some tough characteristics - a specific gravity of 2.0 and an estimated viscosity of 5000 cP. Unlike traditional centrifugal pumps, the Disc Pump excels at handling viscous fluids, becoming more efficient at higher viscosities due to its unique pumping mechanism.

The Disc Pump operates on the principle of "boundary layer - viscous drag", whereby fluid is moved through the pump due to the viscous drag between adjacent layers of fluid. With no wear rings, no close tolerances and an open, clog-free design, the Disc Pump is an ideal choice for hard-to-reach areas and reliability-critical applications, such as offshore platforms.

Based on the success of the Innovator I pumps, Maersk has ordered more units for a proposed second platform. Shipment is expected later this year.



Discflo Pumps at the Maersk Innovator I platform in the North Sea - De-silter pumps, mud charging and mud mixing pumps.

Disc Pumps come in over 20 standard models, including direct-coupled, frame-mounted, close-coupled, submersible, side-by-side, over-under and specialty configurations such as API-610 pumps. Pumps can also be engineered to meet customer specifications.

Discflo offers the fastest turnaround times in the market for non-standard pump metallurgies. Examples include Hastalloys, Carbon Steel, CD4 and Titanium, as well as non-metallic materials and glass-lining of wet ends.

Hydraulic flow capacities: 2–10,000 GPM [0.5–2250 m³/h]
Discharge pressures: up to 1000+ft TDH [300+ m]
Discpac diameters from 8-inch [203mm] to 20-inch [508mm]
Suction pressures: low NPSHr
Working pressures: up to 1400 psi [95 atm]
Operating temperatures: to 1000°F [538°C]
Viscosities: up to 100,000 cPs
Solids size (max): 10 inches [250 mm]
Pump speeds: up to 3600 rpm



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Examples of Discflo Installations

Serving the Oil, Gas and Petrochemical Industry for over 20 Years

Year	Application	Pump Model
2003	De-Silter Pumps, Mud Charging, Mixing Maersk Innovator, North Sea	806-14-2HHD 403-12-2HHD
2002	Produced Water Customer Confidential, Texas	806-17-2HHD in WCB CS
2001	Deep Sea Riserless Mud Pumping Company confidential, North Sea jack-up rig	806-17-2HHD 403-12-2HHD
1999	Heavy Oil and Water Emulsion Aera Energy	402-14-2HHDH
1999	Shear-sensitive Oil/water Emulsion Exxon	302-10-2HHD,
1998 - 1999	Crude Oil Tanker Transfer Flying J Oil	402-14-2HHD
1997	Sand, Oil and Water Sludge Arco Alaska	2015-8-2HHD
1996 - 1997	API Separator Bottoms; Coker Quench; Slop Oil, Sludge with Oil Texaco, Panama and USA	402-14-2HHDH and 2HHDL
1995	Tank Bottom Sludge - Oil & Solvents Chemical Waste Management	806 CD4MCU
1994	Salt Water with Oil and Solids Anadime Stettler Oil Field, Canada	2015 and 312 models
1994	Oil, Water and Sand Sludge Shell USA	302 & 312 models
1991	Crude Oil with 75% Asphalt Amoco Oil	604 model
1990 - 1993	Skim Oil; Polyethylene Pellets; Proprietary Product with Bitumen; Sludge water and Oil Chevron USA	402 & 403 models
1990	Oil and Water w/High Solids Content Platform Irene, California	402 model

Features of Discflo Disc Pumping

Non-impingement pumping, laminar, pulsation-free flow offers the best protection for shear-sensitive products and ensures pump longevity.

No close tolerances or loss of performance due to wear

Open design prevents clogging, so pump can handle large or stringy solids, as well as fluids with varying solids content, size or viscosity

Low NPSHr - about a third to a half less than a comparably sized centrifugal pump

Increasing efficiency as fluid viscosity increases due to the viscous drag pumping principle

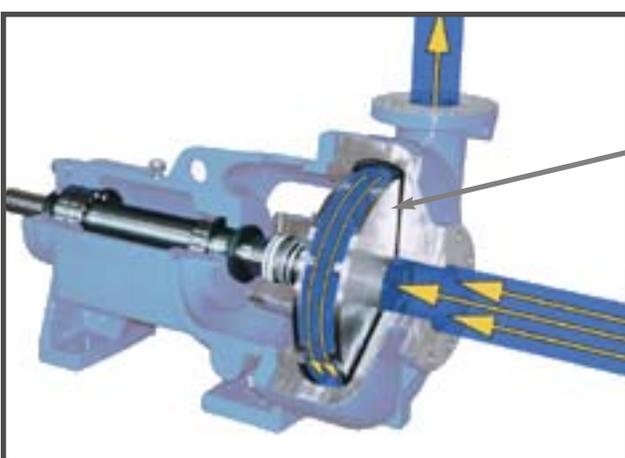
Low wear even in abrasive service due to the laminar flow and non-impingement pumping

Exceptional reliability due to rugged construction and solids-handling capability

Very few spare parts required (less than 5% of company revenue comes from parts sales)

Runs dry indefinitely, provided seal is protected

No radial loads and low axial loads lengthens pump and parts life and cuts maintenance



Disc Pumps operate using the boundary layer - viscous drag principle, using the Discpac as the pumping "impeller"
Discpacs come in high head (left) and smooth (right) designs.