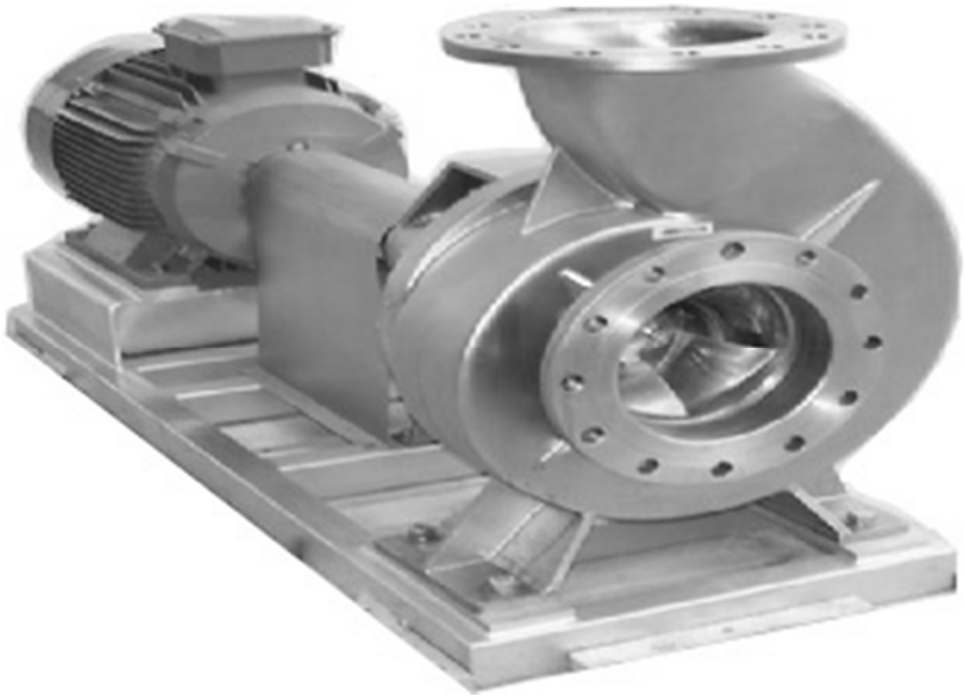
DISC ROTOR PUMP



Designed for the most abrasive, and erosive particulates, slurries and sludges:

- Highly viscous fluids
- Constant efficiency from low to high viscosity
- Slurries with a high solid content
- Severely abrasive fluids
- Delicate and shear sensitive products
- Fluids with entrained air/gas
- Handling large and irregular solids

INN PUMPS

General

The disc rotor design has solved the toughest problems where all others have failed. It is able to pump an exceedingly broad range of services including: viscous, solids, and abrasives.

The ability to resist pump damage translates to minimal damage to process fluids as well. The capacity for pumping ultra-shear sensitive products without damage has led to this design being chosen for seemingly unrelated services from polymers to crystalline products, to latexes and oil/water separator feed.

The disc rotor pump is also uniquely capable of pumping fluids with exceedingly high volumes of entrained gas/air, such as foams and crude oil with sand and gases.

The unparalleled performance has led to an expanded acceptance of this design becoming the top choice of divergent industries from chemical and petroleum to municipal, food, beverage and pharmaceutical processing industries.

What all have in common is the goal of seeking relief from the high costs of conventional pump technologies being pressed into services in which they suffer. Suffer from rapid and excessive wear, lost performance, constant maintenance, costly spare pumps and parts replacement, repeated downtime, unnecessary product damage, all collectively leading to massive lost profits. The goal of minimizing these cost factors has been routinely realized through trying something very different – disc rotor pump technology.

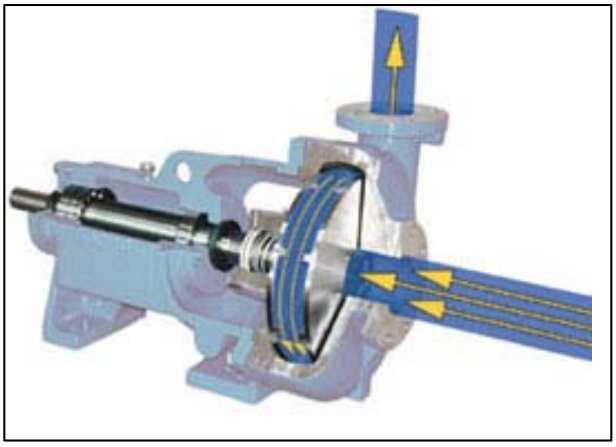
Recent design improvements have resulted in substantial efficiency increases. This has brought the disc rotor pump into consideration within a dramatically expanded range of applications.

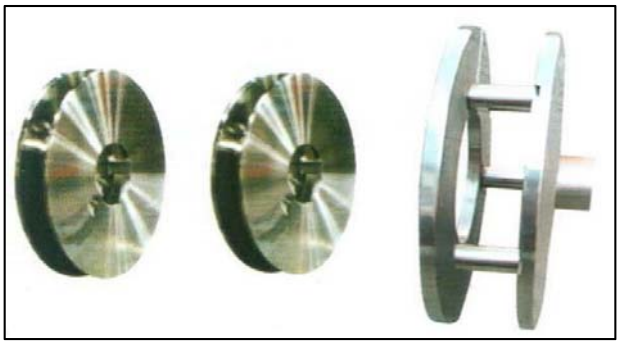
Material Options

Pumps are available in wide range of material to suit a broad range of fluids. Option include: Ductile Iron, 316SS, Carbon Steel, Alloy 20, CD4MCu, Hastelloys, Titanium, and others on special request.

Pump Operating Range

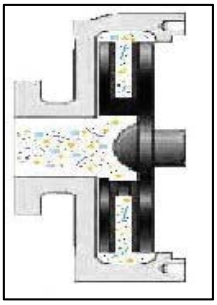
Flow capacities: 2 – 400 m^3/hr
Discharge heads: up to 60 m
Temperature: up to 300 ^oC
Viscosities: to 100,000 cPs
Pump speeds: variable to 3600 rpm
Solids size (max): 100 mm (spherical rock)
Drivers: Electric, Diesel, Hydraulic





Features

The appearance is similar to cenrifugal pumps, minus the internal friction and wear associated with conventional impeller vane technology. Disc rotor pumps function like centrifugals, and are more versatile than progressive cavity (PC), rotary lobe and gear configurations.

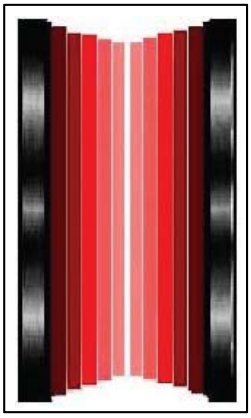


Minimal Contact

Disc rotor pump minimizes contact between the pump and the process fluid. Pump wear is greatly reduced, service interruptions virtually vanished, and eliminate product damage. The unique design bridges the performance gaps of conventional pumps and is capable of out-performing all of them in many applications.

Initial-layer Adhesion & Viscous Attraction

Disc rotor pumps utilize the molecular principles of the initial boundary layer and viscous attraction. While relying primarily upon these two principles as a pumping process is new in the design of pumps, it is routinely recognized elsewhere in process hydraulic engineering, such as in the influence on flow characteristics and friction related loss through a piping system. Under laminar flow conditions, streams of liquid travel at varying velocities through the piping system. Fluid forms a stationary layer adjacent to the pipe wall that separates the pipe surface from the balance of the fluid flow. The relative later thickness increases with viscosity. Each successive layer will move more quickly with highest velocity in the center of the piping.



Laminar Flow

As with piping, when fluid enters the disc-rotor pump, process fluid molecules adhere to the surfaces of the rotor - one or a series of parallel disc - that comprises what is known as the rotor. This creates the initial fluid layer. As the rotor turns, energy is transferred from the initial to successive fluid layers within the space around and / or between the discs through the principle of viscous attraction to generate velocity / pressure within the Rotor. This combination of the initial layer and viscous attraction causes a fluid ‘force field’ that accelerates the fluid within and through the pump creating a smooth, turbulence-free laminar flow.

Disc Rotor Pump Advantages

Highly Viscous Fluids

This design utilizes viscous friction, the higher the viscosity the better it pumps. Services include: tank bottoms, clarifier sludge, tar with coke fines and asphalt. Up to 100,000 cPs and higher can be pumped with standard pumps.

Constant Efficiency for Lo-Hi Viscosity

Although centrifugal pumps on water has better efficiency at low viscosity, but that advantage quickly diminishes as viscosity increases. At approximately 150 cPs, the efficiency of centrifugal and disc pumps is almost the same. The efficiency of the disc pump is constant across a very broad viscosity (>100000cPs) while the centrifugal pumps suffers great efficiency decline.

Slurries with a High Solid Content

Handles slurries containing up to 80% solids without plugging, wearing excessively or stalling. Examples include pumping oil and sand slurries, titanium dioxide slurries and drilling muds.

Severely Abrasive Fluids

Pumps the most severely abrasive fluid s with minimal wear and no maintenance. These include lime slurries, borax, drilling muds with grit and rocks, and ash.

Dry-Run Capability

The disc rotor pump design is capable of being operated indefinitely with zero process fluid.

Delicate and Shear Sensitive Products

Virtually eliminates pump related product damage. Exceptionally effective in handling shear damaging, shear thickening (dilatant) and shear thinning (thixotropic) products, such as latexes, polymer emulsions, and crystal slurries.

Fluids with Entrained Air/Gas

Handles fluids containing high levels of air/gas without vapour locking while resisting cavitational damage, including DAF sludge, crude oil and chemical froths.

Handling Large and Irregular Solids

Disc rotor pump can be configured to handle exceptionally large solids. Solids entering the pump move to the area of highest velocity and pass through without clogging.

Higher Production Yields and Improved Product Quality

When pumping delicate, shear sensitive, or otherwise sensitive products, the disc rotor increases productivity by reducing product losses due to the minimal contact pumping mechanism and laminar flow. Savings can be remarkable with some pumps actually paying for themselves in matter of weeks

Application

Primary Applications

Centrifuge, Belt & Filter press feed.
Heavy oils, waste oil, and hot oil
Filter & Belt Press Feed
Waste Oil
Latex
Polymers
Sand, Gravel & Grit
Reactor Column Bottoms
Corn Mash
Gypsum
Hot Tar
Underflow Thickener Sludge

Abrasive Slurries

Titanium Dioxide
Calcium Carbonate
Synthetic Fuels
Clay
Oil w/ Sand, Gas & Water
Heavy Salt Brine
DE Precoat
Bottom & Fly Ash
Concrete & Grout
Refractories
Municipal Primary Sludge
Digest Sludge
Ceramic Slip
Lime

Sheer Sensitive & Delicate

Polymers
Latex
Sugar Crystals
Polystyrene
Crystalline Suspensions
Oil / Water Separator Feed