
MXQ®
Fluids in Motion™

WHY DISC PUMPS?

Disc pumps are used for difficult pumping applications such as liquids with abrasives, solids, high viscosity, entrained air or gas. They are also used to move shear sensitive liquids and toprevent emulsification.

The mechanisms utilized to propel the fluids are mainly,

1.) **Centrifugal force**

2.) **Friction** in the form of boundary layer and viscous drag

To pump an extremely shear sensitive liquid such as latex or even blood, we may utilize a two flat-plane DiscSet design sacrificing some efficiency in order to have more efficacy.

However, in most industrial applications, both efficacy and efficiency are desired. Therefore, the MXQ Disc Pump is offered with multiple Disc designs to increase both the efficiency and efficacy of the pump.

The SERRATED DISC design allows for more contact surface area than a typical disc perimeter and incorporates winglets holding the DiscSet together while accelerating the fluid through the system. The size, placement, and number of winglets vary according to the fluid being pumped.

MXQ DISC

YOUR SOLUTION

MXQ industrial disc pumps are specially designed to meet your niche requirements. Our disc pumps are abrasion and corrosion resistant. The company's newly-designed disc pumps have a lower net positive suction head required (NPSHR) than most other disc pumps available in the market with an 5%-9% better efficiency. Our cutting edge technology offers close coupled pumps, which help reduce space allocation and save costs. Our disc pumps can withstand highly viscous fluids, trapped air, large solids, and slurries without blockages, obstruction, or cavitation. They are extremely versatile and durable, and require minimal to no repairs or spare parts replacement.

MXQ DISC OPERATION

Disc pumps are **extremely versatile** units. They have the appearance of centrifugal units, but can work like gear pumps, impellers, progressive cavity pumps, and chopper pumps. Here are some basic steps of their operation:

• Disc pumps are designed on the basis of the fluid engineering principle of **boundary layer and viscous drag**. This phenomenon facilitates the transfer of energy from the motor to the fluid.

• The molecules of the fluid entering the pump form the boundary layer by adhering to the surface of serial discs.

• This **boundary layer and viscous drag together create a centrifugal force** that moves in the fluid in a smooth, pulsation-free manner.

• The rotation of the fluid along with the impeller discharges it to the other end of the pump.

• The pace at which this mechanical movement happens decides the discharge pressure. Other factors such as the diameter of the impeller, inlet fluid supply pressure, motor power, and so on affect the pressure and flow within the pump.

• The boundary layer reduces the contact between the fluid and the pump, thus **preventing corrosion, abrasion, or any other chemical reaction**.

MXQ FEATURES

The centrifugal force generated by the radially recessed edges, ribs (or micro-vanes), winglet posts, and viscous drag gently propel the fluid radially away from the eye and toward the perimeter of the DiscSet.

The essence of the MXQ DiscSet is to generate minimum impingement while maintaining a balance between efficiency and efficacy.

The fluid is free-flowing and gently propelled without the constraint of vanes.

Materials of Construction

• Disc pumps are made of sturdy metals and their alloys. Some commonly used metals are:

- **Hard chrome steel**
- **Carbon steel**
- **Hastealloy C**
- **Stainless steel**
- **Monel**
- **Duplex stainless steel**

MXQ DISC ADVANTAGES

LOW MAINTENTANCE

LOW MTBF

LAMINAR FLOW

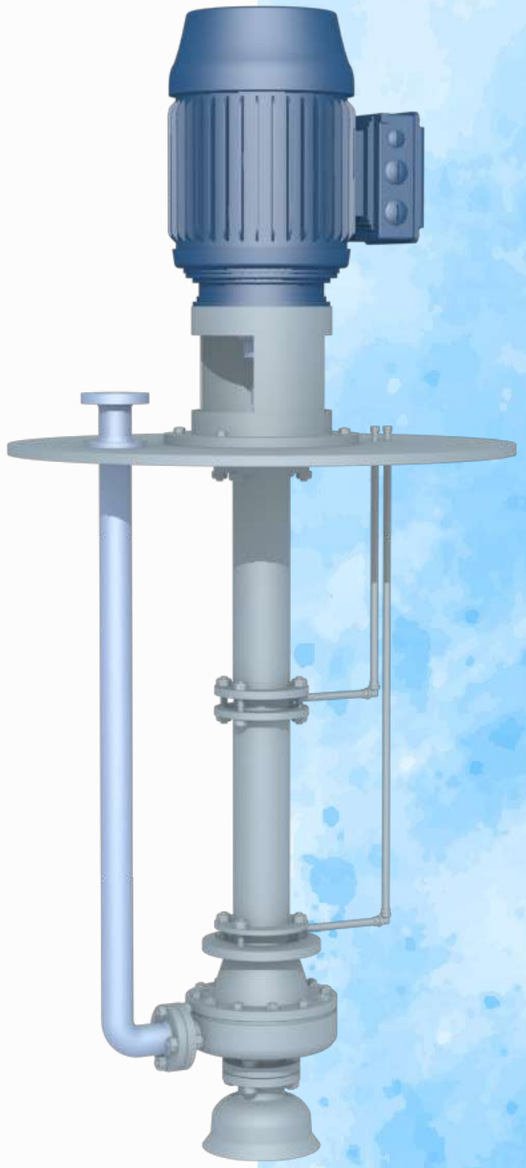
PULSATION FREE

Disc pumps offer various advantages in hard-to-pump applications making them the future of pump technology. Some key benefits of these pumps are:

- Disc pumps are capable of transferring abrasive, air entrained fluids, as well as viscous fluids, high solid slurries, and shear sensitive fluids.

- Unlike the other conventional pumps, these pumps have no close tolerances, offer a pulsation-free flow and operate based on minimal pumping action. All the mentioned features contribute to high reliability and uptime by preventing solids from clogging

- As much as these pumps can handle highly viscous fluids and solids, they can also process fragile products without any damage.



- They have **dry-run capability**. They can operate without processing fluids; however, in this case, the mechanical seal needs to be flushed.

- They are **sturdy and corrosion resistant;** therefore, the wear and tear that occurs due to abrasive fluids is minimal. Therefore, both **repairs and spare parts requirements are low**.

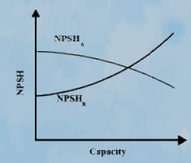
- Their discs have **low radial and axial loads**, which help to extend shaft, bearing, and seal life.

- The net positive suction head **(NPSH) required is far lower** than most other pumps.

All these features reduce the overall cost and time in the long run.

NO RADIAL LOAD

LONG SERVICE LIFE



LOW NPSH

LONG SEAL LIFE

MXQ COMPARISON

MXQ Disc

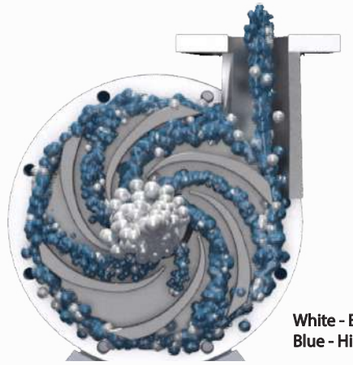
Viscosity refers to a fluid's resistance to deformation.

In the MXQ Disc, highly viscous fluid is **loaded evenly and gently propelled** due to the lack of constraints in the DiscSet.

In the MXQ Disc, the DiscSet design allows for **entrained air to pass through the pump without being centrifuged** and forced to remain at the eye of the impeller.

The open design of the DiscSet **moves high solid content smoothly** with minimum wear and impingement, protecting the pump and the fluid

In the MXQ Disc, as fluid flows from a pipe into the free-flowing DiscSet configuration, there is **very little shearing and emulsification.**



Other Impeller

In a typical centrifugal pump, highly viscous fluid is constrained by the impeller vanes. This causes uneven loading because of the fluid's resistance to deformation. The torsional energy generated by the clogging of the vanes eventually results in inefficiency and failure.

In a typical centrifugal pump, the centrifugal force generated by the rotation of the vanes sends higher density fluid to the periphery and constrains air/gas at the eye of the impeller. This causes uneven loading resulting in inefficiency and failure.

The vanes of a typical centrifugal pump cause clogging and impingement, resulting in the destruction of the fluid and pump.

In a typical centrifugal pump, as fluid flows from a pipe into rectangular vane chambers, it causes impingement that results in shearing and emulsification.

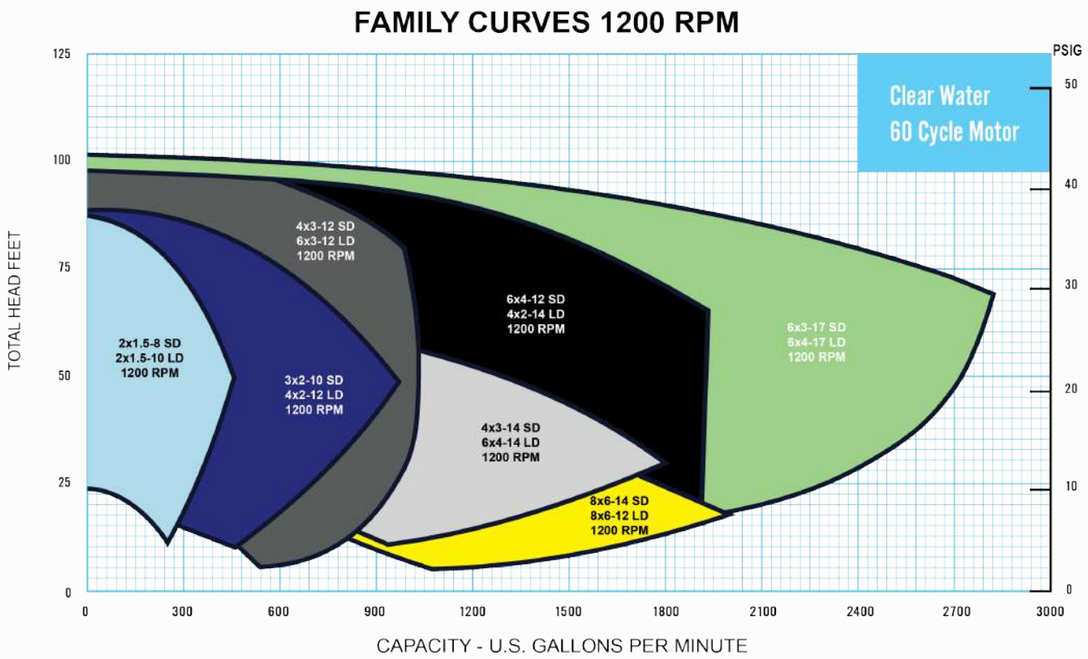
MXQ APPLICATIONS

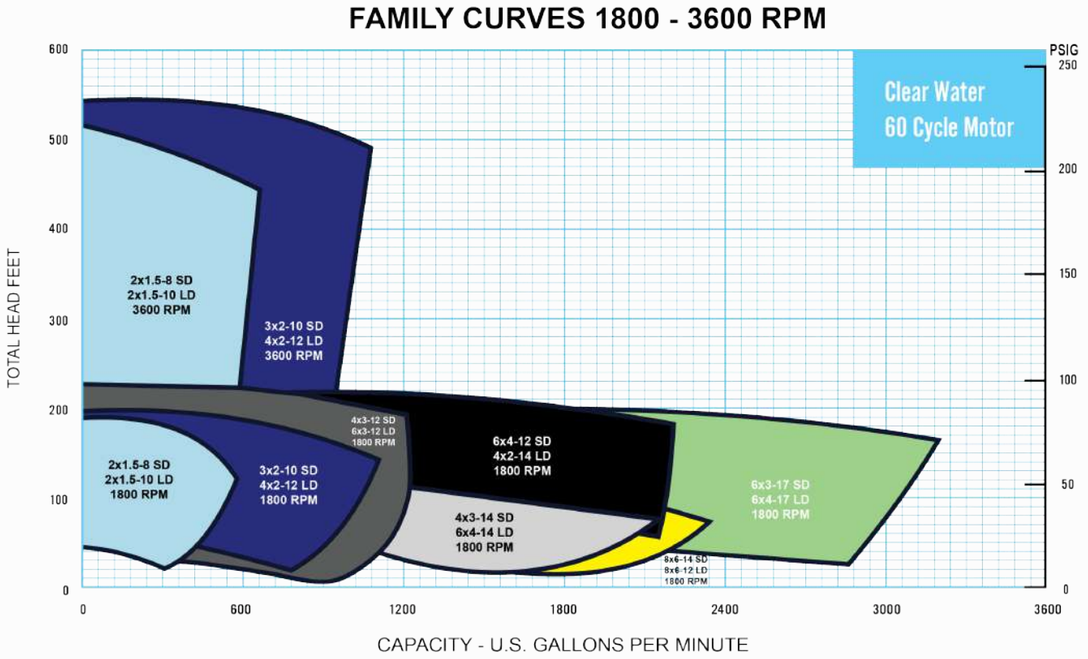
Disc pumps have applications across industries with varying requirements, especially processing hard-to-pump materials. They are commonly used in wastewater treatment by city-based municipal corporations.

Here are a few important application areas:

- **Metals and mining:** Drilling processes and precious metals recovery
- **Wastewater management:** Filter aids, scum mixing, sludge handling processes and recirculation
- **Municipal corporations:** Water treatment plants, recycling and purification
- **Food & beverage:** Food processing industries to process canned sauces, soups, baby foods, fruit juices, breweries, beverages, hydrogenation, milk & milk products, crystallizing
- **Pharmaceutical:** Salt crystal slurries, filter aid, and tablet coating
- **Chemicals:** Pumping of inks, chemicals, dyes, adhesives, paints, emulsions, foundries, varnishes, and gelatins
- **Oil & gas:** Drilling processes for mud and crude oil, subsea cutting recovery, oil refining processes Other general applications: Heat transfer, latex, cutting fluids, fertilizers, solid suspension, slurry mixtures, pulp & paper

PERFORMANCE CURVES

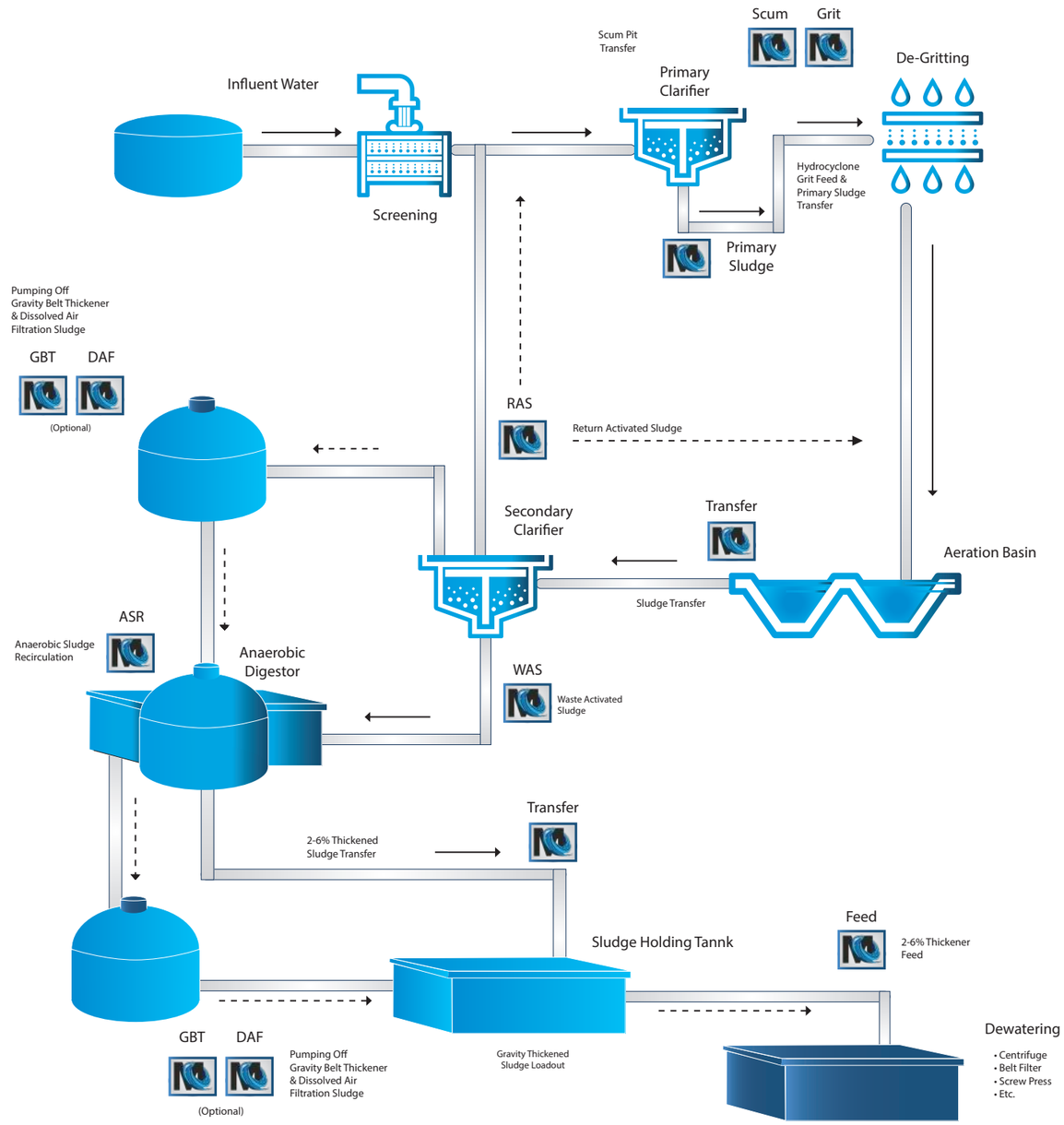




Curves show performance with clear water. If specific gravity is other than 1.0 curve HP must be corrected.

MXQ DISC WILL

OPTIMIZE YOUR WASTEWATER TREATMENT PROCESS



CONNECT WITH US

MXQ®
Fluids in Motion™

MXQ, LLC.
9203 Zaka Road
Houston, Texas 77064

281.376.3500
sales@mxq-usa.com
www.mxq-usa.com