

TDP[®] *Tesla Disk Pumps*

We have the right pump for the job!

At TDP[®], our pumps are designed for the most abrasive and erosive particulates, slurries and sludges. They gently handle the most fragile crystals, sensitive chemicals, and polymer emulsions.

Tesla Disk Pumps are specifically engineered products designed to meet your challenging process requirements. Our pumps are built for toughness and durability against abrasive slurries, sludge, drilling scale, coatings, and filter press feeds. With a unique design, the Tesla Disk Pump can move pipe-size solids without clogging or plugging as other pumps can. Tesla Disk Pumps use the latest improved designs of disk pump technology. They can also be retrofitted to replace impellers from open, semi-open, recessed, and entrained air/gas entrained particles, high solids, and high viscosities.

The newly-designed Tesla Disk Pump has lower NPSHR and is among the lowest in the centrifugal pumps market. This efficiency is 5-9% better than other disc style pumps. Cutting edge technology offers close coupled pumps which save you money and reduce space allocation. Due to the low L3D4 radial load to rotating disk within the pump housing any standard C-faced motor from their storeroom stock can be used. (No special priority needed for back-up spares.)

Tesla Disk Pumps' bearing frames are constructed in a heavy duty rigid Tesla Disk Pumps are 100% interchangeable with other pumps on the market such as Mission, some Crane Deming, and other slurry disk pumps, which saves you money. All pumps are non-witnessed Hydro tested prior to shipping to ensure the highest quality and reliability.



Tesla Disk Pump - How it works

The following describes boundary layer and viscous drag phenomena, which are two properties of fluids the "TESLA DISK PUMP" uses to transfer energy from the motor to the fluid being pumped. Fluid is confined between the twin rotating shrouds and rotates with the shrouds. Because that layer of fluid immediately adjacent to the shroud remains "fixed" relative to that shroud face and subsequent layers of fluid resist separation from the adjacent layer, the entire fluid mass begins to rotate. As the fluid gains energy it moves outward on the "Tesla Disk", gaining additional energy and continues on. The actual path of the fluid through the pump becomes a spiral path. The "TESLA DISK PUMP" displays similar (but not identical) diameter, RPM and pressure relationships to that of conventional impeller pumps. The reason for any departure is that fluid velocity is not fixed by the local Disk velocity but is rather a function of Disk spacing, fluid viscosity and density, radial velocity, and Disk velocity. The flow in the rotating disks falls somewhere between forced vortex and free vortex circulation.

The three most noteworthy performance features of the Tesla Disk Rotor are:

- A. Low NPSH requirement
- B. Ability to handle viscous fluids greater than a centrifugal at higher efficiencies.
- C. Resistance to wear from abrasive liquids.

These characteristics are a result of the nature of viscous drag momentum transfer.

Operational Benefits

Pulsation-Free Smooth Laminar Flow

Pulsation-free flow enhances gentle processing of fragile products and eliminating costly damage along with greatly reducing wear in pump and related piping and instrumentation.

No Tight Internal Tolerances

This allows the disk rotor pump to pass large and irregular hard solids, as well as variable solids stream without plugging.

Low NPSH Requirement

The disk rotor's low NPSH ranges from approx. 1/3 to 1/2 that of conventional centrifugal pump in the same service, also attributed to the smooth laminar flow generated by this design.

Dry-Run Capability

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

NOTE: The mechanical seal must be flushed during dry-running.

Dead-Heading Discharge/Starving the Suction

It is possible to deadhead the discharge and/or starve the suction for extended periods of time at normal operating speeds with minimal damage to the pump.

Minimal Radial and Axial Loads

Exceptional low radial and axial loads generated by the disk rotor result in extended seal, bearing and shaft life.

Exceptionally Versatile Design

Capability of handling a wide range of conditions without requiring internal modifications, even with large variations in process viscosity, temperature, solids type or concentration without process interruption.

Long Life for Pump Components

Few, if any, spare parts are required for the disk rotor pump over its life. The oversized shaft along with minimal axial or radial loads, greatly extend and maximize bearing and seal life.

Low Maintenance/Spare Parts Requirements

Disk rotor pumps are subject to minimal wear even in the most abrasive services due to minimal fluid to pump service contact and laminar flow characteristic. With this pump you won't need parts.

Maximum Run Time and Reliability

Tesla Disk pumps are simply the most reliable pumps on the market for hard-to-pump applications. Disk rotor has no close tolerances to enhance the minimal fluid contacting action. This factor contributes to maximum run time by preventing clogging.

Higher Production Yields and Improved Product Quality

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

TDP® supplies pumps for the following plus many more applications. If your application is not listed here please [contact us](#) for application specifics.

WASTE & WATER TREATMENT:

Flash or Rapid Mixing; Flocculation; Carbon Make-Down; Lime Slurry or Slaked Pebble Lime; Polymer or Polyelectrolyte Day Tanks; Water Treatment Chemicals; Mg(OH)₂; Phosphates; Filter Aids; Neutralization; Equalization; Scum Mixing; Sludge; Aeration; Anoxic Mixing; Anaerobic Digesters; etc.

PETROLEUM/Oil and Gas Recovery:

Drilling Mud; Crude Oil; Gasoline; Drill Cuttings; Subsea Cutting recovery; Cuttings for separation (none shearing); Asphalt.

PHARMACEUTICALS:

Pharmaceutical processes; Media Prep; Extraction; Filter Aid; etc.

MINERALS PROCESSING:

Alumina; Gold Leach; Copper SX Pump Mixers & Settlers; Silver, Platinum or Precious Metals Recovery; etc.

FOOD:

Condiments; Soups; Tomato: Sauce (with chunks), Paste, Juice; Starch; Flavors & Fragrances; Dextrose; Maltose; Fructose; Crystallizers; Fruit Juices; Beverages; Refried Beans; Hydrogenation; Milk; Brewery; Infant Prep.; etc.

CPI & General:

Inks; Pigments; Dyes; Binders; Adhesives; Polish; Styrene; Polymers (numerous); Paints; Titanium Dioxide; Varnish; Gelatins; Emulsions; Cellulose; Flue Gas & Desulphurization; Tall Oil; Plaster; Foundry Prep; Acids; Cosmetics; Health & Beauty Products, Rubber Crum; Carbonators, Gypsum, Sulfonation, Potash; Iron Oxide; Zinc Oxide; Animal Fats; Vegetable Oils; Mud; Fertilizers; Latex; Cutting Fluids; etc.

Special Applications:

Heat Transfer; Mixing Columns, High Viscosity; Dispersion; etc.

GENERAL APPLICATIONS:

Blending; Solid Suspension; Slurry Mixtures; Gas-Liquid; Storage; Batch & Continuous; etc.

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

Unusual Service

- *Fumed Silica (slurry & dry power)
- *Fumed Silica (dry) Rail & Tanker
- *Loading

Abrasive Slurries

- *Titanium Dioxide
- *Calcium Carbonate
- *Synthetic Fuels (40+% abrasives)
- *Clay
- *Oil w/Sand, Gas & Water
- *Heavy Salt Brine
- *DE Pre-coat
- *Bottom & Fly Ash
- *Concrete & Grout
- *Refractories
- *Municipal Primary Sludge
- *Digested Sludge
- *Ceramic Slip
- *Lime (70+%)

Self-Priming

- *Tanker & Rail Car Unloading
- *High Solids Bilge Water
- *Mine Dewatering
- *Coal Fines & Sediment
- *Lift Stations
- *Sludge Sumps

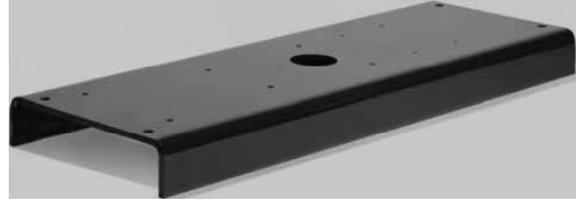
Sheer Sensitive & Delicate Materials

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

TESLA DISK PUMPS



Tesla entry level base can be fabricated from structural steel channel or formed steel



Reinforced formed steel base.



Reinforced formed steel base with external drip rim.



Reinforced formed steel base matching API 610 dimensions, foot mounted or centerline mounted.



Poly non-metallic corrosive resistant base.



TESLA DISK PUMPS

APPLICATIONS

Chemical/Petrochemical processing:

Acid slurries; adhesive; amide slurry; ammonium bromide crystals; calcium stearate; carbon black; catalyst; emulsion latex, filter press feed; glycol; methanol resin; solvent; soda ash; carbon slurry; sulphuric acid; titanium dioxide; uranium sludge; zeolite slurry; lime slurry

Pharmaceutical applications:

Salt crystal slurries; pill coatings; protein; water, methanol and hexane; polyol; ferric nitrate crystals; toluene; organic solvents; blood plasma; and more.

Onshore and offshore oil production:

Drilling mud; subsea mud and de-silting pumping; crude oil; multiphase pumping, sand oil slurry pumping; gas-entrained sludges; oil emulsions; tank bottom transfer; and more.

Wastewater treatment and disposal:

Activated sludge; anaerobic sludge; DAF (Dissolved Air Flotation) sludge; digester slurries; lime slurries to 80% solids, primary scum; sewage (raw); slurry with stringy material; thickened sludge, etc.

Pulp and paper manufacture:

Black liquor soap; green liquor dregs; clarifier sludge, paper stock to 18% consistency; pulp to 16% consistency; kaolin clay, filter rejects; talloil soap; air-entrained sludge; black, green, white liquors; Titanium Dioxide - TiO₂

Food and beverage processing:

Cooked corn, egg whites; corn syrup; cola syrup, milk and dairy products, molasses; chicken and by-products; poultry waste; animal fat, etc.

Other major applications:

Environmental dredging & cleanup, steel and metal manufacture; phosphate mining; mine de-watering; ceramic, glass, pump stone applications; nuclear and coal-fired power plant utilities; agriculture; maritime applications; hospitals; filter press feed, filter cake.

Configurations:

- Horizontal long-coupled base mounted
- Over-under Belt Drive Pump
- Side-by-side Belt Drive Pump
- Close-coupled, with and without base
- Submersible Sump or Pit Pump
- Horizontal multi-stage slurry pump
- Dry Pit Pump
- Vertical Sump or Pit Pump
- Vertical Cantilever Pump
- Horizontal subsea pressure balanced pump
- API-610 horizontal, double case, multi-stage
- Sanitary 3-A

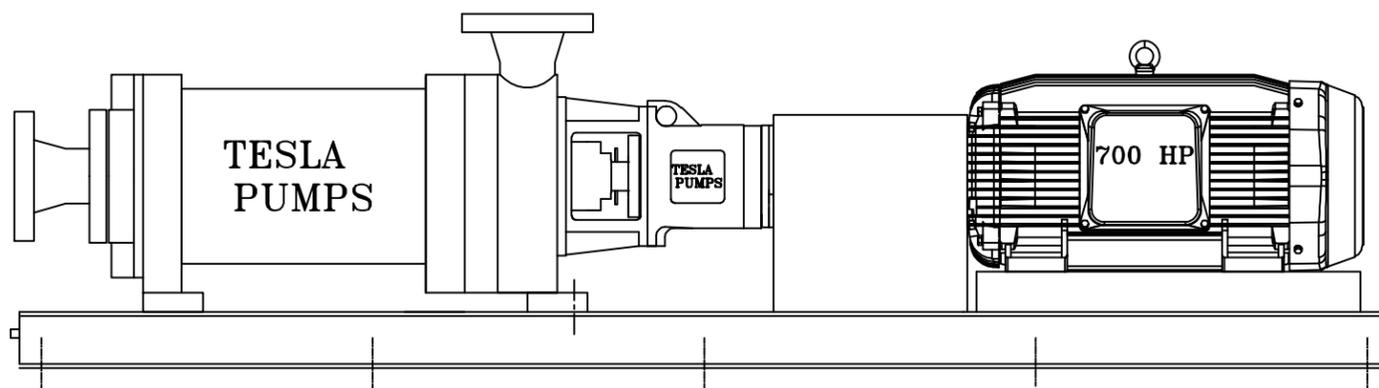
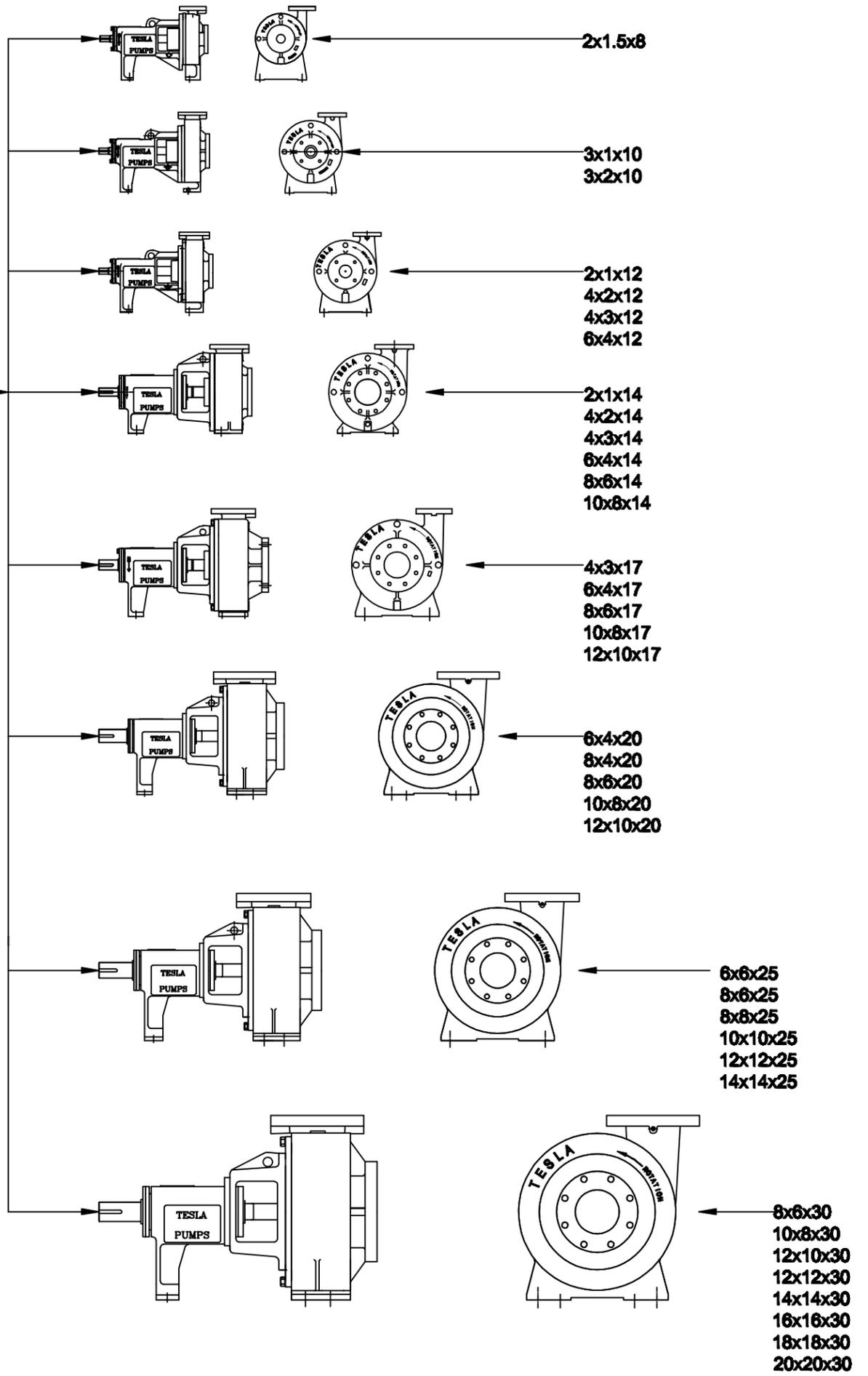




TESLA DISK PUMPS

4 BEARING FRAMES
 S - M - ML - L
 SPEED RANGE FROM 0 TO 4500 RPM
 HP - FRACTIONAL TO 1500
 BEARING FRAMES CROSSOVER TO MOST SIZES

ENGINEERED PUMPS
 WORKING PRESSURE TO 3750+ PSI



TESLA MULTI-STAGE SLURRY PUMPS MINE DEWATERING PUMPS - SUBSEA PUMPS