

# HD PROCESS PUMPS



■ Heavy Duty  
Pumps for Tough  
Applications

 **Tuthill**

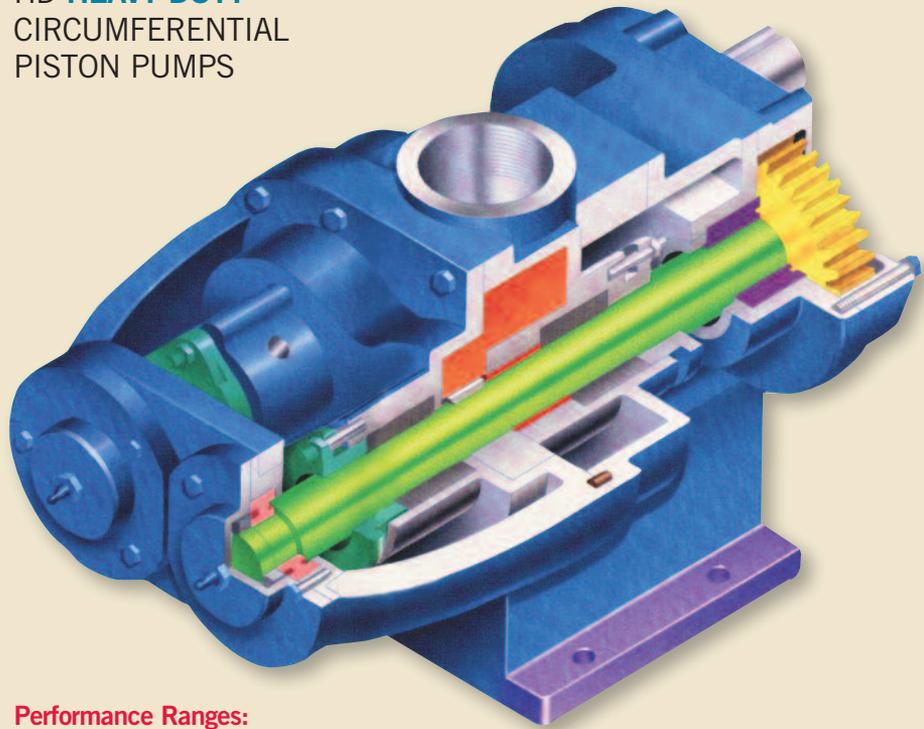
Engineered Solutions

# HDD PROCESS PUMPS

Tuthill offers the HD Series for the most demanding applications – slurries, high viscosity products, suspended solids, concentrated acids, chemicals, high temperature liquids, sludge, resins, sewage and scum, paints, polymers, plastics, pharmaceuticals, foods, and shear sensitive fluids.

This Rotary Positive Displacement, Circumferential Piston pump is Tuthill's severe-duty problem solver. Heavy-Duty Construction provides longer life in the toughest pumping applications.

## HD HEAVY DUTY CIRCUMFERENTIAL PISTON PUMPS

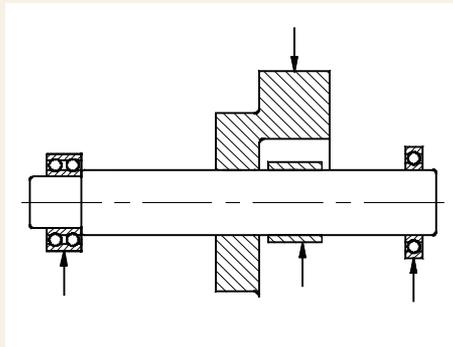


### Performance Ranges:

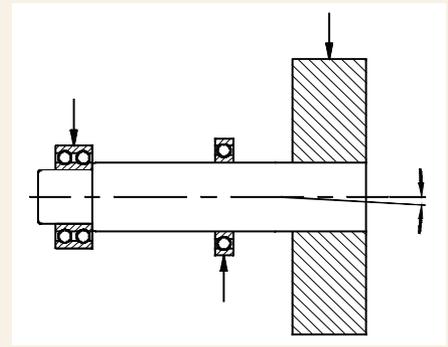
- Flow: Up to 650 GPM
- Pressure: Up to 500 psi
- Viscosity: Up to 4,400,000 cts
- Temperature: Up to 525°F
- Self Priming: Up to 14 feet

### A CLASSIC DESIGN WITH LEGENDARY PERFORMANCE

The secret behind the HD's success is external bearing support on both sides of the impellers which enables the pump to handle high pressure, and pressure spikes associated with sudden surges of viscous mass. The load diagrams below show the rigid HD design compared to cantilevered designs with shaft deflections that can result in galling and seizing of the pump.



HD with bearing support on both sides of impellers

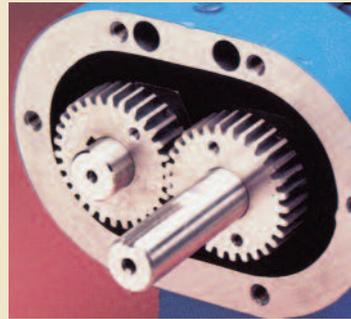


Cantilevered designs and resulting shaft deflection

- External timing gears in separate oil filled reservoir provide safe, non-contact synchronous impeller action.
- Oil lubricated roller bearings provide support for maximum radial loading in models 70A, 120A, 330 and 600.
- Constant diameter shafts (no steps in torque transmission areas) for maximum strength and minimum deflection.
- Housing bushing, positioned under maximum radial load, assuring minimum shaft deflection.
- A selection of sealing solutions is offered including Tuffseall, heavy duty mechanical seals, and packing.
- Impellers provided in single lobe or double lobe design.
- No metal to metal contact in the fluid chamber.
- Housing and gear case are foot mounted to minimize distortion and vibration.
- Heavy duty, grease lubricated, double-row ball bearings for combined radial loading and axial positioning.
- Casings and gear case are precision machined and dowel pin aligned. Procedure results in full interchangeability should field replacement be required.



**SINGLE LOBE IMPELLERS**  
Single lobe impellers provide maximum strength for highly viscous fluids and slurries, and high discharge pressure as well as minimal shear characteristics on the fluids.



**EXTERNAL TIMING GEARS**  
Use of timing gears eliminates metal to metal contact in the fluid chamber, reduces shear, and allows intermittent run dry without damage to the pump.

## MORE RECENT HD PUMP SEALING INNOVATIONS

Tuffseall™ cartridge lip seal technology has been successfully applied to a number of HD pump applications to address the requirements of leak free performance with intermittent run dry conditions. Optional power monitors are offered as run dry protection, and are recommended for use with single mechanical seals where run dry conditions are possible.

### Sealing Choices:

- Standard PTFE/graphite packing
- Food grade packing
- Packing with flush arrangements
- Tuffseall™
- Single or double slurry seals
- Solvent compatible o-rings
- Engineered packing or seal solutions

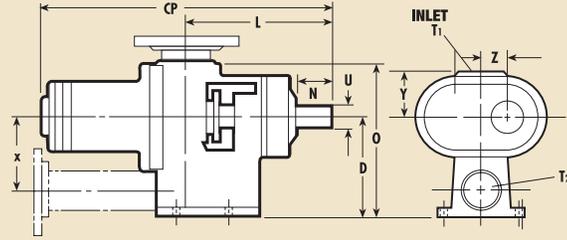


**TUFFSEALL™** features a positive drive, and wear resistant silicon carbide sleeve.



**TUFFSEALL™** has no springs to clog and no dynamic o-rings.

**MODELS 30A, 2A, 3A, 70A, 120A & 330**

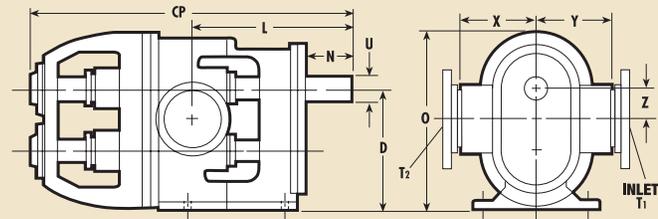


MODEL	PORT SIZE		PER 100 REV.		MAX. DIFF. PRESSURE ▲		MAX. RPM PUMPING ELEMENT ▲	CP	D	L	N	O	U	X	Y	Z	WEIGHT	
	T1 IN. MM	T2 IN. MM	GAL.	LTR.	PSI	BAR		IN. MM	IN. MM	IN. MM	IN. MM	IN. MM	IN. MM	IN. MM	IN. MM	IN. MM	LBS.	KG.
30A	1½ 38	1½ 38	5.5	21	150	10.3	450	18¾ 476	5¾ 146	10⅞ 270	2⅞ 54	8⅞ 225	1 25	4 102	3⅞ 79	1¼ 32	100	45
70A	3 76	2 51	15.0	57	450	31.0	450	24¾ 619	8½ 216	12⅞ 321	3½ 89	13¼ 337	1⅞ 48	6¼ 159	4¾ 121	2½ 64	280	127
120A	4 102	3 76	30.0	114	450	31.0	450	24¾ 619	8½ 216	12⅞ 314	3½ 89	13¼ 337	1⅞ 48	6¼ 159	4¾ 121	2½ 64	300	136
330	5 127	4 102	70.0	265	500	31.0	450	29⅞ 745	10¾ 273	14¼ 362	4 102	16⅞ 429	2¼ 57	7⅞ 200	6⅞ 156	3⅞ 81	550	249

▲ **CAUTION:** THE FLUID BEING PUMPED MUST ALWAYS BE SPECIFIED. APPLICATIONS ABOVE 200 PSI/13.8 BAR, 350°F/177°C, OR 200 RPM MUST BE REVIEWED BY TUTHILL TO INSURE PROPER PUMP SELECTION.

★ SUCTION AND DISCHARGE PORTS CAN BE REVERSED BY CHANGING SHAFT ROTATION

**MODEL 600**



MODEL	PORT SIZE		PER 100 REV.		MAX. DIFF. PRESSURE ▲		MAX. RPM PUMPING ELEMENT ▲	CP	D	L	N	O	U	X	Y	Z	WEIGHT	
	T1 IN. MM	T2 IN. MM	GAL.	LTR.	PSI	BAR		IN. MM	IN. MM	IN. MM	IN. MM	IN. MM	IN. MM	IN. MM	IN. MM	IN. MM	LBS.	KG.
600	6 152	6 152	148.0	560	450	31.0	450	36⅞ 929	13¾ 349	18⅞ 471	5⅞ 138	20¼ 514	2½ 64	9 229	9 229	3½ 89	900	408

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**CUSTOMIZING YOUR HD PUMP**

HD Pumps are very versatile and can be customized to meet the requirements of specific applications.

**Optional Features:**

- Heat Jackets
- Relief Valves
- Double Lobe Impellers for reduced pulsations with thin liquids
- Flanges including high pressure flanges
- Special Clearances
- High Temperature Construction
- Abrasive Fluid Special Construction
- Seal Choices



**DOUBLE LOBE IMPELLERS**



**HEAVY DUTY SLURRY SERVICE MECHANICAL SEAL**

# INDUSTRIAL DUTY PROCESS PUMPS

Tuthill HD Pumps are used in many diverse markets for challenging applications. Below is a partial list of markets and applications served:

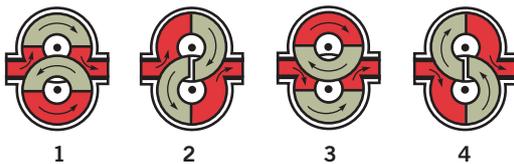
## General Applications:

1. Chemical Processing – Synthetic fibers and films, superphosphoric acid, adhesives
2. Pulp and Paper – Black liquor soap, paper coatings
3. Construction Materials – Silicon caulk, wall board taping compound, limestone filled asphalt for roof shingles
4. Meat Processing – Ground meats, fats, casings, byproducts for rendering, waste products
5. Food Processing – Chocolate, candy mass and gels, peanut butter, corn syrup, molasses, lecithin, sugar magma
6. Oil Exploration and Refining – Slop oil, API 674 reciprocating pumps, crude oil
7. Plastics Composite Parts Manufacturing – Filled plastics molding compounds
8. Wastewater Treatment – Polymers, dissolved air flotation skimming, scum, sludge

*Developing new energy sources from bio-fuels, coal, and waste products presents special pumping challenges. Some of the applications where HD pumps have been applied include:*

1. Biodiesel – Soybean soap stock
2. Ethanol – Spent mash
3. Coal water and coal oil slurries
4. Energy Recovery – Waste oil burner feed

## NO METAL-TO-METAL CONTACT IN THE COMPLETELY ISOLATED FLUID CHAMBER



1. Top impeller has started suction cycle and is completing the discharge cycle. Lower impeller is transferring liquid from the suction to the discharge side of the pump.
2. Top impeller completes suction cycle. Lower impeller starting to discharge.
3. Top impeller is transferring liquid from suction to discharge. Lower impeller has started the suction cycle and is finishing the discharge cycle.
4. Top impeller starting discharge cycle. Lower impeller finishing suction cycle.

## STANDARD MATERIALS OF CONSTRUCTION

Housing	Ductile Iron 316 Stainless Steel
Housing Bearing	DU* Carbon
Faceplate	Ductile Iron 316 Stainless Steel
Faceplate Bearing	Outboard Ball Bearing
Impellers	Ductile Iron 316 Stainless Steel
Shafts	17-4 Stainless Steel
Gear case	Gray Iron

\*BRONZE IN MODEL 330



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To find an authorized distributor,  
visit [www.tuthillpump.com/distributors](http://www.tuthillpump.com/distributors)

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