

Achieving Optimum Balance for Maximum Value

HD PROCESS PUMPS



■ Heavy Duty
Pumps for Tough
Applications

 **Tuthill**

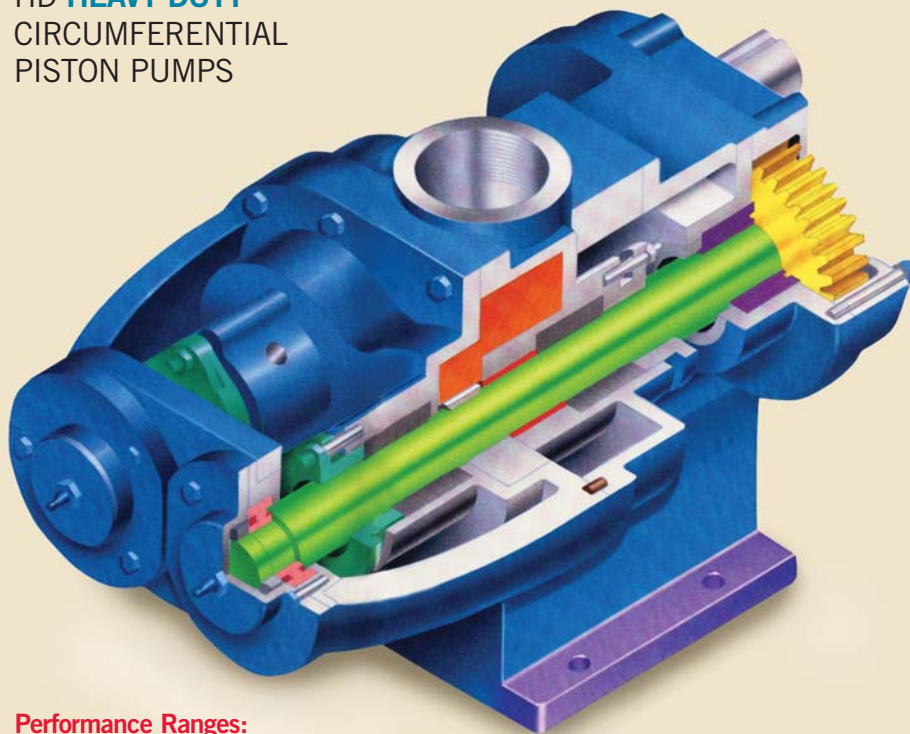
Engineered Solutions

Tuthill offers the HD Series
for the most demanding
applications – slurries,
high viscosity products,
suspended solids, concen-
trated acids, chemicals,
high temperature liquids,
sludge, resins, sewage
and scum, paints,
polymers, plastics, pharma-
ceuticals, 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 PROCESS PUMPS

HD **HEAVY DUTY** CIRCUMFERENTIAL PISTON PUMPS

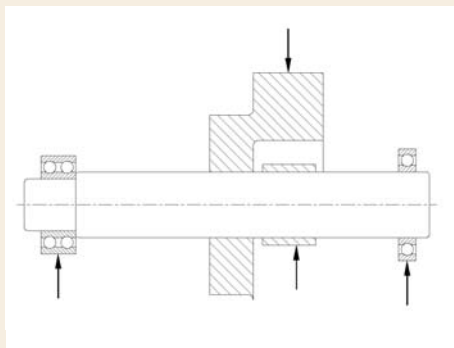


Performance Ranges:

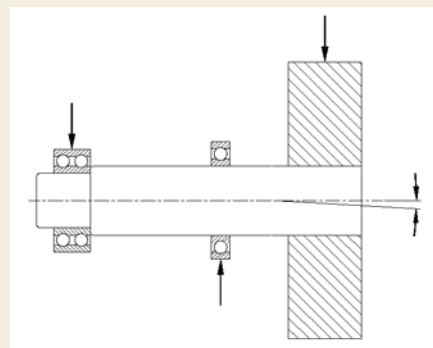
Flow:	Up to 650 GPM
Pressure:	Up to 500 psi
Viscosity:	Up to 4,400,000 cts
Temperature:	Up to 525°F
Self Priming:	Up to 14 feet

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



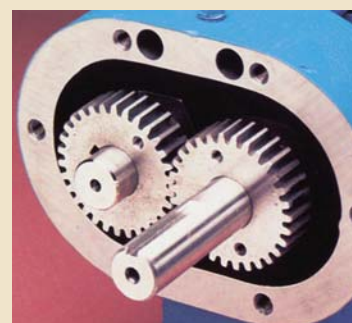
Cantilevered designs and
resulting shaft deflection

- 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

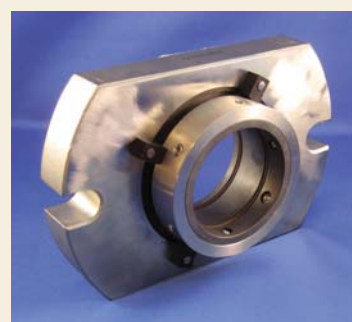
Use of timing gears eliminates metal to metal contact in the fluid chamber, reduces shear, and allows intermittent run dry without damage to the pump.

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.

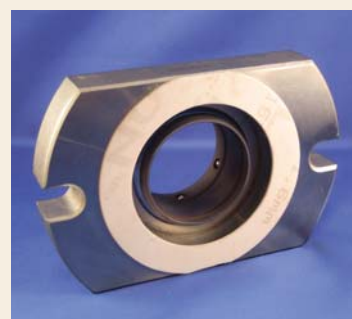
Sealing Choices:

- Standard Teflon/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™

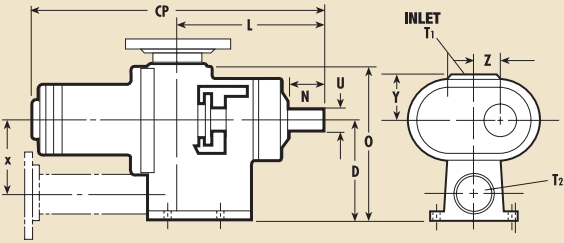
features a positive drive, and wear resistant silicon carbide sleeve.



TUFFSEALL™

has no springs to clog and no dynamic o-rings.

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

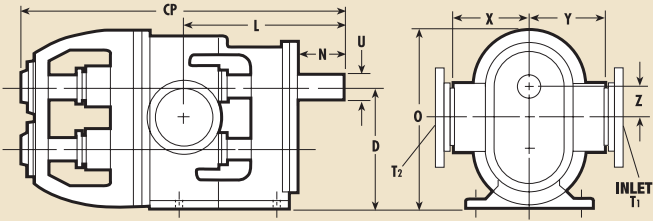


MODEL	PORT SIZE		PER		MAX. DIFF.		MAX. RPM PUMPING ELEMENT ▲	CP		D		L		N		O		U		X		Y		Z		WEIGHT			
	T1 IN.	T2 MM	100 REV. GAL.	LTR.	PSI	BAR		IN.	MM	IN.	MM	IN.	MM	IN.	MM	IN.	MM	IN.	MM	IN.	MM	IN.	MM	IN.	MM	LBS.	KG.		
30A	1½	38	1½	38	5.5	21	150	10.3	450	18¾	476	5¾	146	10⅞	270	2⅞	54	8⅞	225	1	25	4	102	3⅞	79	1¼	32	100	45
70A	3	76	2	51	15.0	57	450	31.0	450	24¾	619	8½	216	12⅝	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	12⅝	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		MAX. DIFF.		MAX. RPM		CP		D		L		N		O		U		X		Y		Z		WEIGHT	
	T1		T2		100 REV.		PRESSURE ▲		PUMPING																					
	IN.	MM	IN.	MM	GAL.	LTR.	PSI	BAR	ELEMENT ▲	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	36 ⁹ / ₁₆	929	13 ³ / ₄	349	18 ⁹ / ₁₆	471	5 ⁷ / ₁₆	138	20 ¹ / ₄	514	2 ¹ / ₂	64	9	229	9	229	3 ¹ / ₂	89	900	408	

▲ **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.

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:

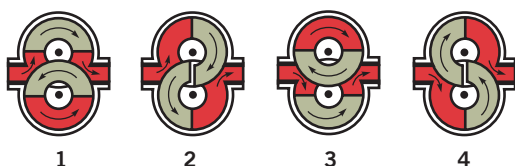
General Applications:

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



www.tuthillpump.com

To find an authorized distributor,
visit www.tuthillpump.com/distributors

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