

Speed - All Chemsteel pumps are rated for operation at a maximum speed of 1750 RPM.

Life and Noise - Pump life will always be extended and noise reduced by selection of either a plastic/plastic or metal/plastic gear combination or by selecting a larger pump and operating at a slower speed. Also, the Chemsteel product line provides the user with the quietest operation possible by offering both plastic combinations of gears and a helical gear profile.

Required Net Positive Suction Head (NPSHr) – NPSHr is the required suction pressure over the vapor pressure of the fluid being pumped (refer to the general literature for more detail). Meeting or exceeding the NPSHr will assure that the fluid does not cavitate inside the pump’s suction side chamber.

Model Number	NPSHr, ft. @ 1750 rpm
103, 104, 106	2
203, 204, 205	2
917, 923	2
207, 930, 935	4
210, 214, 417	6
946	10

Rheology - The power requirement for a given pump will increase with fluid viscosity. For Newtonian fluids (where viscosity is not a function of shear) the table in the following section can be used directly. For non-Newtonian fluids, some adjustment must be made.

For shear thinning fluids (Thixotropic or Pseudo Plastic), the dynamic viscosity may be considered to be approximately 25% of the viscosity tabulated in the literature. For those fluids that are shear thickening (Dilatent, Bingham Plastic), extra care should be taken when selecting the appropriate pump and motor requirements. Usually, a trial would be well advised.

Viscosity - When pumping viscous fluids, the horsepower required of the drive motor will increase. Refer to the following table for the appropriate multiplier to be used against the horsepower required when pumping water. “Water horsepowers” are available by reference to the individual flow curves that are available for all Chemsteel pumps.

Also, the pump speed must be reduced for viscous fluids. Follow the guideline below for maximum shaft speed.

Users should be advised to increase the pipe size by one size over the pump’s standard connection size on the inlet of the pump. On the discharge of the pump, the line size may similarly be increased if the user encounters excessive back pressure.

Chemsteel Pumps - High Viscosity Fluids, Power Requirement										
I. <u>Example Liquids</u>	Viscosity @0.8 S.G.			II. <u>Maximum Shaft Speed rpm</u>	III. (Multiply X Water Horsepower) Multipliers for horsepower					
	<u>Centipoise CP</u>	<u>Centistokes CS</u>	<u>Saybolt SSU</u>		<u>2 psi</u>	<u>20 psi</u>	<u>40 psi</u>	<u>60 psi</u>	<u>80 psi</u>	<u>100 psi</u>
Water @ 70°F	1	1	33	1750	1.00	1.00	1.00	1.00	1.00	1.00
No. 2 Fuel Oil @ 57°F	17	22	100	1700	1.10	1.10	1.05	1.05	1.00	1.00
SAE 10 Oil @ 62°F	86	108	500	1500	1.30	1.25	1.20	1.15	1.10	1.10
SAE 30 Oil @ 72°F	173	216	1000	1300	1.60	1.50	1.40	1.30	1.25	1.20
SAE 60 Oil @ 70°F	864	1080	5000	1000	2.20	2.00	1.80	1.60	1.50	1.40
SAE 70 Oil @ 60°F	1728	2160	10000	600	3.00	2.60	2.20	2.00	1.90	1.80
No. 6 Fuel Oil @ 70°F	8640	10800	50000	400	4.00	3.60	3.20	2.80	2.50	2.20
No. 6 Fuel Oil @ 60°F	17280	21600	100000	200	5.00	4.50	4.00	3.50	3.00	2.50

Teflon® is a registered trademark of DuPont, an equivalent fluoropolymer may be used.
 Ryton® is a registered trademark of Chevron Phillips Chemical, an equivalent polyphenylenesulfide may be used.
 PEEK® is a trademark of Victrex, an equivalent polyetheretherketone may be used
 RULON® is a trademark of Saint-Gobain, an equivalent compounded PTFE based material may be used



CHEMSTEEL® PUMP SELECTION GUIDE



The selection of the appropriate Chemsteel pump to fit a given application depends upon full knowledge of the application including both system parameters and fluid properties. Follow the guidelines given below when selecting a Chemsteel gear pump.

Chemical Compatibility - Select the basic materials of construction for the pump based upon chemical compatibility. Refer to Chemical Resistance Charts to decide on acceptable materials of construction. Then, consider the fluid's lubricity.

Lubricity – As a general rule, use only metal/plastic, plastic/plastic, or W88/W88 gear combinations for non-lubricating fluids, typically viscosities less than 25 centipoise. Drive/idle gear combinations of 316/316 and Alloy-C/Alloy-C must only be used with lubricating fluids to avoid galling.

Pressure - Refer to the following table for limitations on pressure for various constructions. (Not applicable to tandem pumps, consult factory.)

A. Gears and Bearings

Gear Combination	Maximum Differential Pressure		
	Carbon Bearings	Teflon Bearings	Rulon Bearings
Plastic/Plastic	50 psi	50 psi	50 psi
Metal/Plastic	100 psi	50 psi	75 psi
Metal/Metal*	150 psi **	Not Available	100 psi

* Not available for pumps with Ryton housings.

** Mag Drive limited to 110 psi

B. Housing

Housing	Maximum Differential Pressure	Maximum Discharge Pressure
Metal	150 psi	300 psig, S1 & S2 Series
Metal	150 psi	225 psig, S4 & S9 Series
Ryton	100 psi	200 psig

Temperature - Refer to the following table for selection of the appropriate Trim Code when using plastic gears. Teflon or PEEK gears must be trimmed for applications exceeding 110°F. Ryton gears (to a maximum temperature of 200°F) in either a Ryton or metal housing are thermally stable and do not require trimming.

Trim Code	Teflon	PEEK
T1	115 – 134° F	200 – 239° F
T2	135 – 154° F	240 – 279° F
T3	155 – 174° F	280 – 319° F
T4	175 – 194° F	320 – 359° F
T5	195 – 215° F	360 – 400° F

Code	Magnet Material	Temp Limit
M	Neodymium Iron	300° F
W	Samarium Cobalt	450° F

Chemsteel pumps can be applied for temperatures as low as –40° F for pumps of plastic construction, or –50° F for pumps of metal construction.