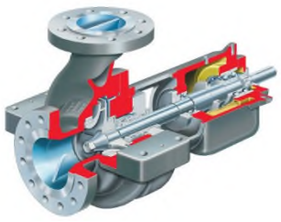
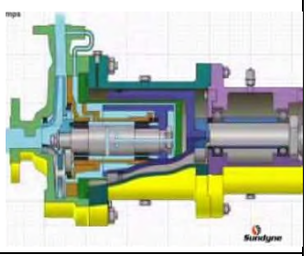
Centrifugal Pump selection metrics

Centrifugal pump: mechanical sealed or sealless pump



Selection parameter
Nature of product,
Solid handling
Vapor pressure,
Specific gravity and viscosity,
Operating and min / max T, P
Initial budget, O&M cost

Parameter	Sealed	Sealess
Hazardous service		
Solid handling		
Initial cost		
maintenance cost		
Efficiency		
Lifecycle Cost		
Safety		
Reliability		

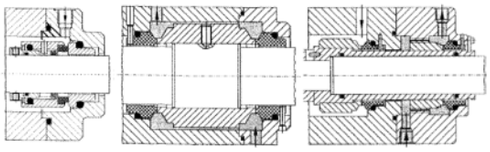


Centrifugal pump Type

Selection parameter: Hydraulics (Flow X head) requirement, NPSHa, Budget, Suction discharge orientation, Space available, Driver and coupling arrangement, applicable standard, installation and maintenance cost. API 610 pump types are listed below.

Flexibly Coupled			Rigidly Coupled	Close Coupled		1-2 Stage		Multi Stage			Single Casing					Double Casing	
Horizontal		Vertical In Line with Bearing Bracket	Vertical In Line	Vertical In Line	High Speed Integrally Geared	Axially Split	Radially Split	Axially Split	Radially Split		Discharge Through Column			Separate Discharge		Diffuser	Volute
Foot Mounted	Centreline support								Single Casing	Double Casing	Diffuser	Volute	Axial Flow	Line Shaft	Cantilever		
OH1	OH2	OH3	OH4	OH5	OH6	BB1	BB2	BB3	BB4	BB5	VS1	VS2	VS3	VS4	VS5	VS6	VS7

Centrifugal pump with mechanical seal type and arrangement: Single, Tandem or double



Selection parameter
Nature of product,
Solid handling
Vapor pressure,
Specific gravity, viscosity,
Operating & min / max T, Pr
Initial budget, O&M cost

Parameter	Single	Tandem	Double
Clean non s			
HC / Emission control			
Abrasive / corrosive			
Back up / containment			
Monitoring system			

Mechanical API Plan selection: Please refer my earlier post exclusively on this topic

Material of construction

Selection parameter: Fluid (Abrasive, corrosive), Maximum / minimum operating temperature, Maximum pressure, component, budget, life cycle (

❖ Type of Corrosion

- Galvanic corrosion
- Pitting corrosion
- Erosion corrosion
- Crevice corrosion
- Uniform corrosion
- Intergranular corrosion
- Stress corrosion
- Graphitization

❖ Galvanic Series of Common Metals and Alloys in Seawater

Most Noble, or Cathodic

Platinum
Gold
Graphite
Titanium
Silver
Hastelloy C
Stainless steel (passive)
Nickel (passive)
Monel
Bronze
Copper
Brass
Hastelloy B
Nickel (active)
Tin
Lead
Stainless steel (active)
Ni-Resist
Cast iron
Steel
Aluminium
Cadmium
Zinc
Magnesium

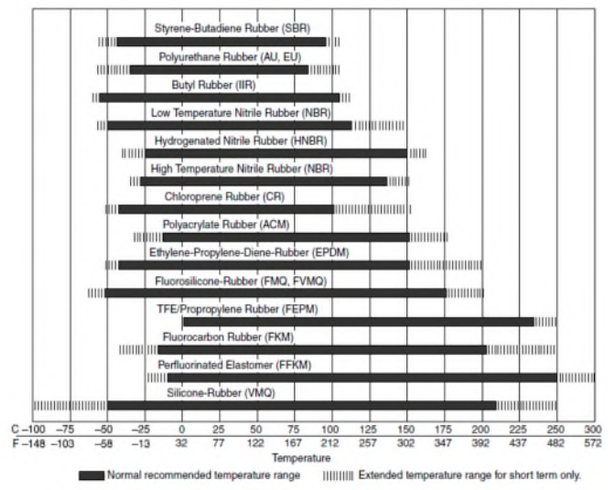
Least Noble, or Anodic

❖ Recommended Pump Materials for Different pH Liquids

PH Value	Material
10–14	Corrosion-resistant alloys or non-metals
8-10	All Iron
6-8	Bronze fitted r Standard fitted
4-6	All Bronze
0-4	Corrosion-resistant alloys or non-metals

For more info. Refer API 610, 12th edition, Annex. G and H

❖ Temperature range for common elastomeric material



❖ Comparison of properties of commonly used elastomer

Elastomer Type (Polymer)	Parker Compound Prefix Letter	Abrasion Resistance	Acid Resistance	Chemical Resistance	Cold Resistance	Dynamic Properties	Electrical Properties	Flame Resistance	Heat Resistance	Impermeability	Oil Resistance	Ozone Resistance	Set Resistance	Tear Resistance	Tensile Strength	Water/Steam Resistance	Weather Resistance
AFLAS (TFE/Prop)	V	GE	E	E	P	G	E	E	E	G	E	E	G	PF	FG	GE	E
Butadiene	D	E	FG	FG	G	F	G	P	F	F	P	P	G	GE	E	FG	F
Butyl	B	FG	G	E	G	F	G	P	G	E	P	GE	FG	G	G	G	GE
Chlorinated Polyethylene	K	G	F	FG	PF	G	G	GE	G	G	FG	E	F	FG	G	F	E
Chlorosulfonated Polyethylene	H	G	G	E	FG	F	F	G	G	G	F	E	F	G	F	F	E
Epichlorohydrin	Y	G	FG	G	GE	G	F	FG	FG	GE	E	E	PF	G	G	F	E
Ethylene Acrylic	A	F	F	FG	G	F	F	P	E	E	F	E	G	F	G	PF	E
Ethylene Propylene	E	GE	G	E	GE	GE	G	P	E	G	P	E	GE	GE	GE	E	E
Fluorocarbon	V	G	E	E	PF	GE	F	E	E	G	E	E	GE	F	GE	FG	E
Fluorosilicone	L	P	FG	E	GE	P	E	G	E	P	G	E	GE	P	F	F	E
Isoprene	I	E	FG	FG	G	F	G	P	F	F	P	P	G	GE	E	FG	F
Natural Rubber	R	E	FG	FG	G	E	G	P	F	F	P	P	G	GE	E	FG	F
Neoprene	C	G	FG	FG	FG	F	F	G	G	G	FG	GE	F	FG	G	F	E
HNBR	N	G	E	FG	G	GE	F	P	E	G	E	G	GE	FG	E	E	G
Nitrile or Buna N	N	G	F	FG	G	GE	F	P	G	G	E	P	GE	FG	GE	FG	F
Perfluorinated Fluoroelastomer	V	P	E	E	PF	F	E	E	E	G	E	E	G	PF	FG	GE	E
Polyacrylate	A	G	P	P	P	F	F	P	E	E	E	E	F	FG	F	P	E
Polysulfide	T	P	P	G	G	F	F	P	P	E	E	E	P	P	F	F	E
Polyurethane	P	E	P	FG	G	E	FG	P	F	G	G	E	F	GE	E	P	E
SBR or Buna S	G	G	F	FG	G	G	G	P	FG	F	P	P	G	FG	GE	FG	F
Silicone	S	P	FG	GE	E	P	E	F	E	P	FG	E	GE	P	P	F	E

P = Poor; F = Fair; G = Good; E = Excellent

Source: From Parker Hannifin Corporation, Seal Group, Lexington, KY. With permission.)

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