

# Pump Selection Guide



# Pump Selection Guide

## Goulds Pumps... Serving the World's Industries

Goulds Pumps presents this Pump Selection Guide to assist users in making an easy initial selection of the best pump for a particular service. To do this, simply refer to the selection chart on page 3 where the full line of Goulds Pumps is listed by pump type. For more details about your selection, refer to the page indicated. Contact your nearest Goulds Pumps sales office or representative for a complete data package on any pump(s) in which you are interested. You will be furnished with any information you require to ensure proper pump selection for optimum reliability and performance.

### Chemical

The family of chemical process pumps includes both ANSI and ISO models. Goulds Pumps specializes in high alloys for our chemical pumps ranging from 316SS to Zirconium and other special alloys as requested. Unique non-metallic pumps offer distinct advantages when handling severe corrosives.

Magnetic drive pumps are designed for services where leakage cannot be tolerated. Our complete understanding of chemical processing and related industries gives us a clear advantage in finding solutions to these particular pumping problems.

### Pulp and Paper

Goulds Pumps' leadership in the pulp & paper industry has been largely due to the success of our comprehensive range of pumps that stand up to the harsh operating requirements of this industry. The Model 3175 has been prized for performance since its introduction in 1968. Our latest 3180/3185 paper stock/process pump line extends the offering for users with a preference for a metric pump. Other superior pumps include the 3500XD enhanced performance medium consistency stock pump and a complete line of double suction and LoPulse fan pumps.

### Mining and Minerals

Goulds Pumps' presence in the mining industry dates back to the late 1800s. Designed for the most severe applications, our pumps can be found in coal, aluminum, copper, iron, clay, phosphate, potash, soda ash, salt, gold and aggregate industries throughout the world.

Goulds Pumps offers the widest range of rubber-lined and metal corrosion/abrasion-resistant slurry pumps in the industry, including vertical, horizontal and submersible designs for cyclone feed, tailings disposal, minerals processing, mine dewatering, clarifier underflow, oil sands, and sump services.

### Power Generation

We offer a wide variety of pumps designed specifically for uses within this industry. The Model 3600, the most modern axially split multistage pump in the world, is ideally suited for boiler feed service.

Vertical turbine and double suction pumps can handle the most demanding condensate or circulating water needs. Sumps can be cleared with Goulds Pumps' line of vertical or submersible sump pumps. Heavy duty slurry pumps like the XHD, SRL and 5500 are specially designed for flue gas scrubbers and ash handling services.

### Oil Refining and Gas Processing

We offer a full range of API 610 pumps to meet your demanding applications: BB1 axially-split, between-bearing pumps, BB2 between bearing radially split pumps, BB3 multistage axially split pumps, BB5 barrel multistage radially split pumps and overhung OH2/OH3 process pumps.

Vertical turbine pumps are available in any configuration including can pumps for low NPSH, fire pumps and submersibles. Design and manufacturing capabilities include standard commercial grades, ASME Section VIII and API-610 for total line capability.

### Pipeline

Whether you are talking short distances between storage tank and truck, or long barren stretches between pumping stations, ITT has the right solution.

Transporting crude, refined product or water demands absolute care. ITT has dependable, efficient products that are crucial to managing your pipelines and transport requirements.

Our offerings include pumps for terminals and tank farms, booster pumps, mainline pumps. We also do hydraulic rerates of existing pumps to improve efficiency and TCO. Our PumpSmart® Smart Control delivers real-time control and protection of your pumps while providing valuable process insight.

### Primary Metals

The wide range of products makes Goulds Pumps the ideal choice for the demanding services of this industry. We provide pumps for vertical and submersible abrasives handling, slurry pumps for scale pits, chemical pumps for pickle liquor and leaching solutions, vertical turbines, double suction pumps for cooling tower and dewatering applications, and pumps for waste acid, scrubber service, and quench.

### Water and Wastewater

We offer the most comprehensive line of double suction, end suction, multistage and vertical turbine pumps for chemical feed, water supply, booster, low lift, and high lift.

For non-clog solids handling, a range of horizontal, vertical sump, and submersible pumps have helped professional engineers solve pollution problems around the world.

### Food and Beverage

Adhering to strict process requirements is only one of the reasons for Goulds Pumps' entry into the forefront of these industries. Goulds Pumps handle a wide variety of grain processing, water, wastes, biofuels, corrosives and erosives.

Breweries, bottling companies, canneries, and a multitude of food and liquid industries rely on Goulds Pumps for successful operations.

# Market Segments - Pump Selection Chart

ITT Goulds Pumps makes the widest range of pumps in the industry — pumps to handle virtually any service. This selection chart is designed to help you find and specify the best pump for your service.

Product Category	Goulds Model	Pump Type	Chemical	Pulp & Paper	Mining & Minerals	Power Generation	Oil & Gas	Pipeline	Primary Metals	Water & Wastewater	Food & Beverage	Nature of Pumpage				Refer to Page	
												Corrosive	High Temperature 260°C(500°F)	Abrasive	Solids		
															Non-Abrasive		Fibrous/Stringy
PRO Services	PRO Services	Rotating Equipment Services														19	
Paper Stock/Process	3175* **	Paper Stock/Process														4	
	3180/3185* **	Paper Stock/Process														4	
	3181/3186	High Temperature														4	
	3500XD	Heavy-Duty Paper Stock														4	
	3171	Vertical Sump and Process														5	
Chemical Process	CV3171	Non-Clog Vertical Sump Process														5	
	NM3171	FRP Vert. Sump/Process														5	
	3196* **	ANSI Chemical Process														6	
	LF3196* **	Low Flow ANSI Process														6	
	HT3196*	ANSI High-Temperature Process														6	
	CV3196*	Non-Clog Process														6	
	3796*	Self-Priming Process														7	
	3996	ANSI In-Line Process														7	
	3296 EZMAG	ANSI Metallic Sealless Process														7	
	NM3196*	ANSI FRP Process														8	
	3298	ANSI ETFE Lined Sealless														8	
	SP3298	ANSI ETFE Lined Sealless														8	
	3198*	ANSI PFA ETFE Lined Process														8	
	V3298	ETFE Lined Sealless														8	
	3299	ANSI PFA PTFE Lined Sealless														7	
	IC*	ISO Chemical Process														9	
	ICB	Close-Coupled ISO Process														9	
	ICP*	High-Temperature ISO Magnetic Drive														10	
	ICM	ISO Metallic Magnetic Drive														9	
	ICMB	Close-Coupled ISO Sealless														9	
ICMP	High-Temperature ISO Magnetic Drive														10		
Oil & Gas API 610	API 3171	Industrial Duty Vertical Sump (VS4)														11	
	3700/3710	1-Stage, Overhung (OH2)														11	
	3910	Vertical In-Line (OH3)														11	
	3610	Axially Split, 1-Stage (BB1)														10	
	3620*	Radially Split, 1-Stage (BB2)														10	
	3640*	Radially Split, 2-Stage (BB2)														10	
	3600*	Axially Split, Multistage (BB3)														11	
	7200CB	Barrel Multistage (BB5)														11	
Sump/Abrasives/Solids Handling	Trash Hog	Solids Handling, Self-Priming														12	
	VHS VJC	Vertical Cantilever														12	
	HSU HSUL JCU	Submersible														12	
	VIDS	Double Suction Vertical (VS2 / VS7)														18	
	VRS	Abrasive Slurry R.L. Cantilever														12	
	JC	Medium-Duty Abrasive Slurry														13	
Abrasives Slurry/Solids Handling	SRL	Rubber-Lined Abrasive Slurry														13	
	SRL-C	Rubber-Lined Abrasive Slurry														13	
	SRL-S	Rubber-Lined Abrasive Slurry														13	
	SRL-XT	Rubber-Lined Abrasive Slurry														13	
	5500	Severe Duty Abrasive Slurry														13	
	HS	Non-Clog Solids Handling														14	
	VRS	Abrasive Slurry R.L. Cantilever														15	
	XHD*	Severe Duty Slurry														13	
Multistage/Axial Flow/Double Suction	AF	Axial Flow														16	
	3311	High-Pressure Multistage														16	
	3393*	High-Pressure Multistage														14	
	3935	Diffuser-Type Multistage														15	
	3400 Series**	Single Stage, Double Suction														15/16	
	3355	Multistage														15	
	3316	Two-Stage														14	
Vertical Mixed and Axial Flow	VCW	Wet Pit Pumps (VS1 / VS3)														17	
	VIC	Vertical Turbine/Can Type (VS6)														17	
	VIT***	Vertical Industrial Turbine (VS1)														17	
	VIS	Vertical Submersible														18	
	VMP	Vertical Marine														18	
	VICR	Vertical Multistage Low Flow, High Head														18	

\*i-ALERT®2 available | \*\*NSF Certified | \*\*\*NSF Certified Q1 2018

 Ideally Suited for Service Indicated



# Process Pumps

## Model 3180 / 3185\*

### Paper Stock / Process

All customer requirements were considered in this line of paper stock / process pumps: excellent hydraulic coverage, high efficiency, extreme ease of maintenance, and mechanical reliability. The Model 3185 pump furnished with ISO or JIS flange drilling, metric fasteners, dimensions. Open, enclosed or Shearpeller™ impellers available. Features *i-ALERT* condition monitoring as standard. Model 3180 standard with ANSI flanges.

#### 3180

- Capacities to 9,000 m<sup>3</sup>/h | 40,000 GPM
- Heads to 125 m | 410 ft
- Temperatures to 230° C | 446° F
- Pressures to 16 bar | 232 PSIG

#### 3185 with Metric standards

- Capacities to 6,000 m<sup>3</sup>/h | 26,000 GPM
- Heads to 125 m | 410 ft
- Temperatures to 230°C | 446°F
- Pressures to 16 bar | 232 PSIG

#### Applications:

- Paper Stock
- Black Liquor
- Chemical Process
- Wastewater

Materials: All Iron / 316SS Trim, 316SS, 317SS, CD4MCu

\*i-ALERT®2 sensor installed (see pg 22 for details)



**NSF**



## Model 3500XD

### Medium Consistency Systems

Thick stock pulp is pumped with the model 3500XD enhanced performance medium consistency pumping system. System includes engineered standpipe, control valve, dilution system and level transmitter. A patented air separation device removes air from the pulp to improve mixing effectiveness. Bleaching chemicals and oxygen are mixed in-line with the Model 3501 mixer with Double Shear™ rotor, optimized injection port, and unique low pressure drop casing design.

- Consistencies from 8% to 16%
- Capacities to 900 m<sup>3</sup>/h | 4,000 GPM
- Pressures to 22 bar | 325 PSIG

#### Applications:

- O<sub>2</sub> Delignification Reactor
- D Stage Feed Pumping
- EOP Stage Pumping
- High Density Tower

Materials: From 316SS to Titanium



## Model 3181 / 3186\*

### High Temperature Paper Stock / Process

End suction, top center line discharge, self-venting. Center line mounted for high temperature services. High efficiency enclosed impeller. TaperBore™ seal chamber standard with mechanical seal arrangement. Features *i-ALERT* condition monitoring as standard.

#### 3181 with ANSI flanges

- Capacities to 3000 m<sup>3</sup>/h | 13,000 GPM
- Heads to 125 m | 410 ft
- Temperatures to 300°C | 508°F
- Pressures to 25 bar | 360 PSIG

#### 3186 with ISO or JIS flanges

- Capacities to 3,000 m<sup>3</sup>/h | 13,000 GPM
- Heads to 125m | 410 ft
- Temperatures to 300°C | 508°F
- Pressures to 25 bar | 360 PSIG

#### Applications:

- Digester Recirculation
- Make-Up Liquor
- White Liquor
- Black Liquor
- High Pressure/High Temperature Pulp Mill Services
- Hot Oil

Materials: Duplex SS

\*i-ALERT®2 sensor installed (see pg 22 for details)



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## Model 3175\*

### Paper Stock / Process

For the toughest services. Thousands of installations handle stock, solids, fibrous / stringy materials, abrasive slurries, and corrosives. Dynamic seal option eliminates mechanical seal problems. Features *i-ALERT* condition monitoring as standard.

- Capacities to 6,360 m<sup>3</sup>/h | 28,000 GPM
- Heads to 107 m | 350 ft
- Temperatures to 232° C | 450°F
- Pressures to 20 bar | 285 PSIG

#### Applications:

- Pulp & Paper Paper stock through 6% Consistency, Black Liquor, Hydropulper and Broke Service, Low NPSH Digester Circulation, Blow tank to Screens, Primary Screens Rejects, High Density Chlorine Tower to Washer, Flotation Cell Circulation
- Chemical Evaporator and Reboiler Circulation, Slurry Services
- Petroleum Corrosive/Abrasive Crude, Catalyst Slurry, Coke fines
- Steel Mill Descaling, Waste Treatment, Venturi Scrubber, Electro-Galvanizing Recirculation
- Food Fruit Pulps, Grain mash and Spent Grains, Evaporator Recirculation, Beet and Cane Sugar, Corn Products
- General Waste Treatment, Air Pollution Abatement, Acid Mine Water, Textile Slurries

Materials: All Iron / 316SS Trim, 316SS, 317SS, CD4MCu

\*i-ALERT®2 sensor installed (see pg 22 for details)



# Vertical Sump & Process

## Model 3171

### Vertical Sump and Process

The "Veteran" vertical sump and process pump. Thousands of installations – industrial process, sump drainage, corrosive liquids, pollution control, molten sulfur. Rugged, heavy construction. Simple mounting.

- Capacities to 722 m<sup>3</sup>/h | 3,180 GPM
- Heads to 95 m | 344 ft
- Temperatures to 232° C | 450° F
- Pit Depths to 6 m | 20 ft

#### Applications:

- Industrial Process
- Industrial Sump Wastes
- Molten Sulfur
- Tank Unloading
- Corrosive and Non-Corrosive Liquids

Materials: Cast Iron, Bronze-fitted, Carbon Steel, 316SS, Alloy 20, Hastelloy B and C, Duplex SS



## Model NM3171

### FRP Vertical Sump and Process

Designed for tough chemical sump pump applications. The fiberglass reinforced Vinyl Ester construction provides excellent corrosion resistance in aggressive acidic and caustic services. The true volute design provides the highest efficiencies in the industry for FRP pumps.

- Capacities to 284 m<sup>3</sup>/hr | 1,250 GPM
- Heads to 92 m | 300 feet
- Temperatures to 93° C | 200° F
- Pit Depths to 5 m | 16 Ft

#### Applications:

- Chemical/Petrochemical-Waste Acid, Sodium Hydroxide; Ferric Chloride, Sulfuric Acid, Spinfinish Wastes
- Utility-Coal pile runoff, Sea water, Demineralized water
- Metal Finishing-Spent pickling solutions, Electroplating rinses, Nickel plating bath
- General-Industrial process, Deionized water, Pollution control, Sump services

Materials: Glass reinforced Vinyl Ester, other resins available upon request.



## Model CV 3171

### Vertical Sump and Process

The CV 3171 is a recessed impeller, circular volute type sump pump. Ideal for large solids and shear sensitive fluids. Circular volute minimizes radial loads making this the ideal pump for low flow process applications.

- Capacities to 295 m<sup>3</sup>/h | 1,300 GPM
- Heads to 126 m | 230 ft
- Temperatures to 232° C | 450° F
- Pit Depths to 6 m | 20 ft

#### Applications:

- Fibrous Wastewater
- Industrial Process
- Industrial Sump Wastes
- Tank Unloading
- Corrosive and Non-Corrosive

#### Liquids

- Food Processing
- Chemical Slurries

Materials: Cast Iron, Duplex SS, 316SS, Alloy 20, Hastelloy B and C



# ANSI Process Pumps

## Model 3196 i-FRAME®\*

### ANSI Process

This is the original ANSI pump that has become the standard of the industry. Over 1,000,000 installations attest to the remarkable performance of the 3196. Available with a wide range of features for handling difficult applications. *i-FRAME*® power ends maximize reliability and MTBF (Mean Time Between Failure).

- Capacities to 1,364 m³/h | 7,000 GPM
- Heads to 223 m | 730 ft
- Temperatures to 371° C | 700° F
- Pressures to 26 bar | 375 PSIG

#### Applications:

- Chemical
- Petrochemical
- Pulp & Paper
- Primary Metals
- Food & Beverage
- General Industries

Materials: Ductile Iron, 316SS, CD4MCu, Alloy 20, Monel, Nickel, Hastelloy B and C, Titanium



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\*i-ALERT®2 sensor installed (see pg 22 for details)



## Model HT 3196 i-FRAME®\*

### ANSI High Temperature Process Pump

Center line mounted in a heavy duty fabricated steel casing support, the Model HT 3196 minimizes shaft misalignment and piping strain associated with elevated temperatures up to 700° F. As a member of the ANSI pump family the HT3196 features Goulds Pumps' premier *i-FRAME*® power end, multiple seal chamber options including the TaperBore PLUS, and a wide variety of rigid and rugged mounting systems.

- Capacities to 1,023 m³/h | 4,500 GPM
- Heads to 282 m | 925 ft
- Temperatures to 371° C | 700° F
- Pressures to 31 bar | 450 PSIG

#### Applications:

- Hot Water
- Thermal Oils
- Heat Transfer Fluids
- Die/Mold Pre-Heating Systems
- Pilot Plants
- Electronic Heating and Cooling
- Reactor Heating
- Urea

Materials: Carbon Steel, 316SS, CD4MCu, Alloy 20, Hastelloy C



\*i-ALERT®2 sensor installed (see pg 22 for details)



## Model LF 3196 i-FRAME®\*

### Low Flow ANSI Process

Designed specifically to provide superior performance for low flow services. Features a concentric (circular volute) casing and open radial vane impeller to eliminate hydraulic and mechanical problems at low flows. Includes *i-FRAME*® power ends.

- Capacities to 50 m³/h | 220 GPM
- Heads to 282 m | 925 ft
- Temperatures to 371° C | 700° F
- Pressures to 31 bar | 450 PSIG

#### Applications:

- Specialty Chemicals
- Batch Chemical Process
- Reactor Feed
- Seal Water
- Shower Service
- Boiler Feed
- Condensate
- High Pressure Process
- Column Bottoms
- Hot Oil
- Column Reflux

Materials: Ductile Iron, 316SS, CD4MCu, Alloy 20, Hastelloy B and C



**NSF**

\*i-ALERT®2 sensor installed (see pg 22 for details)



## Model CV 3196 i-FRAME®\*

### Non-Clog ANSI Process

Perfect solution for handling bulky, fibrous, or shear-sensitive liquids. Recessed impeller design provides non-clog pumping with minimum solids degradation. Capability to handle liquids containing 10 to 20 percent air/gas. *i-FRAME*® power ends.

- Capacities to 610 m³/h | 2,700 GPM
- Heads to 134 m | 440 ft
- Temperatures to 260° C | 500° F
- Pressures to 20 bar | 285 PSIG

#### Applications:

- Filter Slurries
- Latex
- Polystyrene Beads
- Crystal Suspensions
- Screen Rejects
- Hydropulper pump
- Sodium Chlorate Slurry
- Fruit and Vegetable Suspensions
- Dye Liquor
- Fibrous Wastewater
- Long Fibre White Water
- Long Fibre White Water
- Primary Cleaner Pump

Materials: Ductile Iron, CD4MCu, Hastelloy B and C, Alloy 20



\*i-ALERT®2 sensor installed (see pg 22 for details)



# ANSI/Sealless Process Pumps

## Model 3796\*

### Self-Priming ANSI Process

One-piece casing eliminates need for separate priming chamber, air separator, valves or by-pass line. Fully open impeller can be trimmed to meet specific hydraulic requirements. Includes *i-FRAME™* power ends.

- Capacities to 284 m<sup>3</sup>/h | 1,250 GPM
- Heads to 131 m | 430 ft
- Temperatures to 260° C | 500° F
- Suction Lifts to 6 m | 20 ft

#### Applications:

- Industrial Sump
- Mine Dewatering
- Chemical Transfer
- Bilge Water Removal
- Coal Pile Drainage
- Tank Car Unloading
- Filter Systems v Petroleum Transfer
- Column Bottoms and Reflux

Materials: Ductile Iron, 316SS, CD4MCu, Alloy 20, Hastelloy B and C, Titanium

\*i-ALERT®2 sensor installed (see pg 22 for details)



## Model 3996

### In-Line ANSI Process

For corrosives, abrasives and high temperature. Fully open impeller, back pull-out design, heavy duty construction. Field alignment not required.

- Capacities to 318 m<sup>3</sup>/h | 1,400 GPM
- Heads to 213 m | 700 ft
- Temperatures to 260° C | 500° F
- Pressures to 26 bar | 375 PSIG

#### Applications:

- Caustic Transfer
- Acid Unloading
- Monomer/Polymer Transfer
- Liquid Nitrogen
- Liquid Ammonia
- Reflux and Light Tower Bottoms
- Waste Acid Recovery
- Pickle Liquor Circulation
- Chilled Water
- Filter Feed
- Condensate Return

Materials: Ductile Iron, 316SS, Monel, Alloy 20, Nickel, Hastelloy B and C, CD4MCu, Titanium



## Sealless Process Pumps

## Model 3299

### Magnetic Drive ANSI Lined

Designed to handle moderate to severe corrosives with or without solids. Sealless design provides effective alternative to pumps with mechanical seal problems. Thick linings for extended pump life.

- Capacities to 95 m<sup>3</sup>/hr | 425 GPM
- Heads to 149 m | 490 ft
- Temperatures to 180° C | 360° F
- Pressures to 19 bar | 275 PSIG

#### Applications:

- Hot Acids
- Acetic Acid
- Chlorinated Solvents
- Chloroform
- Freon 113
- Acetone
- Hydrofluoric Acid
- Sodium Hypochlorite
- Nitric Acid
- Amines
- Carbon Tetrachloride
- Dichloroethylene
- Ethers
- Bromine
- Chlorine Dioxide

Lining Material: PFA



## Model 3296 EZMAG

### Magnetic Drive ANSI Process

Robust, simple sealless design ideal for difficult liquids such as corrosives, pollutants, ultra-pure liquids and toxics. Meets ANSI dimensional specifications. Features a bearing cartridge for ease of maintenance and improved reliability.

- Capacities up to 159 m<sup>3</sup>/h | 700 GPM
- Heads to 213 m | 700 ft
- Temperatures to 280° C | 535° F
- Pressures to 19 bar | 275 PSIG

#### Applications:

- Batch Chemical Process
- Rail Car or Tank Unloading
- Specialty Chemicals

Materials: 316SS, others upon request



# Sealless Process Pumps

## Model 3298 Magnetic Drive ANSI Lined

Designed to handle moderate to severe corrosives with or without solids. Sealless design provides effective alternative to pumps with mechanical seal problems. Thick linings for extended pump life.

- Capacities to 270 m<sup>3</sup>/hr | 1,200 GPM
- Heads to 162 m | 500 ft
- Temperatures to 121°C | 250° F
- Pressures to 16 bar | 225 PSIG

### Applications:

- Rail Car or Tank Unloading
- Batch Chemical Process
- Specialty Chemicals
- Column Reflux or Bottoms
- Reactor Feed

Lining Material: ETFE



## Model SP 3298 Self-Priming Lined

When suction pressure is negative and air or gases must be evacuated to accomplish pump priming, the SP 3298 has a self-priming dual volute that primes on demand with only an initial charge of liquid in the casing. Priming is accomplished within the casing, eliminating the need for auxiliary priming systems.

- Capacities to 70 m<sup>3</sup>/h | 310 GPM
- Heads to 42.5 m | 140 ft
- Temperatures to 121° C | 250° F
- Pressures to 12 bar | 175 PSIG
- Effective Static Lift to 6m | 20 ft

### Applications:

- Rail Car or Tank Unloading
- Batch Chemical Process
- Specialty Chemicals
- Column Reflux or Bottoms
- Reactor Feed

Lining Material: ETFE



## Model V 3298 Vertical ANSI Lined Process

Ideal for moderate to severe corrosives. With or without solids, the 3298 can handle the tough chemical services. As a sealless design, it's an effective alternative to pumps with mechanical seal problems. Meets strictest EPA regulations.

- Capacities to 270 m<sup>3</sup>/h | 320 GPM
- Heads to 129 m | 425 ft
- Temperatures to 121°C | 250°F
- Pressures to 16 bar | 225 PSIG

### Applications:

- Rail Car or Tank Unloading
- Batch Chemical Process
- Specialty Chemicals
- Column Reflux or Bottoms
- Reactor Feed

Materials: ETFE Construction



## Sealed Lined & Non-Metallic

### Model 3198\* PFA Process ANSI Lined

Virgin PFA Teflon® for handling a wide range of severe corrosive liquids, trace contaminants, and mixtures.

The 3198 features ANSI B73.1 design, and *i-ALERT* power ends. Teflon® molded in place by high pressure technique and mechanically locked.

- Capacities to 182 m<sup>3</sup>/h | 800 GPM
- Heads to 137 m | 450 ft
- Temperatures to 149° C | 300° F
- Pressures to 16 bar | 225 PSIG

### Applications:

- Hydrochloric Acid
- Hydrofluoric Acid
- Ferric Chloride
- Pickling Acid
- Plating Acid
- Plating Solutions
- Chlorinated Brine
- Chlorinated Hydrocarbons
- Sodium Hypochlorite
- Chlorine Dioxide

Material: PTFE



\*i-ALERT®2 sensor installed (see pg 22 for details)



### Model NM3196\* FRP ANSI Process

The Fiberglass reinforced Vinyl Ester construction provides excellent corrosion resistance in many aggressive acidic and caustic services. The random glass orientation and generous ribbing provides flange load ratings equal to a metal pump of the same size. The true volute design provides the highest efficiencies in the industry for FRP ANSI pumps.

- Capacities to 318 m<sup>3</sup>/h | 1,400 GPM
- Heads to 152 m | 500 ft
- Temperatures to 93° C | 200° F
- Pressures to 15 bar | 220 PSIG

### Applications:

- Hydrochloric Acid Unloading
- Ferric Chloride
- Sulfuric Acid Transfer
- Sodium Sulphite
- Sulphate Liquors
- Plating Solutions
- Filter Feed
- Aquarium Water
- Sea Water
- Chlorine Dioxide

Materials: Glass reinforced Vinyl Ester, other resins available upon request



\*i-ALERT®2 sensor installed (see pg 22 for details)





# ISO Process Pumps

## Model IC i-FRAME®\*\* ISO Process

This series is designed in accordance with ISO 5199 and ISO 2858, making it ideal for worldwide chemical or industrial process applications. IC pumps are fitted with a patented seal chamber design called the Cyclone seal chamber, which has been proven to provide the optimum sealing environment for extended mechanical seal life. Optional inducer reduces NPSHr.

- Capacities to 450 m<sup>3</sup>/h | 1,980 GPM
- Heads to 160 m | 525 ft
- Temperature ranges from -40° C to 280° C | -40° F to 530° F
- Pressures to 25 bar | 360 PSIG

### Applications:

- Chemical
- Petrochemical
- Pulp & Paper
- Primary Metals
- Food & Beverage
- General Industries

Materials: Ductile Iron, Carbon Steel, 316SS, Duplex SS, Alloy 20, Hastelloy C, Titanium

\*i-ALERT®2 sensor installed (see pg 22 for details)



## Sealed

## Model ICM ISO Metallic Magnetic Drive Process

The ICM pump is the optimum metallic sealless pump for process fluid services in the chemical, paper and general industries where ISO dimensions are preferred. The ICM is specifically designed to pump difficult fluids such as corrosives, high purity and toxic liquids. Its sealless, sturdy design combines with a wide variety of wet end materials. The bearings are chemical and abrasion resistant Silicon Carbide (SSiC). Optional Dryguard™ dry-run protection can be provided.

- Capacities to 400 m<sup>3</sup>/h | 1,760 GPM
- Heads to 210 m | 685 ft at 3,500 rpm
- Temperature ranges from -40° C to 180° C | -40° F to 360° F
- Pressures to 16 bar | 232 PSIG

### Applications:

- Batch Chemical Process
- Rail Car or Tank Unloading
- Specialty Chemicals

Materials: Stainless Steel, Hastelloy, Ductile Iron, Alloy 20



## Sealless

## Model ICB Close-coupled ISO Process Pump

The ICB series is an extension to the IC series ISO 5199 frame mounted chemical pump series. These new pumps provide a compact and economical pumping solution ideal for OEM applications and confined spaces in industrial processes. No spacer coupling or alignment is required, reducing capital equipment costs and simplifying installation and maintenance. ICB pumps are fitted with our patented Cyclone seal chamber, proven to provide the optimum sealing environment for extended mechanical seal life.

- Capacities to 340 m<sup>3</sup>/h | 1,490 GPM
- Heads to 160 m | 525 ft
- Temperature ranges from -40° C to 140° C | -40° F to 280° F
- Pressures to 16 bar | 230 PSIG

### Applications:

- Specialty Chemicals
- Batch Chemical Process
- Reactor Feed
- Seal Water
- Shower Service
- Boiler Feed
- Condensate
- High Pressure Process
- Column Bottoms
- Hot Oil
- Column Reflux

Materials: Ductile Iron, Carbon Steel, 316SS, Duplex SS



## Model ICMB Close-coupled ISO Magnetic Drive Process Pump

The ICMB is an extension of the ICM series frame mounted sealless process pump. This design provides a compact and economical solution ideal for OEM applications and confined spaces in industrial processes. No spacer coupling or alignment is required, reducing capital equipment costs and simplifying installation and maintenance. ICMB pumps are fitted with the same features as all other ICM pumps, including a patented bearing cartridge and a one piece high pressure containment shell.

- Capacities to 100 m<sup>3</sup>/h | 440 GPM
- Heads to 100 m | 330 ft at 3,500 rpm
- Temperature ranges from -40° C to 180° C | -40° F to 280° F
- Pressures to 16 bar | 232 PSIG

### Applications:

- Batch Chemical Process
- Rail Car or Tank Unloading
- Specialty Chemicals

Materials: Stainless Steel, Hastelloy, Ductile Iron, Alloy 20



# ISO/API Process Pumps

## Model ICP\*

### High Temperature ISO Process Pump

The ICP is a heavy duty chemical process pump designed for extreme temperatures and pressures. The ICP complies with ISO standards and features the patented Cyclone Seal Chamber for extended seal service life. Center line casing design is self venting. Large capacity oil sump provides maximum bearing cooling.

Optional inducer reduces NPSHr.

- Capacities to 450 m<sup>3</sup>/h | 1,980 GPM
- Heads to 150 m | 492 ft
- Temperature ranges from -40° C to 280° C | -40° F to 535° F
- Pressures to 25 bar | 363 PSIG



#### Applications:

- Hot Water
- Thermal Oils
- Heat Transfer Fluids
- Die/Mold Pre-Heating Systems
- Pilot Plants
- Electronic Heating and Cooling
- Reactor Heating
- Urea

Materials: Carbon Steel, 316SS, Alloy 20, Duplex SS, Hastelloy C

\*i-ALERT\*2 sensor installed (see pg 22 for details)



## Sealed

## Model ICMP

### High Temperature ISO Metallic Magnetic Drive Process

The ICMP is a heavy-duty metallic sealless pump for applications with high temperature and pressure conditions. It is designed for aggressive, toxic and

high purity media. The center line casing is optimal for the compensation of dimensional changes due to temperature fluctuations. SSiC Silicon Carbide plain bearings, with optional Dryguard™ dry run protection.

- Capacities to 400 m<sup>3</sup>/h | 1,760 gpm
- Heads to 210 m | 685 ft at 3500 rpm
- Temperature ranges from - 40° C to 280° C | - 40° F to 535° F
- Pressures to 25 bar | 365 PSIG



#### Applications:

- Batch Chemical Process
- Rail Car or Tank Unloading
- Specialty Chemicals

Materials: Stainless Steel, Hastelloy, Ductile Iron, Alloy 20



## Sealless

## API 610 Process Pumps

### Model 3610 API 610 (BB1)

#### Horizontal Split Case, Double Suction

Designed for a wide range of industrial, municipal and marine services.

- Capacities to 11,355 m<sup>3</sup>/hr | 50,000 GPM
- Heads to 215 m | 700 ft
- Temperatures to 150° C | 300° F - optional 205° C | 400° F
- Pressures to 21 bar | 300 PSIG - optional 42 bar | 600 PSIG



#### Applications:

- Petroleum refining, production, and distribution
- Petrochemical and demanding chemical processing
- High temperature applications including boiler circulation
- General industrial requiring high temperature or high pressures

Materials: All API materials, custom materials available



### Models 3620 i-FRAME®\* and 3640 i-FRAME®\* API 610 (BB2)

#### Single and Two-Stage Between Bearings

Between bearings, radially split process pumps designed for smooth, reliable operation. Fully meets requirements of API 610.

- Capacities to 4,540 m<sup>3</sup>/h | 20,000 GPM
- Heads to 455 m | 1,500 ft
- Temperatures to 455° C | 850° F
- Pressures to 70 bar | 1,000 PSIG

#### Applications:

- Refinery – Tower bottoms, process feed, column reflux, circulation and pump around, process booster
- Power Plant – Boiler feed booster, boiler circulation, ash sluice

Materials: All API materials, custom materials available

\*i-ALERT\*2 sensor installed (see pg 22 for details)



# API 610 Process Pumps

## Model 3600 i-FRAME® API 610 (BB3) Heavy Duty Multistage

Advanced design with proven operating history. Axially split, with many enhanced features that make it an extremely reliable, high performance pump well-suited to a wide range of services.

- Capacities to 1,930 m<sup>3</sup>/hr | 8,500 GPM
- Heads to 2,740 m | 9,000 ft
- Temperatures to 205° C | 400° F
- Pressures to 275 bar | 4,000 PSIG

### Applications:

- Refineries
- Injection offshore platforms
- Pipeline
- Boiler feed
- Descaling
- Mine dewatering
- Process transfer
- Desalination
- Water injection
- CO<sup>2</sup> injection

Materials: All API materials, custom materials available



\*i-ALERT®2 sensor installed (see pg 22 for details)



## 7200CB (BB5) Barrel Multistage Pumps

11<sup>th</sup> edition API compliant, severe service, barrel pumps, in-line diffuser style. For high temperatures, pressures and low specific gravities.

- Capacity: 910 m<sup>3</sup>/h | 4,000 GPM
- Head: 2,740 m | 9,000 ft
- Temperature: 425° C | 800° F
- Pressure: 275 bar | 4,000 PSIG

### Applications:

- Petroleum refining, production, and distribution
- Petrochemical and demanding chemical processing
- High temperature applications including boiler circulation
- General industrial requiring high temperature or high pressures

Materials: All API materials, custom materials available



## Model 3700 & 3710 API 610 (OH2) Overhung Process

High temperature and high pressure process pumps designed to fully meet the requirements of API 610. Center line support for high temperature stability, maximum rigidity. Features tangential discharge for maximum hydraulic efficiency. Available in top suction design (Model 3710).

- Capacities to 1930 m<sup>3</sup>/h | 8,500 GPM
- Heads to 360 m | 1,200 ft
- Temperatures to 425° C | 800° F
- Pressures from full vacuum to 60 bar | 870 PSIG

### Applications:

- Column Reflux
- Column Bottoms
- Reboiler
- Injection
- Fuel Blending
- Heat Transfer
- Slop Gas Oil Transfer
- Heavy Gas Oil
- Stripper Overhead
- Hot Oil
- Column Charge
- Reactor Feed
- Stabilizer Overhead
- Scrubber Circulation
- Tower Bottoms
- Offsite Hydrocarbon

Materials: All API materials, custom materials available



## Model 3910 API 610 (OH3) Vertical In-Line with Bearing Frame

High pressure, high temperature services meets API 610 requirements. Back pull-out for ease of maintenance. Bearing frame carries pump loads.

- Capacities to 1,360 m<sup>3</sup>/h | 6,000 GPM
- Heads to 230 m | 750 ft
- Temperatures to 340° C | 650° F
- Pressures to 42 bar | 600 PSIG

### Applications:

- Refinery Units – Distillation, Flasher, CCU, Hydrotreater, MTBE, Alkylation, Reformer, Gas Plant, Isomerization
- Petrochemical Plants – Olefins, BTX Recovery, Ethylene Glycol, Vinyl Chloride, Styrene, Phenol, Propylene Glycol, Alcohols, Ketones, Acids, Acrylonitrile, Anhydrides

Materials: All API materials, custom materials available



## Model API 3171 (VS4) API 610 Vertical Sump and Process

For all refinery services requiring tank mount or sump duties. Fully compliant with 10<sup>th</sup> and 11<sup>th</sup> editions ISO 1370/API 610.

- Capacities to 722 m<sup>3</sup>/h | 3,180 GPM
- Heads to 160 m | 525 ft
- Temperatures to 232° C | 450° F
- Pit depths to 6 m | 20 ft

### Applications:

- Industrial Process
- Industrial Sump Wastes
- Molten Sulfur
- Tank Unloading
- Corrosive & Non-Corrosive Liquids

Materials: Carbon Steel, 316SS, 12% Chrome Fitted, Duplex SS



# Sump/Abrasives/Solids Handling

## Model HSU, HSUL & JCU Submersible

Three different models allow selection of the very best pump for the service conditions whether large, stringy, fibrous solids, or abrasive slurries.

- Capacities to 910 m<sup>3</sup>/h | 4,000 GPM
- Heads to 67 m | 220 ft
- Temperatures to 90° C | 194° F
- Solids to 152 mm | 6 inches

### Applications:

- Waste Treatment Plants
- Sewage Wet Wells
- Reclaim Sumps
- Industrial Waste Sumps
- Sludge Pits
- Drainage Sumps
- Power Plants
- Collection Basins
- General Service Sumps

Materials: Cast Iron, High Chrome Iron, CD4MCu, 316SS



## Trash Hog®

### Solids Handling Self-Priming

Goulds Trash Hog is designed for superior solids handling capability, optimum pump performance, and extreme ease of maintenance for a wide range of industrial, pulp & paper, mining, and wastewater services. Whether handling sludge, debris or plant wastes, there's no other pump that compares to the Trash Hog.

- Capacities to 1,363 m<sup>3</sup>/h | 6,000 GPM
- Heads to 43 m | 140 ft
- Temperatures to 107° C | 225° F
- Pressures to 6 bar | 85 PSIG
- Suction Lifts to 7.6 m | 25 ft
- Spherical solids to 76 mm | 3 inches

### Applications:

- Pulp & Paper Industry – Black Liquor Sump, Paper Machine Floor Sump, Knotters Discharge Pump, White Water Service
- General Industry – Wash Down Sump, Food Wastes, Fish Farming, Rendering Wastes, Machine Coolant Sump
- Mining & Metal Fabrication – Mine Dewatering, Mill Scale Runoff, Cutting Oil Transfer, Construction Site Dewatering

Materials: Cast Iron, Stainless Steel, CD4MCu, High Chrome Iron Fitted



## Models VHS & VJC

### Vertical Cantilever

Ideal for range of tough sump services: abrasive slurries – mine slurry, fly ash, foundry sand, clay, coal prep, power plants or large solids handling.

### Model VHS

- Capacities to 1,590 m<sup>3</sup>/h | 7,000 GPM
- Heads to 42.6m | 140 ft
- Solids to 254 mm | 10 inches
- Lengths to 3.4 m | 11 feet

Materials: Cast Iron, High Chrome Iron, 316SS

### Model VJC

- Capacities to 1,590 m<sup>3</sup>/h | 7,000 GPM
- Heads to 73 m | 240 ft
- Solids to 57 mm | 2 1/4 in
- Lengths to 3.4 m | 11 ft

Materials: Cast Iron, High Chrome Iron, 316SS



### Applications: (Model VHS)

- Mill Scale
- Coal Slurry
- Coal Pile Runoff
- Sludge
- Clay Slurry
- Food Pulp
- Washdown Water
- Waste Paper Stock
- Black Liquor
- Plant Waste
- Sewage Treatment
- Ash Slurry

### Applications: (Model VJC)

- Coal Prep Plant
- Iron Ore Slurry
- Steel Mills
- Power Plants
- Phosphoric Acid Plants
- Cement Mills
- Mine Slurry
- Foundries
- Alumina Refineries
- Phosphate Mines



## Model VRS

### Abrasive Slurry Handling

The VRS is designed using the proven reliability of the SRL and Goulds cantilever pumps. VRS offers higher efficiencies, with maximum reliability and interchangeability. Offered in standard lengths and a variety of elastomers.

- Capacities to 341 m<sup>3</sup>/h | 1,500 GPM
- Heads to 37 m | 120 ft
- Temperatures to 121° C | 250° F
- Pressures to 5 bar 75 PSIG
- Standard Lengths: 1.2 m | 4 ft and 1.8 m | 6 ft

### Applications:

- Mineral Processing
- Non-metallic Mining Sand & Gravel
- Power Utility
- Pulp & Paper
- General Industry

Lining Materials: Natural Rubber, Neoprene, Nitrile, Polyurethane, Chlorobutyl, Hypalon, EPDM, and Metal / Alloy impeller available





# Abrasives/Solids Handling

## Model XHD\*

### Extra Heavy Duty / Rubber and Metal Lined

The XHD lined slurry pump is designed for extremely tough slurry applications. Using advanced CFD technology for optimal hydraulics, it offers the lowest total cost of ownership features including adjustable suction liner and impeller plus double wall construction with extra wall thickness in high wear areas.

- Capacities to 2,950 m<sup>3</sup>/h | 13,000 GPM
- Heads to 85 m | 280 ft
- Pressures to 17 bar | 250 PSIG

#### Applications:

- Primary Metals – SAG/Ball Mill, Cyclone Feed, Tailings
- Mineral Processing – Slurry Transfer, Flotation Cells, Thickener Underflow
- Non-Metallic Mining – Heavy Media, Cyclone Feed, Raw Coal, Clay, Soda Ash and Phosphate Slurries, Slurry Heater, Slurry Digestion, Hydrate
- Power – Absorber Recycle, Gas Cooling, Filter Feed, Lime and Ash Slurries
- Sand & Aggregate – Sand Slurries, Tailings

Materials: HC 600, Endura Chrome

\*i-ALERT®2 sensor installed (see pg 22 for details)



## Model JC

### Medium Duty Slurry

Ideal for most medium duty abrasive and/or corrosive slurry services. Extra thick wet end components extend wear life. Replaceable wear liner for low maintenance cost. Available with dynamic seal for elimination of seal problems, reduced maintenance. Variety of drive arrangements available for application flexibility

- Capacities to 1,600 m<sup>3</sup>/h | 7,000 GPM
- Heads to 73 m | 240 ft
- Temperatures to 121° C | 250° F
- Pressures to 10 bar | 127 PSIG
- Solids to 57 mm | 2.25 in

#### Applications:

- Wet scrubber systems
- Waste sludge
- Fracking slurries
- Paper mill wastes and liquors
- Clay and sand slurries
- Dirty water
- Kaolin water
- Carbon slurry
- Lime mud
- Precipitated CaCO<sub>3</sub>

Materials: Cast Iron, High Chrome Iron, 316SS, CD4MCu, Endura Chrome



## Models SRL / SRL-C / SRL-S / SRL-XT

### Abrasive and Corrosive Slurry Handling

The SRL pumps are designed to handle the toughest abrasive slurry. Features include wear-resistant rubber liners for maximum life and engineered for ease of maintenance. The SRL-S uses a Shearpeller® for froth applications.

- Capacities to 4,542 m<sup>3</sup>/h | 20,000 GPM
- Heads to 50 m | 164 ft
- Temperatures to 121° C | 250° F
- Pressures to 28 bar | 400 PSIG

#### Applications:

- Sag Mill
- Rod & Ball Mill
- Primary & Secondary Cyclone
- Thickener Feed
- Flotation Feed
- Tailings

Lining Materials: Natural Rubber, Neoprene, Nitrile, Polyurethane, Chlorobutyl, Hypalon, EPDM, Ceramic Composites and Metal Alloys



## Model 5500

### Severe Duty Slurry

The "Workhorse" of severe duty slurry pumps. It's not only built to stand up to the toughest services, but the Model 5500 is also designed for extreme ease of maintenance. A heavy duty power end, extra thick wall sections and easily replaceable wear parts add up to long, reliable operation.

- Capacities to 3,861 m<sup>3</sup>/h | 17,000 GPM
- Heads to 139 m | 425 ft
- Temperatures to 121° C | 250° F
- Pressures to 35 bar | 500 PSIG
- Solids to 127 mm | 5 in

#### Applications:

- Tailings
- Thickener Underflow
- Pipeline
- Potash
- Mud Disposal

Materials: High Chrome Iron, CD4MCu, Endura Chrome



# Abrasives/Solids Handling/Multistage Axial Flow/Double Suction

## Model HS

### Hydro Solids

For handling sludges and slurries containing large solids, entrained air, fibrous materials, corrosives and abrasives. Features recessed, non-clog impeller.

- Capacities to 1,590 m<sup>3</sup>/h | 7,000 GPM
- Heads to 43 m | 140 ft
- Temperatures to 93° C | 200° F
- Pressures to 7 bar | 100 PSIG
- Solids to 254 mm | 10 in



### Applications:

- Waste Treatment – Raw Sewage  
Sewage Sludge, Water, Resin, Fiber  
Water & Ashes, Textile Mill Effluent
- Pulp & Paper – Paper Stock, Plant  
Effluent, Black Liquor, Filtrate
- Food Processing – Beet Pulp, Dirty  
Water, Vegetable Refuse, Lemons,  
Tomato Wash Water
- Foundries & Steel Mills – Mill Scale  
Water & Slag, Grit
- Agriculture – Liquid Manure, Drainage  
Mulch, Seed, Water, Cane Wash, Sprigs  
Wood, Fiber
- Manufacturing – Paint Sludge, Plant  
Sewage & Sludge, Floor Wash, Clay  
Slip, Clarifier Sludge

Materials: Cast Iron, High Chrome,  
Iron, 316SS, CD4MCu

## Multistage / Axial Flow / Double Suction

## Model 3393\*

### High Pressure Multistage Ring Section Pump

Radially split, segmented casing, multistage pump designed with modular interstage components. Its multiple suction nozzle and discharge nozzle orientations allow adaptation to multiple piping installations. Multiple hydraulics for each pump size optimize efficiency across a vast range of applications. These pumps are particularly well suited for reverse osmosis, boiler feed, cogeneration, shower/spray service, pressure boosting and high pressure cleaning applications.

- Capacities to 750 m<sup>3</sup>/h | 3,300 GPM
- Heads to 1,000 m | 3,300 ft
- Temperatures to 177° C | 350° F
- Pressures to 114 bar | 1,650 PSIG

### Applications:

- Reverse osmosis
- Boiler feed
- Cogeneration
- Shower / spray service
- Pressure boosting
- High Pressure Cleaning
- Snow making

Materials: 12% chrome, duplex and  
super duplex stainless steels



\*i-ALERT®2 sensor installed (see pg 22 for details)



## Model 3316

### Two-Stage Splitcase

Horizontal split case pumps are ideally suited for boiler feed, mine dewatering and other services requiring moderately high heads with a wide range of operating conditions.

- Capacities up to 681 m<sup>3</sup>/h |  
3,000 GPM
- Heads to 305 m | 1,000 ft
- Temperatures to 177° C | 350° F
- Pressures to 38 bar | 550 PSIG

### Applications:

- Boiler Feed
- Mine Dewatering
- Booster
- High Pressure Process
- Condensate
- High Pressure Cleaning

Materials: Bronze-fitted, Cast Iron,  
Bronze, 316SS



# Multistage/Axial Flow/Double Suction

## Model 3935

### Centrifugal Diffuser Multistage

Centrifugal diffuser type multistage pumps well suited for boiler feed, reverse osmosis, petrochemical and hydrocarbon services.

- Capacities to 28 m<sup>3</sup>/h | 125 GPM
- Heads to 792 m | 2,600 ft
- Temperatures to 204° C | 400° F
- Pressures to 103 bar | 1,500 PSIG
- 

#### Applications:

- Reverse Osmosis
- Boiler Feed
- Descaling
- High Pressure/High Temperature Cleaning
- Spraying Systems
- Hydraulic Systems
- Process Water
- Petrochemical & Hydrocarbon Service Transfer
- All Low Flow Applications – where efficiency is critical

Material: Carbon Steel



## Model 3355

### Multistage

Multistage ring section pump designed for high pressure services including: reverse osmosis, shower service, boiler feed and much more.

- Capacities to 340 m<sup>3</sup>/h | 1,500 USGPM
- Heads to 500 m | 1,640 ft
- Max speed to 3,600 min-1 | 3,600 rpm
- Discharge from 1½ in to 5 in
- Temperatures to 140° C | 280° F
- Pressures to 55 bar | 800 PSIG

#### Applications:

- Boiler Feed
- Condensate Return
- Deaerator
- Reverse Osmosis
- Shower/Spray Service
- Mine De-watering
- Cleaning Systems
- Seal Water Booster
- Product Transfer
- Reactor Feed
- Pressure Boosting

Materials: Cast Iron, Stainless Steel, Stainless Fitted



## Goulds Model 3409

### Medium Capacity

- Capacities to 2,725 m<sup>3</sup>/h | 12,000 GPM
- Heads to 259 m | 850 ft
- Temperatures to 120°C | 250°F
- Working Pressures to 2758 kPa | 400 PSIG

#### Applications:

- Process – Quench water, Stripper bottoms, Reboiler circulation, Cooling tower
- Pulp & Paper – Primary and secondary cleaner, filtrate, mill water supply Fan pump, Headbox supply, Shower
- Primary Metals – Cooling water, quench and leaching
- Municipal – High lift, low lift, wash water, waste water, raw water
- Power Generation – Cooling tower, Component cooling, Service water, Ash Sluicing, Heater drain
- Marine – Bilge and ballast, cargo, cooling water, fire pump
- General – River water, Brine, Sea water

Materials: Cast Iron / Bronze, All Iron, All Bronze, Cast Iron / Stainless Steel, Cast Iron / Ni-Al-Br, All Stainless Steel (1724 kPa)



**NSF**



## Goulds 3410

### Small Capacity

- Capacities to 1,817 m<sup>3</sup>/h | 8,000 GPM
- Heads to 174 m | 570 ft
- Temperatures to 177° C | 350° F
- Pressures to 1,724 kPa | 250 PSIG

#### Applications:

- Process – Quench water, Stripper bottoms, Reboiler circulation, Cooling tower
- Pulp & Paper – Primary and secondary cleaner, filtrate, mill water supply shower, fan pump
- Primary Metals – Cooling water, quench and leaching
- Municipal – High lift, low lift, wash water, waste water, raw water
- Utilities – Cooling tower, component cooling, service water
- Marine – Bilge and ballast, cargo, cooling water, fire pump

Materials: Cast Iron / Bronze, All Iron, All Bronze, Cast Iron / Stainless Steel, Cast Iron / Ni-Al-Br, All Stainless Steel (1724 kPa)



**NSF**

# Multistage/Axial Flow/Double Suction

## Goulds Model 3420

### Large Capacity

- Capacities to 14,762 m<sup>3</sup>/h | 65,000 GPM
- Heads to 122 m | 400 ft
- Temperatures to 135°C | 275°F
- Working Pressures to 1379 kPa | 200 PSIG



**NSF**

### Applications:

- Process – Quench water, Stripper bottoms, Reboiler circulation, Cooling tower
- Pulp & Paper – Primary and secondary cleaner, filtrate, mill water supply Fan pump, Headbox supply, Shower
- Primary Metals – Cooling water, quench and leaching
- Municipal – High lift, low lift, wash water, waste water, raw water
- Power Generation – Cooling tower, Component cooling, Service water, Ash Sluicing, Heater drain
- Marine – Bilge and ballast, cargo, cooling water, fire pump
- General – River water, Brine, Sea water

Materials: Cast Iron / Bronze, All Iron, All Bronze, Cast Iron / Stainless Steel, Cast Iron / Ni-Al-Br, All Stainless Steel (1724 kPa)

## Goulds Model 3498

### Extra Large Capacity

- Capacities to 18,000 m<sup>3</sup>/h | 80,000 GPM
- Heads to 244 m | 800 ft
- Temperatures to 135°C | 275°F
- Working Pressures to 200 PSIG



**NSF**

### Applications:

- Process – Quench water, Stripper bottoms, Reboiler circulation, Cooling tower
- Pulp & Paper – Primary and secondary cleaner, filtrate, mill water supply Fan pump, Headbox supply, Shower
- Primary Metals – Cooling water, quench and leaching
- Municipal – High lift, low lift, wash water, waste water, Raw water
- Power Generation – Cooling tower, Component cooling, Service water, Ash Sluicing, Heater drain
- Marine – Bilge and ballast, cargo, cooling water, fire pump
- General – River water, Brine, Sea water

Materials: Cast Iron / Bronze, All Iron, All Bronze, Cast Iron / Stainless Steel, Cast Iron / Ni-Al-Br, All Stainless Steel (1724 kPa)



## Model Axial Flow®

### Axial Flow

For continuous circulation of corrosive/abrasive solutions, slurries, and process wastes. Fabricated elbow or cast elbow designs available. Most suitable for low head, high capacity pumping.

- Capacities to 68,000 m<sup>3</sup>/h | 300,000 GPM
- Heads to 9.2 m | 30 ft
- Temperatures to 176° C | 350° F
- Available in cast iron, austenitic stainless steels, duplex alloys, nickel, nickel-chrome alloys, nickel-chrome-moly alloys, titanium and other alloys as required for the service
- Available in 6 - 66 inch sizes (larger sizes on application)



Materials: Cast Iron, 304SS, 316SS, CD4MCu, Nickel, Monel, Alloy 20, UHB-904L, Titanium, Hastelloy, Sanicro 28



### Applications:

- Chemical – Evaporator and Crystallizer Circulation
- Mining & Minerals – Phosphate, Soda Ash, Potash and Sodium Chloride Processing
- Petrochemical – Polymerization Reactors, Xylene
- Pulp & Paper – Black liquor evaporator, Chlorine dioxide generators
- Municipal – Sewage digesters
- General – Raw water pumping, Flood control, Marine ballast transfer

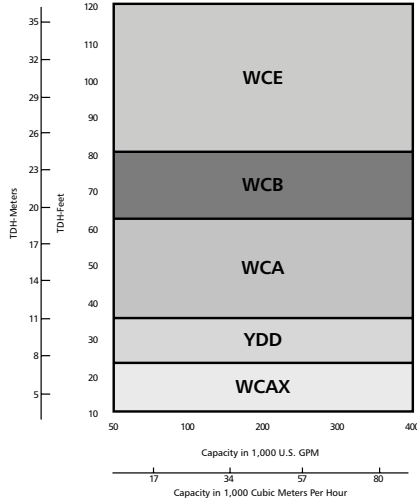


# Vertical Mixed & Axial Flow

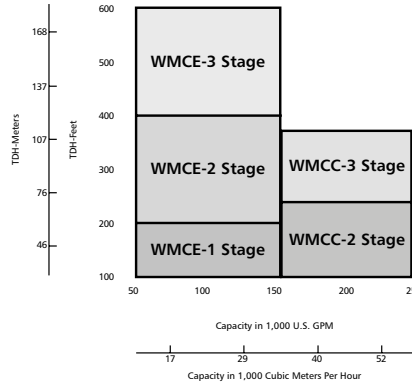
## Models VCV (VS1/VS3)

### Vertical Mixed & Axial Flow

Custom designed for maximum reliability and high efficiency.



- Capacities to 91,000 m<sup>3</sup>/Hr | 400,000 GPM
- Heads to 180 m | 600 ft
- Powers to 7,500 KW | 10,000 hp



Materials: Bronze Fitted, All Bronze, SS Fitted, Ni Resist, All SS

**NSF**

(Q1 2018)

\*i-ALERT<sup>®</sup>2 sensor installed (see pg 22 for details)



## Model VIC (VS6)

### Vertical Can-Type

A wide range of hydraulic conditions allows meeting requirements of virtually every pumping service. Designed to meet custom specifications of the user.

Model VIC can-type turbine meets API 610 specifications.

- Capacities to 15,900 m<sup>3</sup>/Hr | 70,000 GPM
- Heads to 1,067 m | 3,500 ft
- Pressures to 176 kg/cm<sup>2</sup> | 2,500 psi
- Bowl sizes from 152.4 mm to 1,400 mm | 6" to 55"
- Temperatures to 204°C | 400° F
- Horsepower to 3730 KW | 5,000 HP

#### Applications:

- Pipeline Booster
- Product Transfer, Refinery Blending
- Injection-Secondary Recovery
- Chemical Transfer
- Boiler Feed
- Condensate
- Cryogenics
- LNG Transfer
- Light Hydrocarbons
- Water Services

Materials: Any Machinable Alloy

\*i-ALERT<sup>®</sup>2 sensor installed (see pg 22 for details)



**NSF**

(Q1 2018)



## Model VIT (VS1)

### Vertical Turbine

A wide range of hydraulic conditions allows meeting requirements of virtually every pumping service. Designed to meet custom specifications of the user. Model VIT can-type turbine meets API-610 specifications.

- Capacities to 15,900 m<sup>3</sup>/Hr | 70,000 GPM
- Heads to 1,067 m | 3,500 ft
- Pressures to 176 kg/cm<sup>2</sup> | 2,500 psi
- Bowl sizes from 152.4 mm to 1,400 mm | 6" to 55"
- Temperatures to 204°C | 400° F
- Horsepower to 3,730 KW | 5,000 HP

#### Applications:

- Cooling Water
- Seawater & River Water Intake
- Industrial Process Pumps
- Utility Circulating Water
- Condenser Circulating Water Pumps
- Fire Service
- Reclaimed Water

Materials: Any Machinable Alloy

\*i-ALERT<sup>®</sup>2 sensor installed (see pg 22 for details)



**NSF**

(Q1 2018)



# Multistage/Axial Flow/Double Suction

## Model VIS

### Vertical Submersible

For deep settings or where use of lineshaft pumps is impractical. For irrigation, service water, deep well supply, offshore and mine dewatering.

- Capacities to 15,900 m<sup>3</sup>/hr | 70,000 GPM
- Heads to 1,067m | 3,500 ft
- Pressures to 176 kg/cm<sup>2</sup> | 2,500 psi
- Bowl sizes from 152.4 mm to 1,400 mm | 6" to 55"

### Applications:

- Irrigation
- Service Water
- Deep Well
- Sea Water Lift

Materials: Any Machinable Alloy



## Model VMP

### Vertical Marine

Goulds Model VMP pump is an automatically self-priming unit designed specially for efficient unloading and stripping of product tankers and barges.

- Capacities to 4,542 m<sup>3</sup>/h | 20,000 GPM
- Heads to 194m | 635 ft
- Temperatures to 120°C | 250° F

### Applications:

- Product Stripping
- Ship Fire Pumps
- Ballast Pump
- Bilge
- Fuel Oil Transfer

Materials: Any Machinable Alloy



## Model VIDS (VS2/VS7)

### Double Suction Vertical Pump

Unique specific designs that optimized results. Each model of the VIDS line is customized to conform to project specifications. They are available in open pit or can configurations.

- Capacities up to 15,900m<sup>3</sup>/h | 70,000 GPM
- Heads to 244 m | 800 ft on single stage configuration  
1,060 m | 3,500 ft on multi-stage configuration
- Temperatures to 204° C | 400° F
- Pressures to 76 kg/cm<sup>2</sup> | 2,500 psi
- Horsepower to 3,730 kw | 5,000 hp Maximum suspended solids concentration (1 stage): 10,000 PPM

### Applications:

- Pipeline Booster
- Product Transfer, Refinery Blending
- Injection-Secondary Recovery
- Chemical Transfer
- Boiler Feed
- Condensate
- Cryogenics
- LNG Transfer
- Light Hydrocarbons
- Water Services
- Dirty water
- Sea water
- Reclaim & process water

Materials: Any Machinable Alloy



## Model VICR (VS6)

### Vertical Multistage Low Flow, High Head

A wide range of hydraulic conditions with a competitive advantage due to its compact design and reduced number of stages from the radial impeller configuration that can produce more head per stage.

Model VICR can vertical multistage low flow, high head meets API 610 specifications.

- Capacities to 636 m<sup>3</sup>/Hr | 2,800 GPM
- Heads to 1,372 m | 4,500 ft
- Temperatures to 204°C | 400° F
- Discharge flange sizes from 38 mm to 203 mm | 1.5" to 8"
- Powers to 3,000 KW | 4,000 hp

### Applications:

- Pentane, Propane, LPG and other light hydrocarbons with specific gravities ranging from 0.2 to 1.0
- Hotwater applications such as Boiler feed water

\*i-ALERT®2 sensor installed (see pg 22 for details)



\*i-ALERT®2 sensor installed (see pg 22 for details)



# Patented Bearing Housings & Filters

To get superior MTBF you need two things: Optimum pump hydraulics and a robust pump structure. The new i-FRAME housings delivers on the second point by providing a premium robust housing with unique new and improved features that raise the bar on what you can expect from your pump's long term performance. These i-FRAME bearing housings include the new patented one piece design bearing housing for the ball-ball bearing arrangement, as well as the patent pending split bearing housing for the sleeve-ball and sleeve-tilt pad bearing arrangement.

The housings are cast and machined out of ASTM A216 Grade WCB carbon steel.

- Ball/Ball (New orders only)
  - Deep Groove Ball Bearing on the Drive End (DE) to handle radial loads
  - Duplex 40° Angular Contact Bearing Set on the Non- Drive End (NDE) to handle radial and axial loads. Bearing set is supplied with a light clearance

All bearing housings feature a full 180° bearing saddle bolted to the casing positioned with precision dowels for accurate, repeatable alignment. The 180° bearing saddle is optimized for stiffness and rigidity of connection between the pump casing and housing along with increased bolt diameters. This provides significantly increased stiffness compared to the previous design generation, resulting in reduced vibration.





The bearing housing exterior includes distinctive cooling fins placed in a CFD/FEA optimized pattern to aid in heat dissipation.



The i-FRAME bearing housings have enhanced air cooling with axial fans and achieves metal and oil temperature reductions of up to 30° F from previous design without the need for cooling water. All shaft ends on the NDE side come standard with a guarded extension to accept a fan for ease of field retrofit, so if your process needs change the fan can be fitted without the need for expensive pump disassembly.

Bearing oil contamination by wind-blown sand and dust together with atmospheric moisture are major contributors to bearings failing well before their design life. In an industry first, all self-contained bearing housings include a cartridge filter assembly that will help safeguard the bearing oil from debris contamination.

The patent pending filter cartridge will also continuously work to scrub water from the bearing oil utilizing specifically engineered moisture absorbing materials built into the filter.

<u>Oil with Particulate**</u>		<u>Oil with Water</u>	
			
Run time = 72 hrs*	Run time = 314 hrs*	Run time = 0 hrs*	Run time = 72 hrs*
Black Oil	Result: Clean Oil	Cloudy Oil	Result: Clean Oil

\*Continuous operation at 3100RPM

\*\*Test dust used is ISO 12103-1, A3 Medium test dust

The design allows for easy changeover of filter cartridges even while the pump is operating – no need to stop your process. All this additional reliability is achieved *without* the need for additional oil pumps or piping – no additional system complexity, monitoring or control overhead.

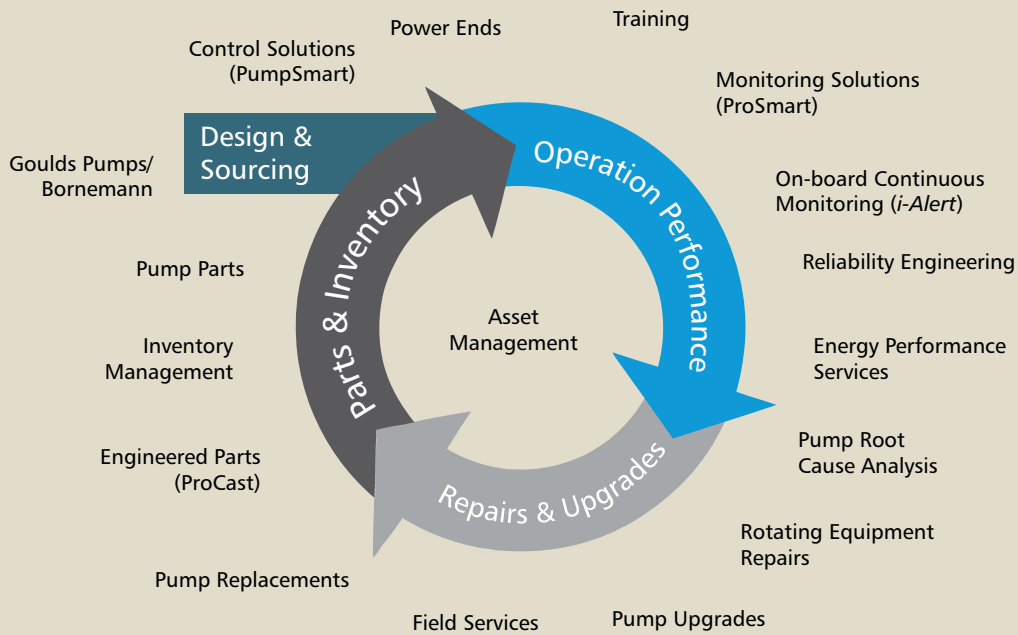


It is important to note these new i-FRAME bearing housings are not interchangeable with the previous design. For other features, see the Standard Product Configuration under the Application and Selection Guide section.

## Reliability has no quitting time.

Building on over 165 years of Goulds Pumps experience, PRO Services provides an array of services focused on reducing equipment total cost of ownership (TCO) and increasing plant output, including predictive monitoring, maintenance contracts, field service, engineered upgrades, inventory management, and overhauls for pumps and other rotating equipment. [www.ittproservices.com](http://www.ittproservices.com)

### Your total Solution For Equipment Life Cycle Optimization





# Pump Upgrades

ITT PRO Services provide upgrades engineering services for a wide range of pumps.

## Re-engineering hydraulics

is the best way to address the root cause of many pump and system damaging mechanisms. ITT PRO Services is experienced at hydraulically re-rating any manufacturer's centrifugal pump for parameters such as Flow/Head, NPSH, Suction Recirculation, and Efficiency through dedicated aftermarket hydraulics engineering and laser scanning and casting technologies.

## Custom drop-in replacement pumps

allow users to fit the hydraulic they need into the footprint available in order to save on piping, foundation, electrical, and civil work often required to completely change a pump train. This solution brings to bear the full capabilities of ITT PRO Services aftermarket mechanical and hydraulic expertise with the fullbacking of an industry leading OEM of centrifugal pumps.

## PRX-OH2 Back Pull-out Upgrade

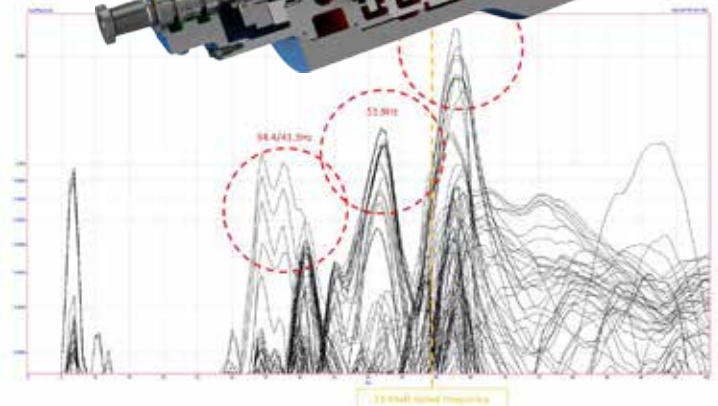
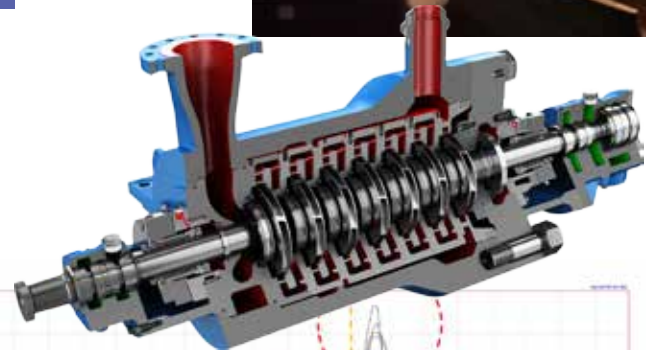
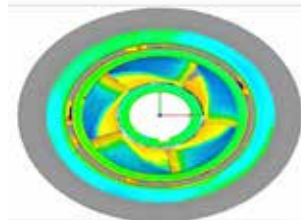
is a back pull-out assembly which provides a complete replacement to your existing equipment while keeping the existing impeller and casing.

## PRX-VSR Rebowl of Vertical Turbine Pumps

offers a more economical solution than a complete new pump, rebowling a pump could be the best option for many pump problems with no disturbance to the existing piping and re-using some of the original pump parts such as the discharge head, mounting plate and the driver.

## PRX-CBS

program exists to replace the internal bundle of a BB5 barrel pump to tailor hydraulics and provide quick sparing with minimized downtime.



# i-ALERT<sup>®</sup> Monitoring Solution

## Sensor | App | Ai Platform

www.i-alert.com



### What it Does:

#### Monitor

Tracks vibration, temperature & run-time hours 24/7/365.

#### Alarm

Takes high resolution data when an alarm condition occurs and stores it for later analysis.

#### Trend

Captures data every 1-60 minutes and has up to 170 days of on-board storage.

#### Analyze

Diagnose machine faults with vibration tools  
Fast Fourier Transform (FFT) & Time Wave Form Analysis.

#### Environment

Rated for any industrial environment. water & dust resistant.  
Intrinsically Safe with a 3-year battery life (use dependent).  
• ATEX Zone 0 AEx ia IIB Ga (Groups C & D)

#### Wireless

Sync data via Bluetooth Smart enabled smartphones and tablets.

#### Online Monitoring

Monitor and manage all of your i-ALERT enabled machines in one place - i-ALERT Ai Online Platform. This subscription service requires no software to download or dedicated hardware to run.

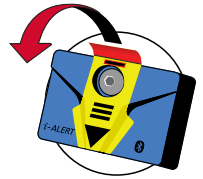


Spend less time collecting data and more time fixing problems. The i-ALERT mobile app has the ability to scan multiple i-ALERT2 sensors within range to quickly and safely inspect multiple machines.

### How it Works:

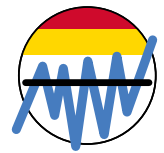
#### 1. ACTIVATE

The i-ALERT2 devices are light activated by removing the sticker. The sensor begins wirelessly broadcasting once activated.



#### 2. AUTO CONFIGURATION

The i-ALERT device averages the vibration over 25 hours of run-time and sets the alarm levels to 2 x average (0.1-1.5ips minimum). Temperature alarm default to 80°C (176°F)



OR

#### 2. MANUAL CONFIGURATION

User manually sets the alarm thresholds via the i-ALERT mobile application.



#### 3. Monitor

The i-ALERT2 sensor is configurable to check every 1-5 minutes. If two consecutive readings are above alarm threshold the i-ALERT device will go into alarm.



#### Dashboard

Simple, intuitive dashboard to track vibration, temperature, run-time & battery life.



#### Trending

Trend vibration, temperature, & kurtosis to monitor any changes in the equipment operation.



#### BOM

Load the as built of materials based on the pump serial number.

# PumpSmart<sup>®</sup> Control Solutions

The industry award-winning and patented pump control logic delivers real-time control and protection of your pumps while also providing valuable process insight. By protecting against pump failure due to process upsets, PumpSmart keeps your operation running longer and reduces unplanned repair activities and expense. By right-sizing your pumps to your system, we can reduce not only your energy consumption, but also wear & tear on your process systems.

## Features (Low Voltage)

- **Smart Flow**  
This patented feature allows PumpSmart to accurately control a process flow WITHOUT a flow meter.
- **Pump Protection**  
Provides the operator the ability to set protection for low flow, no flow, run-out and cavitation.
- **Flow Economy**  
Calculates process efficiency by flow of product versus energy consumption (gpm/kW).
- **Multi-Pump Control**  
Provides control for up to four pumps in a parallel for automatic lead/lag changeover, redundancy back-up and synchronized torque control while still communicating to a field bus or DCS system.
- **Options and Engineered Solutions**  
Available in a low-harmonic configuration guaranteed to meet IEEE519 harmonic specifications for industries requiring low-harmonic distortion on the utility line.

## Features (Medium Voltage)

- **Pump Protection & Predictive Monitoring**  
Takes intelligent control of your pumping system to ensure it operates within the parameters needed for maximized output and it also prevents damage due to process upsets which cause critical "downtime".
- **Multi-Pump Control – Load Balancing**  
Ability to monitor or control multiple pumps while operating in parallel or series piping plans.
- **Upgrade and Improve your standard Medium Voltage VFD Pumping System!**  
Ability to analyze existing VFD controlled systems and give operators visibility to pump systems.  
  
Patented logic can improve overall system reliability and predictive monitoring capabilities.

## Features (Engineered Solutions)

- Pre-Engineered or Custom Engineered Solutions for any pump project
- Dedicated Global Resources for design, drawings and site support
- Integrated Solutions for high energy centrifugal or PD type pumps
- ITT PumpSmart takes ownership of a fully integrated efficient pumping solution



## Pick Your Perfect Process Pump

Whether it's for severe corrosives, abrasive slurries, fibrous/stringy solids, high temperature liquids, hazardous fluids, low flow or high capacity services – Goulds Pumps has a perfect, reliable solution. Our selection of fluid solutions includes horizontal and vertical configurations in a range of alloy and non-metallic constructions, sealed and sealless. Goulds Pumps' wide range of products ensures that we have the right pump for virtually every application.



## Pump Selection Checklist

The following Pump Selection Checklist is designed to assist users in reviewing most pump requirements for ultimate selection of the best pump. Your Goulds Pumps representative has been specially trained in pump application and should be contacted to assist in final pump selection for optimum reliability and safety.

### 1A SYSTEM

Service: \_\_\_\_\_  
Capacity: \_\_\_\_\_  
Total Dynamic Head: \_\_\_\_\_  
NPSH Available: \_\_\_\_\_  
Suction Pressure: \_\_\_\_\_  
Minimum Flow Rate: \_\_\_\_\_  
Total Working Pressure: \_\_\_\_\_

### 2A LIQUID PROPERTIES

Liquid: \_\_\_\_\_  
Vapor Pressure: \_\_\_\_\_  
Specific Heat: \_\_\_\_\_  
Viscosity: \_\_\_\_\_  
Solids Size / Content: \_\_\_\_\_  
Specific Gravity: \_\_\_\_\_  
Temperature: \_\_\_\_\_  
Characteristics: (flammable, explosive, carcinogenic, toxic, noxious, regulated, etc.): \_\_\_\_\_

### 3A SAFETY / ENVIRONMENTAL

- UL label (explosion-proof enclosures)
- Regulations (government, local, plant)
- Temperature limits
- Fugitive emission limits
- Product purity
- Best Available Control Technology
- Reporting requirements

### 4A ECONOMY / RELIABILITY

- MTBF requirements
- Lubrication
- Cooling / Heating
- Operator experience
- Operator maintenance
- Extra product filtering
- Ease of installation

### 1B

Pump Size \_\_\_\_\_  
Impeller diameter \_\_\_\_\_  
HP, efficiency \_\_\_\_\_  
NPSHR \_\_\_\_\_  
Minimum Pump Flow \_\_\_\_\_  
Speed (RPM) \_\_\_\_\_

### 2B

Materials of Construction \_\_\_\_\_  
Bearing cooling \_\_\_\_\_  
Sealing / flushing \_\_\_\_\_  
Requirements \_\_\_\_\_  
Jacketing for Cooling / heating \_\_\_\_\_

### 3B

Explosion-proof enclosures \_\_\_\_\_  
Safety protection options \_\_\_\_\_  
Coupling guard options \_\_\_\_\_  
Casing drain \_\_\_\_\_  
Flange options \_\_\_\_\_  
O-ring materials \_\_\_\_\_

### 4B

Type of lubrication \_\_\_\_\_  
Start-up assistance \_\_\_\_\_  
Operator training \_\_\_\_\_  
Maintenance training \_\_\_\_\_  
Baseplate options \_\_\_\_\_  
Oil seal options \_\_\_\_\_



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