

Centrifugal Pump Selection Guide



Company Overviews

Goulds Pumps

ITT Goulds Pumps is among the most widely recognized and respected brands in the global pump industry, serving customers in the oil and gas, mining, power generation, chemical, pulp and paper, and general industrial markets. As the only manufacturer to make digital monitoring standard on every process pump, ITT Goulds Pumps continues to lead the industry in both mechanical pump design and the adoption of smart technologies.



Rheinhütte Pumpen

As a specialist in corrosion and wear resistant materials the Rheinhütte Pumpen leads the field in know-how in many specific areas. The basis for our comprehensive pump range are the three material groups Metal, Plastics and Ceramics. This wide variety of materials and more than 20 different pump types offer the right solution for your specific project. In close communication with you our experienced project teams develop individual concepts for your sophisticated application. And if you need a standardized application just profit from our extensive pump range.



PRO Services

ITT PRO Services provides replacement parts, repair and upgrade services, reliability and maintenance programs, and asset management assistance to customers with the goals of extending equipment life, reducing Total Cost of Ownership (TCO), and increasing plant output. PRO Services includes, PumpSmart variable speed drive systems, and i-ALERT2 equipment health sensors.



Centrifugal Pump Selection Guide

Goulds Pumps and Rheinhütte pumpen... Serving the World's Industries

Goulds Pumps and Rheinhütte Pumpen presents this Centrifugal 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 4 & 5 where the full line of Goulds Pumps, Rheinhütte Pumpen and PRO Services products are listed by category. For more details about your selection, refer to the page indicated. Contact your nearest Goulds Pumps or Rheinhütte Pumpen 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 and Rheinhütte Pumpen specialize in high alloys for our chemical pumps ranging from 316SS to Zirconium and other special alloys as requested. As well as a wide range of plastic materials. 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 with better efficiencies, multiple impellers, metric flange option and greater hydraulic coverage. Other superior pumps include our 3420 & 3498 large double suction pumps for lo-pulse fan pumps & dilution pump applications along with our 3409 & 3410 models for black liquor transfer applications.

Mining and Minerals

Goulds Pumps' and Rheinhütte Pumpen's 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, H₂SO₄, potash, soda ash, salt, gold and aggregate industries throughout the world.

Goulds Pumps and Rheinhütte Pumpen 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. The Rheinhütte pump model GVSO is ideally suited for solar power systems, with an immersion depth of up to 17.5 metres and for temperatures up to 600°C. Plastic pumps are widely used for waste plant incinerations

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. Rheinhütte Pumpen offers an extensive range of plastic pumps for the steel industry.

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.

Rheinhütte Pumpen offers an extensive range of plastic pumps for this industry.

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.


Fertilizer

Gould pumps and Rheinhütte Pumpen are the only Pump company in the world, that can offer a complete plant solution from one hand. We are a specialist in the field of pumping fluids in the Nitrogen and Phosphate Process for many decades. Optimal customer and engineering solutions are provided in a large selection of special alloys in metal, plastic and ceramic materials combined with special shaft seals to ensure reliability and safety for plants operators.

Market Segments - Selection Chart

ITT Goulds Pumps and Rheinütte Pumpen 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	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														34	
Paper Stock/Process	3175 ^{1 2}	Paper Stock/Process														6	
	3180/3185 ^{1 2}	Paper Stock/Process														6	
	3181/3186	High Temperature														6	
Vertical Sump & Process	3171	Vertical Sump and Process														7	
	NM3171	FRP Vert. Sump/Process														7	
	CV3171	Non-Clog Vertical Sump Process														7	
	LF3171	Low Flow, High Head Vertical Sump Process														7	
	GVSO	Vertical Chemical Centrifugal pump														8	
	GVRN	Vertical Acid Chemical Centrifugal pump														8	
	RK	Vertical Chemical Pump														8	
	RVKu	Vertical Plastic Pump														9	
	RKuV	Vertical Plastic Pump, Cantilever Design														9	
	ANSI Process Pumps	3196 ^{1 2}	ANSI Chemical Process														10
HT3196 ¹		ANSI High-Temperature Process														10	
LF3196 ^{1 2}		Low Flow ANSI Process														10	
CV3196 ¹		Non-Clog Process														10	
3796 ¹		Self-Priming Process														11	
3996		ANSI In-Line Process														11	
Sealless Process Pumps	3299	ANSI PFA PTFE Lined Sealless														12	
	FNPM	Magnetic Drive Plastic Pump														12	
	3296 EZMAG	ANSI Metallic Sealless Process														12	
	3298	ANSI ETFE Lined Sealless														13	
	SP3298	ANSI ETFE Lined Sealless														13	
Sealed Lined & Non-Metallic	V3298	ETFE Lined Sealless														13	
	3198 ¹	ANSI PFA ETFE Lined Process														14	
	NM3196 ¹	ANSI FRP Process														14	
	CPDR	Horizontal Standardized Chemical, Plastic														14	
	RCNKu	Horizontal Standardized Chemical, Plastic														14	
	RCNKu+	Horizontal Standardised Chemical, Plastic														15	
	RCKu	Horizontal Chemical Pump, Plastic														15	
	FNP	Standardized Chemical Pump, PFA-Lining														15	
	FNC	Standardized Chemical Pump, Ceramic														15	
	FGP	Horizontal Liquid Ring Pump, Ceramic														16	
ISO Process Pumps	IC ¹	ISO Chemical Process														17	
	RN	Standardized Chemical Pump														17	
	RNSi	Acid Standardized Chemical Pump														17	
	ICM	ISO Metallic Magnetic Drive														18	
	RMKN	Magnetic Drive Metal Pump														18	
	ICB	Close-Coupled ISO Process														18	
	ICMB	Close-Coupled ISO Sealless														19	
	ICP ¹	High-Temperature ISO Magnetic Drive														19	
	ICMP	High-Temperature ISO Magnetic Drive														19	
	ICO ¹	Open Impeller ISO Chemical Process														19	
API 610 Process Pumps	3610 ¹	Axially Split, 1-Stage (BB1)														20	
	3620 ¹	Radially Split, 1-Stage (BB2)														20	
	3640 ¹	Radially Split, 2-Stage (BB2)														20	
	3600 ¹	Axially Split, Multistage (BB3)														20	
	7200CB	Barrel Multistage (BB5)														20	
	7200SB	Barrel Multistage, In-Line Diffuser (BB5)														21	
	3910	Vertical In-Line (OH3)														21	
	API 3171	Industrial Duty Vertical Sump (VS4)														21	
	3700 ¹	1-Stage, Overhung (OH2)														22	
	RCE	Heavy Duty Centrifugal Pump														6	
3700LFI	1-stage, Overhung, Radially Split (OH2)														22		

¹i-ALERT®2 standard | ²NSF Certified  Ideally Suited for Service Indicated

Market Segments - Selection Chart

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												Corrosive	High Temperature 260°C(500°F)	Abrasive	Solids		
															Non-Abrasive		Fibrous/Stringy
Sump/ Abrasives/ Solids Handling	HSU HSUL JCU	Submersible	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				23	
	VRS	Abrasive Slurry R.L. Cantilever	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				23	
	VHS VJC	Vertical Cantilever	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				23	
	RCEV	Vertical Cantilever	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				23	
	XHD ¹	Severe Duty Slurry	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				24	
Abrasives Slurry/Solids Handling	JC	Medium-Duty Abrasive Slurry	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				24	
	SRL	Rubber-Lined Abrasive Slurry	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				24	
	SRL-C	Rubber-Lined Abrasive Slurry	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				24	
	SRL-S	Rubber-Lined Abrasive Slurry	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				24	
	SRL-XT	Rubber-Lined Abrasive Slurry	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				24	
	5500	Severe Duty Abrasive Slurry	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				24	
	HS	Non-Clog Solids Handling	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				25	
Multistage/ Axial Flow/ Double Suction	3393 ¹	High-Pressure Multistage	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				26	
	3316	Two-Stage	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				26	
	3935	Diffuser-Type Multistage	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				26	
	3355 ¹	Multistage	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				26	
	3400 Series ²	Single Stage, Double Suction	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				27	
	AF	Axial Flow	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				28	
	RSU	Acid Axial Flow	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				28	
Vertical Mixed and Axial Flow	RPROP	Axial Flow	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				28	
	VIC ²	Vertical Turbine/Can Type (VS6)	Yellow	Green	Blue	Red	Teal	Purple	Grey	Blue	Orange	Yellow				29	
	VIT ²	Vertical Industrial Turbine (VS1)	Yellow	Green	Blue	Red	Teal	Purple	Grey	Blue	Orange	Yellow				29	
	VIDS	Double Suction Vertical (VS2 / VS7)	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				29	
	VICR	Vertical Multistage Low Flow, High Head	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				29	
	VCW ²	Wet Pit Pumps (VS1 / VS3)	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				30	
	VIS	Vertical Submersible	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				31	
	VMP	Vertical Marine	Yellow	Green	Blue	Red	Teal		Grey	Blue	Orange	Yellow				31	

¹i-ALERT®2 standard | ²NSF Certified

 Ideally Suited for Service Indicated

Process Pumps

Goulds 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® 2 condition monitoring as standard. Model 3180 standard with ANSI flanges.

3180

- Capacities to 9,000 m³/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 m³/h | 26,000 GPM
- Heads to 125 m | 410 ft
- Temperatures to 230°C | 446°F
- Pressures to 16 bar | 232 PSIG



NSF

Applications:

- Paper Stock
- Black Liquor
- Chemical Process
- Wastewater

Materials: Al/CD4MCuN, CD4MCuN, 316SS, 317SS, Hast-C, Alloy 20, Super Duplex. Other materials available upon request.

*i-ALERT®2 sensor installed (see pg 38 for details)



Goulds 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® 2 condition monitoring as standard.

- Capacities to 6,360 m³/h | 28,000 GPM
- Heads to 107 m | 350 ft
- Temperatures to 232° C | 450°F
- Pressures to 20 bar | 285 PSIG



NSF

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: Al/CD4MCuN, CD4MCuN, 316SS, 317SS, Hast-C, Alloy 20, Super Duplex. Other materials available upon request.

*i-ALERT®2 sensor installed (see pg 38 for details)



Goulds 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® 2 condition monitoring as standard.

3181 with ANSI flanges

- Capacities to 3000 m³/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 m³/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. Other materials available upon request.

*i-ALERT®2 sensor installed (see pg 38 for details)



Rheinhütte RCE

Heavy Duty Chemical Centrifugal Pump in Metal

The RCE is a horizontal single-stage, end-suction, top-discharge, centrifugal pump with heavy duty bolted-down bearing pedestal. The sturdy design with front and back vanes on the impeller is primarily intended to fulfill very specific requirements as a standard chemical pump.

As a product-related special version, the RCE is the first choice in the chemical industry, the basic industry - especially in fertilizer production - environmental technology and many other industrial sectors.

It pumps organic and inorganic as well as aggressive liquids with high solid contents and is particularly suitable for hot media up to 450 degrees. Examples of applications include ammonium nitrate, molten sulphur, phosphoric acid, tar, pitch, urea melt, caustic soda, water glass, mash and cataphoretic paints. A special option of this series is the hydrodynamic shaft seal.

- Capacities to 1200 m³/h | 5283 GPM
- Heads to 180 m | 591 ft
- Temperature ranges from -40 °C to 450 °C | -40 °F to 842 °F
- Pressures to 16 bar | 232 PSIG

Applications:

- Phosphate fertilizer
- Ammonium nitrate melt
- Pitch and Tar
- Urea melt
- Molten Sulphur
- Aggressive Slurries

Materials:

- 12 different cast irons, cast steels, Nickel based materials and high alloy cast steels



Vertical Sump & Process

Goulds 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 m³/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



Goulds 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 m³/h | 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, Spinfoinish 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.



Goulds 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 m³/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



Goulds LF 3171 Low Flow, High Head Vertical Sump Pump

The LF3171 is specifically designed to provide superior performance for low flow high head sump applications. Its concentric (circular volute) casing and open radial vane impeller are designed to eliminate hydraulic and mechanical problems at throttled low flows. Radial loads are reduced as much as 85% versus standard volutes at low flows.

- Capacities to 50 m³/h | 220 GPM
- Heads to 290 m | 950 ft.
- Temperatures to 232° C | 450° F
- Pit Depths to 6 m | 20 ft.

Applications:

- General Sump
- Lift Pump
- Tank Unloading
- Condensate
- Drum Pump
- Drain Pump
- Hydrocarbons / Oily Water
- Molten Sulfur
- Batch & Specialty Chemicals Sumps

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



Vertical Process Pumps

Rheinhütte GVSO

Vertical chemical centrifugal pump in metal

28 basic sizes in a single-stage or multi-stage design allow maximum flexibility even during the planning stage. This means that the GVSO covers volume flows of up to 4.000 m³/h and pumping heights of up to 150 m. Individual immersion depth adjustment from 0.5 to 17,5 m through the use of one or more intermediate bearings completes the maximum level of flexibility. At the customer's request, the connecting dimensions and the shape of the sole plate can be individually adapted to the container and pressure flange. If constant temperatures and viscosities are required, e.g. in the case of molten sulfur, the GVSO is also available as a heated version. Here we offer a customized heating jacket system for steam and other heat transfer media. Only two additional connections for feed and discharge are required here.

- Capacities to 4000 m³/h | 17612 GPM
- Heads to 150 m | 492 ft
- Temperatures to from
-40 °C to 600 °C | -40 °F to 1112 °F
- Pressures to 40 bar | 580 PSIG

Applications:

Aggressive, also contaminated fluids, liquefied gases and melts like e.g. sulphuric acid at all concentrations, oleum, molten sulfur, Phthalic acid, tars and molten salts

Materials:

- 1.0619 (A 216 Grade WCA / WCB)
- 1.4136S (Rheinhütte material)
- 1.4306S (A 743 CF-3 (Type 304L))
- 1.4408 (A 743 CF-8M (Type 316))
- 1.4517 (A890 Grade 1B / A743 Gr. CD4MCuN)
- 1.4529S (A 743 CN3MN (AL-6 XN))
- 1.4581 (A 743 CF-8M (+Nb) / A 351 CF10MC (Type 316Cb))
- 1.7357 (A 217 Grade WC6)
- R30.20 (A 743 CN7M (Alloy 20))
- RH-RS (Rheinhütte material)
- RH-SX (alloy SX)



Rheinhütte GVRN

Acid Vertical chemical centrifugal pump.

The GVRN vertical centrifugal pump has been specially designed for use in modern sulphuric acid plants covers most demanding applications in this area. The high-alloyed material is particularly suitable for hot and highly concentrated acids. The thick-walled cast material ensures long pump service life. The compact design allows easy adaptation to existing system dimensions.

Special designs: wet design as well dry installation design.

- Capacities to 4000 m³/h | 17612 GPM
- Heads to 85 m | 279 ft
- Temperature ranges from
-40 °C to 250 °C | -40 °F to 482 °F
- Pressures to 10 bar | 145 PSIG

Applications:

- HRS (Heat recovery system) Hot Sulfuric Acid
- Concentrated Sulphuric Acid

Materials:

- 1.4136S (Rheinhütte material)
- RH-RS (Rheinhütte material)
- RH-SX (alloy SX)



Rheinhütte RK

Vertical chemical centrifugal pump in metal

Vertical centrifugal pumps type RK are normally designed for open vessels/pits, to drain these objects rotational. This type of pump is not suitable for continuous operation or process operation. RK pumps are used for handling chemically aggressive media, contaminated liquids with solids up to a maximum grain size of 8 mm.

- Capacities to 56 m³/h | 247 GPM
- Heads to 55 m | 180 ft
- Temperature ranges from
-40 °C to 100 °C | -40 °F to 212 °F
- Pressures to 10 bar | 145 PSIG

Applications:

Chemically aggressive media, contaminated liquids with solids up to a maximum grain size of 8 mm.

Materials:

- 1.4408 (A 743 CF-8M (Type 316))



Vertical Process Pumps

Rheinhütte RVKu

Chemical centrifugal pump in plastic

The vertical centrifugal pump RVKu is specially designed for pumping aggressive, slightly contaminated media such as acids, alkalis and chemical waste water. The closed impeller design with long axial throttle gaps allows immersion depths of up to 3m at operating temperatures of 80°C. Smooth running of the shaft is ensured by the use of a ball joint bearing located outside the aggressive zone as well as an immersion plain bearing made of SIC, carbon or ceramic.

- Capacities to 1000 m³/h | 4403 GPM
- Heads to 70 m | 230 ft
- Temperature ranges from -40 °C to 90 °C | -40 °F to 194 °F
- Pressures to 10 bar | 145 PSIG

Applications:

- Pickling
- Chemical wastewater
- Sulphuric acid (H2SO4)
- Surface treatment
- Hydrochloric acid (HCl)
- Fertilizer
- Plastic Production
- Functional media
- Dyes and Pigments
- Salts
- Metal Production
- Organics
- Nitric acid (HNO3)
- Flue gas scrubber
- Steel Industry
- Wasteplants Incineration

Materials:

- PP
- PE 1000
- PVDF



Rheinhütte RKuV

Chemical centrifugal pump in plastic

The vertical centrifugal pump RKuV has been specially developed for pumping aggressive media that are contaminated with solids or that crystallize out. The series is insensitive to dry running and operation against closed slide valves, as there is no plain bearing in the pumped medium. The series is also available as lightweight design RKuVL.

- Capacities to 120 m³/h | 528 GPM
- Heads to 60 m | 197 ft
- Temperature ranges from -40 °C to 100 °C | -40 °F to 212 °F
- Pressures to 10 bar | 145 PSIG

Applications:

- Pickling
- Chemical wastewater
- Sulphuric acid (H2SO4)
- Surface treatment
- Hydrochloric acid (HCl)
- Fertilizer
- Plastic Production
- Functional media
- Dyes and Pigments
- Salts
- Metal Production
- Organics
- Nitric acid (HNO3)
- Flue gas scrubber
- Steel Industry
- Wasteplants Incineration

Materials:

- PP
- PE 1000
- PVDF



ANSI Process Pumps

Goulds 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



NSF

*i-ALERT®2 sensor installed (see pg 38 for details)



Goulds 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 38 for details)



Goulds 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 38 for details)



Goulds 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 38 for details)



ANSI Process Pumps

Goulds 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 m³/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 38 for details)



Goulds 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 m³/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

Goulds 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 m³/h | 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



Rheinhütte FNPM Magnetic drive pump in plastic

Pumps type FNPM are horizontal, single-stage, end-suction, top-discharge centrifugal pumps with magnetic coupling, dimensioned to comply with standards EN 22858, ISO 2858, NF 44-121 and BS 5257.

The scope of application covers the wide fields of chemical processing and environmental technology where chemically aggressive fluids of various concentrations at up to 190°C are to be handled. The constant standardization of the drive components and the unique magnetic cartridge reduce the variety of parts and enable cost-saving stocking concepts. The magnet cartridge is a

ready-to-use unit containing all core components of the magnetic drive pump (e.g. plain bearings, impeller and containment shells). Replacement takes only a few minutes - then the old unit can be reconditioned.

The cost advantage over the usual quick-coupler unit: up to 25%.

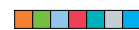
- Capacities to 350 m³/h | 1541 GPM
- Heads to 100 m | 328 ft
- Temperature ranges from -40 °C to 190 °C | -40 °F to 374 °F
- Pressures to 16 bar | 232 PSIG

Applications:

- Hot Acids
- Acetic Acid
- Chlorinated Solvents
- Chloroform
- Steel Industry
- Acetone
- Hydrofluoric Acid
- Sodium Hypochlorite
- Nitric Acid
- Amines
- Chlorine Dioxide
- Flue gas scrubber
- Waste plants
- Incineration

Materials:

- PFA
- PTFE



Goulds 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 m³/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

Goulds 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 m³/h | 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



Goulds 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 m³/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



Goulds 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 m³/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



Sealed Lined & Non-Metallic

Goulds 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® 2 power ends. Teflon® molded in place by high pressure technique and mechanically locked.

- Capacities to 182 m³/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 38 for details)



Goulds 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 m³/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 38 for details)



Rheinhütte CPDR Standardized chemical pump in plastic

Pumps of the CPDR and CPRF type family are horizontal, single-stage, end-suction, top-discharge centrifugal pumps, standardized to EN 22858 (formerly DIN 24256; ISO 2858, NF 44-121, BS 5257 and ISO 5199). The installation length of type CPRF is simply longer about the channel width so that a free passage for the fluid is given. The pumps are used for handling chemically aggressive and/or inflammable liquids within the wide field of chemical processing and environmental technology. The CPDR with open impeller is foreseen for clean liquids and fluids with a small content of solids. The CPRF (Free Flow) is able to handle fluids with larger solids. Both types are possible in close-coupled design instead of bearing block.

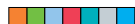
- Capacities to 200 m³/h | 880 GPM
- Heads to 100 m | 328 ft
- Temperature ranges from -40 °C to 190 °C | -40 °F to 374 °F
- Pressures to 16 bar | 232 PSIG

Applications:

- Brine
- Chemical Wastewater
- Chloralkali
- Flue gas scrubbers
- Waste incineration plants
- Hydrochloric acid
- Sea water
- Steel industry
- Sulphuric acid

Materials:

- PP
- PE 1000
- PE 1000R
- PVDF
- PTFE



Rheinhütte RCNKu Standardized chemical pump in plastic

Pumps of the RCNKu and RCFKu type family are horizontal, single-stage, end-suction, top-discharge centrifugal pumps, standardized to EN 22858, ISO 2858, NF 44-121, BS 5257 and ISO 5199. With RCFKu (Free Flow), only the overall length is increased by the amount of the spiral width to ensure a free housing passage. The pumps are used for handling chemically aggressive and/or inflammable liquids within the wide field of chemical processing and environmental technology.

The RCNKu with closed impeller is foreseen for clean liquids and fluids with a small content of solids. The same applies for the RCKu with open impeller design. The RCFKu is able to handle fluids with larger solids

- Capacities to 2500 m³/h | 11007 GPM
- Heads to 100 m | 328 ft
- Temperature ranges from -40 °C to 190 °C | -40 °F to 374 °F
- Pressures to 16 bar | 232 PSIG

Applications:

- Brine
- Chemical Wastewater
- Chloralkali
- Flue gas scrubbers
- Waste incineration plants
- Hydrochloric acid
- Sea water
- Steel industry
- Sulphuric acid

Materials:

- PP
- PE 1000
- PE 1000R
- PVDF
- PTFE



Sealed Lined & Non-Metallic

Rheinhütte RCNKu+

Standardized chemical pump in plastic

Pumps of the RCNKu+ type family are horizontal, single-stage, end-suction, top-discharge centrifugal pumps, standardized to EN 22858 and ISO 5199. The pumps are used for handling chemically aggressive liquids within the wide field of chemical processing and environmental technology.

- Capacities to 400 m³/h | 1761 GPM
- Heads to 110 m | 361 ft
- Temperature ranges from -40 °C to 130 °C | -40 °F to 266 °F
- Pressures to 16 bar | 232 PSIG



Applications:

- Brine
- Chemical Wastewater
- Chloralkali
- Flue gas scrubbers
- Waste incineration plants
- Hydrochloric acid
- Sea water
- Steel industry
- Sulphuric acid

Materials:

- PP
- PE 1000
- PE 1000R
- PVDF



Rheinhütte FNP

Standardized chemical pump with PFA-Lining

The standard chemical pump FNP is universally applicable in the chemical and pharmaceutical industry, in petrochemistry and general process engineering for pumping chemically aggressive and corrosive media.

- Capacities to 70 m³/h | 308 GPM
- Heads to 95 m | 312 ft
- Temperature ranges from -30 °C to 190 °C | -22 °F to 374 °F
- Pressures to 16 bar | 232 PSIG



Applications:

- Hot Acids
- Acetic Acid
- Chlorinated Solvents
- Chloroform
- Acetone
- Hydrofluoric Acid
- Sodium Hypochlorite
- Nitric Acid
- Amines
- Chlorine Dioxide
- Flue gas scrubber
- Steel Industry
- Waste plants Incineration

Materials:

- PFA



Rheinhütte RCKu

Standardized chemical pump in plastic

The RCKu is a cost-effective and place-saving bearing block pump for small power ratings. A variant of the RCKu is the RCKuF in close-coupled design instead of bearing block. The pumps are used for handling chemically aggressive and/or inflammable liquids within the wide field of chemical processing and environmental technology.

- Capacities to 20 m³/h | 88 GPM
- Heads to 50 m | 164 ft
- Temperature ranges from -40 °C to 130 °C | -40 °F to 266 °F
- Pressures to 10 bar | 145 PSIG



Applications:

Chemically aggressive, even slightly contaminated media in all areas of the chemical industry and high-grade chemicals.

Materials:

- PP
- PE 1000
- PVDF



Rheinhütte FNC

Standardized chemical pump in ceramic

Pumps of the FNC are horizontal, single-stage, end-suction, top-discharge centrifugal pumps, standardized to ISO 2858 and ISO 5199. The wear resistance and universal chemical resistance offers great advantages for use in corrosive and abrasive media. FNC pumps are used for handling chemically aggressive and/or abrasive liquids within the wide field of chemical processing and environmental technology.

- Capacities to 600 m³/h | 2642 GPM
- Heads to 90 m | 295 ft
- Temperature ranges from -40 °C to 120 °C | -40 °F to 248 °F
- Pressures to 10 bar | 145 PSIG



Applications:

- Chemical Industry
- Solids-containing fluids
- Titanium dioxide

Materials:

- FRIKORUND



Sealed Lined & Non-Metallic

Rheinhütte FGP

Liquid ring vacuum pump in ceramic

Our FGP liquid ring pump is the suitable partner for difficult evacuation and compression processes involving gases and vapours in all corrosion-critical areas of application in the chemical industry. Together with the freely selectable operating medium of the liquid ring, the FGP allows volume flows of up to 700 m³/h. In compressor mode gas pressures of up to p₂ max = 2.5 barg are easily created. In vacuum mode for aggressive media the pump produces suction pressures of p₁ = 100 mbara up to p₁ = 25 mbara with an additional gas ejector. And this all takes place at gas temperatures of up to 100°C. The highly corrosion-resistant technical ceramic is perfectly suitable for all media containing chlorine and hydrogen chloride.

- Capacities to 700 m³/h | 3082 GPM
- Temperature ranges from -20 °C to 100 °C | -4 °F to 212 °F



Applications:

- Caustic gases
- Chemical industry
- Chlorine gas

Materials:

- FRIKORUND



ISO Process Pumps

Goulds 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 m³/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 38 for details)



Rheinhütte RNSi Standardized Acid Chemical Pump in SIGUSS

The RNSi (ferro-silicon cast iron "Si-Iron") pumps are used for handling chemically aggressive liquids within the wide field of chemical processing and environmental technology, especially for media based on sulphuric acid. Suitable for all Sulphuric acid concentration in all different Temperature ranges.

- Capacities to 1500 m³/h | 6604 GPM
- Heads to 100 m | 328 ft
- Temperature ranges from -40° C to 300° C | -40° F to 572° F
- Pressures to 10 bar | 145 PSIG

Applications:

- Sulphuric acid
- Titanium dioxide
- Spinning bath (Viscose fibre production)
- Electrolytes (Cu, Ni, Zn, etc)
- H2SO4 pickling
- H2SO4 regeneration

Materials:

- SIGUSS (A 518 Grade 3)



Rheinhütte RN Standardized Chemical Pump in Metal

The pump RN is a horizontal, single-stage, endsuction, top-discharge centrifugal pumps, standardized to EN 22858 (formerly DIN 24256) ISO 2858, NF 44-121, BS 5257 and ISO 5199. RN (RNSi) pumps are used for handling chemically aggressive and/or inflammable liquids within the wide field of chemical processing and environmental technology.

- Capacities to 2700 m³/h | 11888 GPM
- Heads to 150 m | 492 ft
- Temperature ranges from -40° C to 300° C | -40° F to 572° F
- Pressures to 16 bar | 232 PSIG

Applications:

Chemically aggressive media in the whole area of chemical processing technology and other areas of industry.

Materials:

- 15 different pure metals (Nickel and Titan), Nickel based materials and high alloy cast steels



ISO Process Pumps

Goulds 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 m³/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



Goulds 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 m³/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



Rheinhütte RMKN

Magnetic drive pump in metal

The RMKN is a horizontal, single-stage, end-suction, top-discharge centrifugal pump with magnetic coupling, dimensioned to comply with standards ISO 2858. The pumps are designed to meet the technical requirements for magnetic drive pumps as determined by VDMA 24279 and DIN EN ISO 15783. The scope of application covers the wide fields of chemical processing and environmental technology where chemically aggressive fluids of various concentrations at up to 250°C are to be handled. For applications where the medium is kept at a constant temperature



the RMKN is available in a heated version. By using heating chamber systems, the RMKN is also very suitable for difficult cases, such as conveying molten sulfur, pitch and tar.

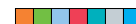
- Capacities to 500 m³/h | 2201 GPM
- Heads to 150 m | 492 ft
- Temperature ranges from -40 °C to 250 °C | -40 °F to 482 °F
- Pressures to 16 bar | 232 PSIG

Applications:

Aggressive, especially toxic, highly flammable, explosive or foul smelling media. In general all liquids that must not get into the atmosphere during the pumping process.

Materials:

- 12 different pure metals (Nickel and Titan), Nickel based materials and high alloy cast steels



ISO Process Pumps

Goulds 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 m³/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



Goulds 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 m³/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 38 for details)



Goulds ICMP

High Temperature ISO Metallic Magnetic Drive Process

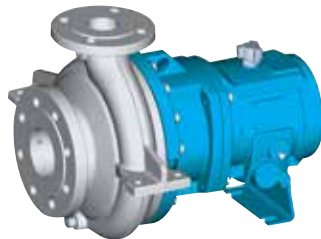
The ICMP is a heavy-duty metallic sealless pump for applications with high temperature and pressure conditions. It is designed for aggressive, toxic and high purity media. The center line casing is optimal for the compensation of dimensional changes due to temperature fluctuations. SSiC Silicon Carbide plain bearings, with optional Dryguard™ dry run protection.

- Capacities to 400 m³/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



Goulds ICO i-FRAME® Series* ISO process pump with i-ALERT®2 Intelligent Monitoring

Goulds Pumps IC family of ISO chemical process pumps is designed in accordance with ISO 5199 and ISO 2858, making it ideal for worldwide chemical or industrial process applications. The range includes the ICO pump which has the following features:

- Semi Open Impeller for improved solids and entrained gas handling
- 34 hydraulic sizes
- Flows up to 450 m³/h | 1980 GPM
- Heads up to 160m | 514 ft
- Temperatures from -40°C to 280°C | -40°F to 530°F
- Pressures up to 25 Bar | 360 PSI
- Available in a comprehensive range of materials for chemical and process applications that include Carbon Steel, 316SS, Duplex SS, Alloy 20, Hastelloy, Nickel and Titanium.

Features:

- Semi Open Impeller for improved solids handling
- ITT Goulds patented Cyclone Seal Chamber
- Suitable for mechanical seal or gland packing
- I-FRAME optimized Bearing Frame.
- Flanges drilled to DIN/ISO or ANSI
- Robust fabricated steel baseplate

*i-ALERT®2 sensor installed (see pg 38 for details)



API 610 Process Pumps

Goulds 3610 API 610 (BB1) Horizontal Split Case, Double Suction

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

- Capacities to 11,355 m³/h | 50,000 GPM
- Heads to 215 m | 700 ft
- Temperatures to 205°C | 400°F
- Pressures to 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



Goulds 3620i* and 3640i** API 610 (BB2) Single and Two-Stage Between Bearings

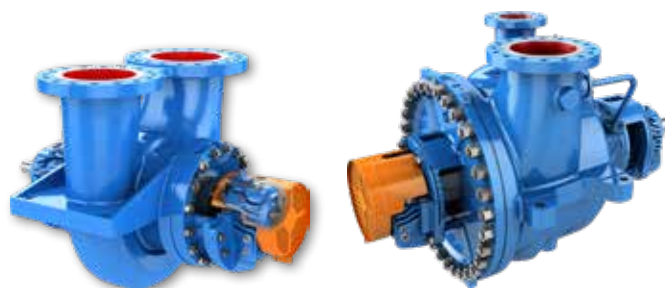
Between bearings, radially split process pumps designed for smooth, reliable operation. Fully meets requirements of API 610.

- Capacities to 4,540 m³/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 38 for details)



Goulds 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 m³/h | 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
- CO₂ injection



Materials: All API materials, custom materials available

*i-ALERT®2 sensor installed (see pg 38 for details)



7200CB (BB5) Barrel Multistage Pumps

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

- Capacity: 910 m³/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



API 610 Process Pumps

Goulds 7200SB

API 610 11th Edition API BB5 Barrel Multistage, Radially Split In-Line Diffuser Type

High Temperature, High Pressure Low Specific Gravity BB5 Barrel Pumps for Critical Services.

- Capacity to 600 m³/h | 2,200 GPM
- Total Dynamic Head to 2430 m | 8,000 ft
- Temperature to 425° C | 800° F
- Pressure to 275 Bar | 4,000 PSIG
- Operating Speed to 3,600 RPM



Goulds API 3171 (VS4)

API 610 Vertical Sump and Process

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

- Capacities to 722 m³/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



Goulds 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 m³/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



API 610 Process Pumps

Goulds 3700 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 m³/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 | • Hot Oil |
| • Column Bottoms | • Column Charge |
| • Reboiler | • Reactor Feed |
| • Injection | • Stabilizer Overhead |
| • Fuel Blending | • Scrubber Circulation |
| • Heat Transfer | • Tower Bottoms |
| • Slop Gas Oil Transfer | • Offsite Hydrocarbon |
| • Heavy Gas Oil | |
| • Stripper Overhead | |

Materials: All API materials, custom materials available



Goulds 3700LFI API 610 11th Edition / ISO 13709 2nd Edition API OH2 Overhung, Single Stage, Radially Split

High-Temperature and Pressure Process Pumps that meet or exceed ISO 13709 and API 610 11th edition. End-suction, centerline-mounted, overhung (OH2) API 610 process pump.

- Capacity to 88 m³/h | 390 GPM
- Total dynamic head to 503 m | 1650 ft
- Temperature to 425° C | 800° F
- Pressure to 75 bar | 1100 PSIG



Applications:

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

Materials: Available in a wide range of materials including all API 610 constructions and custom application needs.



Sump/Abrasives/Solids Handling

Goulds 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 m³/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, CD4MCuN, 316SS



Goulds 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 m³/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



Goulds 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 m³/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 m³/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



Rheinhütte RCEV

Vertical chemical centrifugal pump in metal

Due to its non-pedestal design and impeller equipped with front and rear blades, the RCEV pump type is highly suitable for handling solids-laden liquids. It is possible to pump up to 30 percent solids with this type of pump, where the type and composition of the solids (hard, soft, light or heavy) plays a important role. The decision whether to use an open or closed impeller depends heavily on the type of the solids. The RCEV is used to convey mechanically contaminated, corrosive or neutral liquids such as phosphoric acid, highly contaminated sulphur, titanium dioxide slurries, copper dissolution acids as well as liquids that cannot tolerate localised heating by sliding bearings, e.g. concentrated ammonium nitrate solutions, DNT mixtures.

- Capacities to 900 m³/h | 3963 GPM
- Heads to 85 m | 180 ft
- Temperature ranges from -40 °C to 200 °C | -40 °F to 392 °F
- Pressures to 10 bar | 145 PSIG

Applications:

- Dirty sulphur
- Fertilizer
- Phosphate fertilizer
- Solids-containing fluids
- Sulphuric acid
- Ammonium Nitrate

Materials:

- 9 different cast irons, cast steels and high alloy cast steels



Abrasives/Solids Handling

Goulds 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 m³/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 38 for details)



Goulds 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 m³/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 CaCO₃

Materials: Cast Iron, High Chrome Iron, 316SS, CD4MCuN, Endura Chrome



Goulds 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 m³/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



Goulds 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 m³/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, CD4MCuN, Endura Chrome



Abrasives/Solids Handling

Goulds 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 m³/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, CD4MCuN



Multistage/Double Suction

Goulds 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 m³/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, Other materials available upon request.

*i-ALERT®2 sensor installed (see pg 38 for details)



Goulds 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 m³/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, 316SS, SS-Fitted. Other materials available upon request.



Goulds 3935

Centrifugal Diffuser Multistage

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

- Capacities to 28 m³/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. Other materials available upon request.



Goulds 3355

Multistage

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

- Capacities to 340 m³/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: Stainless Steel, Stainless Fitted. Other materials available upon request.



Multistage/Double Suction

Goulds 3409 Medium Capacity

- Capacities to 2,725 m³/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, Cast Iron / Stainless Steel, Cast Iron / Ni-Al-Br, All Stainless Steel. Other materials available upon request.
(1724 kPa)



NSF

Goulds 3410 Small Capacity

- Capacities to 1,817 m³/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, Cast Iron / Stainless Steel, Cast Iron / Ni-Al-Br, All Stainless Steel. Other materials available upon request.
(1724 kPa)



NSF

Goulds 3420 Large Capacity

- Capacities to 14,762 m³/h | 65,000 GPM
- Heads to 122 m | 400 ft
- Temperatures to 135° C | 275° F
- Working Pressures to 1379 kPa | 200 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, Cast Iron / Stainless Steel, Cast Iron / Ni-Al-Br, All Stainless Steel. Other materials available upon request.
(1724 kPa)



NSF

Goulds 3498 Extra Large Capacity

- Capacities to 18,000 m³/h | 80,000 GPM
- Heads to 244 m | 800 ft
- Temperatures to 135° C | 275° F
- Working Pressures to 200 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, Cast Iron / Stainless Steel, Cast Iron / Ni-Al-Br, All Stainless Steel. Other materials available upon request.
(1724 kPa)



NSF



Axial Flow

Goulds 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 m³/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, 904L, Titanium, Hastelloy, Sanicro 28. Other materials available upon request.



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



Rheinhütte RSU

Axial flow centrifugal pump in metal

Horizontal chemical circulating pump type RSU is designed for high flow rates at relatively low heads. By using specially designed screw impellers or propellers in Siguss is excellent suitability for the circulation of different acids, e.g. for the evaporation of spent and contaminated sulphuric acids. In order to achieve a sufficiently resistant - usually difficult to cast and machinable - materials, armoured versions are available.

- Capacities to 3400 m³/h | 14970 GPM
- Heads to 6 m | 20 ft
- Temperature ranges from -40 °C to 150 °C | -40 °F to 302 °F
- Pressures to 6bar | 87 PSIG

Applications:

- H2SO4 regeneration
- crystallizing lithium sulfate
- Titanium dioxide

Materials:

- SIGUSS (A 518 Grade 3)



Rheinhütte RPROP

Axial flow centrifugal pump in metal

Pumps of type RPROP are horizontal, axial flow circulation pumps, which are fitted in standard with propeller impeller and could be executed in special cases also with inducer impeller. Additionally, there is a close-coupled design (RPROPF) available, which can be installed suspended in the Pipeline. The RPROPF can also be executed with propeller or inducer impeller, but the flow direction is only one-sided. This pump type is installed in evaporation plants, crystallisation plants, pulp and paper industries, plastic production, regeneration plant for spend acid and reaction solutions and production of titanium dioxide.

- Capacities to 8500 m³/h | 37424 GPM
- Heads to 6,5 m | 21 ft
- Temperature ranges from -20 °C to 150 °C | -4 °F to 302 °F
- Pressures to 6 bar | 87 PSIG

Applications:

Crystal suspensions, brine, seawater, cellulose mash, abrasive media, aggressive acids and alkaline solutions. Crystal suspensions, brine, seawater, cellulose mash, abrasive media, aggressive acid, alkaline solutions, food and beverage.

Materials:

- 12 different Nickel based materials, high alloy cast steels and Titan



Vertical Mixed & Axial Flow

Goulds 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 m³/h | 70,000 GPM
- Heads to 1,067 m | 3,500 ft
- Pressures to 176 kg/cm² | 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



NSF

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®2 sensor installed (see pg 38 for details)



Goulds 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 m³/h | 70,000 GPM
- Heads to 1,067 m | 3,500 ft
- Pressures to 176 kg/cm² | 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



NSF

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®2 sensor installed (see pg 38 for details)



Goulds 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 15,900m³/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/cm² | 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

*i-ALERT®2 sensor installed (see pg 38 for details)



Goulds 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 m³/h | 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 38 for details)



Vertical Mixed & Axial Flow



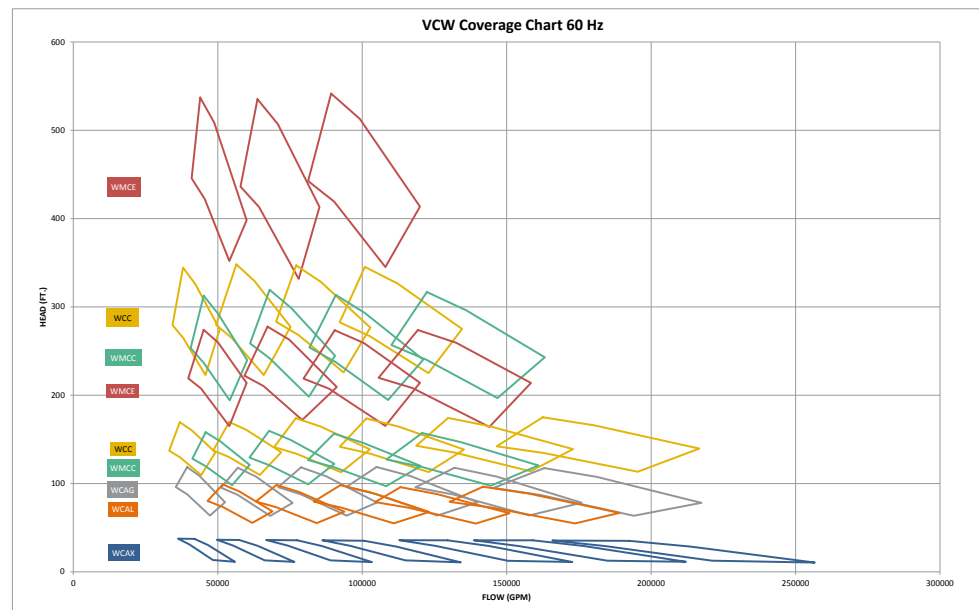
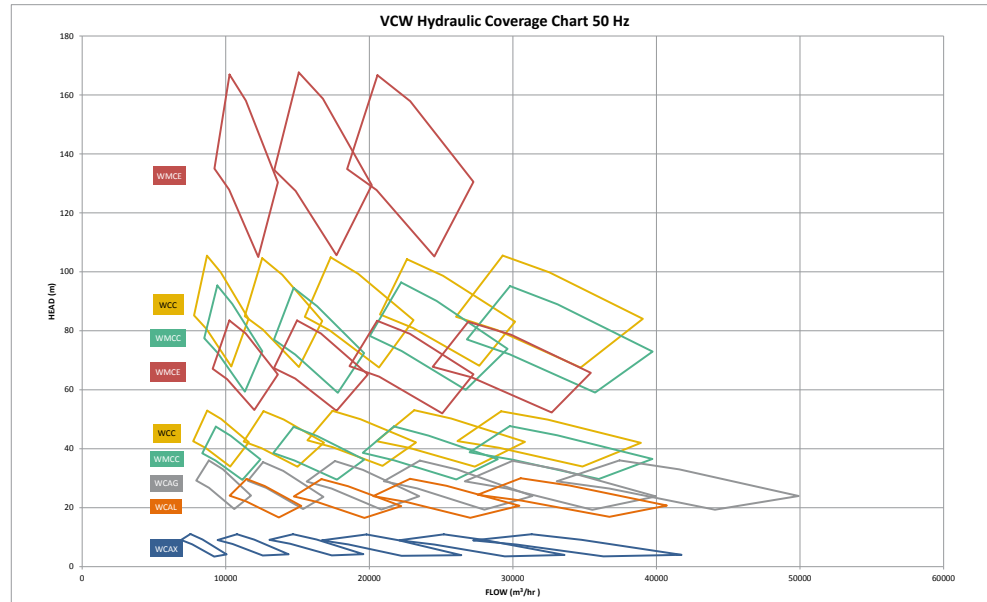
Goulds VCW (VS1/VS3)

Vertical Mixed & Axial Flow

Custom designed for maximum reliability and high efficiency.

- Capacities to 91,000 m³/h | 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



*i-ALERT®2 sensor installed (see pg 38 for details)



NSF



Vertical Mixed & Axial Flow

Goulds 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 m³/h | 70,000 GPM
- Heads to 1,067m | 3,500 ft
- Pressures to 176 kg/cm² | 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



Goulds 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 m³/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



Bearings & Bearing Housings & Filters

To get superior MTBF you need two things: Optimum pump hydraulics and a robust pump structure. The new 360° i-FRAME housings deliver on the second point by providing a premium robust housing with unique features that raises the bar on what you can expect from your pump's long term performance. These 360° 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.

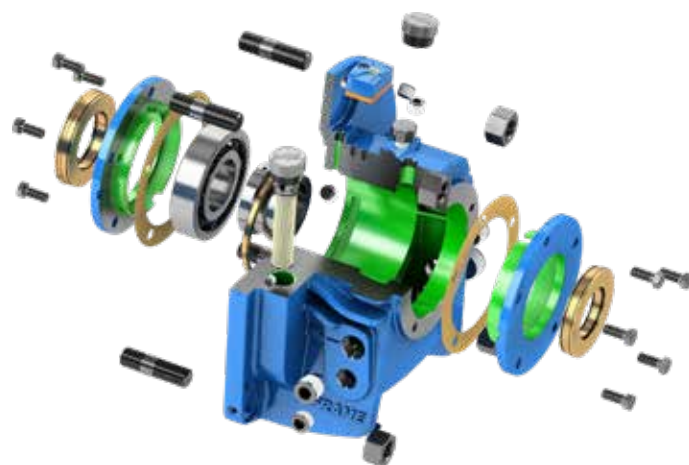
Bearing housings constructed in ASTM A216 Grade WCB carbon steel. Three bearing arrangements available:

- Ball/Ball bearings
 - 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
 - Deep Groove Ball Bearing on the Drive End (DE) to handle radial loads
- Sleeve/Ball bearings
 - Duplex 40° Angular contact Bearing Set on the Non-Drive End (NDE) handle axial loads. Bearing set is supplied with a light clearance.
 - Babbitt lined Sleeve Bearings handle radial loads on NDE and DE (Non Drive End and Drive End)
- Sleeve/Tilt pad bearings
 - Tilting pad Bearings are installed on NDE to handle axial load.
 - Babbitt lined Sleeve Bearings handle radial loads and are installed on NDE and DE (Non Drive End and Drive End).
 - This bearing configuration utilizes an external pressurized Lubrication Oil System (LOS) to lubricate and cool the bearings. Both API, standard and custom designed systems can be offered.

All bearing housings feature a 360° bearing saddle bolted to the casing positioned with precision dowels for accurate, repeatable alignment. The 360° 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, resulting in reduced vibration.

The bearing housing exterior includes distinctive cooling fins optimized by CFD/FEA analysis to aid in heat dissipation.

The Ball/Ball and Sleeve/Ball 360° i-FRAME bearing housings have enhanced air cooling with axial fans and without the need for cooling water. The NDE side comes standard with a guarded extension to accept a fan for ease of field retrofit, so if your process needs to change, the fan can be fitted without the need for expensive pump disassembly and installation.



Bearing housing put through rigorous testing.

Bearings & Bearing Housings & Filters

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 Ball/Ball and Sleeve/Ball 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 dissolved water from the bearing oil utilizing specifically engineered moisture absorbing materials built into the filter. 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.



Oil with Particulate**



Run time = 72 hrs*	Run time = 314 hrs*
Black Oil	Result: Clean Oil

Oil with Water

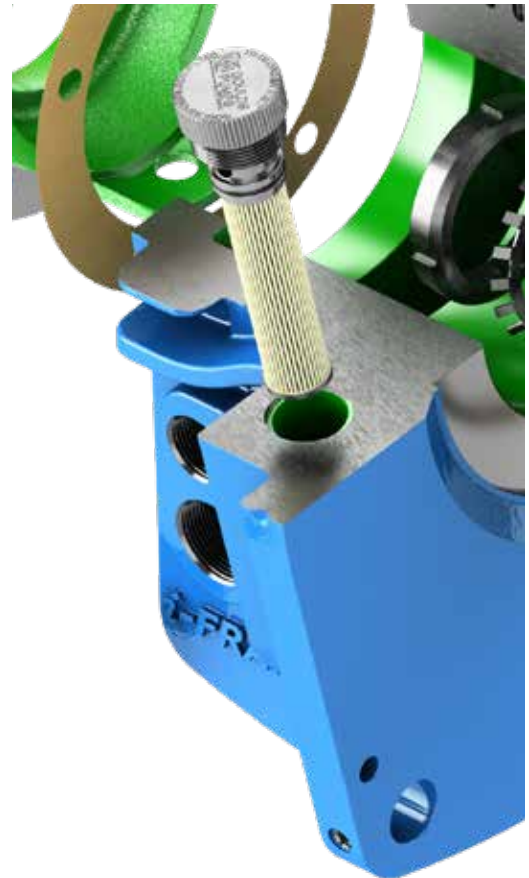


Run time = 0 hrs*	Run time = 72 hrs*
Cloudy Oil	Result: Clean Oil

*Continuous operation at 3100RPM

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

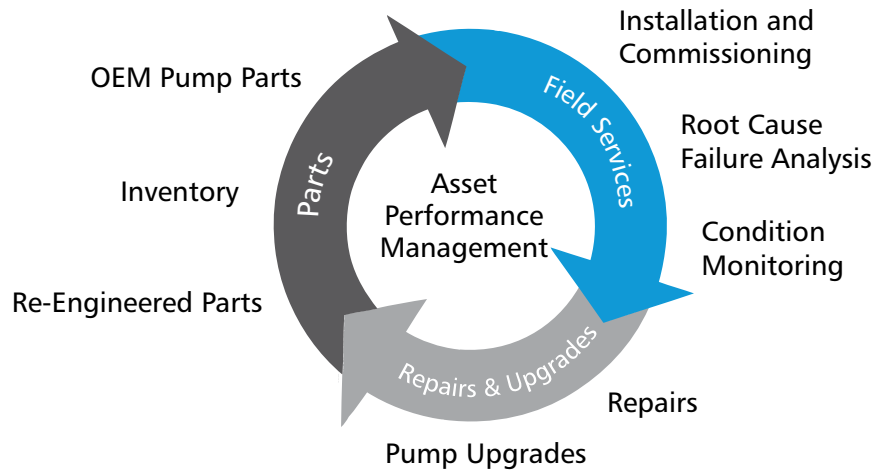
Another smart feature included as standard is the award winning, i-ALERT® 2. This provides class leading continuous machine monitoring with comprehensive wireless reporting including diagnostic quality vibration FFTs and operating history to the mobile phone or tablet of your choice. The bearing housings come equipped *as standard* with constant level oilers¹, sight window¹ and provisions for instrumentation including: RTD's, proximity probes¹, and accelerometers. If your monitoring needs change in the future, this comprehensive approach allows field retrofitting of almost any monitoring scheme without replacing your bearing housings or relying on ad-hoc instrument mounting.



¹where appropriate, based on the bearing arrangement purchased.

Reliability has no quitting time.

Building on centuries of pump design experience, **PRO Services** provides an array of services focused on reducing equipment total cost of ownership (TCO) and increasing plant output, including condition monitoring, predictive maintenance contracts, field service, engineered upgrades, inventory management, and overhauls for pumps and other rotating equipment.



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

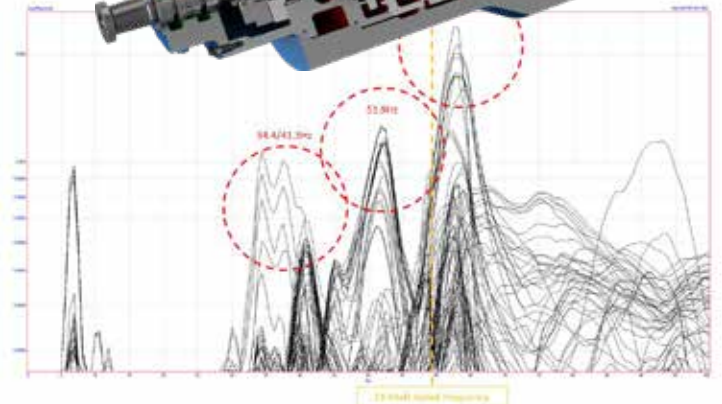
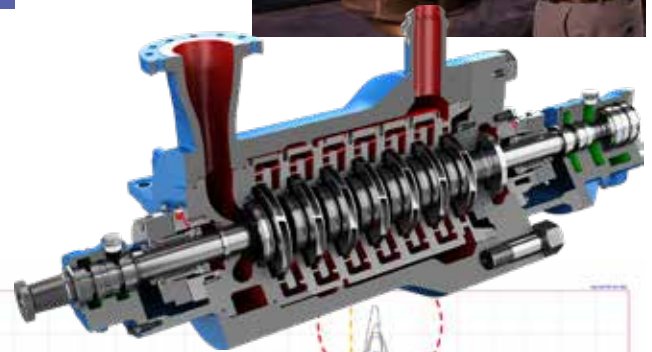
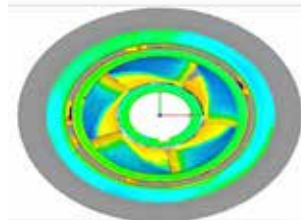
is a back pull-out assembly which provides a complete replacement to your existing equipment while keeping the existing impeller and casing.

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.



ITT OEM and Re-engineered Parts

In addition to providing OEM parts for the full suite of ITT pump brands, we also supply replacement parts for all other pumps helping to solve pump performance or part supply issues for obsolete equipment.

Utilizing global engineering center capability, regional manufacturing resources, combined with the latest available technology, PRO Services is able to re-engineer parts to improve hydraulic performance and equipment life cycle.

All parts meet or exceed OEM specifications at very competitive pricing and often with faster lead times. These parts deliver the advantages of ITT's advanced modeling capabilities and integrated pattern shop, and more than a century of pump design and manufacturing experience for a variety of applications worldwide.



Field Services

PRO Services brings its expertise and global coverage to support your equipment on site to ensure reliable, trouble free operation. Our Field Services team are experienced at supporting all types of pumps and rotating equipment. Using the latest industry equipment and capabilities we can provide a variety of services including installation & commissioning, machine analysis, removal and installation services and field repairs 24 hours a day, 7 days a week, 365 days a year.



i-ALERT[®] 2 Monitoring Solution

Sensors | App | Ai Platform | Gateway www.i-alert.com



i-ALERT[®] Sensor



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 hourly 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[®] 2 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-ALERT[®] 2 sensors within range to quickly and safely inspect multiple machines.

Pressure Sensor

Process Monitoring

Directly measure and monitor the pressure and temperature of any process fluid. Build long term trends and capture transient events with the built in data logger.



Technical Specifications

Pressure: -14.7 to 10,000 psi
Temperature: -20°C to 85°C (-4°F to 185°F)
Wireless: Bluetooth V4, Range 30-100m (100-300ft)
Data Storage: 300 Days (based on hourly data)
Power: 2 Year Replaceable Lithium Battery (use dependent)
Enclosure: IP68 / NEMA4x
Wetted Material: 17-4 Stainless Steel

i-ALERT[®] Gateway

Secure Connection

The i-ALERT Gateway provides a secure connection between the i-ALERT sensors and the i-ALERT Ai portal. Apply power and let the gateway automatically connect to the cellular network and configure all the i-ALERT sensors in range.



Technical Specifications

Cellular WAN*: LTE, 3G
Bluetooth: Bluetooth 4.0 (Max 12.5 dBm)
Wireless Range: 30-100m (100-300ft)
Power: 120-240VAC or 6-90 VDC
Temperature: -30°C to 60°C (-22°F to 140°F)
Enclosure: IP68 / NEMA4x, Class 1 Division 2

i-ALERT[®] Ai Online Platform

Monitor and manage all of your i-ALERT[®] 2 enabled machines and sensors in one place. This subscription service requires no software to download or dedicated hardware to run.



PumpSmart[®] 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 and Rheinhütte pumps have 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' and Rheinhütte pumps have a 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 and Rheinhütte pumps representative has been specially trained in pump application and should be contacted to assist in final pump selection for optimum reliability and safety.

<p>1A SYSTEM</p> <p>Service: _____ Capacity: _____ Total Dynamic Head: _____ NPSH Available: _____ Suction Pressure: _____ Minimum Flow Rate: _____ Total Working Pressure: _____</p>	<p>2A LIQUID PROPERTIES</p> <p>Liquid: _____ Vapor Pressure: _____ Specific Heat: _____ Viscosity: _____ Solids Size / Content: _____ Specific Gravity: _____ Temperature: _____ Characteristics: (flammable, explosive, carcinogenic, toxic, noxious, regulated, etc.): _____</p>	<p>3A SAFETY / ENVIRONMENTAL</p> <p><input type="checkbox"/> UL label (explosion-proof enclosures) <input type="checkbox"/> Regulations (government, local, plant) <input type="checkbox"/> Temperature limits <input type="checkbox"/> Fugitive emission limits <input type="checkbox"/> Product purity <input type="checkbox"/> Best Available Control Technology <input type="checkbox"/> Reporting requirements</p>	<p>4A ECONOMY / RELIABILITY</p> <p><input type="checkbox"/> MTBF requirements <input type="checkbox"/> Lubrication <input type="checkbox"/> Cooling / Heating <input type="checkbox"/> Operator experience <input type="checkbox"/> Operator maintenance <input type="checkbox"/> Extra product filtering <input type="checkbox"/> Ease of installation</p>
<p>1B</p> <p>Pump Size _____ Impeller diameter _____ HP, efficiency _____ NPSHR _____ Minimum Pump Flow _____ Speed (RPM) _____</p>	<p>2B</p> <p>Materials of Construction _____ Bearing cooling _____ Sealing / flushing Requirements _____ Jacketing for Cooling / heating _____</p>	<p>3B</p> <p>Explosion-proof enclosures _____ Safety protection options _____ Coupling guard options _____ Casing drain _____ Flange options _____ O-ring materials _____</p>	<p>4B</p> <p>Type of lubrication _____ Start-up assistance _____ Operator training _____ Maintenance training _____ Baseplate options _____ Oil seal options _____</p>

Member of

 Hydraulic
 INSTITUTE



ITT Brands

240 Fall Street
 Seneca Falls, NY 13148
 Phone: 315.568.2811
 Fax: 315.568.2418
www.gouldspumps.com

RHEINHÜTTE Pumpen GmbH
 Rheingaustraße 96-98 – 65203 Wiesbaden – Germany
 Tel: +49 (0)611 604-0 – Fax: +49 (0)611 604-328
info@rheinhuette.de
www.rheinhuette.de