GOULDS PUMPS

ICM/ICMB

ISO Dimensional Metallic Magnetic Drive
Chemical Process Pump

ITT

ENGINEERED FOR LIFE

ICM/ICMB

Model ICM

The model ICM/ICMB is a metallic magnetic drive chemical process pump made of Ductile Iron, 316 Stainless Steel, Duplex SS, Alloy 20, Hastelloy and Titanium designed for normal and demanding chemical process applications.

ISO Dimensional Metallic Magnetic Drive Chemical Process Pump

- Capacities to 340 m^3/h (1,490 USgpm) at 2,900 rpm and 400 m^3/h (1,760 USgpm) at 3,500 rpm
- Heads to 160 m (525 feet) at 2,900 rpm and 210 m (685 feet) at 3,500 rpm
- Temperature Range -40°C to 180°C (-40°F to 360°F), optional as ICMP up to 280°C (530°F)
- Pressures to 16 bar (235 PSIG), optionally 25 bar (360 psi); sizes 65-40-315 and 80-50-315: 25 bar (360 psi) standard

Design Features

- Single-stage, magnetic drive centrifugal pump
- Dimensions and technical design in accordance with EN 22858/ISO 2858/ISO 5199, ISO 15783
- Standard frame-mounted design, alternatively close coupled
- Sealless design eliminates the need for shaft sealing
- Flanges drilled to DIN/ISO, ANSI, BS, JS

Ease of Maintenance

- Modular design for maximum interchangeability between all 18 pump sizes
- Back pull-out design makes maintenance safe and simple
- Complies with ISO 2858/EN 22858 for retrofit capability

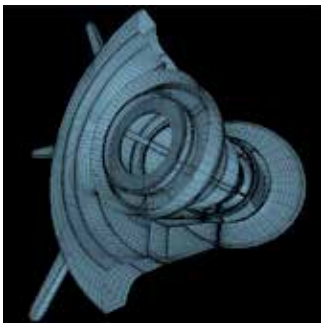
Applications

- Chemical Process
- Pharmaceutical and Petrochemical Industry
- Food Technology
- Pulp Preparation
- Metal Processing
- General Industry
- Nuclear Power Plants
- Waste Disposal/Recycling Industries
- OEM

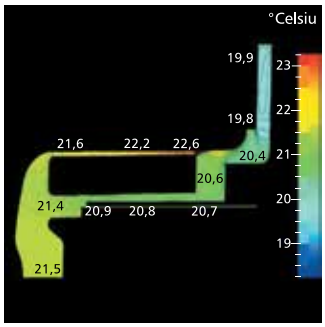
Design principles: Maximum Customer Value, Safety and Reliability

Special emphasis was paid to:

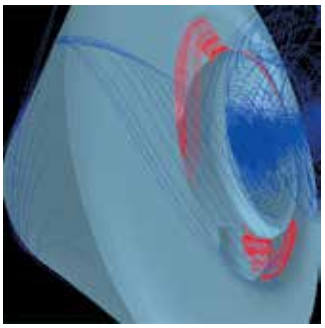
- Reducing customer Life Cycle Cost (LCC) by minimizing maintenance, operating and installation cost
- A comprehensive range of materials and accessories are offered to meet customer needs for a wide range of applications
- Integrated possibilities to connect safety and monitoring devices
- Design standardization and simplification to provide for easy maintenance and to minimize spare parts inventory requirements



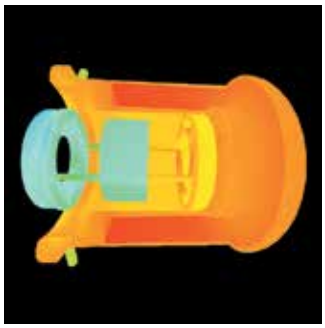
Networking of the body geometries of the ICM



Temperature profile in the can/magnetic drive area during medium conveyance



Flow patterns in the rear can area



Temperature profile in the can/plain bearing area during operation

Reliable Bearing Cartridge

Plain bearings must run reliably. If, however, pump maintenance is required, it must be performed correctly and often as quickly as possible. The cartridge plain bearing system of the ICM is designed accordingly:

- Fast and simple installation and replacement of the plain bearings, no need for installation settings
- Cartridge design can be rebuilt/refurbished with individual components to minimize spare parts and repair costs
- Radial and thrust plain bearings made of highly abrasion-resistant pure silicon carbide (SSiC) with universal chemical resistance
- In case of a plain bearing failure the encapsulated cartridge design both will act to contain possible silicon carbide (SSiC) fragments and to prevent the inner magnet assembly from contacting the can
- Optionally the Dryguard™ PLUS bearing system can be supplied to provide an optimized dry-running capability. Dryguard™ PLUS has proven its worth in thousands of operating chemical process pumps

Hastelloy Containment Shell

The can is the most important sealing element against the atmosphere. This component was thus carefully examined during the development phase. The pressure and flow conditions inside the can were illustrated, simulated and analyzed using a computer.

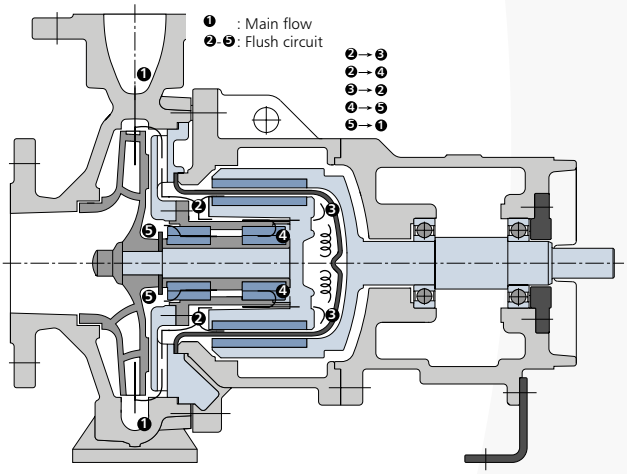
The can is therefore optimally designed.

- Hastelloy C4 (2.4610) as standard, deep-drawn non-welded design for reliable corrosion resistance
- Vortex breaking bead at the bottom of the can prevents against erosion of the can
- Burst pressure > 150 bar (> 2,175 psi)
- Large clearances (1.5 mm/ 1/16") between the can and the inner magnet assembly allow for greater reliability in solid laden services or with higher viscous media

Engineered Flush Circuit

A reliable flush circuit is important for heat dissipation, lubrication of the plain bearings and solids handling without clogging. The heat produced in the metallic can by eddy currents must be controlled to prevent against flashing because dry-running/inadequate lubrication and overheating are the most important causes of sealless pump downtimes and failures.

Coupling years of ITT's sealless pump experience and using modern CFD (comutational fluid dynamics) methods, an effective and reliable flush circuit has been designed during the development stages of the ICM. The flush circuit is enhanced by special design features in the inner magnet assembly, can and plain bearing cartridge to guarantee reliable pumping even under the most demanding applications. Rigorous testing has been completed to confirm its reliability.



Solids Handling Capability

Based on extensive testing the ICM has shown to be capable of pumping liquids which contain highly abrasive powders without any breakdowns or detectable signs of wear. Admissible solids contents need to be checked case by case.

ICM/ICMB

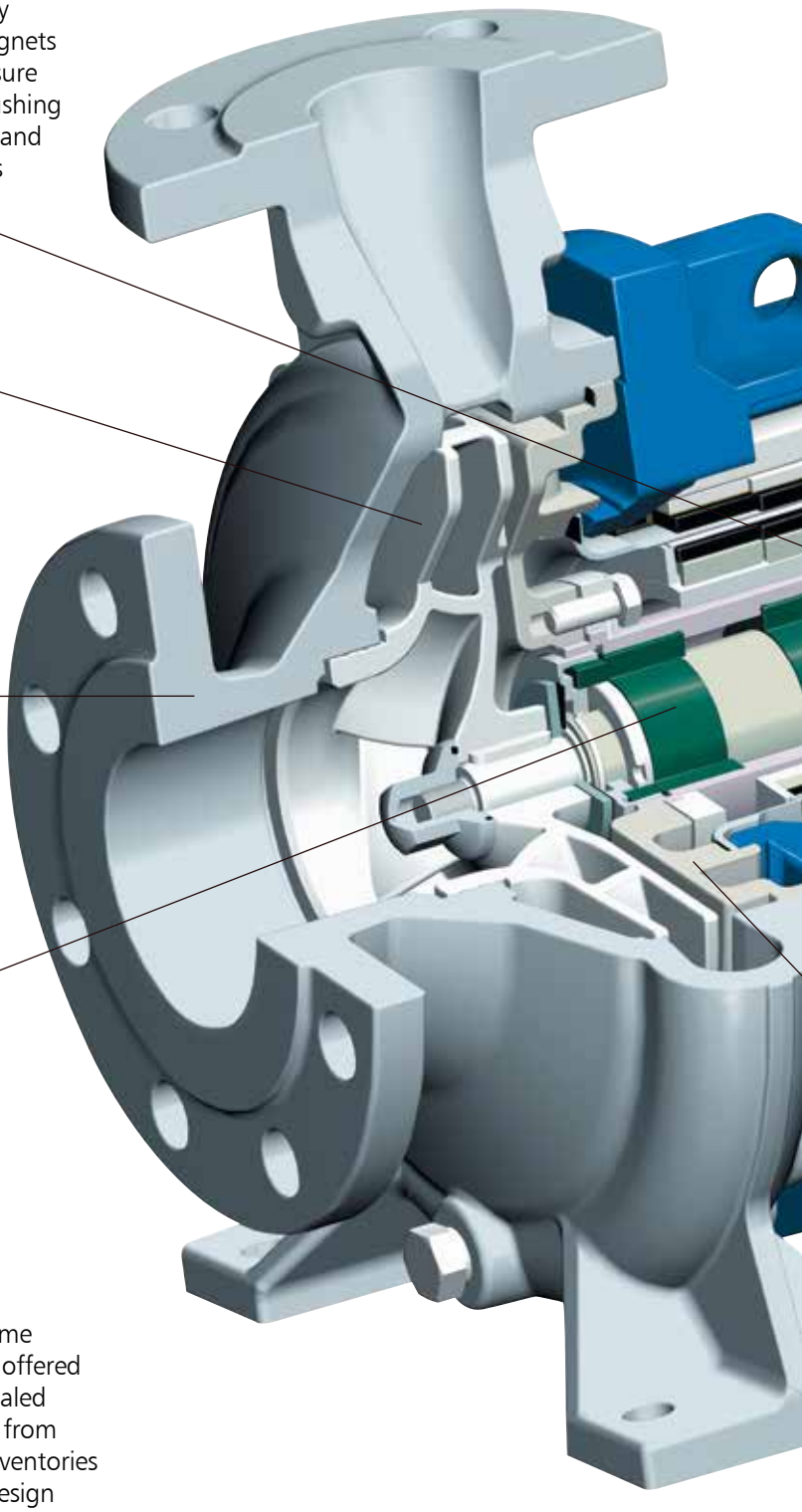
Design Features for a Wide Range of Applications in the Chemical Process Industry

IMPELLER

- Precision-cast stainless steel, optionally Hastelloy and other material
- Back vanes or balance holes reduce axial thrust
- Optional suction inducer:
  - reduces the NPSHr by 35-50%
  - permits smaller pumps at higher speeds = lower costs
  - is advantageous for media with gas content

INNER MAGNET ASSEMBLY

- Inner magnet assembly with encapsulated magnets
- Integral axial vanes assure positive pressurized flushing flow to both lubricate and cool the plain bearings



CASING

- Minimum corrosion allowance: 3mm
- Standard 3/8" housing drain connection
- Replaceable housing wear ring (optional)
- Integrated connections for pressure and temperature monitors
- Jacketed housing for media heating or cooling on request

BEARING CARTRIDGE

- Standard Pure Silicon Carbide SiC (SSiC), highly abrasion-resistant, with universal chemical resistance
- Cartridge design eliminates measurements and fitting for simplified maintenance
- Optional Dryguard PLUS dry-running bearing system provide added safety during upset conditions
- High level of safety even in the event of plain bearing failure

EXCELLENT PUMP HYDRAULICS

The ICM utilizes the same hydraulic components offered on the mechanically sealed IC series. Users benefit from reduced repair parts inventories due to this hydraulic design standardization

PUMP CONDITION MONITORING

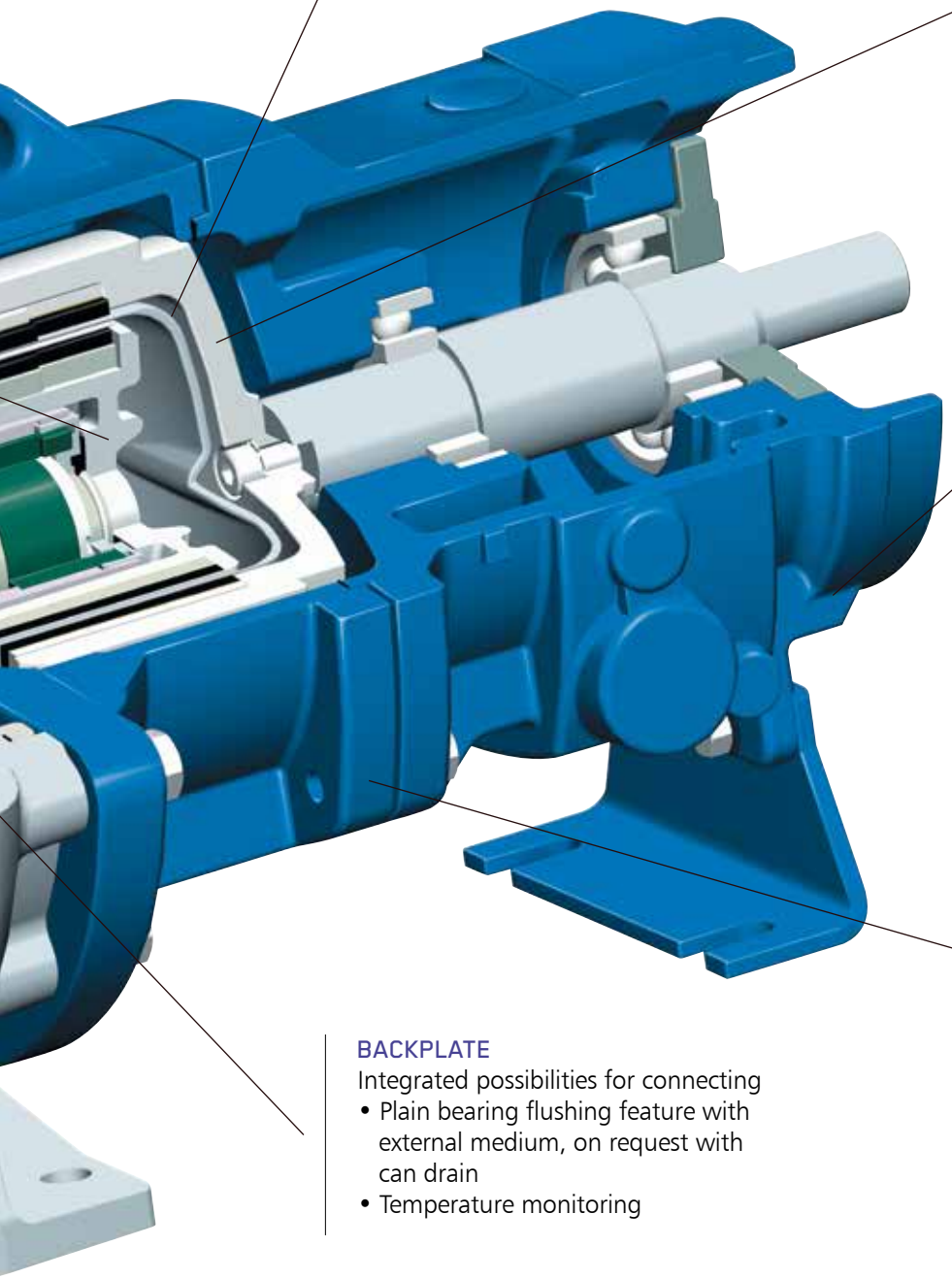
The ICM is prepared for the attachmen installation of a variety of monitoring and control devices.

CAN

- Hastelloy C4 (2.4610) as standard
- Non-welded, deep-drawn one-piece construction
- Rated for an operating pressure of 25 bar (360 psi), burst pressure > 150 bar (2175 psi)

DRIVE MAGNET ASSEMBLY WITH HIGH-PERFORMANCE PERMANENT MAGNETS

- Coupling ratings of up to 330 Nm (100 kW at 2900 rpm), variable through modular design
- Integral outer thrust ring prevents against contact with the can in the event of a roller bearing failure, Spark-free as an option



STURDY FRAME

- Standard grease-for-life bearings
- Options: flood oil lubrication with extra large oil volume, oil sump cooling, labyrinth oil seals

SIMPLIFIED ASSEMBLY AND DISASSEMBLY

- The number of "loose" components has been minimized due to its modular design concept
- High component interchangeability within the frame size groups
- No special tools required
- No fitting measurements
- Split lantern/bearing pedestal design: Allows for maintenance of the drive side while keeping the liquid end assembled and pressurized ("back pull out design")

BACKPLATE

Integrated possibilities for connecting

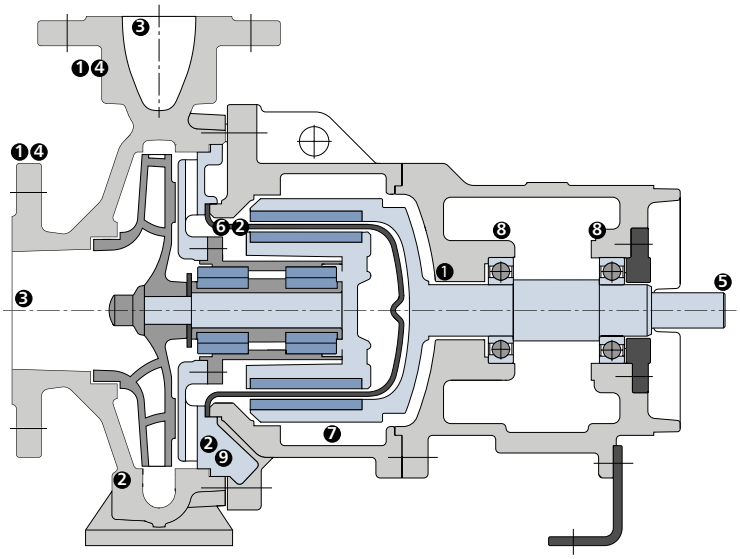
- Plain bearing flushing feature with external medium, on request with can drain
- Temperature monitoring

Pump Control and Monitoring

When a sealless pump is specified the Number One user concern is safe and leak free operation, especially when noxious, toxic, carcinogenic and other hazardous materials are conveyed.

The ICM has been designed such that most condition monitoring and speed control devices can be easily and economically installed and retrofitted. The following condition monitoring options are available:

1. Pump speed control (PumpSmart®, etc)
2. Temperature monitor
3. Flow and filling level monitor
4. Pressure monitor
5. Motor load monitor
6. Can temperature monitor
7. Can leakage sensor in the lantern
8. Rolling bearing monitor
9. Connection for external flush supply
10. Secondary sealing: The space around the can can be sealed against the rolling bearings by means of special shaft or labyrinth seals.



Customized solutions on request.

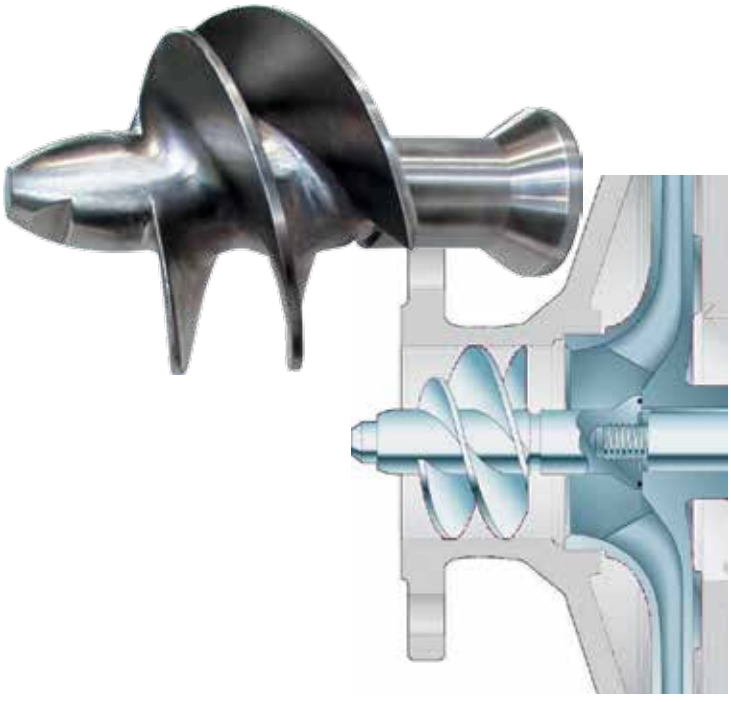
If the can is damaged, the drive side and atmosphere would be protected against the medium for a certain time. Therefore, in conjunction with one of the can monitors, this results in an effective preventive environmental protection in the case of critical media.

Inducer

As an option all ICM pumps can be fitted with a suciton inducer.

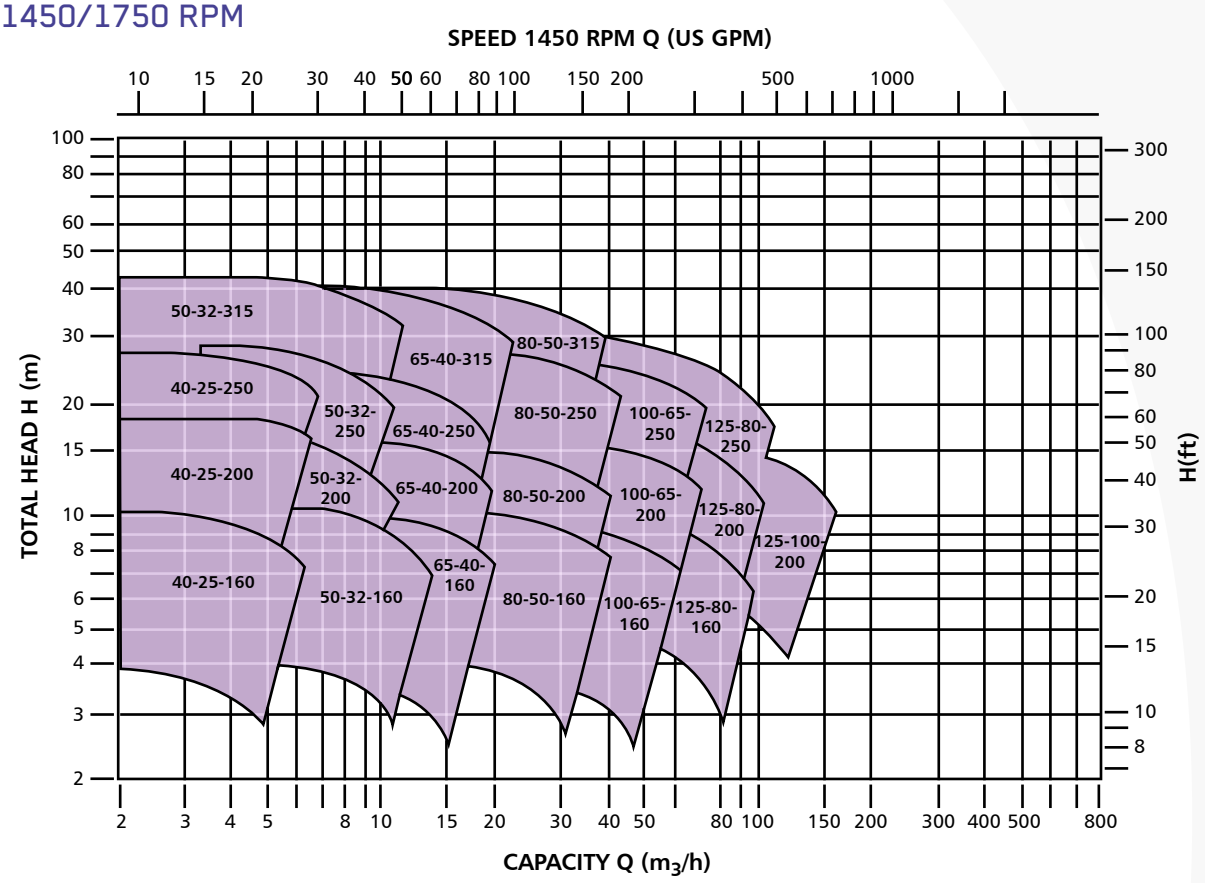
The inducer
- reduces the NPSHr by 35-50%
- permits smaller pumps at higher speeds for lower installation costs
- is advantageous for media with entrained gas, high vapor pressures or specific heats

ITT's inducer technology has been proven practice for over thirty years.

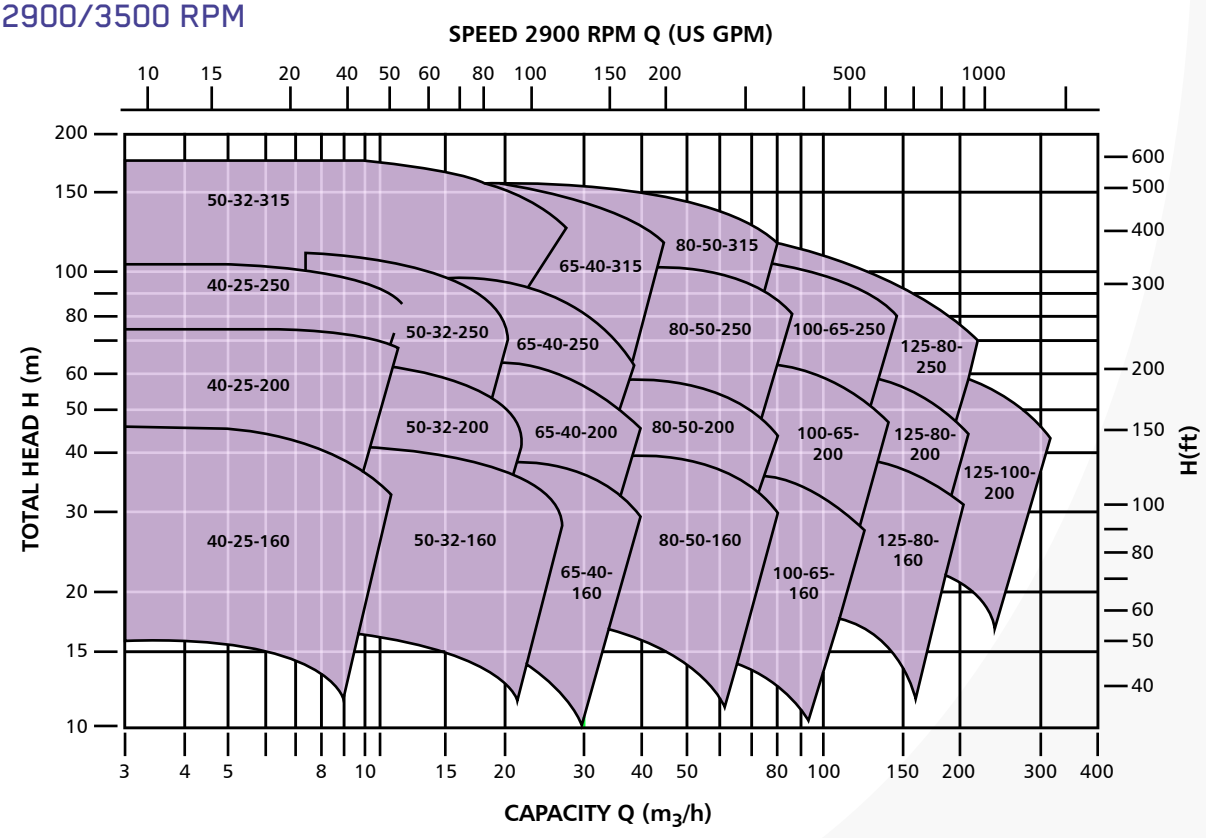


Hydraulic Coverage

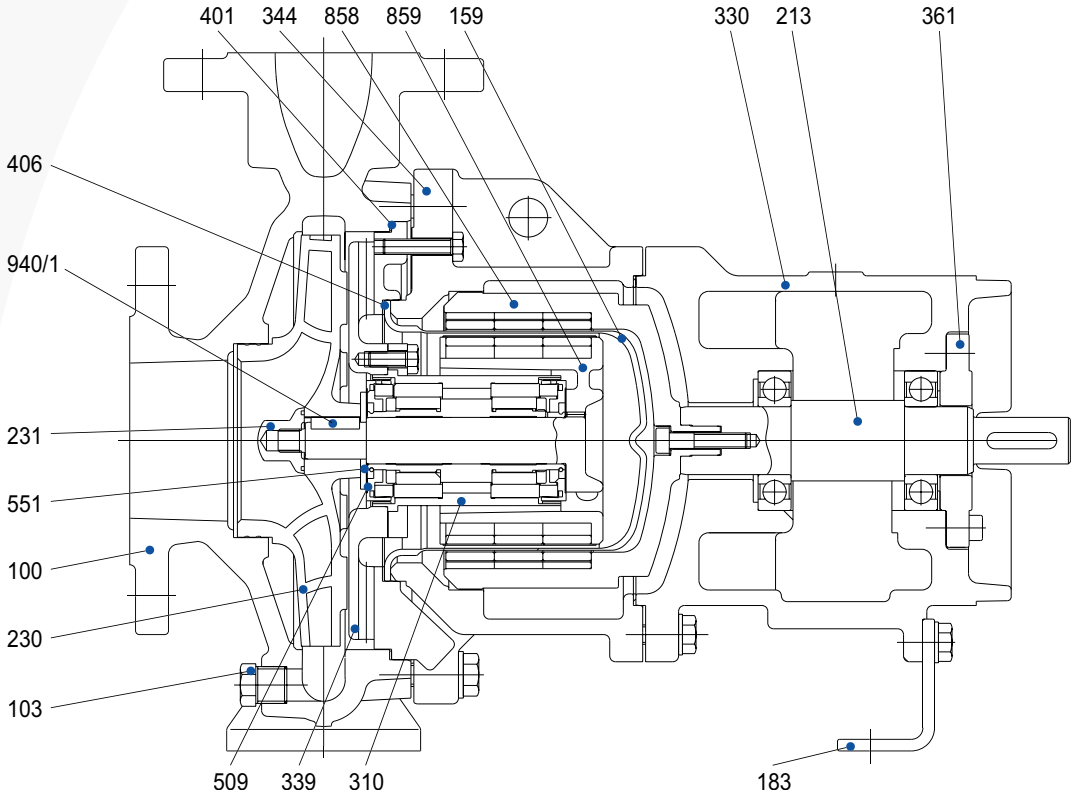
1450/1750 RPM



2900/3500 RPM



Parts List and Materials of Construction



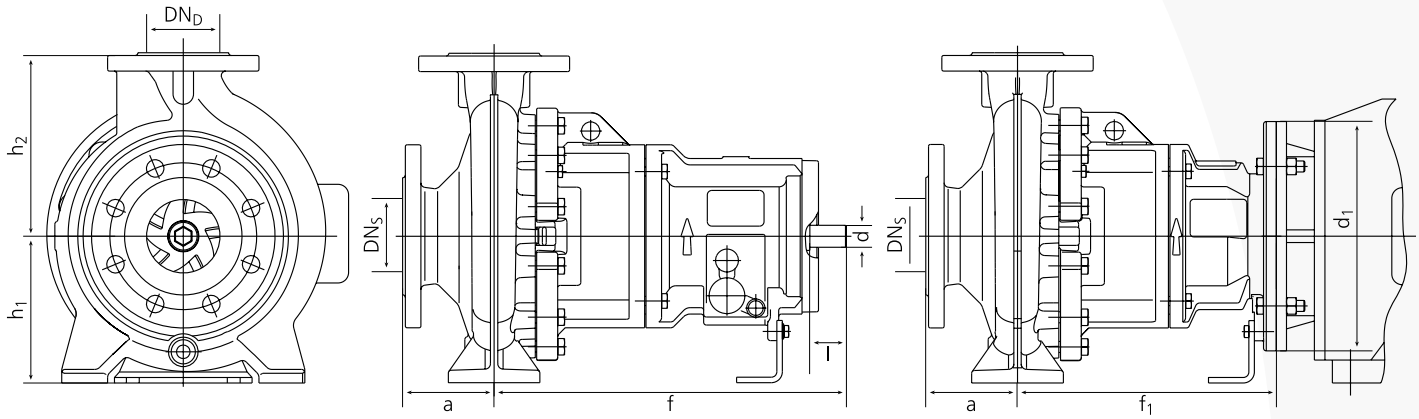
Item No	Part Designation	Stainless steel (W)	Duplex (WW)	Ductile cast iron (NL)	Ductile cast iron/stainl. steel	Hastelloy (CC)	Alloy 20 (AA)
100	Housing	1.4408	1.4517	.07043		Hastelloy	Details
230	Impeller	1.4408	1.4517	0.6025	1.4408	Hastelloy	on request
339	Plain bearing pedestal	1.4408	1.4517	1.4408		Hastelloy	
310	Plain bearing cartridge	Duplex 1.4462/SSiC				Hastelloy	
859	Inner mag. ass./Magnets	Duplex 1.4517/NdFeB				Hastelloy	
159	Can	Hastelloy C4 2.4610					
231	Impeller nut	Duplex 1.4517				Details on	
551	Distance washer	1.4571				request	
940/1	Key (impeller)	1.4571					
401	Housing gasket	Asbestos-free aramide fibre					
406	Can gasket	Asbestos-free aramide fibre					
509	Intermediate ring	Graphite					
344	Lantern	0.7043					
858	Drive mag. ass./Magnets	0.6020/NdFeb					
330	Bearing pedestal	0.6025					
213	Drive shaft	1.4021					
361	Rear bearing cover	1.0601					
183	Support bracket	1.0037					
103	Housing drain plug	Stainless steel				Details on request	
	Screws, nuts etc.	Stainless steel					

Options not shown:

236	Inducer	Duplex 1.4462			Hastelloy	Details on
502	Housing wear ring	1.4410	Duplex 1.4439	1.4410	Hastelloy	on request
642	Oil level sight glass	Plastic/glass				

Pump Dimensions

Material Comparison Tables



All dimensions in mm

Pump Size	Flanges		Pump				Shaft end		Weight min (kg)
	DN_S	DN_D	a	f	h_1	h_2	d	l	
40-25-160	40	25	80	385	132	160	24	50	58
40-25-200	50	32	80	385	132	160	24	50	59
40-25-250	50	32	80	385	160	180	24	50	67
50-32-160	50	32	100	500	180	225	32	80	119
50-32-200	40	25	80	385	160	180	24	50	64
50-32-250	40	25	100	500	180	225	32	80	115
50-32-315	50	32	125	500	200	250	32	80	145
65-40-160	65	40	80	385	132	160	24	50	60
65-40-200	65	40	100	385	160	180	24	50	69
65-40-250	65	40	100	500	180	225	32	80	119
65-40-315	65	40	125	500	200	250	32	80	155
80-50-160	80	50	100	385	160	180	24	50	63
80-50-200	80	50	100	385	160	200	24	50	70
80-50-250	80	50	125	500	180	225	32	80	121
80-50-315	80	50	125	500	225	280	32	80	160
100-65-160	100	65	100	500	160	200	32	80	107
100-65-200	100	65	100	500	180	225	32	80	112
100-65-250	100	65	125	500	200	250	32	80	132
125-80-160	125	80	125	500	180	225	32	80	114
125-80-200	125	80	125	500	180	250	32	80	120
125-80-250	125	80	125	500	225	280	32	80	143
125-100-200	125	100	125	500	200	280	32	80	126

Motor-dependent pump dimensions for close-coupled version			
Pump size	Motor size	f_1	d_1
40-25-160	80	275.5	200
50-32-160	90	275.5	200
65-40-160	100	275.5	250
80-50-160	112	275.5	250
40-25-200	132	295.5	300
50-32-200	160	325.5	350
65-40-200	180	325.5	350
80-50-200	200	325.5	400

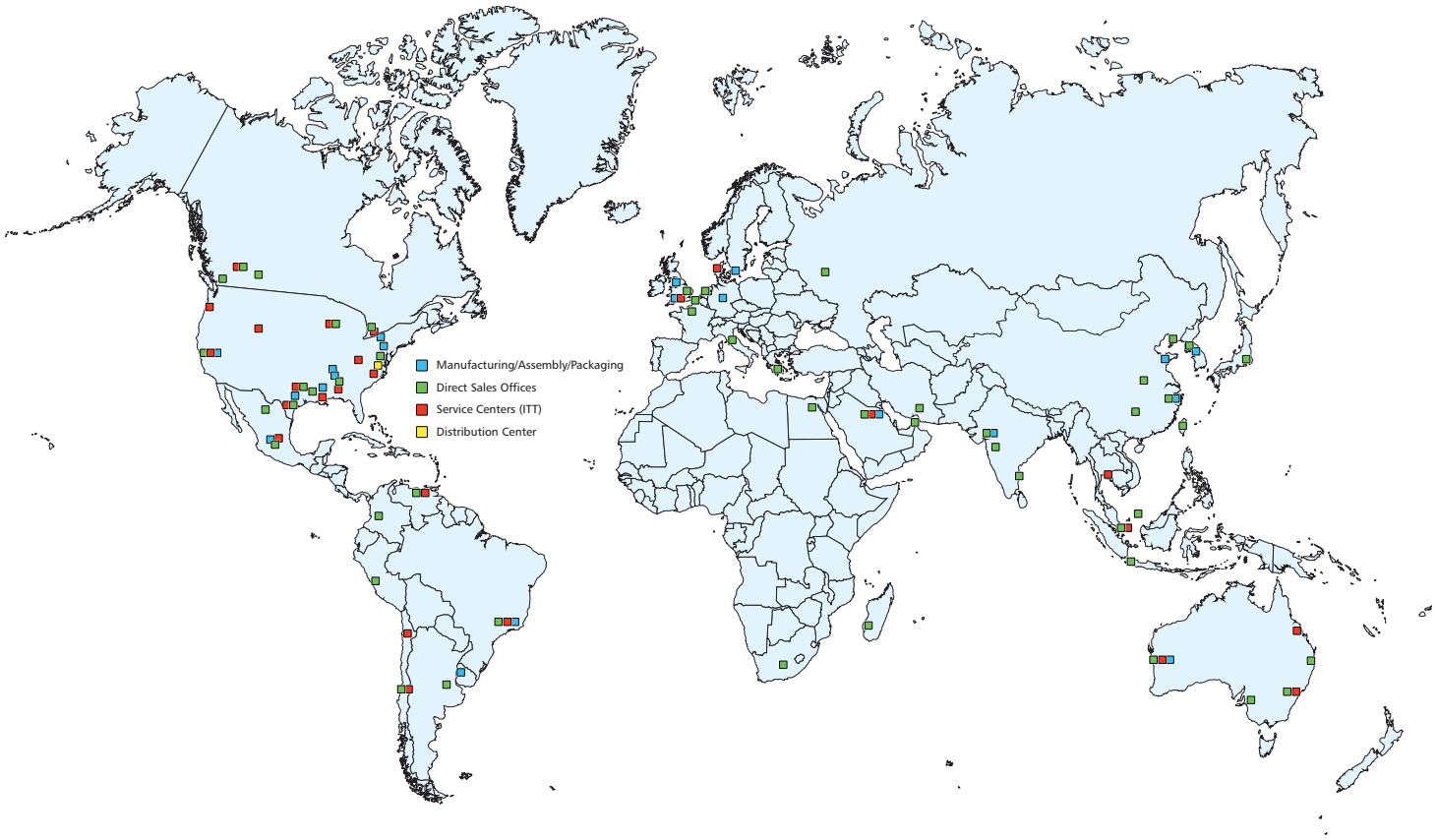
Material comparison table			
Cast materials	ICM standard	Equivalent standards	
		DIN	ASTM
Cast iron	EN-GJL-250 (JL040)	0.6025	A48, Class 35 B
Duct. cast iron	(JS1025) 400-18-LT EN-GJS-	0.7043	A395, grade 60-40-18
Stainless steel	1.4408	1.4408	A743, CF-8M
Duplex	1.4517	1.4517	A744 CD4-MCu
Alloy 20	1.4536	1.4536	A743 CN-7M
Hastelloy C	V2.4811	2.4811	A494N-12MV
Hastelloy B	V2.4810	2.4810	A494CX 2MV

Notes

Notes

Visit our website at
www.gouldspumps.com

Wherever you are, we're there too.

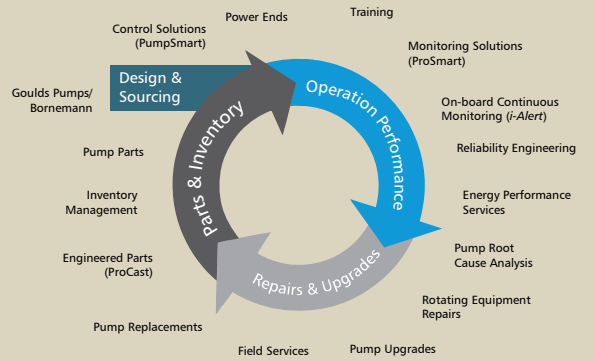


PRO services

Reliability has no quitting time.

Building on over 160 years of Goulds Pumps experience, PRO Services provides an array of services focused on reducing equipment total cost of ownership (TCO) and increasing plant output, including predictive monitoring, maintenance contracts, field service, engineered upgrades, inventory management, and overhauls for pumps and other rotating equipment.

Your Total Solution For Equipment Life Cycle Optimization



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