





- ITT Brands

# **Li-Ion Battery Value Chain**

Products & Services for Electrode, Electrolyte & Cell Manufacture



# ITT Transforming th



# e Li-Ion Value Chain



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# ITT's Capabilities & Technology

From pump systems used in ore and brine extraction to chemical pumps used in electrolyte production and delivery, ITT fluid handling technologies are used in all areas of the Battery Industry.

# Expertise

For over 160 years, our engineers have worked closely with major energy producers worldwide to develop innovative products and technologies that optimize the life cycle of equipment required by this demanding industry.

ITT is recognized as the premier supplier of pumps, valves, controls and monitoring, and services to the Lithium Ion Battery Industry.

### Reliability

ITT is recognized worldwide for our brands such as Goulds Pumps®, Bornemann, Rheinhütte, PRO Services, Engineered Valves, Blakers, and C'treat®. We have developed specific engineered products for Li-Ion Battery Manufacturing applications and offer custom designs for scaled and new applications as the industry continues to develop. The latest foundry and manufacturing technologies, combined with demanding quality control processes and procedures, ensure the highest quality products. We provide the greatest value in life cycle cost, efficiency and performance.applications.

### Innovation

ITT is the world leader in technology and engineering expertise, utilizing capabilities such as:

- Computational fluid dynamics
- Materials science
- Manufacturing technology
- Finite element analysis
- Efficiency optimization
- Controls and monitoring
- Rapid prototyping
- Hydraulic design
- Mechanical design

PumpSmart® controls and iAlert® monitoring systems keep processes reliably on-line by automatically adjusting pump output to meet system needs, detecting and correcting problems before they disrupt the process.

### Environment, Safety & Health

ITT is proud to be a leader in protecting our employees, customers and the communities where we operate.

The ITT Environment, Safety and Health Management System provides for the systematic control of environmental, safety and health (ESH) risks.

Using this system, operational, and administrative ESH processes are standardized and applied to continually improve environmental, safety and health performance.



# ITT – Manufacturing Expert

# **ITT Commitment**

ITT is committed to the Li Ion market, all along the value chain. We have been investing in technology to continuously improve our products to meet increasingly demanding industry requirements.

### **Proven Chemical Leadership**

ITT is a proven leader in chemical pumps with over 100,000 units installed.

160+ years of pump expertise and participating member on ANSI, HI, ISO design committees.

### **Complete Portfolio of Chemical and Slurry Pumps**

ITT Goulds Pumps, Rheinhütte and Bornemann have a complete portfolio of proven chemical and slurry pumps:

- Overhung pumps
- Magnetically driven pumps
- Slurry pumps
- Liquid ring vacuum pumps
- Specialty pumps
- Twin screw pumps
- Positive displacement pumps
- Axial flow pumps

### **Global Coverage**

ITT's family of industrial brands - Goulds Pumps, Rheinhütte, Bornemann, PRO Services, Engineered Valves, and C'treat have the global coverage needed to serve multi-national companies in any region.

### Industry Leading Hydraulic Coverage

We offer extensive hydraulic coverage to meet your process needs. Better hydraulic fits can mean improved efficiency, and long-term reliability and extended parts life.

Our focus is on reducing the total cost of ownership and wear of our equipment. Regardless of the slurry composition, we offer features to maximize the design life and minimize the replacement cost.

Our products can be hard metal or rubber lined; we offer enclosed or open impellers; and in vertical or horizontal configurations.

We also support all utility, off- and on-site applications for the mining market.

ITT is a world leader in technology and engineering, including hydraulics, materials science, mechanical design and fluid dynamics.

# **Electrode Raw Materials**

Recognized as a premier supplier of products and services for the Mining Industry, it's only natural that ITT provides the rugged and reliable products necessary to extract and process minerals & metals.



### Pump Key

- 1 XHD | SRL | JC | JCU | VJC | W-Series
- 2 3196 | IC | 3700 | AF | RCNK | VIT | SLI | JC | JCU | VJC
- **3** 3196 | IC | 3700
- 4 3196 | IC | AF | SLI
- 5 3196 | IC | ICM | 3296 | 3298/99 | FNPM

**Spodumene Concentration** 

- 6 3196 | IC
- **7** 3196 | IC

### Extraction

Lithium is one of the key ingredients required for the production of batteries. There are two primary sources for lithium:

- Lithium bearing brines from sub surface sources or salt lakes, converted to form lithium carbonate or lithium hydroxide
- Spodumene deposits held within rock substrates, conventionally mined and concentrated into lithium carbonate or lithium hydroxide

Our focus is on reducing the total cost of ownership and wear of our equipment. Regardless of the slurry composition, we offer features to maximize the design life and minimize the replacement cost.

We also support all utility, off and on-site mining applications.



**Lithium Brine Concentration** 

# **Electrolyte Production**

Whether you are talking large or small-scale production, ITT has the right solution.

Under corrosive conditions, producing high purity electrolytes demands absolute care. ITT has dependable, efficient products that are crucial to managing your process requirements and maintaining product quality.

For chemical facilities, we offer a full range of API, ANSI and ISO pump models, including exotic metallurgies to handle highly corrosive applications, as demanded by the newest battery technologies.

# ITT's offerings include:

- Transport pumps
- Slurry pumps
- Booster pumps
- Recirculation pumps
- Centrifugal + Twin Screw Pumps for loading and unloading of ships, tank wagons, tanker trucks as well as storage tanks
- Condition Monitoring



We are experts in packaging engineered pumps that meet your demanding applications



Li-Ion Manufacture

# **Cell Manufacturing**

A cell manufacturing and assembly plant requires high alloys as well as reliable equipment to maintain continuous operation. ITT offers a wide range of safe, reliable products and services designed for these challenging applications.

We make highly engineered pumps that range from electrolyte transfer pumps to simple cooling water and sump pumps. For temperatures up to 800°F (426°C) and pressures up to 4,000 PSI (275 bar), we cover it all. Sealless pumps are well suited for this industry to minimize emissions and maximize safety of operators.

Our global support services ensure around-the-clock operation of your facility.

## Pump Key

- 1 SLI
- 2 3196 | IC | ICM | 3298 | FNPM
- (3) ICM | 3296 | 3298/99 | FNPM





# Recycling



# Recycling

ITT products are engineered for use with harsh and unknown fluids. For battery and cell recycling, you can trust our robust pumps to transport undefined pumpage to support growing global recycling demands.

For 'dirty' services, heavy duty, reliable pump designs are required. Which is why our pumps in both dry and wet processes, are designed to last.

With changing technologies, our pumps can be upgraded with higher metallurgies, plastics, or linings to meet new and 'first of kind' processes.

### Pump Key

- 1 XHD | JC | SLI | W-series
- 2 3196 | IC | RCNKu
- 3 3196 | IC

### Li-Ion Manufacture

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# Products



#### Goulds 3196 i-FRAME® ANSI Process

- Capacities to 1,364 m<sup>3</sup>/h | 7,000 GPM
- Heads to 223 m | 730 ft
- Temperatures to 371° C | 700° F
- Pressures to 26 bar | 375 PSIG



### Goulds XHD\*

- Extra Heavy Duty / Rubber and Metal Lined
  - Capacities to 2,950 m<sup>3</sup>/h | 13,000 GPM
  - Heads to 85 m | 280 ft
  - Pressures to 17 bar | 250 PSIG



#### Goulds 3298 Magnetic Drive ANSI Lined

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



#### Goulds Axial Flow<sup>®</sup> Axial Flow

- Capacities to 68,000 m<sup>3</sup>/h | 300,000 GPM
- Heads to 9.2 m | 30 ft
- Temperatures to 176° C | 350° F



#### Goulds 3299 Magnetic Drive ANSI Lined

- Capacities to 95 m<sup>3</sup>/h | 425 GPM
- Heads to 149 m | 490 ft
- Temperatures to  $180^\circ\,\text{C}$  |  $360^\circ\,\text{F}$
- Pressures to 19 bar | 275 PSIG



#### Goulds JC Medium Duty Slurry

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



#### Goulds 3296 EZMAG Magnetic Drive ANSI Process

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



#### Goulds 3700i API 610 (OH2) Overhung Process

- Capacities to 8,500 GPM (1930 m3/h)
- Heads to 360 m | 1,200 ft
- Temperatures to  $425^{\circ}$  C |  $800^{\circ}$  F
- Pressures from full vacuum to 60 bar | 870 PSIG



#### Goulds LF 3196 i-FRAME®\* Low Flow ANSI Process

- Capacities to 50 m<sup>3</sup>/h | 220 GPM
- Heads to 282 m | 925 ft
- Temperatures to 371° C | 700° F
- Pressures to 31 bar | 450 PSIG



#### Goulds IC i-FRAME<sup>®\*</sup> ISO Process

- 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

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# Products



#### Goulds ICM ISO Metallic Magnetic Drive Process

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



#### Goulds ICB Close-coupled ISO Process Pump

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



#### Goulds ICMB

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

- 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



#### Goulds 3171 Vertical Sump and Process

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



#### Goulds VJC

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

#### JCU Submersible

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



#### Rheinhütte RKuV Chemical centrifugal pump in plastic

- Capacities to 120 m³/h  $\mid$  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

# Products



#### Rheinhütte RCNKu+ Standardized chemical pump in plastic

- Capacities to 400 m<sup>3</sup>/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



#### W-Series Twin Screw Pump

- Up to 6500m<sup>3</sup>/h
- Up to 60 bar
- Up to 350°C



#### Rheinhütte FNPM Magnetic drive pump in plastic

- 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



#### SLI Twin Screw Pump

- Up to 400 m<sup>3</sup>/h
- Up to 25 bar
- Up to 200°C



#### Rheinhütte RPROP Axial flow centrifugal pump in metal

- 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



#### Goulds VIT Vertical Turbine

- Capacities to 15,900 m3/h |70,000 GPM
- Heads to 1,067 m | 3,500 ft
- Temperatures to 204°C | 400° F
- Pressures to 176 kg/cm<sup>2</sup> | 2,500 psi



#### Rheinhütte RN Standardized Chemical Pump in Metal

- Capacities to 2700 m<sup>3</sup>/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



#### Rheinhütte GVSO Vertical chemical centrifugal pump in metal

- Capacities to 4000 m³/h | 17612 GPM
- Heads to 180 m | 590 ft
- Temperatures to from
- -40 °C to 600 °C | -40 °F to 1112 °F
- Pressures to 40 bar | 580 PSIG

# Materials with a Purpose

As consumer and industrial technologies continue to advance, so too do the expectations of end users for the equipment used to support those processes. None more important than the materials used and selected for their manufacturing. That is why we offer one of the widest and specialty material selections in the pump industry. From durable metals, to exceptionally abrasion and chemically resistant plastics and elastomers, to specialty ceramics, our product and material portfolio is unparalleled.

Below are *some* of the materials we offer, specifically along the Li Ion value chain. We are not limited to the materials listed below and this list continues to grow as processes evolve.

For your process and material needs, please contact us as industry experts to ensure that you're designing tomorrow's industry with the latest material technologies of today.

Bits         DIN         ASTM         Description           0.6025         A48, Class 25 & 35         Cast Iron         0.7043         A395, Grade 60–40–18         Duttile Iron           0.965         Cast Steel         1.0619         A216 Grade WCB         Carbon Steel         1.41365         -         High Alloy Cast Steel           1.4510         -         Alloy Antinit A610         5tailess Steel (316)         1.4408         A995 Grade 6A         Super Duplex           1.4517         A995 Grade 1B         Duplex         1.4512         A14 Grade CN-7M         Alloy 20           1.4517         A744 Grade CN-7M         Alloy 20         1.4512         A743 Cr-8M         Super Duplex           1.4518         A995 Grade 1B         Duplex         1.4512         A744 Grade CN-7M         Alloy 20           1.4517         A995 Grade 2         Titasiz, Class III Type A Hardened         Hc600         Endura Chrome           -         CC-50         Ultra High Chrome         -         CC-50         Ultra High Chrome           Silicon Iron Alloy         -         A 518 Grade 2         Titanium         3.7031         B367 Grade 2         Titanium           3.7031         B367 Grade 2         -         Titanium         Hypalon         EPDM	Bit         ASTM         Description           0.6025         A48, Class 25 & 35         Cast Iron           0.7043         A395, Grade 60-40-18         Duttile Iron           0.965         Cast Steel         Cast Steel           1.0619         A216 Grade WCB         Carbon Steel           1.41365         -         High Alloy Cast Steel           1.4361         -         Alloy Antinit A610           1.4406         A995 Grade 6A         Super Duplex           1.4517         A995 Grade 1B         Duplex           1.4517         A995 Grade CN         Alloy 20           1.4527         A744 Grade CN-7M         Alloy 20           1.4528         A 743 Ch3MN         AL-6 XN           -         ASTM A532, Class III Type A Hardened         Hcdoro           -         ASTM A532, Class III Type A Hardeneed         Hcdoro           -         CC-50         Ultra High Chrome           -         CC-50         Ultra High Chrome           -         CC-50         Ultra High Chrome           -         3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium         Titanium           3.7032         -         Titanium						
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Status         1.4361         -         Alloy Antinit A610           1.4408         A 743 CF-8M         Stainless Steel (316)         1.4469         A995 Grade 6A         Super Duplex           1.4517         A995 Grade 6A         Super Duplex         1.4517         A995 Grade 6A         Super Duplex           1.4527         A744 Grade CN-7M         Alloy 20         1.4527         A744 Grade CN-7M         Alloy 20           1.45295         A 743 CN3MN         AL-6 XN         -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         HC600         -         ASTM A532, Class III Type A Hardened         Endura Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS         SIGUSS           a.7031         B367 Grade 2         Titanium         3.7032         -         Titanium           3.7032         -         Titanium         -         Natural Rubber         -         Neoprene         -           Sigen         -         Nitrile         -         -         -         -         -           Sigen         -         -         -         -         -         -         -         -         - <t< td=""><td>Billion Iron Alloy         Alloy Antinit A610           Silicon Iron Alloy         -         Alloy Antinit A610           Silicon Iron Alloy         -         ASTM A532, Class III Type A Hardened         Endura Chrome           -         -         CC-50         Ultra High Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           Silicon Iron Alloy         -         A 518 Grade 2         Titanium           3.7032         -         Titanium           Silicon Iron Alloy         -         A 518 Grade 2         Titanium           3.7032         -         Titanium         -           VPFA         Natural Rubber         Neoprene         -           VITTI         Hypalon         -         EPDM         -           Vitrile         Urethane         -         -         Fickorund</td><td></td><td></td><td>1.4136S</td><td>-</td><td>High Alloy Cast Steel</td></t<>	Billion Iron Alloy         Alloy Antinit A610           Silicon Iron Alloy         -         Alloy Antinit A610           Silicon Iron Alloy         -         ASTM A532, Class III Type A Hardened         Endura Chrome           -         -         CC-50         Ultra High Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           Silicon Iron Alloy         -         A 518 Grade 2         Titanium           3.7032         -         Titanium           Silicon Iron Alloy         -         A 518 Grade 2         Titanium           3.7032         -         Titanium         -           VPFA         Natural Rubber         Neoprene         -           VITTI         Hypalon         -         EPDM         -           Vitrile         Urethane         -         -         Fickorund			1.4136S	-	High Alloy Cast Steel	
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Start         1.4469         A995 Grade 6A         Super Duplex           1.4517         A995 Grade 1B         Duplex           1.4517         A995 Grade CN-7M         Alloy 20           1.4527         A744 Grade CN-7M         Alloy 20           1.4529         A 743 CN3MN         AL-6 XN           -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         Endura Chrome           -         CC-50         Ultra High Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           2.4066         A494 Grade CZ100         Nickel         3.7031           3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium           3.7032         -         Titanium           3.7032         -         Titanium           Struggen         Natural Rubber         Neoprene           Neoprene         Nitrile         149910n           EPDM         Urethane         Urethane	Step         1.4469         A995 Grade 6A         Super Duplex           1.4517         A995 Grade 1B         Duplex           1.4527         A744 Grade CN-7M         Alloy 20           1.4528         A 743 CN3MN         AL-6 XN           -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         Endura Chrome           -         CC-50         Ultra High Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium           3.7033         B367 Grade 2         Titanium           3.7033         B367 Grade 2         Titanium           3.7033         B367 Grade 2         Titanium           Step         PTFA         Neoprene           VIET         Nitrile         Nitrile           Urethane         Urethane         Frikorund	<u>v</u>	tee	1.4408	A 743 CF-8M	Stainless Steel (316)	
Silicon Iron Alloy         1.4517         A995 Grade 1B         Duplex           Silicon Iron Alloy         -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         Endura Chrome           -         CC-50         Ultra High Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium           3.7032         -         Titanium           Sige         PFFA         PFFA           Veoprene         Natural Rubber         Nitrile           Urthane         Hypalon         EPDM           Urethane         Urethane         Urethane	Silicon Iron Alloy         A 518 Grade 18         Duplex           0         A 51M A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         Endura Chrome           -         CC-50         Ultra High Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium           Sigen         PFFA         Neoprene           Sigen         Neoprene         Nitrile           Urethane         Hypalon         EPDM           EPDM         Urethane         Frikorund	<b>n</b>	st S	1.4469	A995 Grade 6A	Super Duplex	
Notes         1.4527         A744 Grade CN-7M         Alloy 20           1.45295         A 743 CN3MN         AL-6 XN           -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         Endura Chrome           -         CC-50         Ultra High Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           Silicon Iron Alloy         -         A 518 Grade 2         Titanium           3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium           3.7032         -         Titanium           Silicon Iron Alloy         -         A 518 Grade 2         Titanium           3.7031         B367 Grade 2         Titanium         Titanium           3.7032         -         Titanium         Titanium           Silicon Iron Alloy         -         PFFA         PIFE           Silicon Iron Alloy         -         -         Titanium           3.7032         -         Titanium         -           Silicon Iron Alloy         -         -         -           Silicon Iron Alloy         -         -         -	Notes         1.4527         A744 Grade CN-7M         Alloy 20           1.4529S         A 743 CN3MN         AL-6 XN         AL-6 XN           -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         Endura Chrome           -         CC-50         Ultra High Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium           3.7032         -         Titanium           Siged         PTFE         Natural Rubber           Neoprene         Nitrile         Nitrile           Urethane         EPDM         Fikorund	, T	Ğ	1.4517	A995 Grade 1B	Duplex	
Visit         1.4529S         A 743 CN3MN         AL-6 XN           -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         Endura Chrome           -         CC-50         Ultra High Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           Silicon Iron Alloy         -         A 518 Grade 2         Titanium           3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium           3.7032         -         Titanium           Sige         -         PFFA           PTFE         -         Natural Rubber           Nitrile         -         -           Hypalon         -         -           EPDM         -         EPDM           Urethane         -         -	V         1.4529S         A 743 CN3MN         AL-6 XN           -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         Endura Chrome           -         CC-50         Ultra High Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           9         1.4529S         A 743 CN3MN         AL-6 XN           -         ASTM A532, Class III Type A Hardened         Endura Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           9         1.459         A 7031         B367 Grade 2         Titanium           3.7032         -         Titanium         Titanium           3.7032         -         Titanium           3.7032         -         Titanium           3.7032         -         Titanium           Sigged         -         Natural Rubber           Neoprene         Nitrile            Hypalon         Hypalon         EPDM           Sigged         Frikorund         Frikorund	Ĭ	Alloy	1.4527	A744 Grade CN-7M	Alloy 20	
Product         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         Endura Chrome           -         CC-50         Ultra High Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           3.7031         B367 Grade 2         Titanium         Titanium           3.7032         -         Titanium           3.7032         -         Titanium           Sigura         Sigura         PFA           Sigura         PTFE         PTFE           Sigura         Natural Rubber         Nitrile           Chlorobutyl         Hypalon         Hypalon         EPDM           Sigura         EPDM         Urethane         EPDM	Prescuency         -         ASTM A532, Class III Type A Hardened         HC600           -         ASTM A532, Class III Type A Hardened         Endura Chrome           -         CC-50         Ultra High Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           Silicon Iron Alloy         -         A 518 Grade 2         Titanium           3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium           3.7032         -         Titanium           Sigenal         3.7032         -         Titanium           Sigenal         -         PFA         -           PFA         -         Natural Rubber         -           Sigenal         -         -         -	2		1.4529S	A 743 CN3MN	AL-6 XN	
Image: Second	Silicon Iron Alloy     -     ASTM A532, Class III Type A Hardened     Endura Chrome       Silicon Iron Alloy     -     A 518 Grade 3     SIGUSS       Silicon Iron Alloy     -     A 518 Grade 3     SIGUSS       Silicon Iron Alloy     -     A 518 Grade 2     Titanium       3.7031     B367 Grade 2     Titanium       3.7032     -     Titanium       3.7032     -     Titanium       Sigeral     PFA       PFA     PTFE       Natural Rubber     Neoprene       Nitrile     Nitrile       Othorobutyl     Hypalon       EPDM     Urethane       Sigeral     Frikorund		Hig	-	ASTM A532, Class III Type A Hardened	HC600	
Image: Silicon Iron Alloy         -         CC-50         Ultra High Chrome           Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           3.7031         B367 Grade CZ100         Nickel           3.7032         -         Titanium           3.7032         -         Titanium           Sige         -         FFA           PIFE         -         PIFE           Sige         -         Natural Rubber           Nitrile         -         Nitrile           Image: Sige         -         -           Sige         -         -	Image: space		_	-	ASTM A532, Class III Type A Hardened	Endura Chrome	
Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           9         2.4066         A494 Grade CZ100         Nickel           3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium           9         9         9         9           9         9         9         9           9         9         9         9           9         9         9         1           3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium           9         9         9         9           9         9         9         9           9         9         9         9           9         9         9         9           9         9         9         9           9         9         9         9           9         9         9         9         9           9         9         9         9         9           9         9         9         9         9           9         9         9         9         9	Silicon Iron Alloy         -         A 518 Grade 3         SIGUSS           B         2.4066         A494 Grade CZ100         Nickel           3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium           3.7032         -         Titanium           9         9         9         9           9         9         3.7032         -         Titanium           3.7032         -         Titanium         1         1           9         9         9         9         9         9           9         9         9         9         9         9           9         9         9         9         9         9           9         9         9         9         9         9         9           9         9         9         9         9         9         9         9         9           9			-	CC-50	Ultra High Chrome	
New         Nickel           3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium           State         PFA         PFA           PTFE         Natural Rubber         Neoprene           Nitrile         Othorobutyl         Hypalon           Hypalon         EPDM         Urethane           Sie         Sie         Othorobutyl	Note         Nickel           3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium           3.7032         -         Titanium           9999         3.7032         -         Titanium           3.7032         -         Titanium         Titanium           9999         -         PFA         PFA           9999         -         Natural Rubber         PTFE           9999         -         Nitrile         PTFE           9999         -         Nitrile         PTFE           9999         -         -         -           9999         -         -         -           9999         -         -         -		Silicon Iron Alloy	-	A 518 Grade 3	SIGUSS	
Main         3.7031         B367 Grade 2         Titanium           3.7032         -         Titanium           Signal         PFA           PFFE         PTFE           Natural Rubber         Neoprene           Nitrile         Chlorobutyl           Hypalon         EPDM           EPDM         Urethane	Natural Rubber           Signal         Neoprene           Signal         Nitrile           Opposition         Nitrile           Signal         EPDM           Signal         Frikorund		e) s	2.4066	A494 Grade CZ100	Nickel	
Image: Second	Signal     3.7032     Titanium       Natural Rubber     PTFE       Natural Rubber       Neoprene       Nitrile       Chlorobutyl       Hypalon       EPDM       Urethane       Signal       Signal		bure	3.7031	B367 Grade 2	Titanium	
PEA           PTFE           Natural Rubber           Neoprene           Nitrile           Chlorobutyl           Hypalon           EPDM           Urethane	PFA           PTFE           Natural Rubber           Neoprene           Nitrile           Chlorobutyl           Hypalon           EPDM           Urethane           Sigging		<u>5</u>	3.7032	-	Titanium	
Big         PTFE           Natural Rubber         Neoprene           Nitrile         Chlorobutyl           Hypalon         EPDM           Urethane         Urethane	PTFE PTFE PTFE PTFE PTFE PTFE Preparent PTFE PTFE PTFE PTFE PTFE PTFE PTFE PTFE		si		PFA		
PTFE       Natural Rubber       Neoprene       Nitrile       Chlorobutyl       Hypalon       EPDM       Urethane	Image: PTFE           Natural Rubber           Neoprene           Nitrile           Chlorobutyl           Hypalon           EPDM           Urethane           Simeon           Simeon           Frikorund		stic				
Natural Rubber Neoprene Nitrile Chlorobutyl Hypalon EPDM Urethane	Natural Rubber Neoprene Nitrile Chlorobutyl Hypalon EPDM Urethane Simeged Frikorund		Play	PTFE			
Neoprene           Nitrile           Chlorobutyl           Hypalon           EPDM           Urethane	Neoprene           Nitrile           Chlorobutyl           Hypalon           EPDM           Urethane           Frikorund	Ĕ		Natural Rubber			
Nitrile Chlorobutyl Hypalon EPDM Urethane	Nitrile Chlorobutyl Hypalon EPDM Urethane	a			Neoprene		
Vertical Stress     Chlorobutyl       Hypalon       EPDM       Urethane	Chlorobutyl Hypalon EPDM Urethane Simular Frikorund	ի-Met	Elastomers	Nitrile			
Hypalon       EPDM       Urethane	Hypalon EPDM Urethane Simeral Bigging Frikorund			Chlorobutyl			
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# i-ALERT<sup>®</sup> Remote Monitoring Solution Zero Unplanned Downtime

Sensor | App | Gateway | Diagnostics | Ai Platform

With unpredictability at an all-time high, the need to stay agile, proactive and productive is great. The need to do so costefficiently is even greater. ITT i-ALERT is a total machine health monitoring ecosystem that improves plant reliability by enabling rotating equipment to run with less unplanned downtime.



# **Easy Setup**

Begin monitoring your equipment in minutes. No power or wires to install. Sensor installation supports threaded connection, epoxy or magnetic mounting. Download the free i-ALERT mobile app and follow the on screen instructions to get started.



# Smart

i-ALERT immediately begins monitoring your equipment on activation. Built in edge computing processes vibration spectrum data to enable in-depth analysis of the equipment health. Get automated vibration analysis and diagnostics through the i-ALERT Ai Platform.





# Plug & Play

For 24/7 remote monitoring the i-ALERT Gateway provides a secure connection between the i-ALERT sensors and 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.



# Accurate

The i-ALERT sensor was designed to accurately measure vibration in all three axes and is on par with dedicated vibration analysis tools in much higher price ranges. Vibration diagnostics are available to anyone with a smart mobile device.



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



vibration, temperature, run-time & battery life.

www.i-alert.com

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# ITT's Vision & Values

ITT is a diversified leading manufacturer of highly engineered critical components and customized technology solutions for the energy, transportation and industrial markets. Built on a strong heritage and imaginative spirit, ITT solves our customers' most complex, mission-critical needs for key industries that underpin our modern way of life.

### The ITT Way

Our people are at the center of all we do, and our values of Respect, Responsibility and Integrity are central to who we are as a company. They are the standards to which we hold ourselves and they guide our words and actions every day. Our values are also the foundation of The ITT Way which is how we differentiate ourselves, operate to grow and create value. It is our model for how we create enduring impact for all of our stakeholders.

### Environment, Safety & Health

ITT is proud to be a leader in protecting our employees, customers and the communities where we operate. The ITT Environment, Safety and Health Management System provides for the systematic control of environmental, safety and health (ESH) risks. Using this system, operational, administrative and cultural ESH processes are standardized and applied to continually improve environmental and occupational safety and health performance.adjusting pump output to meet system needs. Problems are corrected before they disrupt your process. ITT invests in R&D funds designing for reliability, ease of maintenance and safety.

ITT Engineered Valves provides Fabri-Valve<sup>®</sup> gate valves and Dia-Flo<sup>®</sup> diaphragm valves for oil and gas applications.

# **Eco-Footprint**

ITT is acting to preserve and enhance our environment. We are striving to shrink our eco-footprint by further reducing the use of natural resources and hazardous materials in production, lowering emissions and energy use in operations, and by improving product design.

Through our involvement in the API 610, API 676 and API 682 committees, we actively address and participate in the drive for increased safety, reliability and emissions contain- ment in the oil and gas industry.



# Locations





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