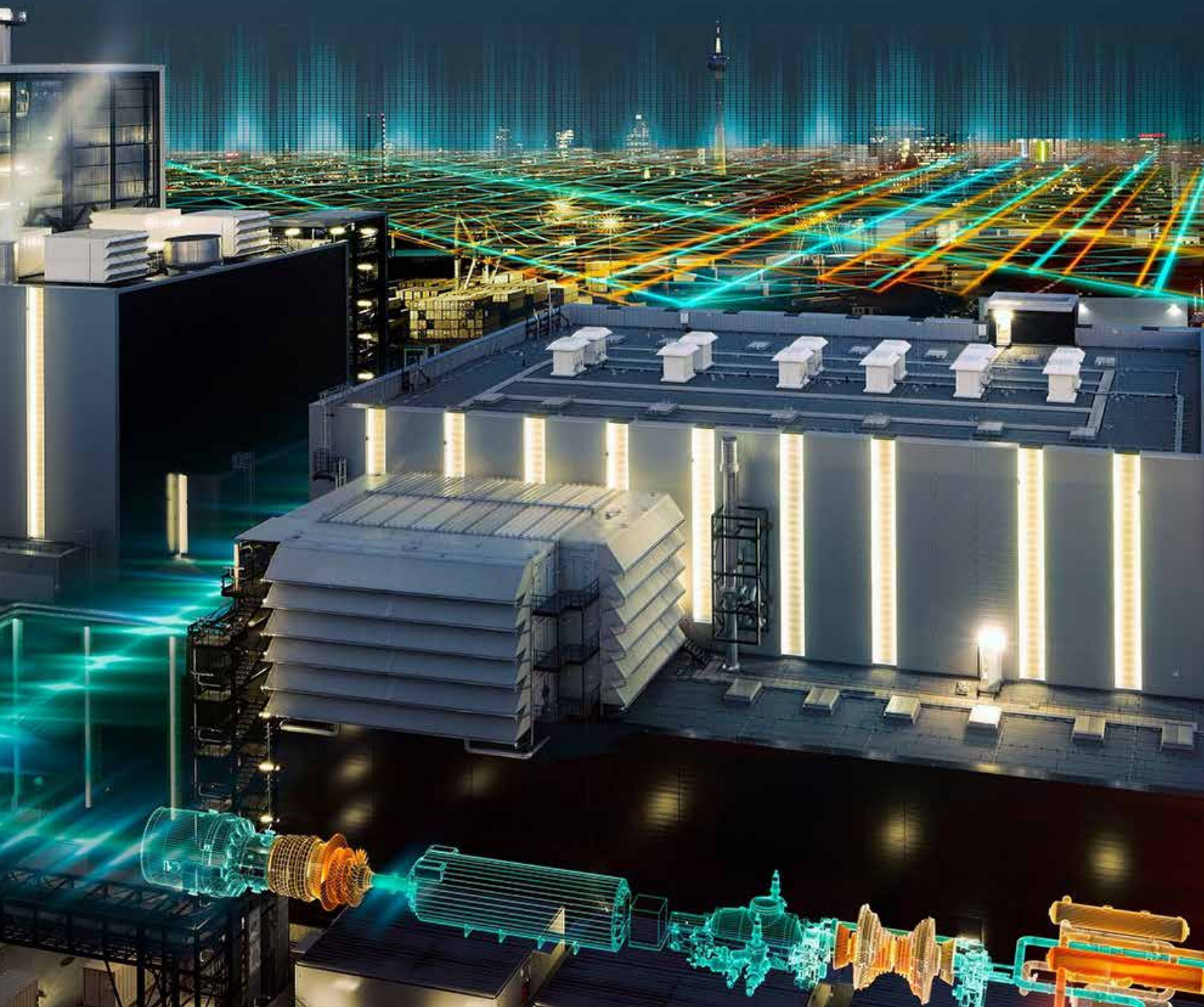
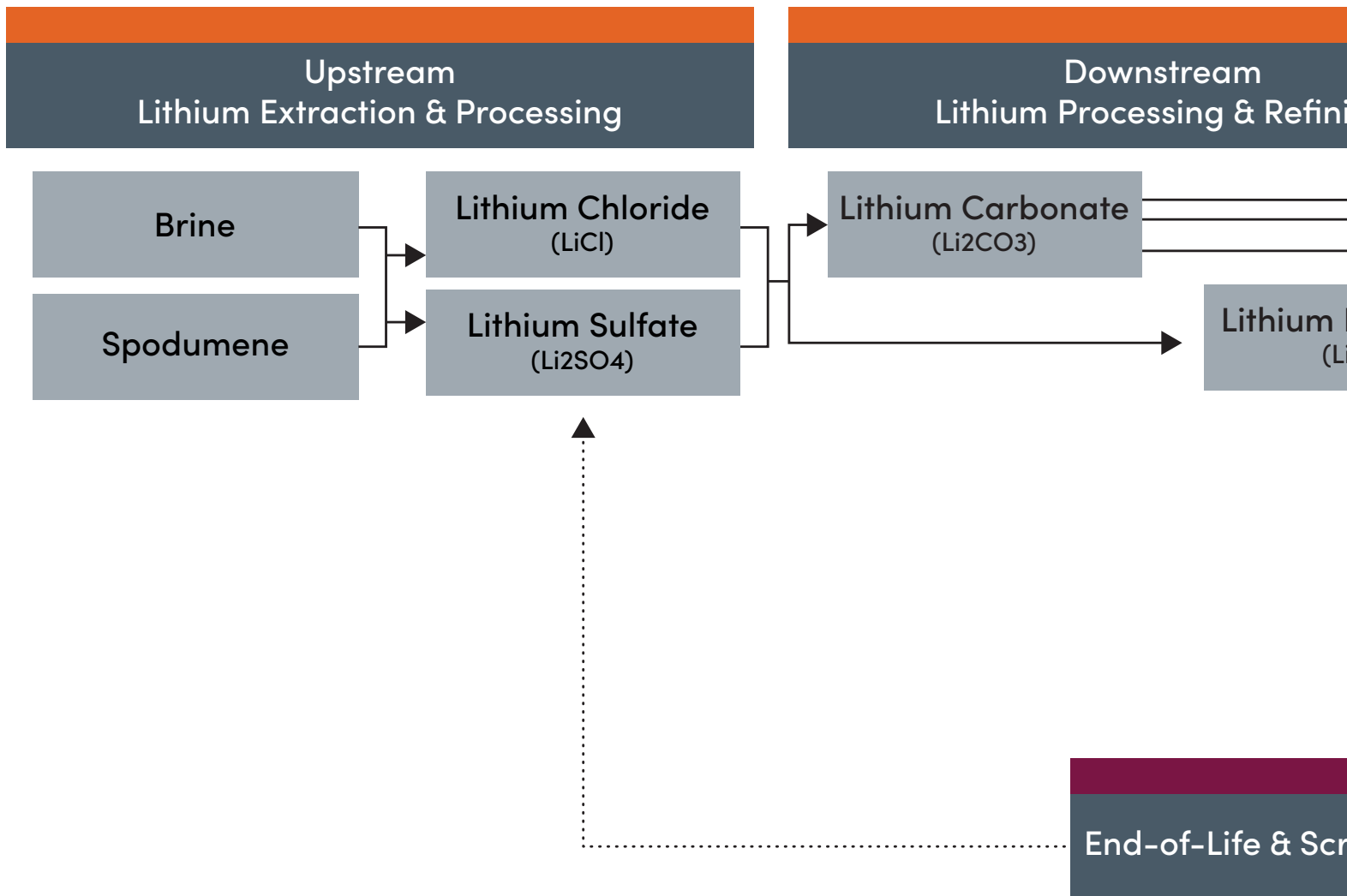


Li-Ion Battery Value Chain

Products & Services for Electrode, Electrolyte & Cell Manufacture

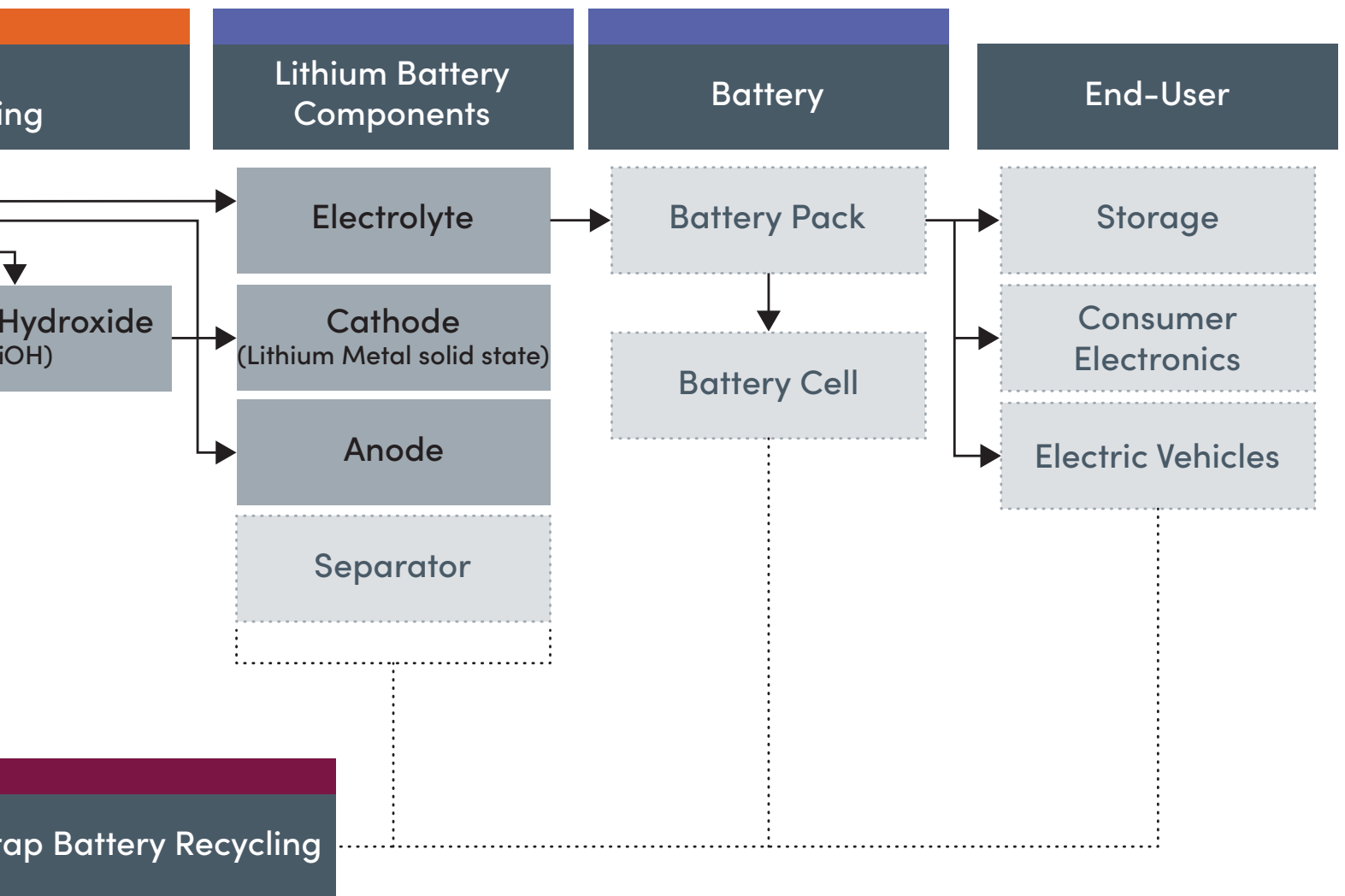


ITT Transforming the



- Electrode Raw Materials (pg6)
- Electrolyte Production and Cell Mfg (pg7)
- Recycling (pg9)

The Li-Ion Value Chain



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
- ⑥ 3196 | IC
- ⑦ 3196 | IC

Extraction

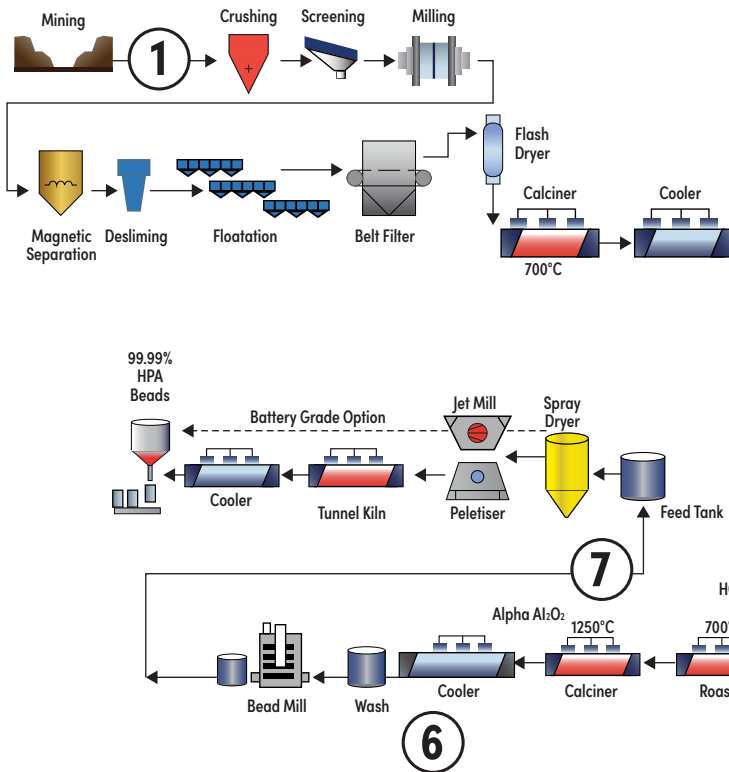
Lithium is one of the key ingredients required for the production of batteries. There are two primary sources for lithium:

- 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

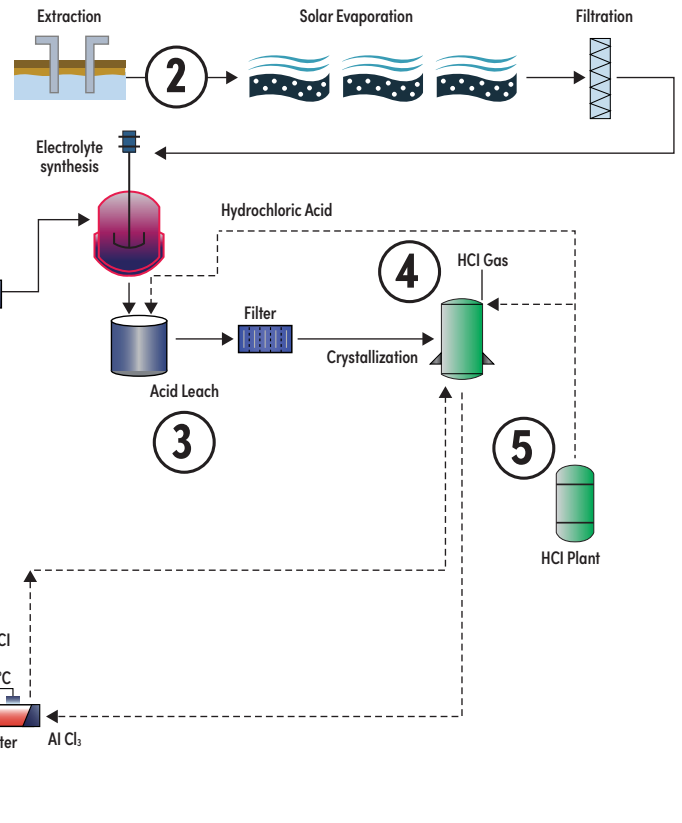
Our focus is on reducing the total cost of ownership and wear of our equipment. Regardless of the slurry composition, we offer features to maximize the design life and minimize the replacement cost.

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

Spodumene Concentration



Lithium Brine Concentration



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.

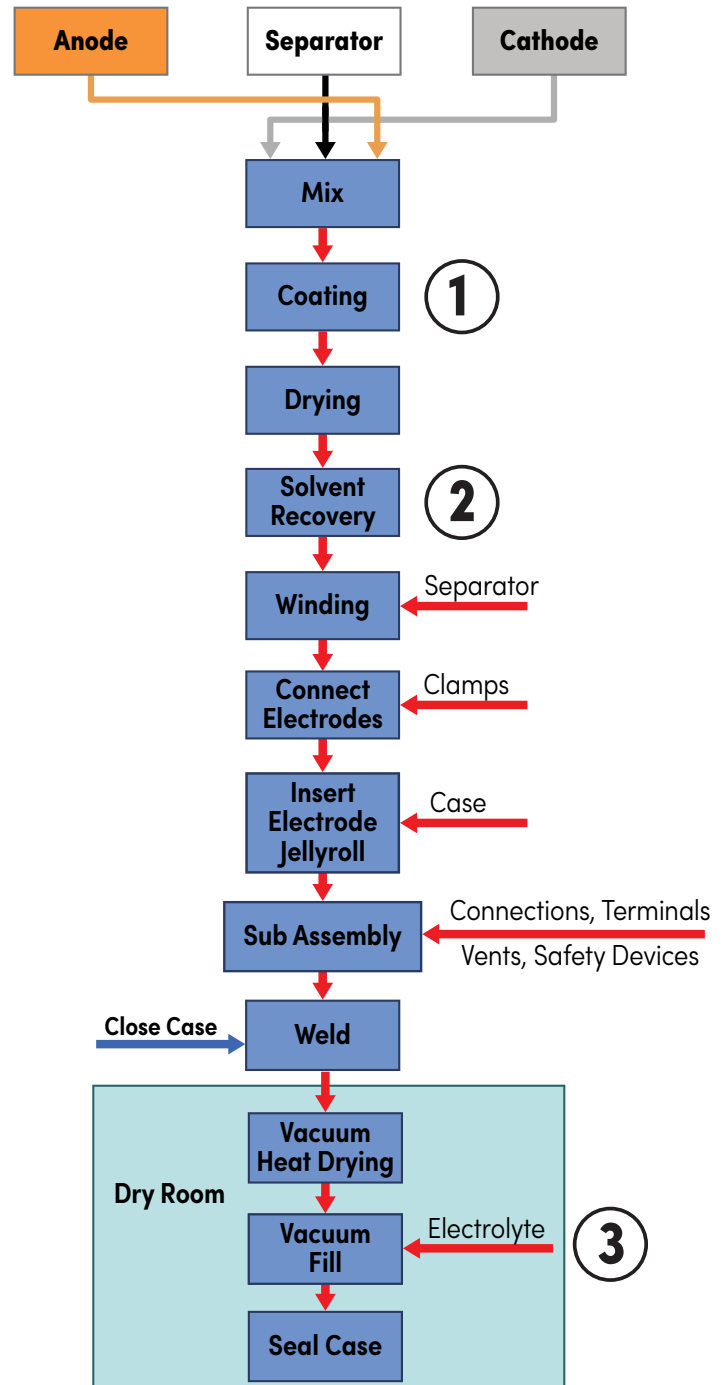
Our global support services ensure around-the-clock operation of your facility.

Pump Key

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

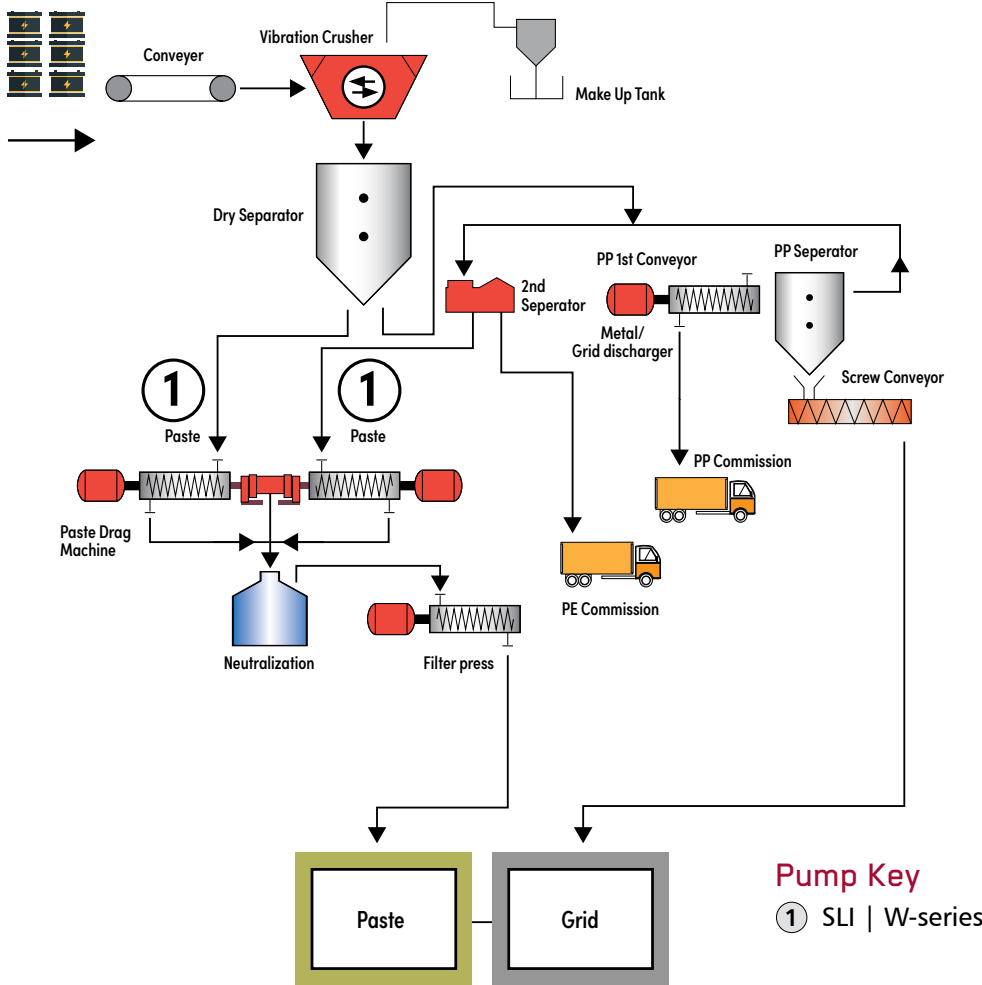


Cell Assembly



Recycling

Dry Process



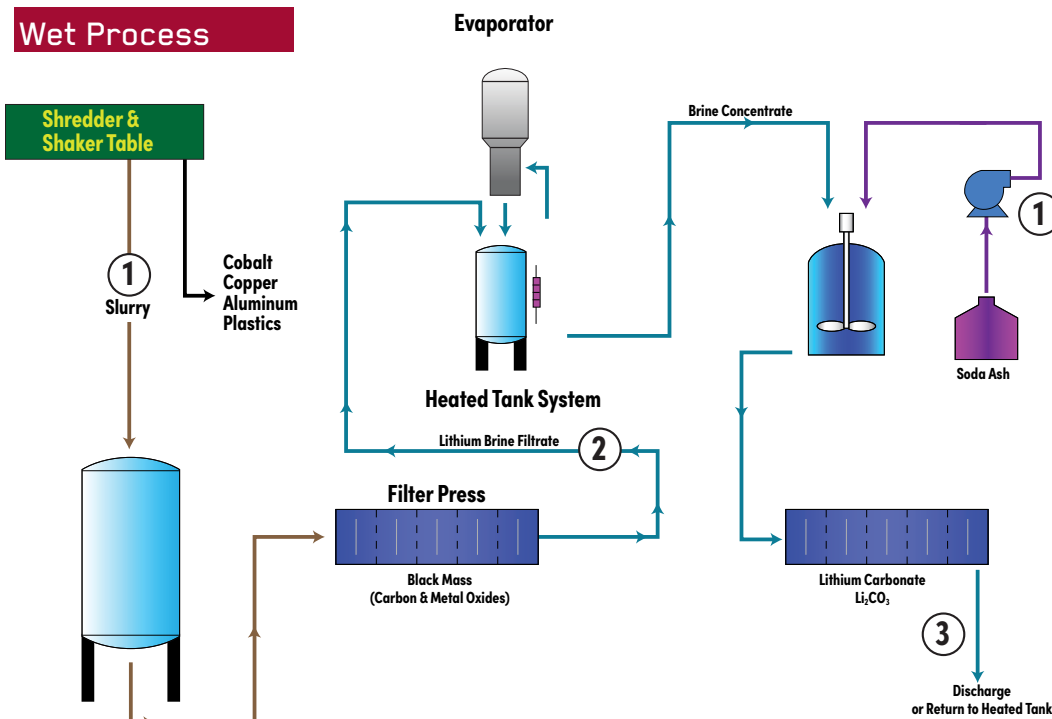
Recycling

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.

Wet Process



Products



Goulds 3196 i-FRAME®
ANSI Process

- 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



Goulds XHD*
Extra Heavy Duty / Rubber and Metal Lined

- Capacities to 2,950 m³/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 m³/h | 1,200 GPM
- Heads to 162 m | 500 ft
- Temperatures to 121° C | 250° F
- Pressures to 16 bar | 225 PSIG



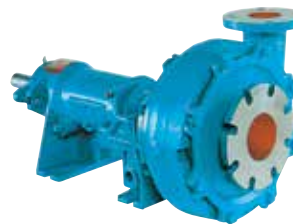
Goulds Axial Flow®
Axial Flow

- Capacities to 68,000 m³/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 m³/h | 425 GPM
- Heads to 149 m | 490 ft
- Temperatures to 180° C | 360° F
- Pressures to 19 bar | 275 PSIG



Goulds JC
Medium Duty Slurry

- 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



Goulds 3296 EZMAG
Magnetic Drive ANSI Process

- 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



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° C | 800° F
- Pressures from full vacuum to 60 bar | 870 PSIG



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

- 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



Goulds IC i-FRAME®**
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

Products



Goulds ICM ISO Metallic Magnetic Drive Process

- 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



Goulds ICB Close-coupled ISO Process Pump

- 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



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 m³/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 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



JCU Submersible

- 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



Rheinhütte RKuV Chemical centrifugal pump in plastic

- 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

Products



Rheinhütte RCNku+
Standardized chemical pump in plastic

- 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



W-Series Twin Screw Pump

- Up to 6500m³/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 m³/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/cm² | 2,500 psi



Rheinhütte RN
Standardized Chemical Pump in Metal

- 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



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.

		DIN	ASTM	Description
		Cast Iron & Steel	0.6025	A48, Class 25 & 35
0.7043	A395, Grade 60–40–18		Ductile Iron	
0.965			Cast Steel	
1.0619	A216 Grade WCB		Carbon Steel	
High Alloy Cast Steel	1.4136S	-		High Alloy Cast Steel
	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 1B		Duplex
	1.4527	A744 Grade CN–7M		Alloy 20
	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
Pure Metals	2.4066	A494 Grade CZ100		Nickel
	3.7031	B367 Grade 2		Titanium
	3.7032	-		Titanium
Non-Metallic	Plastics	PFA		
		PTFE		
	Elastomers	Natural Rubber		
		Neoprene		
		Nitrile		
		Chlorobutyl		
		Hypalon		
		EPDM		
		Urethane		
	Ceramics	Frikorund		



i-ALERT[®] 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 cost-efficiently 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.



Dashboard

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

www.i-alert.com

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

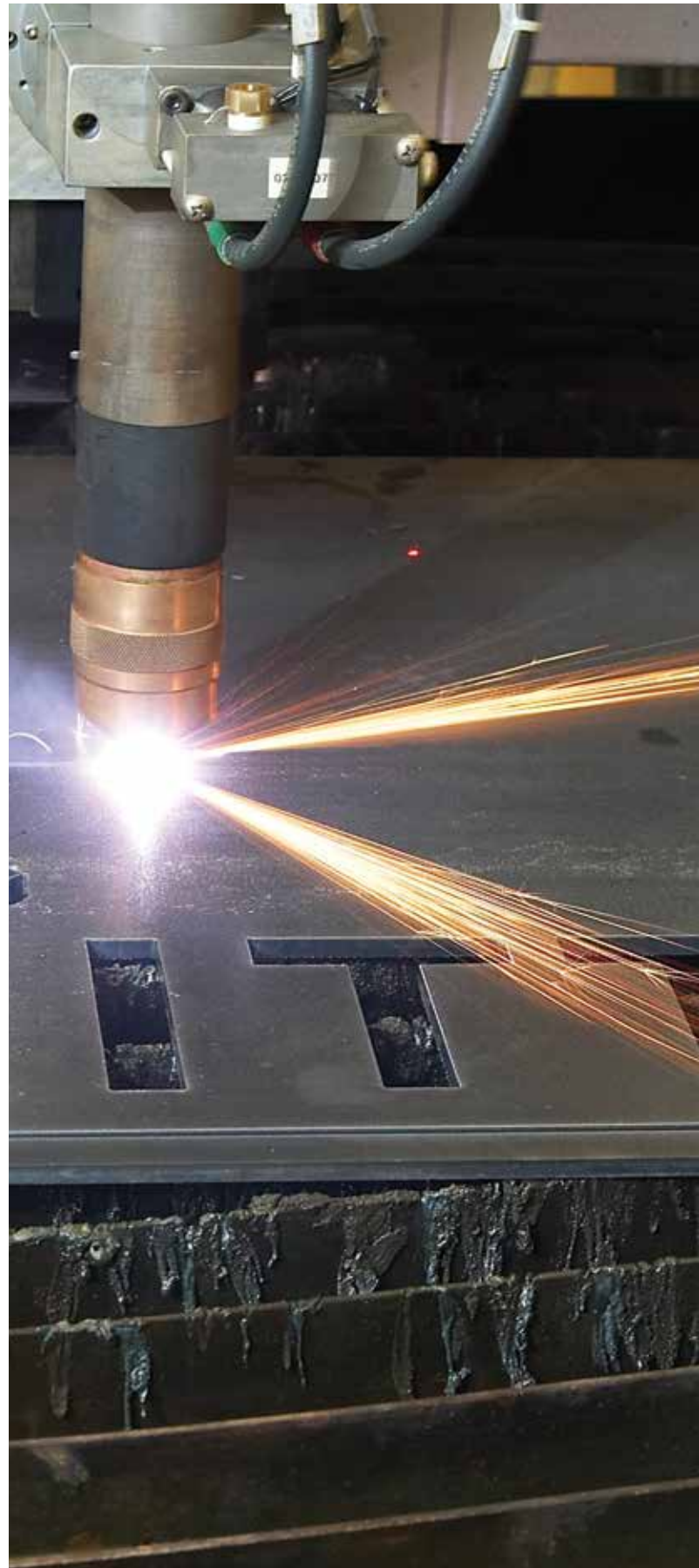
ITT is proud to be a leader in protecting our employees, customers and the communities where we operate. The ITT Environment, Safety and Health Management System provides for the systematic control of environmental, safety and health (ESH) risks. Using this system, operational, administrative and cultural 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® gate valves and Dia-Flo® diaphragm valves for oil and gas applications.

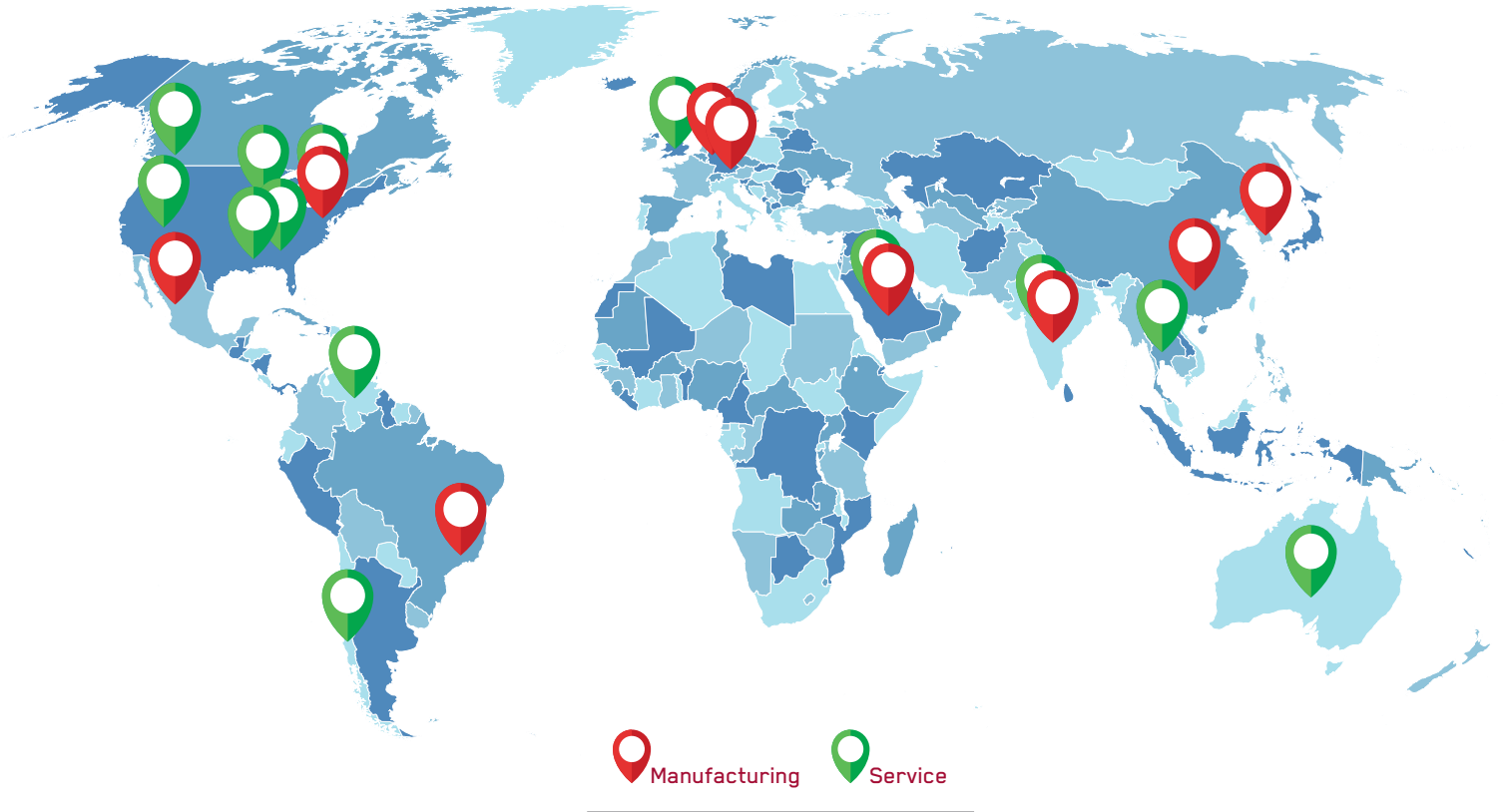
Eco-Footprint

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 containment in the oil and gas industry.



Locations



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