GE Oil & Gas is a leading provider of artificial lift solutions. Dedicated to lowering your lifting costs, increasing production, and optimizing operations, we draw on innovative solutions across GE’s high-tech portfolio to bring more capabilities to the field. Our time-tested technology solutions, integrated software and analytics—and intuitive automation technologies—are all complemented by superior regional and local support services. We are one source and one team. Responsive, reliable and ready to enhance the performance of your well—whatever its location or stage. It’s an overall experience that’s totally uplifting.

ESP SYSTEMS

GE’s artificial lift portfolio includes a comprehensive range of electric submersible pump (ESP) systems, surface pumping systems (SPSTM), variable speed drives and controls. To help operators optimize their production, we also offer the remote monitoring and diagnostics (RM&D) and automation solutions. With sales, service and manufacturing centers around the globe operating under ISO 9001 certification, we are able to meet your unique requirements with the product quality and reliability you demand.

GE’s PLUS Line of ESP products delivers performance, longevity, and unsurpassed service.

Performance
Enhance your well’s performance with new GE technologies for motors, pumps, seals, gas management, and controls.

Longevity
Incorporating innovation and technology developed by experts with decades of oil field experience—our PLUS line ESP systems provide the longevity in product life required to reduce downtime, increase production and lower operating costs.

Unsurpassed Service
Services include:
• **Run and Pull Services.** Provided by our highly trained well installation and spooling crews for submersible and surface equipment.
• **Optimizer™ Portable Well Testing.** Testing the productivity and economic viability of wells, customized testing programs to develop productivity index (PI) and inflow performance relationship (IPR) curves.
• Other services, including application engineering, logistics, surveillance, customer support, and training.

![Image](image_url)
LIFT PLUS HIGH EFFICIENCY PUMPS

Our Lift PLUS multi-stage centrifugal pumps consist of rotating impellers and stationary diffusers that can be assembled in floater, compression or abrasion resistant modular configurations to meet the most demanding performance requirements.

We offer a broad range of pumps with wide-vane openings to improve performance in viscous fluids and to reduce the effects of sand, gas and scaling. These pumps—available in radial-flow and mixed-flow designs—provide some of the highest efficiency and head-per-stage ratings in their pump class range.

Floater pump construction allows impellers to “float” or move up and down relative to the pump shaft, preventing the transfer of impeller thrust loads to the seal thrust bearing.

For abrasive environments, the abrasion resistant (AR) pumps can be used to improve system run life, and the Ace Plus gas handler and Ace Plus gas separator options optimize production in wells with free gas present.

<table>
<thead>
<tr>
<th># of Models</th>
<th>Pump Capacities</th>
<th>Flow Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pump Series</td>
<td>OD (in mm)</td>
</tr>
<tr>
<td>6</td>
<td>3.38/TA</td>
<td>3.38 (85.9)</td>
</tr>
<tr>
<td>13</td>
<td>4.00/TD</td>
<td>4.00 (101.6)</td>
</tr>
<tr>
<td>7</td>
<td>5.38/TE</td>
<td>5.38 (136.7)</td>
</tr>
<tr>
<td>2</td>
<td>5.62/TH</td>
<td>5.63 (143.0)</td>
</tr>
<tr>
<td>4</td>
<td>6.75/TJ</td>
<td>6.75 (171.5)</td>
</tr>
<tr>
<td>1</td>
<td>8.62/TM</td>
<td>8.63 (219.2)</td>
</tr>
<tr>
<td>1</td>
<td>9.50/TN</td>
<td>9.50 (241.3)</td>
</tr>
</tbody>
</table>

†Wider range pumps are available.
LIFT PLUS ABRASION RESISTANT (AR) PUMPS

As the only ESP provider offering a complete range of pump construction technology, we can meet your complete production needs.

Our Lift PLUS AR pumps can prevent radial and downthrust wear due to abrasives, gas, low fluid levels, or combinations of these problems. Depending on the severity of the application, there are several configurations to choose from:

Compression Construction

Compression pumps (CMP) are built with impeller hubs stacked together to prevent axial movement. Stages are protected from downthrust wear because all downthrust loads are transferred to the seal thrust bearing. Optional tungsten carbide (TC) bearings can be included in the head and base of the pump to enhance radial stability in these critical areas.

Abrasion Resistant Compression Construction

AR compression pumps (AR CMP) combine AR floater TC bearing placements and fixed-impeller compression construction. Downthrust and radial wear protection make AR compression pumps an effective solution for extreme levels of abrasives.

Lift PLUS AR Modular

AR modular pumps (AR MDLR) use specialized bearing sets placed at predetermined intervals—to provide both radial support and downthrust protection to all pump stages—without transferring thrust loads to the seal thrust bearing. The bearing sets are comprised of TC bushings and flanged sleeves, which allow the bearings to carry the impeller downthrust load at each bearing placement. Compared to modular bearings from other manufacturers, GE’s modular bearings feature unique geometry and increased density and strength, providing:

- The most robust modular pump bearings in the industry
- Superior radial and downthrust wear protection
- Expanded downthrust protection for deeper applications
- Enhanced performance and extended runlife in abrasive applications

Radial vs. Mixed Flow Stage Types

Depending on the desired flow rate, radial flow stages can effectively handle up to 10% GVF. Mixed flow stages are capable of handling up to 25% GVF due to their vane geometry. GE Oil & Gas offers a wide variety of mixed flow stage types at key flow rates to meet a range of customer requirements.
LIFT PLUS Q+ SERIES WIDE-RANGE AR PUMPS

The most challenging applications require the most durable pump construction. The industry first design of the Lift Plus Q+ series provides TC bearings for wear protection in both upthrust and downthrust, increasing the operating range from 70% to 300%. See the sample pump ranges below.

The pump curve graph at right shows the operating range for a TD1000 pump (4.0" OD, 1000 bbl/d at 60 Hz) with standard floater construction, compression and AR modular construction, and Lift Plus Q+ construction. The operating range for the Lift Plus Q+ construction can be from 70% to 300% wider than standard range, depending upon model.

ESP TD1000 Q+
Pump performance curve for ESP TD 1000 Q+
1 stage @ 60 Hz 3500 RPM Specific Gravity 1.0

ABOVE: New Q+ pump technology extends the operating thrust range of the TD1000 greater than 140% of the range of the floater construction.
ACE PLUS GAS HANDLING PUMPS

The Ace Plus gas handling series from GE Oil & Gas is part of a suite of gas management products for high-, medium- and low-flow rate applications. This multi-stage, axial-flow gas handling can efficiently manage downhole applications with high percentages of free gas. These pumps were developed in conjunction with GE Global Research Centers in Niskayuna, New York and Munich, Germany, and are the result of six million models run on a supercomputing cluster using multiphase computational fluid dynamics (CFD) expertise. The final configuration was confirmed after exploring thousands of options using GE’s extensive research expertise.

The Ace Plus gas handling pump can be deployed as a solution for extreme gas content. By breaking up gas content before it enters the main production pump, it creates a homogenized solution with additional pressure that behaves more like a liquid. This enables the system to handle gas content exceeding the range of conventional gas handlers. The pump’s alternating centrifugal and axial flow stages allow it to operate in up to 75% gas volume fraction (GVF) at low intake pressure. Configured to enable customizable stage counts, it may be used with or without the Ace Plus gas separator for production at even higher GVF levels.

Drivers for Handling Gas

- Economical solution for producing low GVF content
- Production of extreme GVF levels
- Surface venting/flaring restrictions
- Non-vented packers
- Improved production and efficiency in moderate to high GVF levels

<table>
<thead>
<tr>
<th>Ace Plus Gas Handling Pump Product Line</th>
<th>Outside Diameter</th>
<th>BEP (BPD)</th>
<th>Application Range (BPD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ace Plus Model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TD GH650</td>
<td>4&quot;</td>
<td>650</td>
<td>300–900</td>
</tr>
<tr>
<td>TD GH1400</td>
<td>4&quot;</td>
<td>1500</td>
<td>800–1800</td>
</tr>
<tr>
<td>TD GH2500</td>
<td>4&quot;</td>
<td>2650</td>
<td>1000–3200</td>
</tr>
<tr>
<td>TD GH6000</td>
<td>4&quot;</td>
<td>6300</td>
<td>3400–7600</td>
</tr>
<tr>
<td>TE GH4000</td>
<td>5.38&quot;</td>
<td>4500</td>
<td>1400–5400</td>
</tr>
<tr>
<td>TE GH7000</td>
<td>5.38&quot;</td>
<td>8000</td>
<td>3000–9600</td>
</tr>
</tbody>
</table>

Inlet Vanes: Homogenize Fluid
Discharge Veins: Create Pressure

Inlet Vanes
Impeller
Diffuser
Vanes
Creates pressure and guides fluid to the next impeller
ACE PLUS GAS SEPARATORS

GE’s history of innovation in ESP gas separation began with the invention of the rotary gas separator. To avoid gas-related pumping problems, our separators support natural and assisted mechanical separation of gas from the well fluid so it can be expelled into the annulus prior to reaching the pump. There are several configurations available to provide the optimal solution for your challenging well conditions and production rate needs.

Ace Plus 1, 2, and 3 Stage Gas Separators

The design of GE’s Ace Plus gas separators is unique in the oilfield. The configuration provides the benefits of tandem rotary and vortex separators in a single device and housing, effectively reducing the bottlenecks associated with running tandem units. By making the Ace Plus gas separators available as 1, 2 or 3 stage in a single housing, the flow restrictions are reduced. These products are designed for industry-best separation efficiency at the highest flow rates available in 4-inch and 5.38-inch separators.

Exclusive Coatings for Best-in-Class Protection

The Ace Plus gas separators feature the industry’s first use of a CVD coating to reduce wear caused by abrasive materials and diminish corrosion and scaling. Originally developed for and used in GE’s aviation products, this additional level of protection has demonstrated the ability for the ESP to withstand wear in the harshest unconventional wells.

Patented GE Oil & Gas Design

• Industry leading flow rate capabilities
• Excellent separation efficiencies at maximum operating range
• Available in 1, 2, or 3 stage configurations in a single housing
• Design reduces costs and the bottlenecks associated with tandem connections
Dura Plus™ High-Efficiency Extra High Temperature Submersible Motors

GE provides Dura Plus™ 456 series extra high temperature (XHT) and 562 series XHT motors for operation in the most demanding wells, such as SAGD applications. New generation ESP components have been redesigned with improved insulation materials and new bearing materials to improve radial stability to help withstand extreme well conditions. GE’s Dura Plus™ XHT systems tolerate the extreme temperature swing from the subfreezing surface to the severe heat of bottom-hole temperatures (BHT rated for 230°C ambient) and have been engineered and manufactured to provide greater reliability in high temperatures.

Additional Dura Plus™ Motor Design Features

- Higher efficiency shaped-bar technology
- Full line power range 19 HP to 500 HP (Dura Plus™ 456) and 38 HP to 950 HP (Dura Plus™ 562) at 60 Hz
- Plug-in MLC on motor nameplate ratings up to 112 Amps
- New oil communication valves to reduce oil loss during installation on rig floor

Advantages of Shaped Bar vs. Round Bar Motor Design

- Provide more open space for copper within stator slots and rotor stacks
- More copper equals higher current capacities
- Higher current through motor copper creates more powerful magnetic fields in stator and rotor
- Stronger magnetic field interaction equals higher torque and HP potential
DURA PLUS™ SEAL SECTIONS

The new Dura Plus™ seals offer the flexibility and performance to meet different well conditions and simplify field service requirements. Three-chamber modular configurations not only allow operators to improve reliability but also reduce tandem applications.

Multiple technology enhancements combine to deliver a product that reduces field installation time and improves the seal filling process over other available technologies. Quicker installation and serviceability simplifies the production process for operators.

Seals are available in bag (“bladder”) and labyrinth-chamber designs and can be used in tandem configurations for increased motor protection. Single-bag and double-bag seals function as a positive barrier between the motor oil and well fluids.

Advanced material in the expansion bags provides greater motor and seal protection than alternative materials. This especial material has superior properties to resist well and chemical treatment fluids. The unique feature of double bag seals is the possibility to work in series or parallel without the need of changing any chamber configuration. This seal has more flexibility for different applications, depending on heat and oil expansion conditions. It can be configured at the well site.

All Dura Plus™ seals have a unique design to provide radial stabilization and reduce vibration transmitted to the motor in aggressive conditions (sand). High-temperature and high-load seals incorporate specialized elastomers and thrust bearings to handle high reservoir temperatures and deliver greater pump thrust capacity for deeper well applications.

DURA PLUS™ MODULAR SEALS FEATURES

- Available in three series: 338, 400 and 538
- Improved serviceability and quicker installation
- Two-and three-chamber configurations enhance redundancy
- Advanced materials in expansion bags that provide superior chemical resistance
- All configurations offered with abrasion resistant bushing in head, guides and bases
### Technical Specifications 338 Series

<table>
<thead>
<tr>
<th></th>
<th>60 Hz Operation</th>
<th>50 Hz Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing Diameter</td>
<td>3 – 3/8 In.</td>
<td>3 – 3/8 In.</td>
</tr>
<tr>
<td>Shaft Limit</td>
<td>256 HP</td>
<td>213 HP</td>
</tr>
<tr>
<td>Max BHT Temp.</td>
<td>150°C (300°F)</td>
<td>150°C (300°F)</td>
</tr>
<tr>
<td>Thrust Capacity</td>
<td>4400 Lbs.</td>
<td>3600 Lbs.</td>
</tr>
<tr>
<td>Rotation</td>
<td>CW and CCW</td>
<td>CW and CCW</td>
</tr>
</tbody>
</table>

### Available Configurations 338 Series

<table>
<thead>
<tr>
<th></th>
<th>3-Chamber</th>
<th>2-Chamber</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L/2BS</td>
<td>L/2BP</td>
</tr>
<tr>
<td></td>
<td>2BS</td>
<td>L/L</td>
</tr>
</tbody>
</table>

### Technical Specification 400 Series

<table>
<thead>
<tr>
<th></th>
<th>60 Hz Operation</th>
<th>50 Hz Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing Diameter</td>
<td>4 In.</td>
<td>4 In.</td>
</tr>
<tr>
<td>Shaft Diameter</td>
<td>7/8 In.</td>
<td>7/8 In.</td>
</tr>
<tr>
<td>Shaft Limit NIT/HSS</td>
<td>256 HP / 410 HP</td>
<td>213 HP / 342 HP</td>
</tr>
<tr>
<td>Max BHT Temp.</td>
<td>150°C (300°F)</td>
<td>150°C (300°F)</td>
</tr>
<tr>
<td>Thrust Capacity</td>
<td>7000 Lbs.</td>
<td>5800 Lbs.</td>
</tr>
<tr>
<td>Rotation</td>
<td>CW and CCW</td>
<td>CW and CCW</td>
</tr>
</tbody>
</table>

### Technical Specification 538 Series

<table>
<thead>
<tr>
<th></th>
<th>60 Hz Operation</th>
<th>50 Hz Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing Diameter</td>
<td>5 – 3/8 In.</td>
<td>5 – 3/8 In.</td>
</tr>
<tr>
<td>Shaft Diameter</td>
<td>1 – 3/8 In.</td>
<td>1 – 3/8 In.</td>
</tr>
<tr>
<td>Shaft Limit NIT/HSS</td>
<td>637 HP / 1019 HP</td>
<td>531 HP / 849 HP</td>
</tr>
<tr>
<td>Max BHT Temp.</td>
<td>150°C (300°F)</td>
<td>150°C (300°F)</td>
</tr>
<tr>
<td>Thrust Capacity</td>
<td>11600 Lbs.</td>
<td>9200 Lbs.</td>
</tr>
<tr>
<td>Rotation</td>
<td>CW and CCW</td>
<td>CW and CCW</td>
</tr>
</tbody>
</table>

### Available Configurations 400 and 538 Series

<table>
<thead>
<tr>
<th></th>
<th>3-Chamber</th>
<th>2-Chamber</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L/2BS</td>
<td>L/2BP</td>
</tr>
<tr>
<td></td>
<td>2BS</td>
<td>2BP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L/L</td>
</tr>
</tbody>
</table>
POWERLINE™ ESP POWER CABLES

GE Oil & Gas supplies a complete and cost-effective range of ESP power cable and cable services. PowerLine™ cable is available in a comprehensive set of materials, duty ranges and constructions, allowing for application-specific, cost-effective cable selection. Our PowerLine™ ESP power cable has been expertly engineered and utilized globally in harsh, hot, gassy and corrosive conditions with high reliability. Along with power cable, we also provide a level of cable spooling service that sets us apart from the competition in any land, offshore or arctic setting.

### PowerLine™ 190
The cost-effective choice for cooler, non-aggressive applications. Economic polypropylene insulation and jacket provide good run life, while reducing total costs. Rated to 190°F (88°C).

### PowerLine™ 205
The cost-effective and highly durable solution for general applications. Economic polypropylene insulation provides good run life, an oil resistant nitrile rubber jacket provides added protection while reducing total costs. Available in round or flat construction. Rated to 205°F (96°C).

### PowerLine™ 225
Specially designed for use in gassy and high CO₂ wells. Economic polypropylene insulation is surrounded by an extremely durable lead jacket, which provides a superior barrier of protection against harmful gas and increased resistance against heat and corrosives. Rated to 225°F (107°C).

### PowerLine™ 400
The PowerLine™ 400 features a reinforced barrier extending the capabilities to medium and high temperature applications. Rated to 400°F (204°C).

### PowerLine™ 450
Designed to stand up to the harshest well environments. EPDM insulation and a lead jacket provide reliability against extreme heat, gas, and corrosion. It is a must for critical wells where workover costs due to ESP failure are high. Rated 450°F (232°C).

Other power cables are available, including models for highly specialized applications.

<table>
<thead>
<tr>
<th>PowerLine™ ESP Cable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PowerLine™ 190</strong></td>
</tr>
<tr>
<td>-40°F (-40°C) • 190°F (88°C)</td>
</tr>
<tr>
<td><strong>PowerLine™ 205</strong></td>
</tr>
<tr>
<td>23°F (-5°C) • 205°F (96°C)</td>
</tr>
<tr>
<td><strong>PowerLine™ 225</strong></td>
</tr>
<tr>
<td>-40°F (-40°C) • 225°F (107°C)</td>
</tr>
<tr>
<td><strong>PowerLine™ 400</strong></td>
</tr>
<tr>
<td>-22°F (-30°C) • 400°F (204°C)</td>
</tr>
<tr>
<td><strong>PowerLine™ 450</strong></td>
</tr>
<tr>
<td>-40°F (-40°C) • 450°F (232°C)</td>
</tr>
</tbody>
</table>

*PL400 includes higher temperature rated reinforcement barrier. EPDM-Ethylene Propylene Diene Monomer.
GE Oil & Gas offers a wide variety of surface control equipment to help you increase production and reduce operating costs.

Vector™ Plus Variable Speed Drives

The Vector™ Plus Variable Speed Drive (VSD) provides enhanced control capability and superior performance to improve production in ESP and SPS™ applications. Advanced software and an easy-to-use Human Machine Interface (HMI) combine to simplify operation while reducing power consumption and improving equipment run time under challenging conditions.

Provided in NEMA 4 rated outdoor enclosures, these drives are available in ratings from 173–998 KVA and include the following features and benefits:

- Motor-friendly sine wave output – extends motor life
- Full color graphical display
- Continuous operation through power line dips and swells
- Highest operating efficiency
- High input power factor
- Extensive data collection and event logging
- Application-specific intelligent control capability to improve drawdown and reduce gas locking
- Built-in serial and Ethernet communications capability

Vector™ Switchboards

Vector™ Switchboards are designed to provide protection for Fixed Speed Direct-On-Line motor starting applications to 5000 volt AC. They include a fused input disconnect switch, vacuum contactor, and the same extensive data collection, event logging and communications as our Vector™ Plus Variable Speed Drives.

[Images of Vector™ Plus VSD and Pump Curve]
Improved Surface Pumping Solutions

The drive for long-lasting, highly-reliable, environmentally-friendly pumping solutions has led many customers to appreciate our Surface Pumping Systems. GE’s SPS™ pumping systems provide versatile, low-maintenance alternatives to many high-speed integral gear driven centrifugal (OH6), positive displacement (PD) and vertical-turbine pump (VTP) models.

SPS™ Benefits:
- Field-upgradeable Easily Modified Frame (EMFTM)
- DualAccess™ Mechanical Seal System – service bearings and seal without disturbing piping or alignment
- Optimized for abrasive, corrosive fluids
- Quick delivery options (8 weeks or less)
- Faster installation with pre-wired instrumentation

Pre-packaged Units

SPS™ systems are delivered to the job site pre-assembled—only requiring suction flange, discharge flange and power hookups. The Easily Modified SPS™ Frame is pre-wired with instrumentation and cabling terminated in a central junction box. This proprietary frame, paired with the versatile design of our pumps, allows for easy on-site installation and maintenance with reduced site preparation.

Trouble-free Service

The SPS™ pump is designed for years of trouble-free operation. There are no v-belts or packing to service. Routine maintenance consists of a quarterly lubricant change and component check. SPS™ units generate little to no vibration-related wear or stress on piping components and they are available with a variety of mechanical seal options (including API 682 seals). The modular design makes SPS™ units suitable for a wide variety of applications, from routine water injection to mine dewatering and leaching operations. GE’s SPS™ pump is very reliable, highly-efficient and easily modified in the field, saving you maintenance time.

Modularity Reduces Downtime

GE’s patented modular SPS™ design reduces downtime in a variety of critical applications (oilfield, mining, industrial, etc.). Our SPS™ centrifugal pumps are available in electric, gas, or diesel-powered models and can handle up to 3,500 GPM (120,000 BPD) and discharge pressures over 6000 psi. GE offers a wide range of cost-effective system options from 15 to 2500 HP. With over 3,500 global SPS™ installations, GE has the experience and expertise to address the most challenging pumping applications.

Easily Modified Frame (EMFTM)

The patented Easily Modified Frame (EMFTM) features a rigid skid foundation for low vibration and ease of installation. The motor mounting system enables rapid field modifications when pumping conditions change, requiring no invasive cutting or welding.

The pump mounting system maintains the factory laser alignment, while accepting modular inserts that adapt to different flow rate pump models. Additionally, where limited site access exists (i.e., underground mines), multiple component skids can be provided to facilitate portability and assembly. Frame extensions can also be used to upgrade existing SPS™ units in the field for higher pressure output.

DualAccess™ Thrust Chamber

Our industry leading, patent pending design feature allows flexibility to access the pump and seal from both ends of the system, resulting in less intervention/disassembly for less downtime and smaller service charges.
IMPROVE YOUR ESP OPERATIONS

Field Vantage™ software can help you improve the operation of your ESP systems. In oilfield production operations, data-driven insights enable faster and more informed decisions, empowering you to lower lifting costs, meet production targets and operate safer. Powered by GE’s Predix™ operating system, Field Vantage™ goes beyond traditional systems’ data streams and alarms to offer unique software solution that provides situational intelligence on all your wells to help run your operation at maximum efficiency.

The Field Vantage™ software solution continually analyzes your well performance, identifies opportunities for improvement and notifies you of wells that need attention. This unburdens you from looking through data well-by-well, and lets you concentrate on executing operational improvements that make real financial impacts to your operation.

Field Vantage™ is a simple yet powerful tool designed by operators for operators. Highlights include:

• A simple yet comprehensive real-time view of your artificial lift operations
• Field-wide visibility and prioritization of wells
• Real-time analytics that are watching all of your wells, all of the time
• Real-time analytics that provide automated operational recommendations to help meet production targets
• Real-time analytics that work like a radar on your data, providing you with early warning advisories of potential operational issues
• Tools to help you collaborate with colleagues, share information and help solve problems faster
• The ability to remotely fine tune well site controller set points that optimize run life and uptime

Far beyond SCADA, Field Vantage™ produces results. It reduces lifting costs per barrel by reducing equipment failures and well interventions, improving energy efficiency, and streamlining field activities.

Without Field Vantage™

With Field Vantage™
GE INNOVATION

Research and development of today’s solutions...and tomorrow’s

We continue to build on the time-tested solutions with research into innovative technology that anticipates global needs in our Artificial Lift Research & Development Center and in GE’s Global Research Centers.

ARTIFICIAL LIFT R&D CENTER

The GE Oil & Gas Engineering Technology Center for artificial lift products is located in Oklahoma City, OK, USA. At this state-of-the-art research center and laboratory, our team of highly trained experts use the latest technology tools such as 3D solid modeling, computational fluid dynamic analysis (CFD), finite element analysis (FEA)—and application of lean and six sigma techniques for product engineering and technology development.

To enhance the quality, reliability and endurance of our products, we conduct a variety of performance tests for conditions up to 5,000 PSI and 660°F during new product development. These tests diminish the needs for field trials, accelerate the new product release process and provide efficiency data—such as the optimum operating point—to be later used by operators.

• Test to Destruction Well
• Gas Management Test Bench
• Motor Test Well
• Thrust Bearing Tester
• High Pressure Vessel/Cable Tester
• High Volume Pump Test Loop
• Abrasion Media Test Loop
• High Temperature Test Loop

GE GLOBAL RESEARCH CENTERS

Over 6,000 researchers around the globe inventing new technology, we also work with universities and governments on research projects to connect technology with industry. From our GE Oil & Gas Technology Center in Oklahoma City, Oklahoma—which is dedicated to the oil and gas industry, we drive progress on several fronts:

• **Production Optimization.** Enhanced data acquisition and analytics, new artificial lift downhole technology resulting in asset optimization and improved production.

• **Well Construction.** Transformational drilling and completion technologies.

• **Energy Systems.** Building new markets, optimizing oil and gas energy portfolios, focusing on CNG and LNG.

• **Water Treatment.** Creating novel approaches to reduce, reuse, recycle and replace water.

• **CO₂ Fracturing and Enhanced Oil Recovery (EOR).** Creating market leadership with the separation, capture, handling and recycling of CO₂—utilizing a systems approach.