



Solutions for Harsh Subsea Applications

Advanced Interconnect Products, Technology and System Solutions

Advanced Engineering for
Reliability and Long-Term Performance
in Harsh Environments

Bringing Reliability to New Levels of Performance



PERFORMANCE

- We're focused on improving performance and increasing reliability in subsea applications by providing rugged connectivity solutions to tame the most extreme environments on earth.

PARTNER

- We have a wide range of cable, drymate, and wet-mate products in our portfolio and are accustomed to delivering subsea system solutions.
- Our goal is to meet your expectations for innovation, quality, delivery, and support.

COLLABORATION

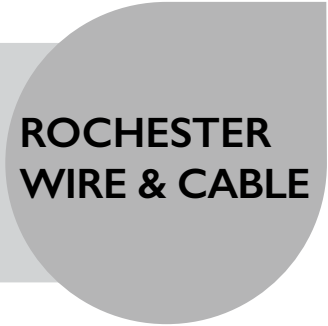
- Our advanced design, prototyping, and manufacturing capabilities enable us to optimize for weight and space savings, for easier use, for safety, and for more choice in meeting the needs for power, control, and high-speed signals.

- *High-performance connectivity for harsh environments*
- *Extensive field service installation and support*
- *Extensive range of optical and electrical dry-mate and wet-mate connection systems*

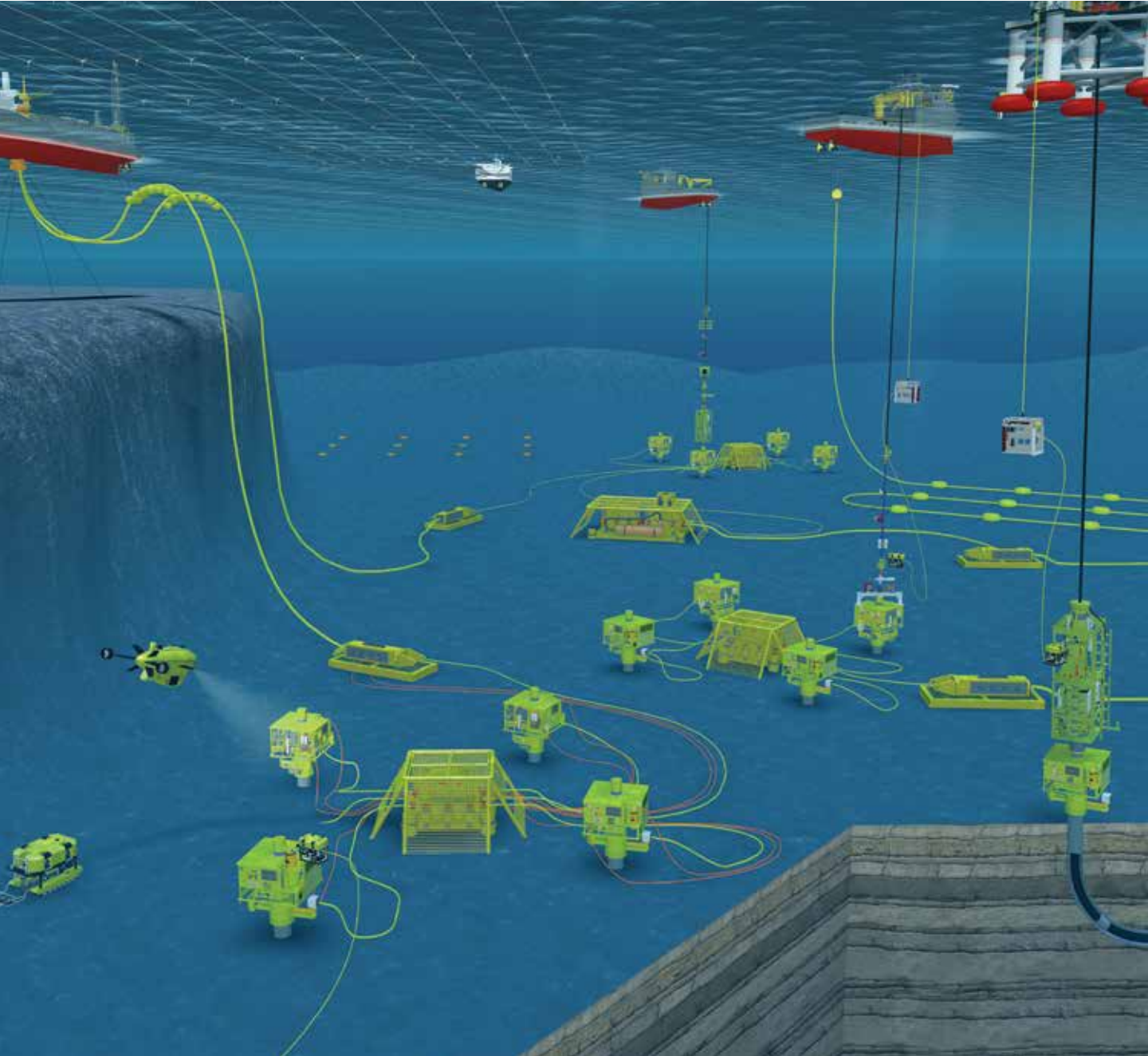


- *High-performance connectivity for harsh environments*
- *High power electrical wet-mate connectors*
- *Explosion-proof communication and power connectors*
- *Optical and electrical feedthrough systems*

- *Engineered cable designed for demanding applications:*
 - *Oil and gas exploration and development*
 - *Defense*
 - *Oceanography*



TE Connectivity expansion allows for a strong intercompany team approach to meet any challenge with brands such as Advanced Fiber Products, Raychem, SubCom, and TE Sensors



TE Components . . . TE Technology . . . TE Know-how . . .

AMP | AGASTAT | CII | HARTMAN | KILOVAC | MICRODOT | NANONICS | POLAMCO | Raychem
SEACON | Rochester | DEUTSCH

Empower Engineers to Solve Problems, Moving the World Forward.

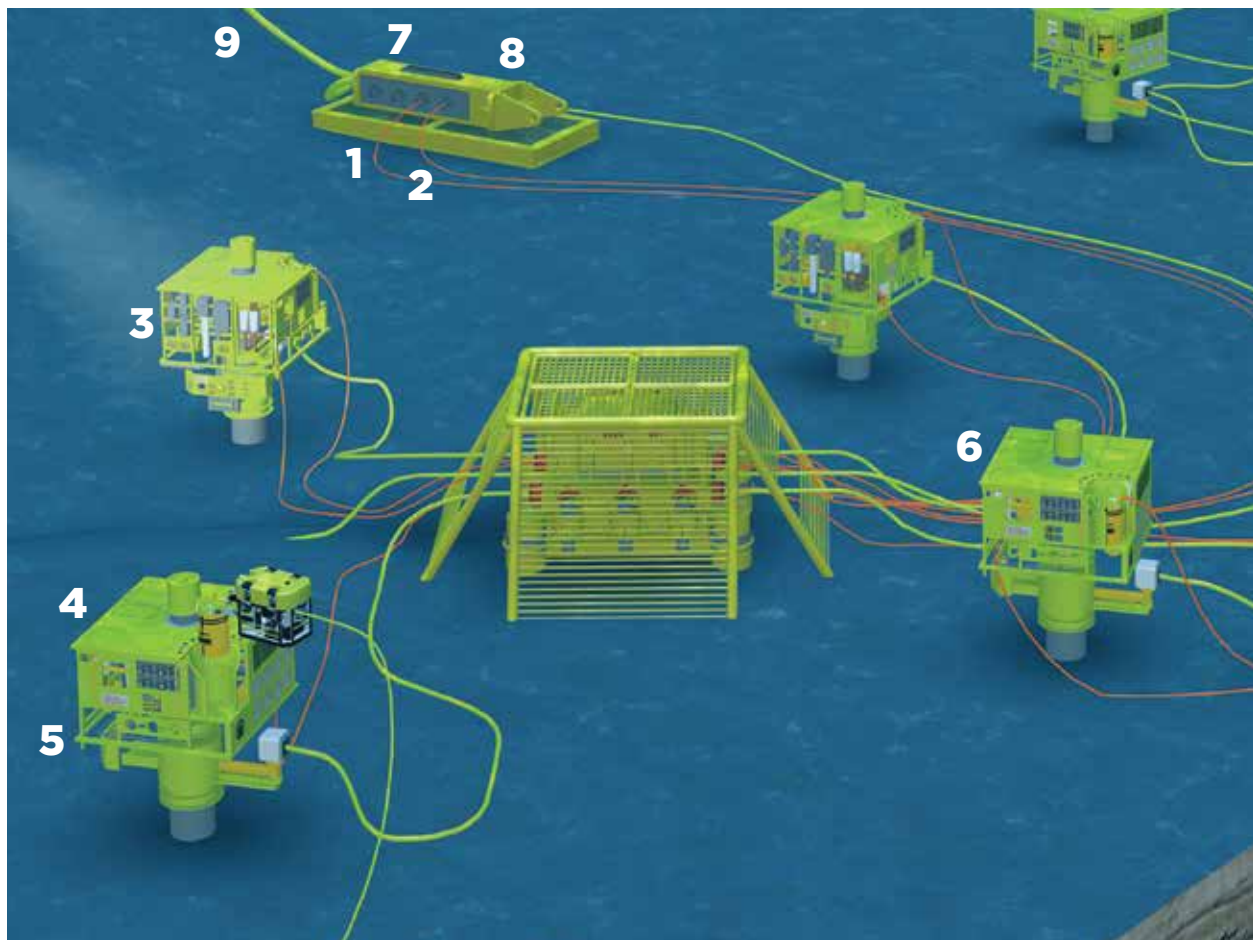
Subsea Production

Fathom the Possibilities

You have unlimited opportunity with one of the widest ranges of underwater electrical and fiber optic connectors available anywhere in the world. This range of connectors covers not only optical, signal, and power, but hybrid connectors mixing these capabilities in a single unit. Our broad range of cable, connectors, penetrators, sensors, and switches gives you the flexibility to configure the ideal connector system for your most extreme applications.

Applications

- X-Mas Trees
- Subsea Control Modules (SCM)
- Manifolds
- Umbilical Termination Assembly (UTA)
- Router Modules





1 SEACON HydraLight Wet-Mate Connectors

- Oil-filled, pressure-balanced optical connectors
- Qualified for depths of 7,000 meters
- 8 Fiber optic contact configuration connectors
- Design life of 30 years and 100 mating cycles



2 SEACON HydraElectric Wet-Mate Connectors

- Qualified for depths of 4,000 meters
- 4, 7, and 12 electrical contact configurations
- Design life of 30 years and 1,000 mating cycles
- Available in ROV, manual and stab plate configurations



3 Penetrators

- Support power, signal, and optics
- Designs to support hermetic needs
- Reliable transitions from outside subsea pressures to the inside of equipment
- Can be installed in any environment



4 SEACON MINI-CON Connectors

- Control module connectors
- Available in 13 shell sizes for up to 203 contacts standard
- Rated to 16,000 psi, with higher ratings on request



5 SEACON OPTI-CON Connectors

- Control module connectors
- Five shell sizes
- Rated to 7,500 psi
- 1, 4, 8, 12, or 20 channels in any electrical or optical configuration, single mode or multimode



6 DEUTSCH Tubing Hanger Feedthrough Connectors

- Available in both electrical and optical multichannel configurations
- For horizontal and vertical X-mas Trees
- Withstand high temperatures and high pressures
- Rated up to 15,000 psi, 350°F, and PSL 3G, per API 6A



7 SEACON oSUTA

- Designed for termination and distribution of optical cables
- Single cable entry and multiple hose configurations
- Fiber management system



8 SEACON oSUTA HD

- Multiple cable and hose configurations
- In-line entry/exit option
- Same-side entry/exit option
- Compact design for ease of installation



9 Rochester Umbilical Cable

- Customizable optical and electrical circuits
- Double-layered, flexible steel armor protection
- Withstands depths to 6,000 m hydraulic

Enhanced Oil Recovery

Maximizing Yields for the Life of the Well

In addition to helping you with connectivity solutions that enable the installation of subsea equipment safely and reliably, we also have solutions that help you monitor and maintain equipment to maximize oil recovery, even after the field has matured.

Our Bottomless Commitment

Our wide and deep experience solving the tough problems in offshore exploration and production, and close working relationship with customers, enable us to deliver the best solution. Working closely with both equipment designers and exploration/production service companies gives us the ability to create connectivity solutions and meet the specific demands of an application in topside, subsea, and downhole environments.

Applications

- Pumps
- Compressors
- Pipeline Heating
- Transformers/Switchgear
- PRM





1 DEUTSCH 9316 Connectors

- ATEX certified explosion-proof
- ATEX and subsea version
- Robust dry-mate-able connections
- Electrical, optical, and hybrid options



2 SEACON HD HydraLight Connectors

- High Density (HD) connectors allow up to 48 optical channels
- Angled Physical Contact (APC) connections
- Performance relates to 8 way UPC bullet



3 Pressure Transducers

- Sensors and transducers for hazardous locations
- Certified to the latest international standards including, but not limited to, NEC, IECEx, ATEX, SIL, and CRN



4 SEACON Optical Penetrators

- Sealing Acetal isolation flange
- Insertion Loss <0.2 dB per channel
- Return Loss <-55 dB per channel
- Optional integration to PBOF hose



5 SEACON ESD Gate Valve

- Electrical power supplied from topsides by subsea cable
- Capable of accepting power from surface or converting hydraulic energy into electrical
- Integrated into HydraElectric wet-mate connectors



6 HydraElectric High Power Connectors

- 1 contact with a rated voltage of 18/30 (36) kV
- Maximum rated current: 400 A
- Withstands pressures to 4,400 psi differential



7 DEUTSCH P6-SW400 Wet-Mate Connectors

- Peek insulation
- 1 contact with a rated voltage of 6/10 (12) kV
- Maximum rated current: 400 A
- Withstands pressures to 4,400 psi differential



8 DEUTSCH P6-SW400 Penetrators

- Offered in ceramic and peek insulation
- 1 contact with a rated voltage of 6/10 (12) kV
- Maximum rated current: 400 A
- Withstands pressures to 4,400 psi differential



9 DEUTSCH P6-SW1600 Wet-Mate Connectors

- Jumper options for straight or 90° terminations
- 1 contact with a rated voltage of 6/10 (12) kV
- Maximum rated current: 1,600 A
- Withstands pressures to 2,900 psi differential

Well Access Systems

Monitoring and Control

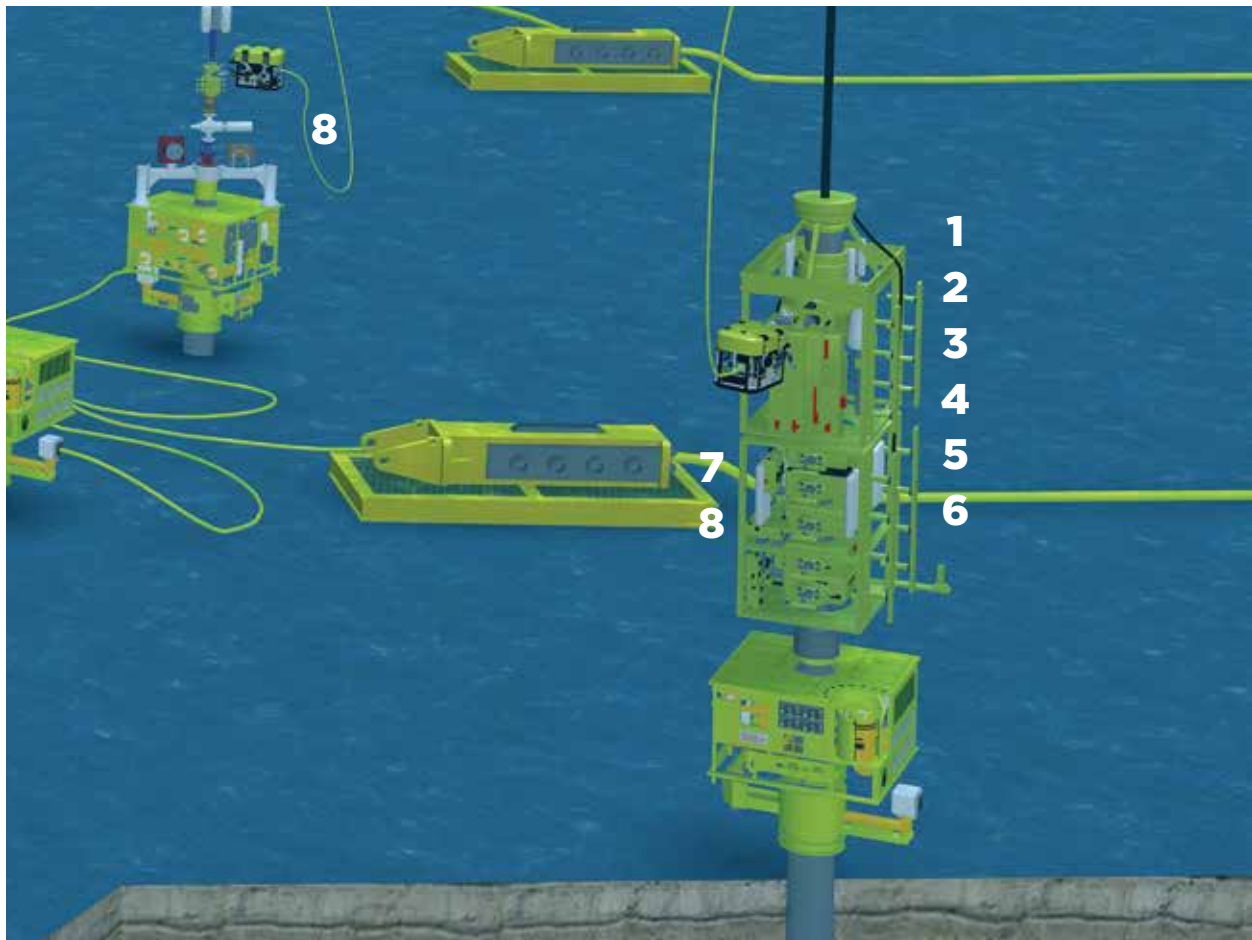
Downhole applications represent one of the most challenging environments. Data from downhole not only provides a clear real-time picture of current conditions, but also forms the basis for sophisticated predictive modeling. This permits enhanced operating efficiencies and improved recovery of petroleum reservoirs.

Reliability Below the Seabed

Beyond withstanding pressures to 15,000 psi and operating temperatures as high as 300°F, connectors for downhole applications must be sealed against harsh fluids. Plus, the environment is space constrained so that size matters significantly, and compact connectors are favored.

Applications

- Blowout Preventer
- Workover Systems
- Landing Strings
- Drill Stem Testing
- IWOCs





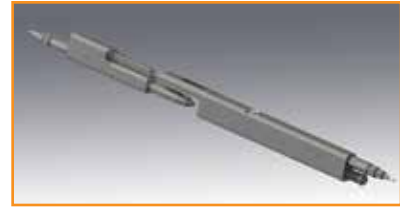
1 SEACON MSS-API Bulkhead Connectors

- American Petroleum Institute specifications 16D and 17E
- Ratings include voltages to 600 VDC and pressure to 10,000 psi
- Electrical and optical connector options are available in 8 shell sizes



2 SEACON ALL-WET Connectors

- Reliable rubber molded connectors
- Enables users to make and break connections both on the surface and underwater
- Available in a range of configurations
- Capabilities of up to 42 contacts, 600 VDC, 50 A, and 20,000 psi pressure



3 SEACON G3 Connectors

- Underwater-mateable connector offers low-profile optical connectivity
- Available in 6 channels with either single-mode or multimode optical fibers
- Rated to 15,000 psi
- Operating temperature up to 150°C



4 SEACON SEA-MATE Connectors

- For diver communications, underwater TV, lights, ROVs, and ship-to-shore communication
- 7500 psi in both mated and unmated conditions
- Options include oil-filled pressure balancing, ROV mateability, and a high-power 50 A version



5 SEACON MSS Metal Shell Series Connectors

- Designed to withstand full ocean depth pressure and harsh environments
- Offshore, exploration and military applications
- Available in 8 shell sizes with up to 156 contacts, including coax



6 DEUTSCH Downhole Electrical and Optical Connectors

- For high-pressure, high-temperature downhole applications
- Signal and optical wet-mateable connectors with multiple contacts
- Withstands pressures up to 30,000 psi and temperatures to 205°C



7 SEACON RUFF-NEK Connectors

- MSSQ RUFF-NEK CCP connector is a MUX cable termination
- Positive pressure, maintained at 60 psi using a spring-loaded piston, deters water ingress
- Advanced conductor booting technology assures functionality even when the connector is water-flooded



8 Rochester Wireline Cable

- Used in logging, perforating, and downhole well applications worldwide
- Designed for hot, corrosive downhole environments
- High-temperature insulations
- Special copper alloys
- Anticorrosive alloys for armoring



9 ROV Umbilical and Tether Cable

- Small diameter cable reduces overall weight, even with optional wire armor
- Central hermetic stainless steel or brass tube for high density fiber optic channels
- Customizable features, catering to pressure, temperature, channel count, length, design life, and more

Wherever You Need Us, We'll Be There

Serving global customers with a single point of contact, the Global Center of Excellence Network helps minimize risks, preserve profits, automate efficiencies and gain real-time intelligence from a scalable platform offering integrated solutions.

We bring the full force of the TE Connectivity global network to help you solve your toughest challenges for more stringent applications that go deeper and deeper into harsh environments. Our marine, oil and gas group and management team are dedicated to working closely with both equipment designers and exploration/production companies to create connectivity solutions that meet the specific demands of your subsea applications.

For more than half a century, our best-in-class electronic systems and components have withstood weather, corrosion, and extreme temperatures to help keep subsea oil and gas exploration and production productive, safe, and dependable in tough operating environments.

Advanced Fiber Products
Suffolk, UK

American Sensor Technologies
Budd Lake, NJ

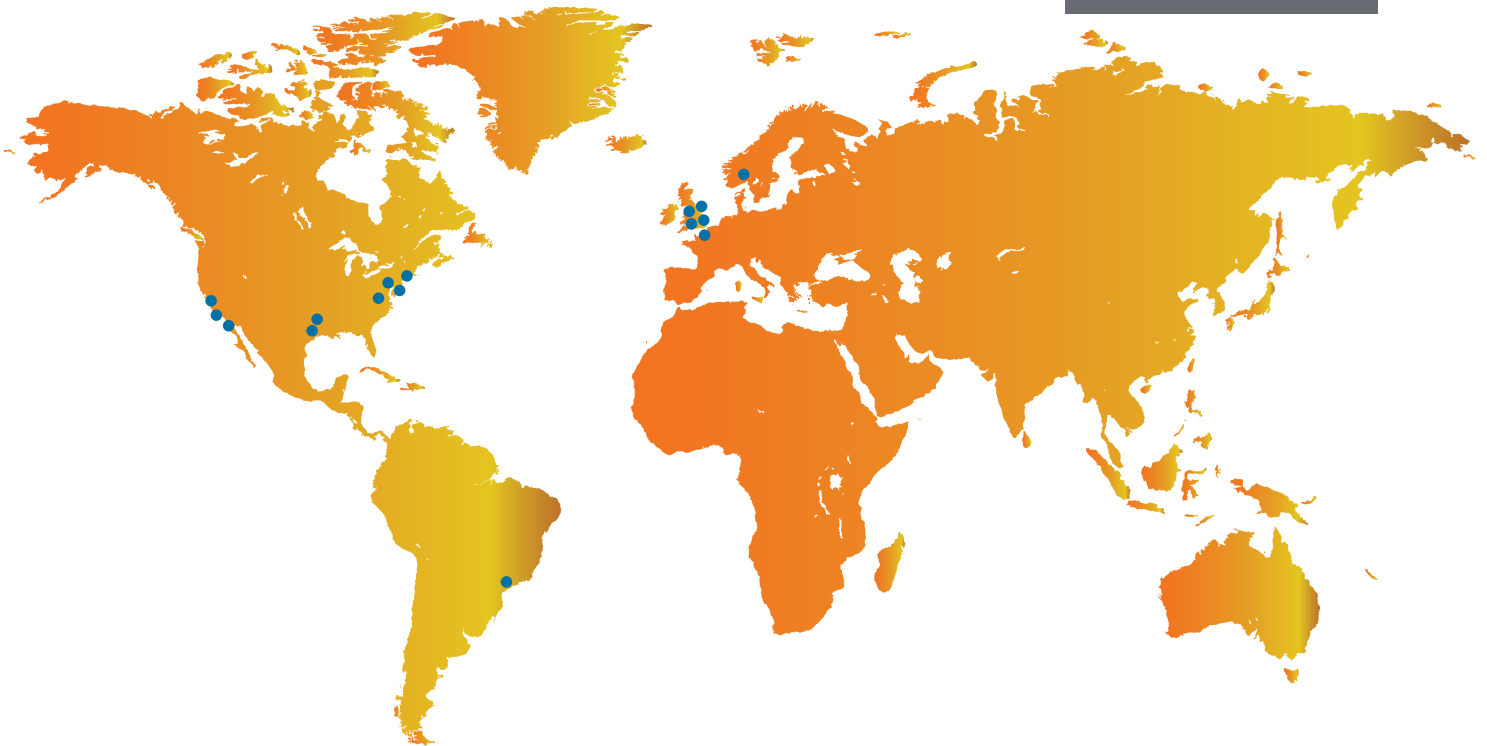
DEUTSCH Offshore
Le Mans, France

Raychem
Menlo Park, CA
Swindon, UK

Rochester Wire and Cable
Culpepper, VA
Houston, TX
Bedfordshire, UK

SEACON
El Cajon, CA
Bellville, TX
Ashaway, RI
Tijuana, Mexico
Great Yarmouth, UK
Rio de Janeiro, Brazil
Notodden, Norway

SubCom
Eatontown, NJ



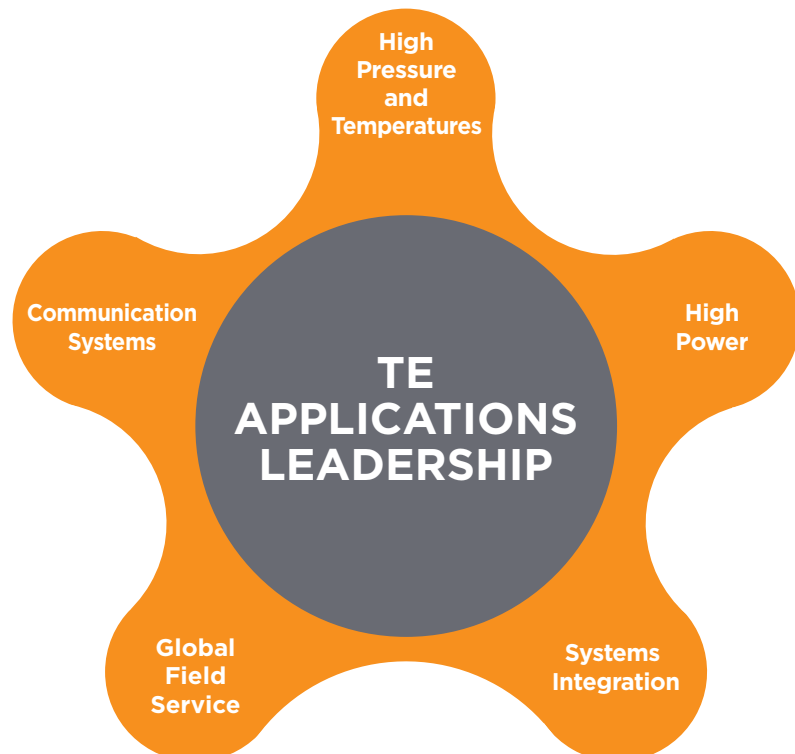
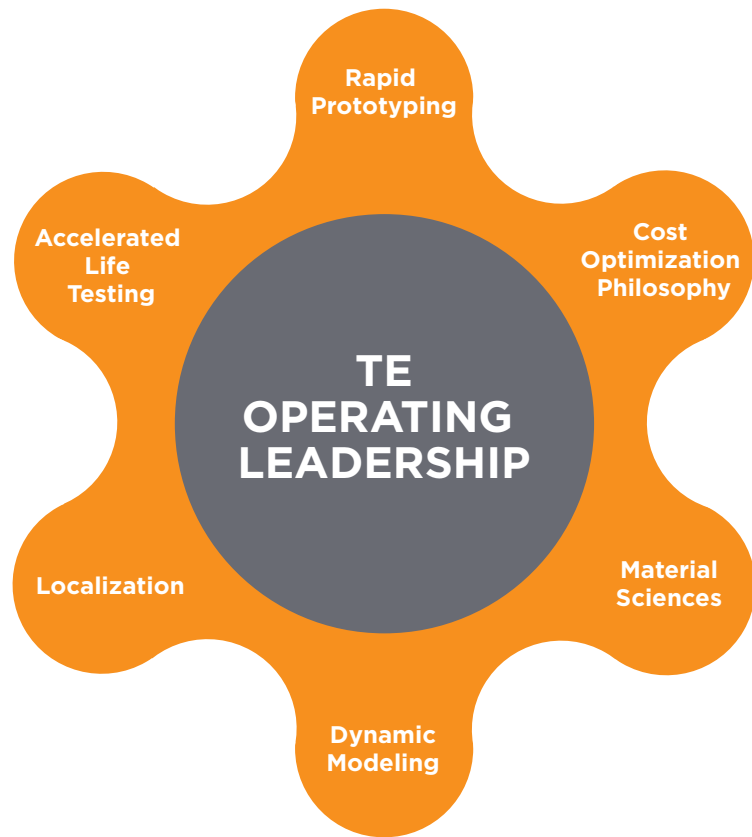


Thought Leadership: Connecting Performance with Reliability

Thought Leadership starts with capabilities and extends into products and applications.

TE helps you boost performance and increase reliability in one of the most extreme application environments on earth. Whether it's corrosive salt spray on a wind-swept oil rig or the incredible hydrostatic pressures on umbilical cable on a 10,000 foot dive of a remotely operated vehicle (ROV), we're relentless in our drive to save space and weight and increase performance to the maximum.

Count on TE for wide-ranging interconnection solutions. We speak your language, have wide and deep experience solving the tough problems in offshore exploration and production, and work closely with customers to find and deliver the best solution.



LET'S CONNECT

We make it easy to connect with our experts and are ready to provide all the support you need. Just call your local support number or visit te.com to chat with a Product Information Specialist.

Technical Support

te.com/support-center

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Consult TE for the latest dimensions and design specifications.

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