



# SOLUTIONS FOR MILITARY MARINE

SEAWORTHY SOLUTIONS

For Surface Ships and Submarines . . . Space-Saving,  
Performance-Enhancing Electrical Interconnects, Cables,  
and Power Management that Keep the Fleet on Station

**iS** Rayfast

# LAUNCH WITH MISSION-CRITICAL RELIABILITY

## Supporting the Mission with Powerful Solutions

The sea is a harsh environment, ever challenging the electrical and electronic systems that control naval vessels. With our deep understanding of the unique needs of marine environments, TE Connectivity (TE) has a proud history of providing solutions to make ships more reliable, more sophisticated, and mission ready. Our solutions save weight, require less space, and help you achieve new levels of performance. Whether it's processing-intensive target acquisition or reliable delivery of power, you'll find more choice of seaworthy products to support the mission undersea, in littoral waters, or across the expanses of oceans.

## Typical Applications

- Main Guns
- Close-In Weapon Systems
- Missile Systems
- Torpedo Systems

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

AMP | Agastat | CII | Hartman | Kilovac | Microdot | Nanonics | Polamco | Raychem | Rochester | DEUTSCH  
SEACON Phoenix | L.L. Rowe | Phoenix Optix | SEACON

Get your product to market faster with a smarter, better solution.

### DEUTSCH DTS AND 602 BRONZE CONNECTORS

DTB threaded connectors are MIL-DTL-38999 Series III style and STD CECC 75201-002 styles, but feature a bronze shell and environmental sealing to withstand harsh marine environments. The 602/RR Series are medium-density bayonet-coupling connectors. They include styles and layouts qualified to Pattern 602 and are intermateable with MIL-DTL-26482 Series II connectors. An aluminiumbronze option is designed specifically for naval applications



### RECTANGULAR CONNECTORS

A full line of rack-and-panel connectors support power, signals, RF and optics in modular high-density rectangular connectors for easier "black-box" installation and removal of LRUs and similar equipment. Along with a full range of high-speed backplane connectors, we support speeds of 10+ Gb/s while providing rugged reliability in marine environments





## Solutions for Weapons Systems

### High-Speed Connectors

- High-Speed Electrical and Optical I/O Connectors
- High-Speed Backplane Connectors

### High-Performance Connectors

- Rack and Panel Connectors
- Circular Mil-Spec Connectors
- RF Connectors
- Rugged Optics

### Relays and Contactors

- High-Performance Relays and Contactors
- Motor Drive Relays

### Wire and Cable

- Zero-Halogen Wire and Cable
- Multiconductor Cable
- Harnessing Components

### MOTOR DRIVE RELAYS

Our competence in high-performance relays for military applications is exemplified by MDR relays. Even under extreme vibration and shock, MDR relays give chatter-free operation. The 10 A rotary relays are available with up to 24 poles, AC or DC coils, and latching and nonlatching styles to satisfy a variety of needs for high-reliability operation in challenging applications



### DEUTSCH DBAS SERIES 81703 CONNECTORS

An extremely rugged connector with push-pull coupling, the DBAS Series offers easy and secure locking. The coupling ring is free to rotate, providing a unique feel-control check for 100% mating. With a temperature rating from -55°C to +200°C, the connectors are available in environmentally or hermetically sealed, rack-mountable, and lanyard release versions



### SEACON PHOENIX CABLE ASSEMBLIES

Integrated harnesses provide ready-to-install solutions that mean reliability in the toughest application environments. Every assembly meets your requirements for sealing, pressure proofing, moisture and chemical resistance, shielding, strain relief, flexibility, and ease of use



# RELY ON HIGH-PERFORMANCE POWER CONTROL

## Connecting Vessels with Rugged Performance

We offer relays and contactors with make/break current ratings up to 2000 A, current ratings up to 1000 A at 28 VDC and 500 A at 900 VDC, and hermetic sealing for reliability. Our relays offer an industry-leading combination of high-current switching in compact, lightweight packages.

Power cables and connectors are designed to carry power efficiently, with lower resistance and less bulk. Our power solutions may help combat the potential hazards of naval applications, resisting salt, moisture, harsh oils, fuels, and other solvents and maintaining efficient power distribution under tough conditions of vibration and shock.

## Typical Applications

- Power Distribution Racks
- Load Centers
- Automatic Bus Transfers
  
- Motor Controllers
- Hybrid Electric Propulsion

### DEUTSCH RACK AND PANEL POWER SUPPLY CONNECTORS

Designed for battery racks, CSR 31000 Series connectors offer two main power contacts—with ratings of 350 or 500 A—and zero or seven pilot contacts. The fixed socket and floating plug arrangement offers generous misalignment tolerances for easy mating



### RAYCHEM HIGH-VOLTAGE TERMINATION KITS

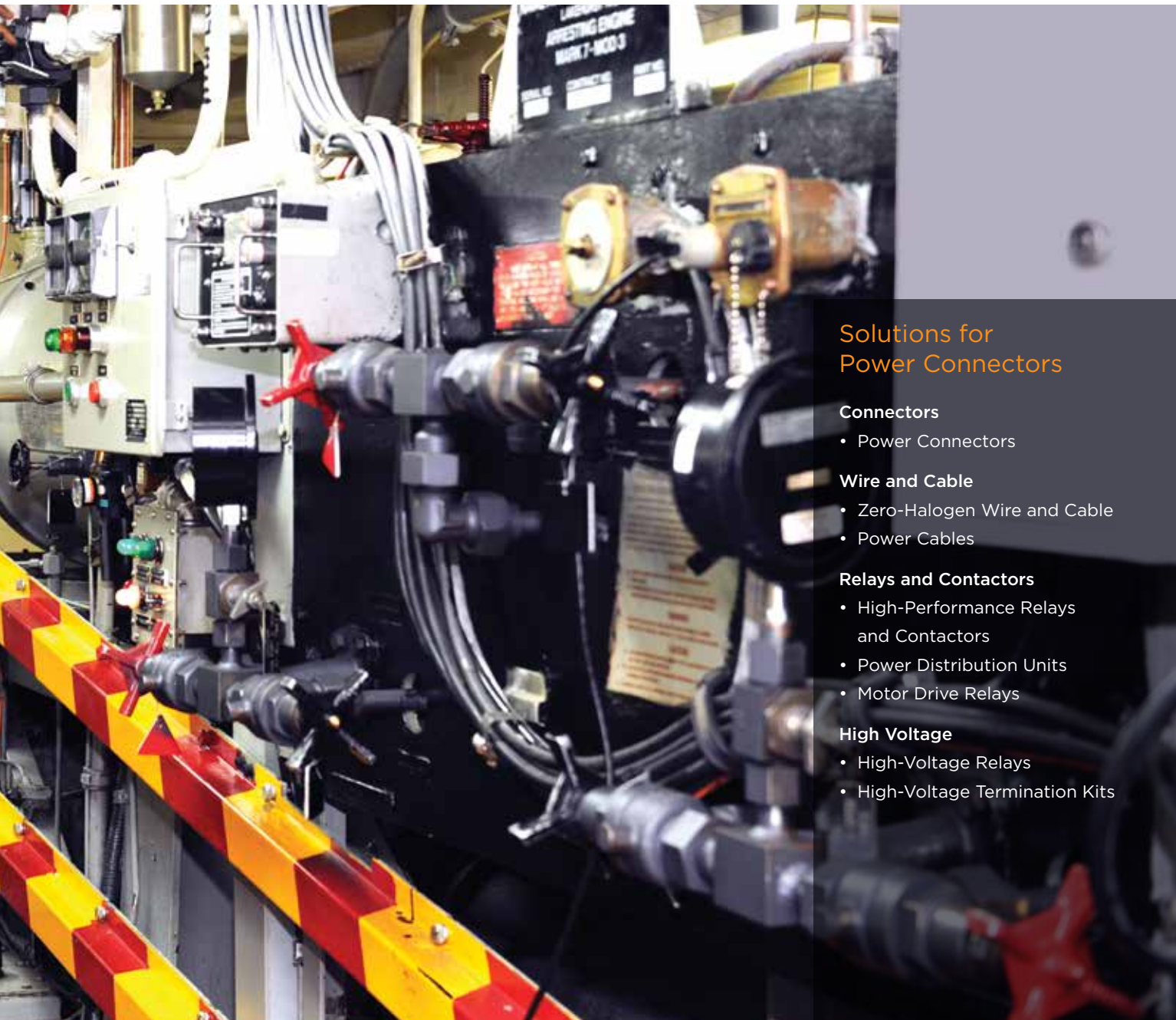
For a long service life at ratings of up to 35 kV, high-voltage termination kits feature a nontracking insulating surface that can withstand long-term electrical stress and surface pollution. Extensive load cycle testing verifies the long-term thermomechanical compatibility between the termination system and the cable



### RAYCHEM ZERO-HALOGEN POWER CABLES

Safer power is possible by reducing or eliminating emissions of toxic or corrosive gasses in the event of a fire. Our flexible and lightweight zero-halogen power cables accommodate both primary and secondary power needs in a rugged cable





## Solutions for Power Connectors

### Connectors

- Power Connectors

### Wire and Cable

- Zero-Halogen Wire and Cable
- Power Cables

### Relays and Contactors

- High-Performance Relays and Contactors
- Power Distribution Units
- Motor Drive Relays

### High Voltage

- High-Voltage Relays
- High-Voltage Termination Kits

### DEUTSCH DTS-HC SERIES CONNECTORS

Ideally suited for high-power interconnections in harsh environments, the connector's power contacts are rated to 300 A and are suitable for terminating conductors up to 70 mm<sup>2</sup>. Based on proven military standard 38999 housings, the connectors provide the reliability and performance required for the most demanding military and aerospace applications



### HIGH-VOLTAGE DC CONTACTORS

TE delivers the switching performance demanded for marine, aerospace and defense applications with our lightweight contactors, which offer continuous current ratings up to 500 A at 900 VDC in very compact sealed packages. Custom-designed main power and high-voltage distribution assemblies are also available



# SMARTER CONNECTIVITY FOR INTELLIGENT COMMUNICATIONS

## Increasing Capability in Communications Systems

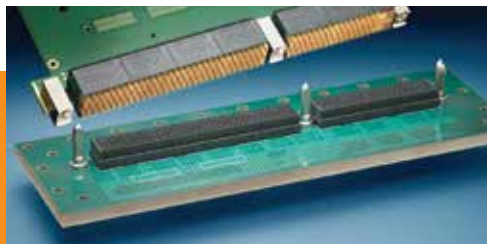
The increasing sophistication and importance of communication systems demand more processing power and more bandwidth. Equally important is miniaturization to pack more processing power into smaller spaces. We offer a wide range of high-density, high-speed connectors to enable high speeds from the backplane to the I/O.

## Typical Applications

- Combat Systems
- Fire Control
- Machinery Control
- C4 Processors
- Radio Systems
- Radar

### CONNECTORS FOR VPX EMBEDDED COMPUTING

Achieve complete high-speed, high-density interconnections for VPX embedded computing with MULTIGIG RT 2 connectors for VITA 46, Mezalok mezzanine connectors for VITA 61, MULTI-BEAM XLE power connectors for VITA 62, and optical and RF modules for VITA 66 and 67



### FIBER-OPTIC CONNECTORS

Count on complete support of your needs for optical connectivity—whether you need vibration-tolerant expanded beam, high-performance ceramic ferrule, or high-density MT ferrule-based interconnections. Choices include fiber-specific connectors and termini for a range of Mil-Spec circular and rectangular connectors



### RF CABLE AND CONNECTORS

As a leading manufacturer of RF connectors, cable, cable assemblies and application tooling, we provide a wide range of coaxial connectors for the defense industry including military-qualified SMA, BNC and TNC connectors along with a portfolio of small form factor high-frequency connectors





## Solutions for Radar and Communications

### Embedded Computing

- High-Speed I/O Connectors
- High-Speed Backplane Connectors
- Optical and RF Modules

### Mil-Spec Connectors

- Circular Connectors
- RF Connectors
- Rugged Optics
- High-Voltage Connectors

### Wire and Cable

- Controlled Electrical Cables
- Zero-Halogen Wire and Cable
- High-Speed Networking Cable

### Relays and Contactors

- High-Voltage Relays
- Lightweight AC/DC Relays and Contactors
- Motor Drive Relays
- Signal Relays

### CEELOK FAS-X CONNECTORS

Using a 38999-style shell, CeeLok FAS-X connectors handle speeds of 10 Gb/s and more, making them an ideal choice for 10G Ethernet, IEEE 1394, USB 2.0 and other high-speed protocols. The termination and assembly is fast and straightforward, including the ability to field terminate and repair in as little as 5 minutes



### POLAMCO BACKSHELLS

Our newest line offers a complete range of high-performance backshells for unshielded, shielded, and rugged conduit systems. Supporting one of the widest variety of Mil-Spec and COTS connectors, we have a solution for rugged, lightweight, and specialized needs



### 9316 SERIES CONNECTORS

A workhorse family for a wide range of on-ship and off-ship applications, immersible 9316 connectors are available in seven stainless steel shell sizes for power, signal, coaxial, and optical contacts. The connectors are available with a range of voltage, current, and temperature ratings, with a pressure rating to 10,800 psi, and in explosion-proof and hermetic versions



# BUILD IN RELIABILITY FROM BOW TO STERN

## Boosting Performance with Powerful Infrastructure Solutions

We support the complete infrastructure of naval craft, from power to communications and from networks to electrical systems. You will find cables with reduced size and weight, sealed relays and contactors, and a wide assortment of products to help manage and identify cables and subsystems. Marine-grade heat-shrink tubing, identification products, grounding and wire termination, and sealed bulkhead feed-throughs are just a few examples of products that can help build a reliable, maintainable infrastructure.

## Typical Applications

- Cable Management Systems
- Electrical/Control Panels
- Lighting Systems
- Voice/Video Systems
- Feed-Through Panels

### SEACON PHOENIX AND L.L. ROWE PENETRATORS

Our range of pressure-tested penetrators spans the needs of submarines, surface ships, and unmanned underwater vehicles—from hulls to compartmentalization. With support for signals, power, and optics, penetrators are available in standard and custom configurations to meet specific requirements for pressure, contact configurations and density, and service life



### DEUTSCH 901 SERIES CONNECTORS

With a strong coupling system to resist harsh environmental and mechanical challenges, these rugged connectors are designed in accordance with ABG/T 538 standards



### COMPOSITE ENCLOSURES

Custom-made enclosures using advanced composites have excellent impact resistance and strength, but are significantly lighter to save critical weight. Plus they can offer EMI shielding, custom circuits and contacts, embedded antennas, and other features







## Solutions for Hull Systems

### Connectors

- Pressure-Proof Connectors
- Penetrators

### Wire and Cable

- Custom Marine Cables
- Multiconductor Cables
- Zero-Halogen Wire and Cable

### Harnessing

- Zero-Halogen Tubing, Boots and Transitions
- Gel-filled Sealing Boots
- Glands
- Anti-Corrosion Sealing Sleeves
- Shield Termination and Grounding Kits

### L.L. ROWE SUBMARINE NAVIGATION LIGHTS

We design a variety of lights qualified to MIL-DTL-24560 for shipboard navigation, signal, and warning lights suited to both surface and subsea applications. Submarine lights use tempered glass Fresnel globes to enhance light output, increase impact resistance, and withstand discoloration and etching at sea



### RAYCHEM MULTICONDUCTOR CABLE

Our expertise in advanced materials yields wire and cable that's smaller, lighter, and tougher than traditional counterparts, with wide temperature ranges, resistance to fuels, salt water and contaminants, and options for EMI/EMP shielding. They also offer the flexibility to route through tight spaces and sharp turns



# GO THE DISTANCE WITH HIGH PERFORMANCE ON SHIP OR OFF

## Strengthening Cable Reliability Through Innovation

Towed array sonar and similar applications require tough cables. Supporting both shallow and deep towing, we offer steel-armored cables capable of withstanding depths up to 6000 meters with concentric stranded conductors and ruggedized optical packages for harsh environments. The cables provide the strength and low rotation required for high-speed towing.

We offer a wide range of configurations—available in both standard and custom versions—supporting power, multiconductor, coaxial, and optical needs for power, instrumentation, video and any other applications. And we excel at producing cables that are smaller and lighter without sacrificing performance.

## Typical Applications

- Processors
- Receivers
- Transmitters
- Towed Arrays

### L.L. ROWE ELECTRICAL PANELS

Our electrical panels for communications, testing, and power distribution are built to meet MIL-STD-461 EMC and MIL-S-901 shock requirements. They feature heavy-gauge construction and shielding as appropriate to create rugged panels that will neither interfere with sensitive electronics nor be susceptible to outside EMI



### ROCHESTER AND RAYCHEM SONAR DIPPING CABLE

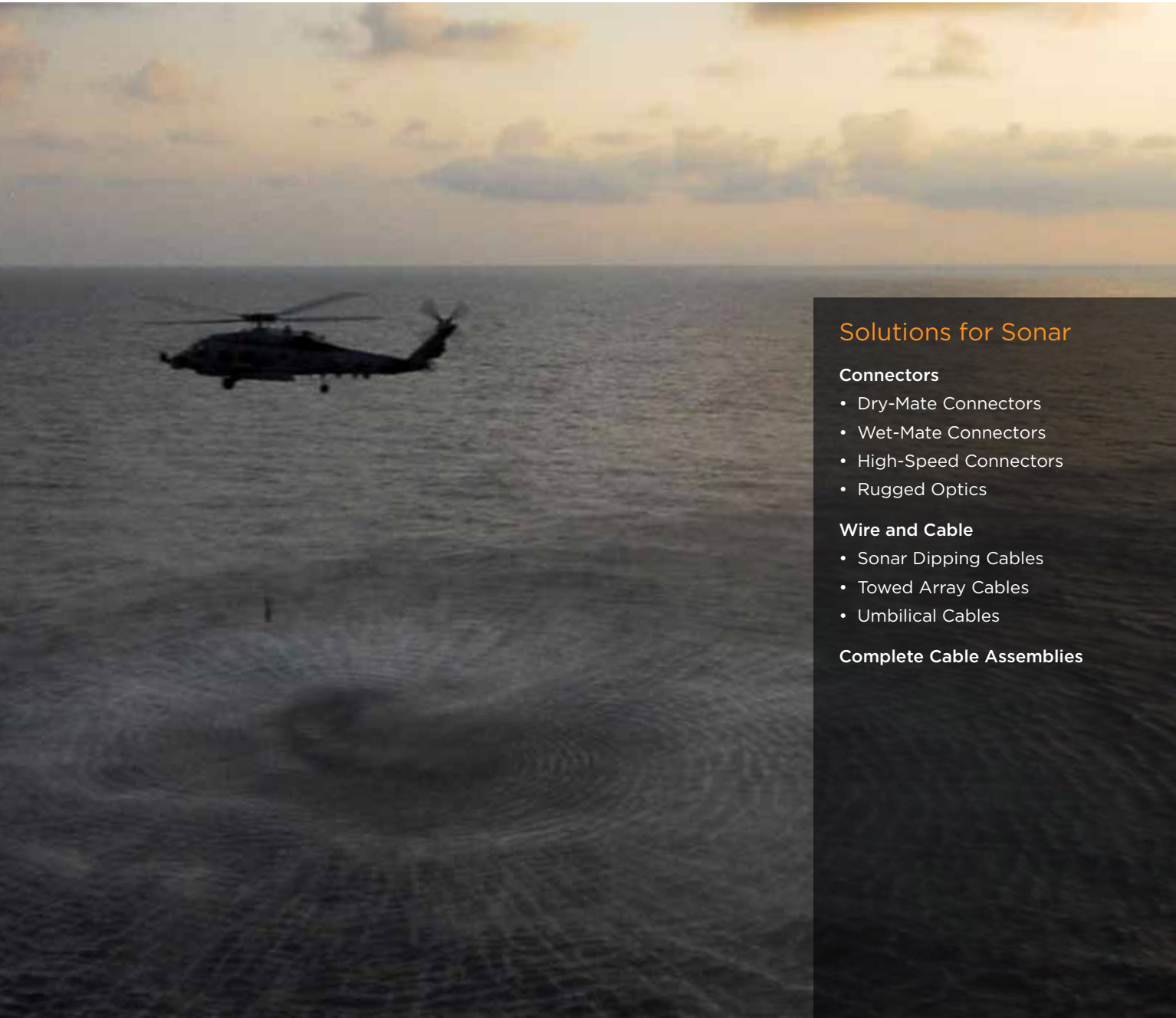
Naval organizations throughout the world rely on both Raychem and Rochester Cable branded products for applications including submarine towed array cables, helicopter dip sonar cables and electro-optical cables for ROV salvage and recovery



### SEACON AND L.L. ROWE PROXIMITY SWITCHES

Pressure-tested and hermetically sealed magnetic proximity switches, which are commonly used to indicate mast and antenna position, withstand pressures as high as 10,000 psi. The rugged switches offer high cycle lives to provide a rugged solution





## Solutions for Sonar

### Connectors

- Dry-Mate Connectors
- Wet-Mate Connectors
- High-Speed Connectors
- Rugged Optics

### Wire and Cable

- Sonar Dipping Cables
- Towed Array Cables
- Umbilical Cables

### Complete Cable Assemblies

#### SEACON AND DEUTSCH UNDERWATER CONNECTORS

Wet-mate or dry-mate, our pressure-tested connectors withstand the pressures and harsh environment of underwater applications



#### ROCHESTER TOWED ARRAY CABLES

Designed for and successfully deployed in the most hostile environments, our towed array cables, available with both copper systems and state-of-the-art electro-optic systems, feature custom armoring and steel-armored optical elements to achieve extended life



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