

A collage of three images showing different types of rugged fiber optic cable assemblies. The top left shows a cable with a multi-pin connector. The bottom left shows a cable with a blue connector. The center shows a cable with a black connector. The background of the collage is a mix of light blue and orange.

PHOENIX OPTIX RUGGED FIBER OPTIC CABLE ASSEMBLIES

FOR HARSH ENVIRONMENTS

Wide Choice in Custom Cable Assemblies to
Help Meet Challenging Outdoor Environments

CABLE ASSEMBLIES

for Harsh Environments

HIGH PERFORMANCE

- Assemblies meet or exceed industry requirements for optical performance
- Factory tested for reliability and optical performance
- Sealed for dust and water protection
- Corrosion resistant

COST EFFECTIVE

- Overall cost per assembly is lower than other common options, such as field termination

READY TO INSTALL

- No special tools or training required

CUSTOMIZED TO YOUR REQUIREMENTS

- Length
- Labeling
- Furcation and breakouts
- Cable type
- Fiber counts
- Connector types and finishes

FULL RANGE OF CABLE TYPES

- Single mode and multimode
- Tactical
- OSP
- Armored
- Indoor/outdoor

The Phoenix Optix Advantage

Save Time and Money

By replacing on-site cable terminations with preterminated cable assemblies, you can help speed deployment and eliminate scrap. You also reduce costs for training and tooling associated with various connector types and procedures. Assemblies are provided ready to install.

Get Premium Performance

Phoenix Optix cable assemblies from TE Connectivity (TE) are made with some of the best performing connectors and cables in the industry. And our processes and uncompromising commitment to quality means optical performance meets or exceeds industry standards such as TIA-568C.

Each cable assembly is factory tested and you receive documentation of test results. So you know exactly what you are getting.

We offer SC and LC connectors with PC, APC, and UPC end finishes, and MPO ferrules in standard and low-loss versions.

Built to Survive Harsh Environments

For harsh environments, we offer a large variety of cable assemblies. Our cable assemblies give you excellent environmental sealing and resistance to vibration, corrosion, and temperatures.

Whether it is Fiber to the Antenna for connections to remote radio heads, tactical deployment in military applications, or rugged industrial applications, our cable assemblies provide rugged durability.

We offer five types of harsh-environment cable assemblies:

- **ODVA-style** connectors with IP68 sealing with MPO, LC, or SC connectors
- **TE FullIXS** connectors with LC connectors and designed for FTTA applications
- **TE PRO BEAM Jr** expanded beam connectors for high-vibrations or high-mating-cycle applications
- **TFOCA connectors** with physical contact interface for tactical military and similar applications
- **MIL-PRF-28876** connectors with physical contact interface and up to 31 fibers

Optical Performance

Application	Connector Type	Insertion Loss	Return Loss
Multimode	MPO	.35 dB	-25 dB
	MPO Low Loss	.25 dB	-25 dB
	LC/SC	.25 dB	-30 dB
	LC/SC Low Loss	.15 dB	-30 dB
Single Mode	MPO	.60 dB	-60 dB
	LC/SC	.25 dB	-57 dB

Test Methods: IL per TIA/EIA-455-171 Method B • RL per TIA/EIA-455-107 Method 1

LC, SC, AND MPO CONNECTORS

IP68-Rated Cable Assemblies



Applications

- FTTA
- Industrial
- Broadcast
- Communications

Rugged

- IP68 sealing
- Lightweight, durable materials
- ODVA compliant
- -40°C to +70°C

Optical Performance

- See page 2

Easy to Use

- Bayonet locking for easy reliable mating

Wide Range of Choices

- LC duplex connectors
- SC simplex connectors
- Standard or low-loss 12-fiber MPO connectors, male or female
- In-line or chassis-mount adapters

PERFORMANCE

Durability: 100 mating cycles

Pull Force, Straight: 25 kg

GR-326-Core Compliant

Fiber Types: OM1, OM2, OM3, OM4, and SM

Cable Types: Indoor/outdoor, tactical, Mil-Spec, armored

TYPICAL CONFIGURATIONS

Consult TE for full range



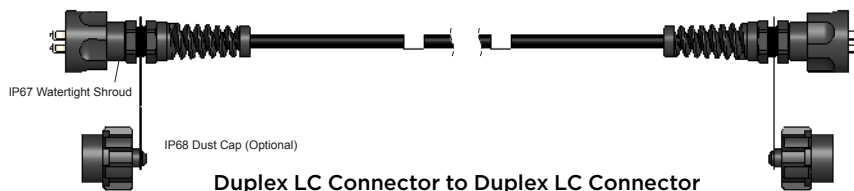
LC Connector



SC Connector



MPO Connector



Duplex LC Connector to Duplex LC Connector



MPO Connector to MPO Connector



MPO Connector to SC Connector

FULLAXS CONNECTORS

Cable Assemblies for Remote Transceivers



Applications

- FTTA
- Outdoor Industrial
- Robotics
- Aerospace and Defense

Excellent Environmental Performance

- IP65 or IP67 sealing
- 100-mating-cycle durability
- -40°C to +85°C
- Vibration resistant

Low Insertion Loss

- 0.5 dB multimode
- 0.3 dB single mode

High Return Loss

- 50 dB

Easy to Use

- One-handed, blind mating
- Robust bayonet locking requiring only 30° turn
- Allows easy access to transceiver ports

Two Sizes

- Standard
- Space-Saving Mini: 20% smaller than the standard FullAXS connector
- Duplex LC connectors

CONNECTOR ENVIRONMENTAL PERFORMANCE

Protection Class: IP65 and IP67 (IEC 60529)

Operating Temperature

Mini: -40°C to +85°C

Std: -40°C to +70°C

Pull Force:

Mini: 150 N (IEC 60512-17-1/
EIA-364-38)

Std: 150 N (IEC 61300-2-4)

Side Load:

Mini: 150 N (IEC 60512-17-1/
EIA-364-38)

Salt Spray:

Mini: EIA 364-26B Condition A

Std: IEC 61300-2-26

Durability: 100 mating cycles
(EIA-364-9)

Flammability Rating: UL94-V0

UL F1 rated (ISO 4892-3)

Vibration

Mini: 10-150-10Hz sweeping
(IEC 60512-6-4)

Std: IEC 61300-2-1

Impact:

Std: IEC 61300-2-12

Temperature/Humidity:

Std: IEC 61300-2-22

Lightning Strike:

Mini: 20 kA at 10/350 μ s
(IEC 62305-1)

TYPICAL CONFIGURATIONS

Consult TE for full range



FullAXS Connectors to LC Connectors



FullAXS Connector to FullAXS Connector

PRO BEAM JR CONNECTORS

Expanded Beam Cable Assemblies



Applications

- Broadcast
- Military Deployment
- Industrial
- Oil/Gas/Mining
- Marine Ship to Shore

Easy to Use

- Hermaphroditic Interface
- No gender mating issues
- Consistent polarity
- Assemblies can be concatenated

Repeatable Low-Loss Performance

- 0.7 dB, multimode
- 1.0 dB, single mode

Flexible Choices

- Aluminum or nickel aluminum bronze shells
- 2 or 4 fibers

Rugged Interface

- Very vibration resistant
- Dust and debris resistant
- Weather and water resistant
- Easy alignment for low-loss, repeatable performance
- -40°C to +85°C

Durable

- No wear on fiber optic expanded beam interface
- 3000-mating-cycle durability
- Low sensitivity to thermal fluctuations and interface contamination

CONNECTOR ENVIRONMENTAL PERFORMANCE

Mud: Five minute immersion, clean with water (EIA/TIA 455-20)

Water Pressure: MIL-STD-810, Method 512.4, 1 m, 48 hrs

Ice Crush: DOD-STD-1678, Method 4050

Humidity: EIA/TIA 455-5, Method B, 10 cycles

Flammability: MIL-STD-1344, Method 1012

Vibration (Operational): EIA/TIA 455-11: 10 g at Test Condition III, 1.5 hrs at Test Condition IV-C

Shock: EIA/TIA-455-14, Condition C

Mating Durability: 2000 cycles per EIA/TIA-455-21

Cable Seal Flexing: EIA/TIA 455-1, Procedure 1

Twist: 1000 cycles per EIA/TIA-455-36, $\pm 90^\circ$, 11 lbs

Cable Retention: EIA/TIA-455-6, 400 lbs min., 10 minutes

Impact: EIA/TIA-455-2, Method B, Severe Service

Crush Resistance: EIA/TIA-455-26, 450 lbs min.

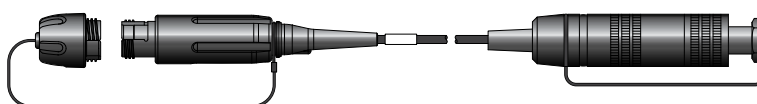
Corrosion Resistance: MIL-STD-1344, Method 1001, Condition A

TYPICAL CONFIGURATIONS

Consult TE for full range



PRO BEAM Jr Connector to PRO BEAM Jr Connector



PRO BEAM Jr Connector to TFOCA Connector

TFOCA CONNECTORS

Tactical Physical Contact Cable Assemblies



Applications

- Broadcast
- Military Deployment
- Industrial
- Oil/Gas/Mining
- Marine Ship to Shore

Easy to Use

- Hermaphroditic Interface
- No gender mating issues
- Consistent polarity
- Assemblies can be concatenated

Low Insertion Loss

- .30 dB multimode
- .40 dB single mode

High Return Loss

- 50 dB return loss

Rugged

- Designed to withstand weather, corrosion, and vibration
- -46°C to +71°C

Wide Range of Choices

- 2 to 24 fibers
- Flange mount
- Jam nut
- Zinc nickel-plated stainless steel or brass shells
- Four keying options

CONNECTOR ENVIRONMENTAL PERFORMANCE

Mating Durability: TIA-455-21, 2000 cycles

Impact: TIA-455-2, Method B

Twist: TIA-455-36, 1000 Cycles @ $\pm 90^\circ$

Cable Seal Flexing: TIA-455-1, (Procedure 1)

Cable Retention: TIA-455-6, 400 lbs min.

Crush Resistance: TIA-455-26, 450 lbs

Temperature Life: TIA-455-4, 250 hrs, $85 \pm 2^\circ\text{C}$

Thermal Shock: TIA-455-71, 10 cycles @ 85° and -62°C

Physical Shock: TIA-455-14A, Condition C

Vibration: TIA-455-11B, Condition III and VI, for 1.5 hrs Except III

Humidity: TIA-455-5C, Method B

Salt Spray: TIA-455-16, Condition C

Fluid Immersion: TIAs-455-12, All fluids subject to 24 hrs

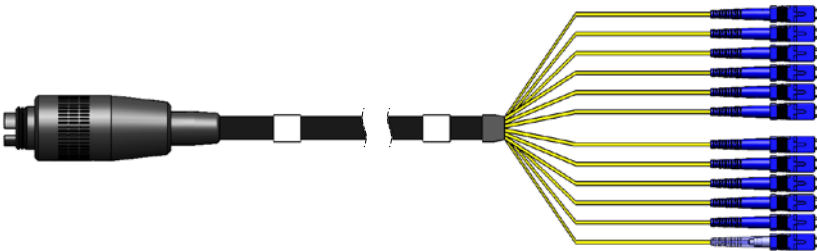
Freezing Water Immersion: TIA-455-98, Method A, Procedure 1, 1 m for 24 hrs, bulkhead mounted in watertight housing

TYPICAL CONFIGURATIONS

Consult TE for full range



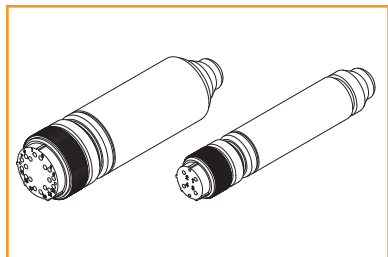
TFOCA Connector to TFOCA Connector



TFOCA Connector to SC Connectors

M28876 CONNECTORS

Physical Contact Cable Assemblies



Applications

- Broadcast
- Military Deployment
- Industrial
- Oil/Gas/Mining
- Marine Ship to Shore

CONNECTOR ENVIRONMENTAL PERFORMANCE

Durability: 500 mating cycles per EIA/TIA-455-21

Vibration: EIA/TIA-455-11, Test Condition II & VII, 30 minutes/axis

Humidity: EIA/TIA-455-5, Method B, 240 hrs @ 98% RH

Mechanical Shock: MIL-STD-901, Grade A, Class I

Thermal Shock: EIA/TIA-455-11, Test Condition II & VII, 30 minutes/axis, -40°C to +70°C,

Thermal Cycling: EIA/TIA-455-3, -5°C to +25°C, 5 cycles per

Corrosion Resistance: EIA/TIA-455-16, Test Condition I, 500-hr salt spray

Ozone Exposure: EIA/TIA-455-189, 150 ppm for 2 hrs

Fluid Immersion: EIA/TIA-455-12

Crush Resistance: EIA/TIA-455-26, 7 tests at 1250 N

Cable Pull Out Force: EIA/TIA-455-6, 162 lb for 10 minutes

Cable Sealing Flexing: EIA/TIA-455-1, 200 cycles at 180° flex

Impact: EIA/TIA-455-2, Method B, 8 drops at 7 ft rotated each time per

Flammability: EIA/TIA-364-810, 75 inch flame for 10 seconds mated, 1.5 inch flame for 60 seconds unmated

Rugged

- Full environmental sealing
- Fully field maintainable in accordance with MIL-STD-2042
- MIL-PRF-28876 qualified
- -28°C to +65°C

Low Insertion Loss

- 0.35 dB typ. single mode/multimode

High Return Loss

- -50 dB typ.

Wide Range of Choices

- Three shell sizes:
Size 13: 4 channels
Size 15: 6 or 8 channels
Size 23: 18 or 31 channels
- 6 keying options
- Variety of mounting and backshell options

TYPICAL CONFIGURATIONS

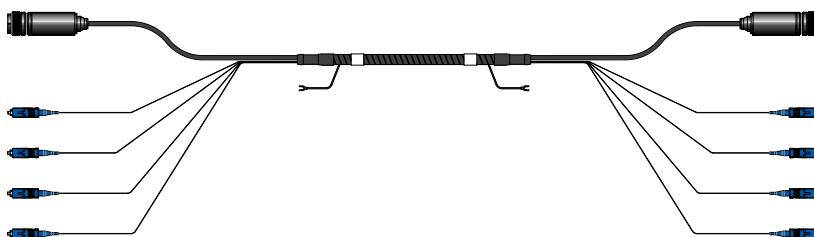
Consult TE for full range



4-Fiber M28876 Connector to M28876 Connector



18-Fiber M28876 Connector to M28876 Connector



Hybrid M28876/SC Connectors to M28876/SC Connectors

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PHOENIX OPTIX RUGGED FIBER OPTIC CABLE ASSEMBLIES FOR HARSH ENVIRONMENTS
WIDE CHOICE IN CUSTOM CABLE ASSEMBLIES TO HELP MEET CHALLENGING OUTDOOR ENVIRONMENTS



PhoenixOptix.com

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