



INDUSTRIAL FIBER OPTIC CABLE

Phoenix Digital provides fiber optic cable specifically designed for rugged industrial applications. Phoenix Digital's Industrial Fiber Optic Cable provides a full range of superior optical performance, rugged packaging and protection, and the physical integrity the industrial user wants and needs for ease of installation and handling.



FEATURES

- INDUSTRIAL PACKAGING OPTIONS...

- Rugged Industrial Construction - Life Expectancy Exceeds 20 Years
- Double Jacketing, High Tensile Strength
- Extended Temperature and Humidity Range
- Oil, Chemical, Moisture, Abrasion, and UV Sunlight Resistant
- Low Smoke, Zero Halogen
- Riser Rated (OFNR) and CSA FT-4, Passes Stringent UL 1666 Flame Test
- Plenum Rated (OFNP) and CSA FT-6, Passes Stringent UL 910 Flame Test

- WIDE VARIETY OF INSTALLATION OPTIONS...

- Dry Block With Gel Filled, Loose Tube Construction for both Indoor and Outdoor Installation
- Self Supporting, All Dielectric Cable for Aerial Installation
- Direct Burial, Armored Cable for Underground Installation
- Riser and Plenum Rated Cable for Riser, Premise, and Cable Tray Installation



- SUPERIOR OPTICAL PERFORMANCE...

- Multiple Fibers per Cable (2 to 36 Fibers)
- 9/125, 50/125, 62.5/125, and 200/230 Micron sizes
- Multiple Wavelengths
- Multimode and Singlemode Capability

- FULLY COMPATIBLE WITH PHOENIX DIGITAL'S COMPLETE LINE OF INDUSTRIAL OPTICAL COMMUNICATION MODEMS FOR...

Rockwell/A-B	Modicon
Siemens/TI	Foxboro
GE Fanuc	Rosemount
Square D	Honeywell
ABB Process Automation	Omron
Kent-Taylor	Plus Many Others

EXTENDED PERFORMANCE FIBER OPTIC CABLE FOR INDUSTRIAL APPLICATIONS

FEATURES... BENEFITS:

- Extended Performance...
Suitable for Harsh Industrial Environments
- Proprietary, Polyolefin-Based Jacketing Material (No Plasticizers)...
Corrosion, Moisture, Oil, Flame, Gas, Chemical and UV Resistant
Meets the Requirements of IEEE-383 Flame Test UL 1581
- Rugged, Industrial Construction...
Life Expectancy Exceeds 20 Years
- Superior Abrasion and Flexibility to Standard PVC and Polyethylene...
Ease of Installation and Handling in Both High and Low Temperature Environments
- Gel Filled, Loose Tube Construction...
Wide Storage and Operating Temperature Range
- Dry Block Technology...
Simplifies Installation and Reduces Termination Time

INSTALLATION:

Both Indoor and Outdoor Application
Cable Tray... Crush Resistant, Low Friction Jacketing Material
Aerial... With Messenger
Burial... In Conduit

SPECIFICATIONS FOR MODEL # FOC-EXP FIBER OPTIC CABLE:

Mechanical Properties...

Fiber Quantity	Outer Diameter inches (mm)	Cable Weight lbs./1,000 ft. (kg/km)	Maximum Tension lbs. (N)		Minimum Bend Radius inches (cm)		Maximum Vertical Rise ft. (M)
			Install.	Operating	Install.	Operating	
2	0.425 (10.8)	65 (97)	600 (2670)	200 (890)	8.5 (21.6)	4.3 (10.8)	2462 (750)
4	0.425 (10.8)	65 (97)	600 (2670)	200 (890)	8.5 (21.6)	4.3 (10.8)	2462 (750)
6	0.425 (10.8)	65 (97)	600 (2670)	200 (890)	8.5 (21.6)	4.3 (10.8)	2462 (750)
8	0.425 (10.8)	65 (97)	600 (2670)	200 (890)	8.5 (21.6)	4.3 (10.8)	2462 (750)
10	0.425 (10.8)	65 (97)	600 (2670)	200 (890)	8.5 (21.6)	4.3 (10.8)	2462 (750)
12	0.425 (10.8)	65 (97)	600 (2670)	200 (890)	8.5 (21.6)	4.3 (10.8)	2462 (750)
24	0.425 (10.8)	65 (97)	600 (2670)	200 (890)	8.5 (21.6)	4.3 (10.8)	2462 (750)
36	0.454 (11.5)	77 (115)	600 (2670)	200 (890)	9.1 (23.1)	4.5 (11.5)	2078 (633)

Environmental Properties...

Storage Temperature = -40° C to +80° C
Operating Temperature = -40° C to +80° C
Relative Humidity = 0 to 100%

SELF SUPPORTING, ALL DIELECTRIC FIBER OPTIC CABLE FOR AERIAL INSTALLATION

FEATURES... BENEFITS:

- Self Supporting Installation...
Additional Strength Members Eliminate Need to Install or Lash to Messenger Cable Between Poles
- High Density Double Polyethylene Jacket...
Corrosion, Moisture, Oil, Chemical, and UV Resistant
- All Dielectric Construction...
Superior Performance When Exposed to Lightning, Electric Fields from Adjacent Power Lines, etc.
- Track Resistant...
Suitable for Installation in High Voltage Applications up to 25kv/m
- Abrasion Resistant...
Reduces Ice Build-up in Aerial Installations and Allows Longer Pulls in Wire Duct
- Gel Filled, Loose Tube Construction...
Wide Installation and Operating Temperature Range

INSTALLATION:

Outdoor Application

Aerial... No Messenger Required

Wire Duct... High Tensile Strength and Low Abrasion for Longer Pulls

SPECIFICATIONS FOR MODEL # FOC-SSA FIBER OPTIC CABLE:

Mechanical Properties...

Fiber Quantity	Outer Diameter inches (mm)	Cable Weight lbs./1,000 ft. (kg/km)	Maximum Tension lbs. (N)		Breaking Strength lbs. (N)	Minimum Bend Radius inches (cm)	
			Install.	Operating		Install.	Operating
2	0.525 (13.34)	100 (150)	1000 (4450)	2000 (8900)	7500 (33,375)	10.6 (26.6)	5.3 (13.3)
4	0.525 (13.34)	100 (150)	1000 (4450)	2000 (8900)	7500 (33,375)	10.6 (26.6)	5.3 (13.3)
6	0.525 (13.34)	100 (150)	1000 (4450)	2000 (8900)	7500 (33,375)	10.6 (26.6)	5.3 (13.3)
8	0.525 (13.34)	100 (150)	1000 (4450)	2000 (8900)	7500 (33,375)	10.6 (26.6)	5.3 (13.3)
10	0.525 (13.34)	100 (150)	1000 (4450)	2000 (8900)	7500 (33,375)	10.6 (26.6)	5.3 (13.3)
12	0.525 (13.34)	100 (150)	1000 (4450)	2000 (8900)	7500 (33,375)	10.6 (26.6)	5.3 (13.3)
24	0.525 (13.34)	100 (150)	1000 (4450)	2000 (8900)	7500 (33,375)	10.6 (26.6)	5.3 (13.3)
36	0.525 (13.34)	100 (150)	1000 (4450)	2000 (8900)	7500 (33,375)	10.6 (26.6)	5.3 (13.3)

Environmental Properties...

Storage Temperature = -40° C to +70° C

Operating Temperature = -40° C to +70° C

Relative Humidity = 0 to 100%

CRUSH RESISTANT, ARMORED FIBER OPTIC CABLE FOR DIRECT BURIAL INSTALLATION

FEATURES... BENEFITS:

- Direct Burial Installation
- Corrugated Steel Armor Bonded to Outer Jacket...
 Provides Additional Crush Strength and Rodent Protection
- MDPE Double Polyethylene Jacket...
 Corrosion, Moisture, Oil, Chemical, and UV Resistant
- Abrasion Resistant...
 Ease of Installation and Handling
- Dry Block With Gel Filled, Loose Tube Construction...
 Wide Installation and Operating Temperature Range

INSTALLATION:

Underground... Direct Burial Conduit
Conduit, Wire Duct, and Aerial Lashing

SPECIFICATIONS FOR MODEL # FOC-DBA FIBER OPTIC CABLE:

Mechanical Properties...

Fiber Quantity	Outer Diameter inches (mm)	Cable Weight lbs./1,000 ft. (kg/km)	Maximum Tension lbs. (N)		Minimum Bend Radius inches (cm)		Maximum Vertical Rise ft. (M)
			Install.	Operating	Install.	Operating	
2	0.650 (16.5)	148 (220)	600 (2670)	200 (890)	13.0 (33.0)	9.8 (24.8)	1080 (330)
4	0.650 (16.5)	148 (220)	600 (2670)	200 (890)	13.0 (33.0)	9.8 (24.8)	1080 (330)
6	0.650 (16.5)	148 (220)	600 (2670)	200 (890)	13.0 (33.0)	9.8 (24.8)	1080 (330)
8	0.650 (16.5)	148 (220)	600 (2670)	200 (890)	13.0 (33.0)	9.8 (24.8)	1080 (330)
10	0.650 (16.5)	148 (220)	600 (2670)	200 (890)	13.0 (33.0)	9.8 (24.8)	1080 (330)
12	0.650 (16.5)	148 (220)	600 (2670)	200 (890)	13.0 (33.0)	9.8 (24.8)	1080 (330)
24	0.650 (16.5)	148 (220)	600 (2670)	200 (890)	13.0 (33.0)	9.8 (24.8)	1080 (330)
36	0.690 (17.5)	160 (238)	600 (2670)	200 (890)	13.8 (35.1)	10.4 (26.3)	1000 (305)

Environmental Properties...

Storage Temperature = -40° C to +70° C
 Operating Temperature = -40° C to +70° C
 Relative Humidity = 0 to 100%

LOW SMOKE, ZERO HALOGEN FIBER OPTIC CABLE FOR PREMISE AND RAPID TRANSIT INSTALLATIONS

FEATURES... BENEFITS:

- Halex Jacketing (OFN, UL1581)...
Zero Halogen Content, Low Toxicity, Low Smoke, and Flame Retardent
- Meets Fire Safety Tests IEEE-383, NRS 713, NES 711, ASTM E-622,
AETA D-2671-74, and IEC 754-1

INSTALLATION:

Both Indoor and Outdoor Application
Premise and Rapid Transit Installation

SPECIFICATIONS FOR MODEL # FOC-LSZHB FIBER OPTIC CABLE:

Mechanical Properties...

Fiber Quantity	Outer Diameter inches (mm)	Cable Weight lbs./1,000 ft. (kg/km)	Maximum Tension lbs. (N)		Minimum Bend Radius inches (cm)		Maximum Vertical Rise ft. (M)
			Install.	Operating	Install.	Operating	
2	0.425 (10.8)	70 (104)	600 (2670)	200 (890)	21.6 (8.5)	10.8 (4.3)	2286 (697)
4	0.425 (10.8)	70 (104)	600 (2670)	200 (890)	21.6 (8.5)	10.8 (4.3)	2286 (697)
6	0.425 (10.8)	70 (104)	600 (2670)	200 (890)	21.6 (8.5)	10.8 (4.3)	2286 (697)
8	0.425 (10.8)	70 (104)	600 (2670)	200 (890)	21.6 (8.5)	10.8 (4.3)	2286 (697)
10	0.425 (10.8)	70 (104)	600 (2670)	200 (890)	21.6 (8.5)	10.8 (4.3)	2286 (697)
12	0.425 (10.8)	70 (104)	600 (2670)	200 (890)	21.6 (8.5)	10.8 (4.3)	2286 (697)
24	0.425 (10.8)	70 (104)	600 (2670)	200 (890)	21.6 (8.5)	10.8 (4.3)	2286 (697)
36	0.454 (11.5)	76 (113)	600 (2670)	200 (890)	23.1 (9.1)	11.5 (4.5)	1975 (602)

Environmental Properties...

Storage Temperature = -40°C to +80°C
Operating Temperature = -40°C to +80°C
Relative Humidity = 0 to 100%

QUALITY CONTROL:

- Post Construction Fiber Testing For Attenuation and Bandwidth
- Optional Sweep Bandwidth Testing
- Quality Assurance Program meets requirements of IOCFR50, Appendix B

ULTRA-STRONG, NON-ARMORED FIBER OPTIC CABLE FOR HIGH CRUSH STRENGTH AND LONG VERTICAL RISE INSTALLATIONS

FEATURES... BENEFITS:

- Stronger than Standard Armored Cables...
Crush Strength = 1,500 lbs/inch (2,684 N/cm)
- Longer Vertical Rise...
Ideal for Deep Mine Applications
- Non-Armored Construction...
Smaller and Lighter than Standard Armored Cables
- Meets Stringent Standards...
NEC Type OFNR UL1666 Riser Rated and CSA FT-4 and FT-5
Mine Safety and Health Administration Approved MSHA-SC-P-7K-263066
Pennsylvania Bureau of Deep Mine Safety Approved ("P" Number)
- Gel Filled, Loose Tube Construction...
Wide Installation and Operating Temperature Range

INSTALLATION:

Both Indoor and Outdoor Application
Conduit, Wire Duct, and Aerial Lashing

SPECIFICATIONS FOR MODEL # FOC-USNA FIBER OPTIC CABLE:

Mechanical Properties...

Fiber Quantity	Outer Diameter inches (mm)	Cable Weight lbs./1,000 ft. (kg/km)	Maximum Tension lbs. (N)		Minimum Bend Radius inches (cm)		Maximum Vertical Rise ft. (M)
			Install.	Operating	Install.	Operating	
2	0.415 (10.50)	59 (81)	1000 (4450)	333 (1482)	8.3 (21.0)	4.1 (10.5)	3281 (1000)
4	0.415 (10.50)	59 (81)	1000 (4450)	333 (1482)	8.3 (21.0)	4.1 (10.5)	3281 (1000)
6	0.415 (10.50)	59 (81)	1000 (4450)	333 (1482)	8.3 (21.0)	4.1 (10.5)	3281 (1000)
8	0.415 (10.50)	59 (81)	1000 (4450)	333 (1482)	8.3 (21.0)	4.1 (10.5)	3281 (1000)
10	0.415 (10.50)	59 (81)	1000 (4450)	333 (1482)	8.3 (21.0)	4.1 (10.5)	3281 (1000)
12	0.415 (10.50)	59 (81)	1000 (4450)	333 (1482)	8.3 (21.0)	4.1 (10.5)	3281 (1000)
24	0.415 (10.50)	59 (81)	1000 (4450)	333 (1482)	8.3 (21.0)	4.1 (10.5)	3281 (1000)
36	0.415 (10.50)	59 (81)	1000 (4450)	333 (1482)	8.3 (21.0)	4.1 (10.5)	3281 (1000)

Environmental Properties...

Storage Temperature = -40° C to +80° C
Operating Temperature = -40° C to +80° C
Relative Humidity = 0 to 100%

RISER AND PLENUM RATED FIBER OPTIC CABLE

FEATURES... BENEFITS:

- Halex Jacketing (OFNR)...
Low Smoke, Zero Halogen, Fire Safe
- Optical Fiber Non-Conductive Riser-Rated (OFNR and CSA FT-4)...
Passes Stringent UL 1666 Flame Test
- Optical Fiber Non-Conductive Plenum-Rated (OFNP and CSA FT-6)...
Passes Stringent UL 910 Flame Test

INSTALLATION:

OFNR Fiber Optic Cable for Riser and Premise Installation

OFNP Fiber Optic Cable for Plenum, Riser, and Premise Installation

Breakout Installation for Cabling from Wire Closets, Equipment Racks, etc.

SPECS FOR MODEL # FOC-RRB & FOC-PRB FIBER OPTIC CABLE:

OFNR Fiber Optic Cable Mechanical Properties...

Fiber Quantity	Outer Diameter inches (mm)	Cable Weight lbs./1,000 ft. (kg/km)	Maximum Tension lbs. (N)		Minimum Bend Radius inches (cm)		Maximum Vertical Rise ft. (M)
			Install.	Operating	Install.	Operating	
2F ⁽¹⁾	0.12 x 0.24 (3.0 x 6.0)	8 (12)	224 (997)	112 (498)	2.0 (5.0)	1.0 (2.5)	N/A
2	0.286 (7.26)	33 (48)	270 (1201)	112 (498)	5.8 (14.6)	2.9 (7.3)	2715 (830)
4	0.325 (8.25)	40 (60)	400 (1780)	215 (957)	6.6 (16.6)	3.3 (8.3)	4300 (1310)
6	0.380 (9.65)	57 (84)	600 (2670)	250 (1112)	7.6 (19.4)	3.8 (9.7)	3510 (980)
8	0.445 (11.30)	78 (115)	600 (2670)	250 (1112)	9.0 (22.9)	4.5 (11.3)	2565 (780)
10	0.510 (12.95)	105 (157)	600 (2670)	250 (1112)	10.2 (26.0)	5.1 (13.0)	1900 (580)
12	0.565 (14.40)	129 (192)	600 (2670)	250 (1112)	11.4 (28.8)	5.7 (14.4)	1550 (475)
24	0.680 (17.30)	194 (288)	600 (2670)	250 (1112)	13.6 (34.6)	6.8 (17.3)	1030 (315)
36	0.780 (19.80)	212 (315)	600 (2670)	250 (1112)	15.6 (39.6)	7.8 (19.8)	945 (290)

OFNP Fiber Optic Cable Mechanical Properties...

Fiber Quantity	Outer Diameter inches (mm)	Cable Weight lbs./1,000 ft. (kg/km)	Maximum Tension lbs. (N)		Minimum Bend Radius inches (cm)		Maximum Vertical Rise ft. (M)
			Install.	Operating	Install.	Operating	
2F ⁽¹⁾	0.12 x 0.24 (3.0 x 6.0)	8 (12)	224 (997)	112 (498)	2.0 (5.0)	1.0 (2.5)	N/A
2	0.231 (5.86)	24 (35)	270 (1201)	112 (498)	4.6 (11.7)	2.3 (5.9)	3730 (1135)
4	0.272 (5.90)	30 (43)	600 (2670)	250 (1112)	5.4 (13.8)	2.7 (6.9)	2985 (910)
6	0.323 (8.20)	44 (65)	600 (2670)	250 (1112)	6.4 (16.4)	3.2 (8.2)	4545 (1385)
8	0.401 (10.19)	70 (103)	600 (2670)	250 (1112)	8.0 (20.3)	4.0 (10.2)	2855 (870)
10	0.462 (11.73)	93 (138)	600 (2670)	250 (1112)	9.2 (23.4)	4.6 (12.7)	2150 (655)
12	0.523 (13.3)	125 (186)	600 (2670)	250 (1112)	10.5 (26.6)	5.2 (13.3)	2740 (835)
24	0.620 (15.73)	150 (220)	600 (2670)	250 (1112)	12.4 (31.6)	6.2 (15.8)	1350 (410)
36	0.715 (18.15)	185 (280)	600 (2670)	250 (1112)	14.4 (36.4)	7.2 (18.2)	1085 (330)

(1) Flat Zipcord Breakout Construction

Environmental Properties...

Storage Temperature = -40° C to +80° C

Operating Temperature = -20° C to +80° C

Relative Humidity = 5 to 95%

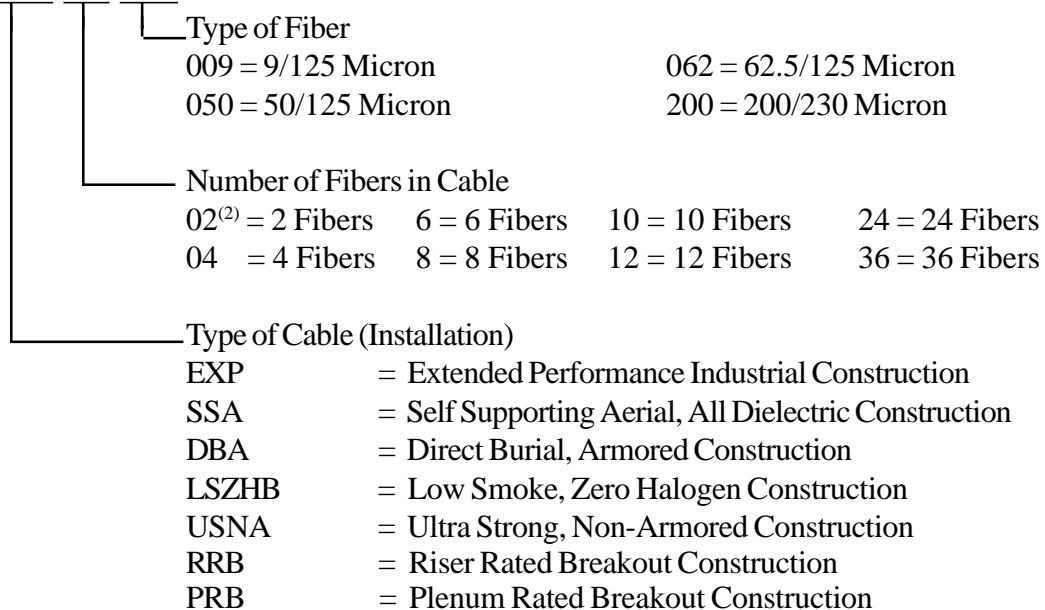
OPTICAL PERFORMANCE:

FIBER OPTIC CABLE MODEL # FOC-EXP, FOC-SSA, FOC-DBA, FOC-LSZHB, AND FOC-USNA

Fiber Type (Core/Cladding size...microns)	Mode Type	Max. Attenuation (db/km)		Min. Bandwidth (MHz-km)		Numerical Aperture
		850 nm	1300 nm	850 nm	1300 nm	
9/125	Singlemode	N/A	.4	N/A	N/A	N/A
50/125	Multimode	3.00	1.00	800	800	0.200
62.5/125	Multimode	3.75	1.50	160	500	0.275
200/230	Multimode	7.0	N/A	15	N/A	0.370

FIBER OPTIC CABLE MODEL # FOC-RRB AND FOC-PRB

Fiber Type (Core/Cladding size...microns)	Mode Type	Max Attenuation (db/km)		Min Bandwidth (MHz-km)		Numerical Aperture
		850 nm	1300 nm	850 nm	1300 nm	
9/125	Singlemode	N/A	.7	N/A	N/A	N/A
50/125	Multimode	3.50	1.50	800	800	0.200
62.5/125	Multimode	3.75	1.50	160	500	0.275
200/230	Multimode	12.0	N/A	15	N/A	0.370

FIBER OPTIC CABLE ORDERING INFORMATION⁽¹⁾ :Model # FOC-XXX-YY-ZZZ

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