

Fiber Optic Cables



Fiber Optic Cable Selection

Chainflex® cable	Jacket	Shield	Class	Bending radius moving (factor x d)	Temperature moving from/to °F (°C)	Oil-resistant	Torsion resistant	V max. ft/s (m/s) unsupported	V max. ft/s (m/s) gliding	a max. ft/s² (m/s²)	Approvals and standards
Fiber Optic cables (FOC)											
CFLG-2H	PUR		4.2.2	12.5	-4/+140°F (-20/+60°C)	✓		32.81 ft/s (10 m/s)	19.69 ft/s (6 m/s)	65.62 ft/s² (20 m/s²)	CE
CFLK	PUR		5.3.2	12.5	-4/+158°F (-20/+70°C)	✓		32.81 ft/s (10 m/s)	16.41 ft/s (5 m/s)	65.62 ft/s² (20 m/s²)	CE
CFLG-2LB	TPE		6.3.3	5	-40/+140°F (-40/+60°C)	✓		32.81 ft/s (10 m/s)	19.69 ft/s (6 m/s)	65.62 ft/s² (20 m/s²)	CE
CFLG-G	TPE		6.3.3	15	-40/+140°F (-40/+60°C)	✓		32.81 ft/s (10 m/s)	19.69 ft/s (6 m/s)	65.62 ft/s² (20 m/s²)	CE

Seamless communication between machines is becoming more and more complex every day. Finding the right cables for these types of applications is very important.

Many plant manufacturers and operators have EMC problem that occur sporadically or over time.

These problems are often based on conventional bus cables that either have insufficient or unreliable shielding.

Chainflex® bus cables are designed to prevent these problems and now Chainflex® Fiber Optic cables provide further advantages and safety benefits

Important fiber types:

● Multi-mode fibers

50/125 µm

62,5/125 µm

The ideal fiber for large data volumes and longer transmission lengths in the field of automation. On account of the very low output attenuation (0.8-3 db/km per fiber and light wave length) of these fiber types, transmission lengths of several hundred meters can be realized quite easily.

● POF (Plastic fibers)

980/1000 µm

The ideal and low-cost fiber for short transmission paths. On account of the high output attenuation of the fiber type of 160-230 dB/km, lengths over 15 mm must be avoided in permanent-motion energy chains®.

● PCF (Polymer Cladded fiber)

200/230 µm

The ideal compromise for POF fiber. This plastic-coated quartz glass fiber is a viable alternative for many terminal devices that have been designed for POF. This means greater transmission lengths (100 m and more) are possible without the original POF terminal devices having to be replaced.

Chainflex® FOC cables offer the following advantages:

1. Greater data security thanks to:

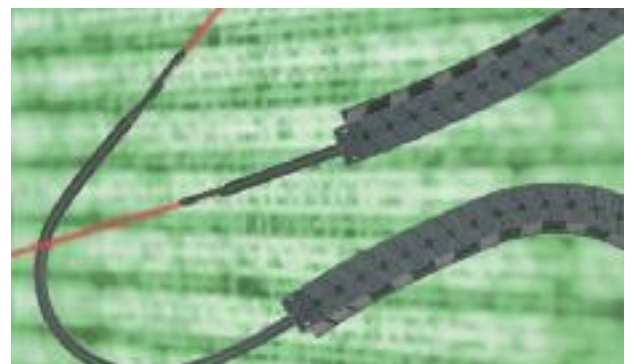
- FOC-typical better transmission characteristics
- Greater possible transmission lengths of several 100 m
- Greater possible data volumes thanks to lower attenuation values
- Maximum EMC protection for the data transmitted
- Future-proof installation (no cable replacement with new bus systems)

2. Greater mechanical protection through:

- The FOC designed for permanent mechanical movement
- The igus®-typical highly abrasion-proof and chemical resistant sheathing materials
- The special Chainflex® design concept (tested at 30 million cycles without a significant increase in attenuation)

3. Future-oriented cost reduction through:

- Bus-independent bus cable wiring
- Longer service life in E-Chains®
- Extendable without transmission limits



For further information see the test data on page 10.27



Chainflex® CFLG-2H

PUR Energy Chain® gradient glass fiber optic cable, UV-resistant, halogen-free, oil-resistant, metal-free

FOC

Fiber optic with jacket

Fiber coating

Strain relief with individual cover

Core

Jacketed FOC cores twisted with optimized pitch length stranded around a strain relief element

Outer jacket

Gusset-filled pressure extruded PUR Blend



Construction

Fiber: 50/125 µm; 62.5/125 µm fibers in gel filled hollow cores

Core stranding: Tubes with one fiber in each are twisted with strain relief elements

Color code: Black fiber jackets with white printed numbers

Outer jacket: PUR-based blend, adapted to the requirements of an Energy Chain®. Silicone-free in compliance with PV 3.10.7 - status 1992 **Color:** Black

Technical Data

Minimum bending radius, moving: 12.5 outer cable diameter

Minimum bending radius, fixed: 7.5 x outer cable diameter

Permissible temperature, moving: -4°F to +140°F (-20°C to +60°C)

Permissible temperature, fixed: -13°F to +140°F (-25°C to +60°C)

UV Resistance: High

Oil Resistance: High

Typical Applications

- for high mechanical load requirements
- maximum EMI protection
- indoor and outdoor applications
- for unsupported and gliding travel up to 328 ft (100m) and more
- storage and retrieval units, machine tools, packaging machines, quick handling, cranes, refrigerating sector

Part No.	Fiber Count	Fiber Diameter	Outer Diameter		Weight (approx.)	
			µm (approx)	in. (mm)	lbs/mft	(kg/km)
CFLG-2HG-MF-50/125	2	50/125	.35	(9)	56	(85)
CFLG-2HG-MF-62.5/125	2	62.5/125	.35	(9)	56	(85)
CFLG-2HS-MF-200/230	2	200/230	.35	(9)	56	(85)

NOTE: Other fiber counts available upon request

NOTE: The mentioned external diameters are maximum values.

Part No.	Bandwidth with 850 nm	Attenuation with 850 nm	Bandwidth with 1300 nm	Attenuation with 1300 nm
	(Mhz x km)	(dB/km)	(Mhz x km)	(dB/km)
CFLG-2HG-MF-50/125	200 - 600	2.5 - 3.5	600 - 1200	0.7 - 1.5
CFLG-2HG-MF-62.5/125	160 - 200	3.2	200 - 500	0.9
CFLG-2HS-MF-200/230	20	6.0	—	—



PUR Fiber Optic Cable

Chainflex® CFLK

PUR Energy Chain® polymer optic cable, oil-resistant



CFLK

CLASS
5.1.3

Price Index



Construction

Polymer fiber: Fiber diameter: 980/1000 µm; Numerical aperture, NA = 0.47

Core: PE insulation with stranded reinforcement

Color: Black

Outer jacket: PUR-based blend, adapted to the requirements of the Energy Chain®. Silicone-free in compliance with PV 3.10.7 - status 1992 **Color:** violet

Technical Data

Minimum bending radius, moving: 12.5 outer cable diameter

Minimum bending radius, fixed: 7.5 x outer cable diameter

Permissible temperature, moving: -4°F to +158°F (-20°C to +70°C)

Permissible temperature, fixed: -13°F to +158°F (-25°C to +70°C)

UV resistance: Medium

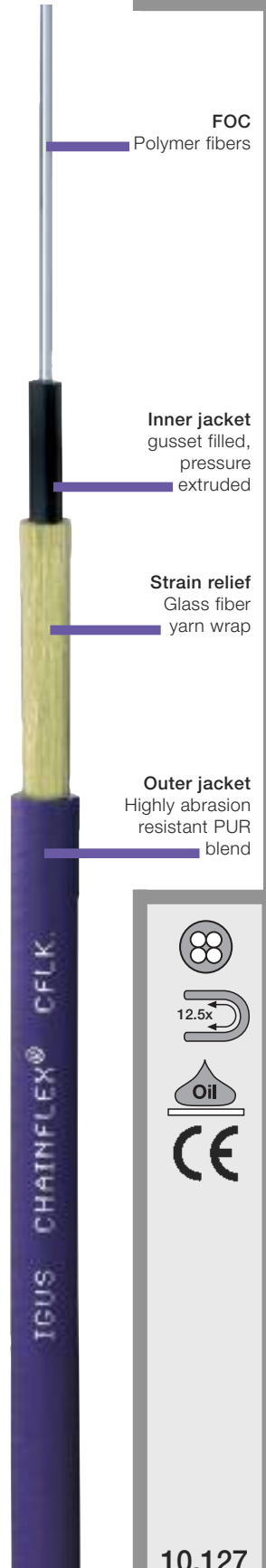
Oil resistance: High

Typical Applications

- for high mechanical load requirements
- maximum EMI protection
- preferably indoor applications
- for unsupported and gliding travel up to 49 ft (15m) and more
- wood/stone processing, packaging industry, supply system, handling, adjusting equipment

Part No.	Numbers of Fibers KWL	Fiber Diameter µm (approx)	Outer Diameter (approx.)		Weight	
			in.	(mm)	lbs/mft	(kg/km)
CFLK-L1-01	1	980/1000	.24	(6)	17.0	(25)

Part No.	Bandwidth with 650 nm (Mhz x km)	Attenuation with 650 nm (dB/km)
CFLK-L1-01	40	200



No Minimum Order • No Cut Charges on up to 10 cuts of the same part number

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CFLG-2LB



TPE Fiber Optic Cable (FOC)

Chainflex® CFLG-2LB

TPE Energy Chain® gradient glass fiber optic cable,
UV-resistant, oil-resistant, metal-free,
low temperature (-40°F)

CLASS
7.3.4

Price Index



FOC

Fiber optic
with jacket

Center element

Reinforced
optical fibers
twisted with an
optimized pitch

Strain relief

Aramid braid for
torsion
protection

Outer jacket

Pressure extruded
halogen-free TPE
blend



Construction

Fiber: 50/125 µm; 62.5/125 µm special fixed wire elements with aramide strain relief

Core stranding: FOC wires stranded with high tensile aramide dampers with especially short pitch length

Color code: Fibers blue with white numbers

Outer jacket: TPE particularly abrasion-resistant, high-flex blend, oil-resistant, coolant resistant, adapted to suit the requirements of an Energy Chain®. Silicone-free in compliance with PV 3.10.7 - status 1992.

Color: Black (RAL 9005)

Technical Data

Minimum bending radius, moving: 5 x outer cable diameter

Minimum bending radius, fixed: 5 x outer cable diameter

Permissible temperature, moving: -40°F to +140°F (-40°C to +60°C)

Permissible temperature, fixed: -40°F to +140°F (-40°C to +60°C)

UV Resistance: High

Oil Resistance: High

Typical Applications

- for maximum load requirements
- maximum EMC protection
- indoor and outdoor applications
- for unsupported and gliding travel up to 328 ft (100m) and more
- storage and retrieval units for high-bay warehouses, machining units/packaging machines, quick handling, semi-conductor insertion, refrigerating sector

Part No.	Fiber Count	Fiber Diameter	Outer Diameter		Weight	
			µm (approx)	in. (mm)	lbs/mft	(kg/km)
CFLG-2LB-62.5/125	2	62.5/125	.33	(8.5)	31.5	(47)
CFLG-2LB-50/125	2	50/125	.33	(8.5)	31.5	(47)

Note: The mentioned external diameters are maximum values and may tend toward lower tolerance limits.

Part No.	Bandwidth with 850 nm	Attenuation with 850 nm	Bandwidth with 1300 nm	Attenuation with 1300 nm
	(Mhz x km)	(dB/km)	(Mhz x km)	(dB/km)
CFLG-2LB-62.5/125-TC	160 - 200	3.2	200 - 500	0.9
CFLG-2LB-50/125	200-600	2.5 - 3.5	600 - 1200	0.7 - 1.5



TPE Fiber Optic Cable

Chainflex® CFLG-G

TPE Energy Chain® gradient glass fiber optic cable, UV-resistant, halogen-free, oil-resistant, metal-free, low temperature (-40°C), hydrolysis resistant and microbe resistant



CFLG-G

Price Index



CLASS
7.4.4

Construction

Fiber: 50/125 µm; 62.5/125 µm fibers in gel filled hollow cores

Core stranding: Strength rods with integrated torsion protection braid over gel-filled fiber sheath

Color code: 6 fiber — natural, yellow, green, red, violet, blue

12 fiber — above colors and light blue, gray, brown, black, orange, pink

Outer jacket: TPE particularly abrasion-resistant, high-flex blend, oil-resistant, coolant resistant, adapted to suit the requirements of an Energy Chain®. Silicone-free in compliance with PV 3.10.7 - status 1992.

Color: Black (RAL 9005)

Technical Data

Minimum bending radius, moving: 15 x outer cable diameter

Minimum bending radius, fixed: 8.5 x outer cable diameter

Permissible temperature, moving: -40°F to +140°F (-40°C to +60°C)

Permissible temperature, fixed: -40°F to +140°F (-40°C to +60°C)

UV Resistance: High

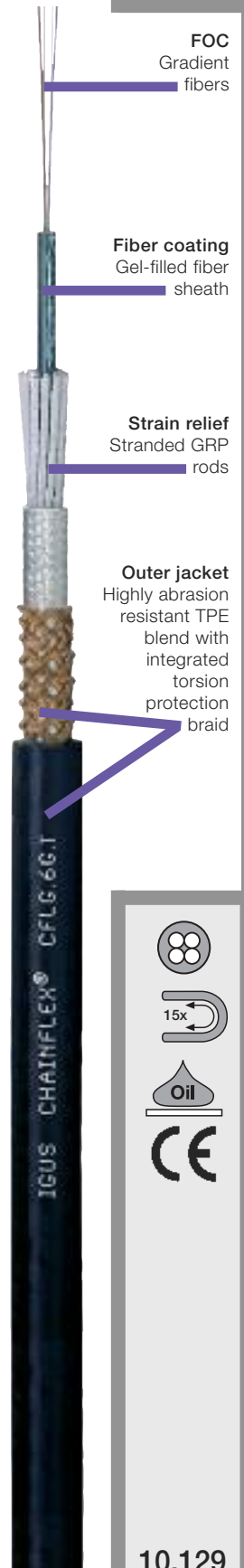
Typical Applications

- for high mechanical load requirements
- maximum EMI protection
- indoor and outdoor applications
- for unsupported and gliding travel up to 1641 ft (500m) and more
- outdoor ship-to-shore, crane applications, conveyor technology

Part No.	Fiber Count	Fiber Diameter	Outer Diameter		Weight (approx.)	
			µm (approx)	in. (mm)	lbs/mft	(kg/km)
CFLG-6G-62.5/125-TC	6	62.5/125	.45	(11.5)	75	(110)
CFLG-12G-62.5/125-TC	12	62.5/125	.45	(11.5)	75	(110)
CFLG-6G-50/125-TC	6	50/125	.45	(11.5)	75	(110)
CFLG-12G-50/125-TC	12	50/125	.45	(11.5)	75	(110)

Part No.	Bandwidth with 850 nm (Mhz x km)	Attenuation with 850 nm (dB/km)	Bandwidth with 1300 nm (Mhz x km)	Attenuation with 1300 nm (dB/km)
	CFLG-6G-62.5/125-TC	160 - 200	3.2	200 - 500
CFLG-12G-62.5/125-TC	160 - 200	3.2	200 - 500	0.9
CFLG-6G-50/125-TC	200 - 600	2.5 - 3.5	600 - 1200	0.7 - 1.5
CFLG-12G-50/125-TC	200 - 600	2.5 - 3.5	600 - 1200	0.7 - 1.5

NOTE: The mentioned external diameters are maximum values.



No Minimum Order • No Cut Charges on up to 10 cuts of the same part number

Fiber
Optic
Cables



igus® Energy Chain
System®

Telephone 1-800-521-2747
Fax 1-401-438-7270

Internet: <http://www.igus.com>
email: sales@igus.com
QuickSpec: <http://www.igus.com/quickspec>

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Fax 1-401-438-7270

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