

# Fiber optic cables



chainflex® cable	Jacket	Shield	Bend radius min., E-Chain® [factor x d]	Temperature, E-Chain® from/to [°F]	Approvals and standards	oil-resistant	torsion resistant	v max. [ft/s] unsupported	v max. [ft/s] gliding	a max. [ft/s²]	Page
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Fiber optic cables

Information Fiber optic cables 204

CFLK	PUR	12.5	-4/ +140		✓	✓	32.81	16.41	65.62	208
CFLG88	PVC	7.5	+41/ +158				9.84		65.62	210
CFLG-LB-PUR	PUR	5-7.5	-31/ +176		✓	✓	32.81	19.69	65.62	212
CFLG-LB	TPE	5	-31/ +176		✓	✓	32.81	19.69	65.62	216
CFLG-G	TPE	10	-40/ +176		✓	✓	32.81	19.69	65.62	220

Torsional Fiber Optic Cables (Chapter Torsional cables) ▶ Page 366

CFROBOT5	TPE	10	-4/ +176		✓	✓	180°/s	60°/s		384
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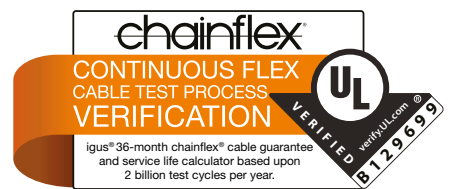
Overview to find the right Fiber optic cable

	POF Plastic FOC 980/1000 µm	PCF Glass fiber FOC 200/230 µm	GOF Multimode Glass fibre FOC 50/125 µm 62.5/125 µm	GOF Singlemode Glass fiber FOC 9/125 µm
CFLK	✓			
CFLG88			✓	
CFLG-LB-PUR			✓	✓
CFLG-LB		✓	✓	
CFLG-G			✓	✓
CFROBOT5			✓	

**36 months chainflex® guarantee**  
**Guaranteed lifetime for predictable reliability**  
 ▶ Selection table page 206

With the help of the chainflex® service life calculator, you can quickly and easily calculate the expected service life of chainflex® cables specifically for your application:

[www.igus.com/chainflexlife](http://www.igus.com/chainflexlife)



## The safest and often cheapest way to transfer data to machines and plant.

Fault-free communication between all systems in machines and plant that is becoming more and more complex all the time should be a matter of importance these days.

However, many plant manufacturers or operators have major EMC problems that occur sporadically or even only years later.

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

Alongside igus® chainflex® bus cables that already prevent these problems to a large extent, chainflex® glass fiber optic cables provide further advantages for even greater data safety.

Fiber optic cables (FOC) do not require a braided shielding that is susceptible to mechanical damage as EMC protection, and are insensitive to EMC on account of their very nature, since industrial conventional interference fields do not have any effect on light signals.

In addition, fiber optic cables can be used independently of the system, since a special bus cable is not required for every bus system, rather one FOC type can usually be used to operate any bus system providing the bus system manufacturer provides respective FOC converters.

The large number of fiber optic cables in industrial data transmission is also much more manageable than the large number of different field or high-speed buses which require a separate cable for each bus.

Thus the following fiber types can be used for industrial data communication, completely independent of the type of field bus used. The fiber type and number depends only on which converters are used and which fiber type the respective manufacturer prescribes. The fibers are defined on the basis of diameter and result in a clear and limited choice.

### Important fiber types:

- **Multimode 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 metres are possible.

- **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 plasticcoated 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 offer the operator the following advantages:

**1. Greater data security thanks to**

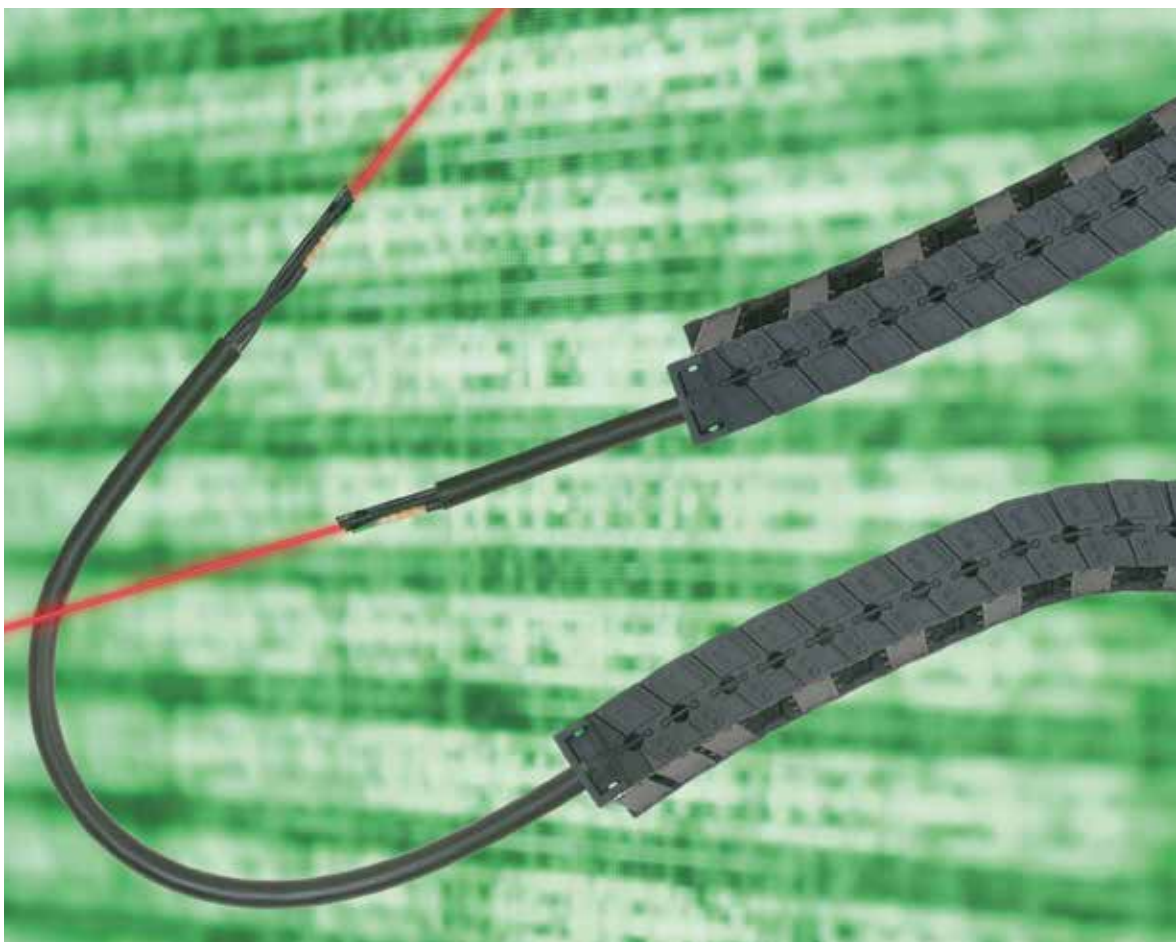
- FOC-typical better transmission characteristics
- Greater possible transmission lengths of several 100 meters
- Greater possible data volumes thanks to lower attenuation values
- Maximum EMC protection for the data transmitted
- Future-proof installation (no cable replacement with new bus systems)

**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



# chainflex® guarantee



chainflex® cable	Temperature, from/to [°F]	v max. [ft/s]		a max. [ft/s²]	Travel distance [ft]
		unsupported	gliding		
Fiber optic cables					
 CFLK	-4 / +14 +14 / +122 +122 / +140	32.81	16.41	65.62	≤ 65.62
 CFLG88	+41 / +59 +59 / +140 +140 / +158	9.84	-	65.62	≤ 32.81
 CFLG-LB-PUR	-31 / -13 -13 / +158 +158 / +176	32.81	19.69	65.62	≤ 328.1
 CFLG-LB	-31 / -13 -13 / +158 +158 / +176	32.81	19.69	65.62	≤ 328.1
 CFLG-LB-CU	-31 / -13 -13 / +158 +158 / +176	32.81	19.69	65.62	≤ 328.1
 CFLG-G	-40 / -22 -22 / +158 +158 / +176	32.81	19.69	65.62	> 1,312

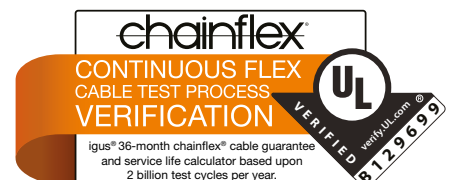
<sup>(1)</sup> **Exclusive!** Guaranteed lifetime for this series according to the guarantee conditions ► Page 26-27

# Guaranteed lifetime <sup>(1)</sup>

Bend radius min. [factor x d]	Bend radius min. [factor x d]	Bend radius min. [factor x d]	Page
5 million (1 million) cycles *	7.5 million (3 million) cycles *	10 million (5 million) cycles *	
15	16	17	208
12.5	13.5	14.5	
15	16	17	
10	11	12	210
7.5	8.5	9.5	
10	11	12	
7.5	8.5	9.5	212
5	6	7	
7.5	8.5	9.5	
7.5	8.5	9.5	216
5	6	7	
7.5	8.5	9.5	
10	11	12	216
7.5	8.5	9.5	
10	11	12	
12.5	13.5	14.5	220
10	11	12	
12.5	13.5	14.5	

\* Higher number of cycles? Online lifetime calculation ► [www.igus.com/chainflexlife](http://www.igus.com/chainflexlife)

Figures in brackets refer to chainflex® series CFLG88



# Fiber optic cable | PUR | chainflex® CFLK





**36** 10,000,000

**12.5 x d**  
Bend radius E-Chain®





**65.6 ft**  
Travel distance E-Chain®

- Plastic Optical Fibers (POF) for high mechanical load requirements and interference-free transmission
- PUR outer jacket
- Oil-resistant and coolant-resistant









## Dynamic Information

 Bend radius	<b>E-Chain® linear flexible</b>	min. 12.5 x d min. 10 x d
	<b>fixed</b>	min. 7 x d
 Temperature	<b>E-Chain® linear flexible</b>	-4 °F to +140 °F (-20 °C to +60 °C) -40 °F to +140 °F (-40 °C to +60 °C)
	<b>fixed</b>	-58 °F to +140 °F (-50 °C to +60 °C)
 v max.	<b>unsupported</b>	32.81 ft/s (10 m/s)
	<b>gliding</b>	16.41 ft/s (5 m/s)
 a max.		65.6 ft/s² (20 m/s²)
 Travel distance		Unsupported travel distances and for gliding applications up to 65.6 ft (20 m), Class 3

## Cable structure

 Fibre Optic Cable	980/1000 µm fiber with PE Insulation.
 Conductor construction	Polymer Optical Fiber cabled with high-tensile plastic reinforcement.
 Color code	► See P/N Table
 Outer jacket	Low-adhesion PUR mixture, adapted to suit the requirements in E-Chains® (following DIN EN 50363-10-2). Color: Violet (similar to RAL 4001)

## Properties and approvals

 UV resistance	Medium
 Oil resistance	Oil-resistant (following DIN EN 50363-10-2), Class 3
 Silicone-free	Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
 Halogen-free	Following DIN EN 60754
 UL verified	Certificate No. B129699: igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year
 REACH	In accordance with regulation (EC) No. 1907/2006 (REACH)
 RoHS	Lead-free Following 2011/65/EC (RoHS-II/RoHS-III)
 CE	Following 2014/35/EU

Configurators ► [www.igus.com/CFLK](http://www.igus.com/CFLK)

36 month guarantee ... 1,354 types from stock ... no cutting charges

Basic requirements  
Travel distance  
Oil resistance  
Torsion

low	1	2	3	4	5	6	7	highest
unsupported	1	2	3	4	5	6	≥ 1312 ft	
none	1	2	3	4	highest			
none	1	2	3	4	±360°			

CFLK  
PUR  
12.5 x d

## Class 5.3.3.1

Guaranteed service life (details see page 26-27)

Cycles*	5 million	7.5 million	10 million
Temperature, from/to [°F]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]
-4/+14	15	16	17
+14/+122	12.5	13.5	14.5
+122/+140	15	16	17

\* Higher number of cycles? Online lifetime calculation ► [www.chainflex.com/chainflexlife](http://www.chainflex.com/chainflexlife)

### Typical application areas

- For high mechanical load requirements, Class 5
- Unsupported travel distances and for gliding applications up to 66 ft (20 m), Class 3
- Almost unlimited resistance to oil, Class 3
- Highest EMC safety
- Preferably indoor applications
- Wood/stone processing, Packaging industry, supply systems, Handling, adjusting equipment

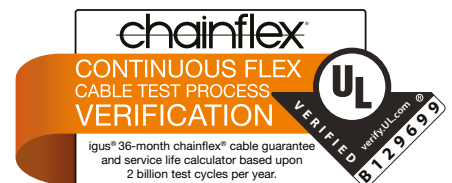
Part No.	Fiber Count	Fiber Diameter approx.	Outer diameter max.		Weight	
			[in.]	[mm]	[lbs/mft]	[kg/km]
CFLK-L1-01	1	980/1000	0.24	6.0	18.1	27
CFLK-L1-02	2	980/1000	0.28	7.0	20.8	31

Note: The given outer diameters are maximum values.

Part No.	Bandwidth [MHz x km] @ 650 nm	Attenuation [dB/km] @ 650 nm	Fiber identification
CFLK-L1-01	2	200	black
CFLK-L1-02	2	200	black, blue



Woodworking machines with e-chains® and chainflex® cables





# Fiber optic cable | PVC | chainflex® CFLG88






**36** 5,000,000  
Cycles guaranteed

**7.5 x d**  
Bend radius E-Chain®





**32.8 ft**  
Travel distance E-Chain®

- Graded index glass-fibre cable for flexing applications
- PVC outer jacket
- Flame-retardant








## Dynamic Information

	<b>Bend radius</b>	<b>E-Chain® linear flexible</b>	min. 7.5 x d min. 6 x d
		<b>fixed</b>	min. 4 x d
	<b>Temperature</b>	<b>E-Chain® linear flexible</b>	+41 °F to +158 °F (+5 °C to +70 °C) +23 °F to +158 °F (-5 °C to +70 °C)
		<b>fixed</b>	+5 °F to +158 °F (-15 °C to +70 °C)
	<b>v max.</b>	<b>unsupported</b>	9.84 ft/s (3 m/s)
	<b>a max.</b>		65.6 ft/s² (20 m/s²)
	<b>Travel distance</b>		Unsupported travel distances up to 32.8 ft (10 m), Class 1

## Cable structure

	<b>Fibre Optic Cable</b>	50/125 µm, 62.5/125 µm special fixed fiber elements with aramid strain relief
	<b>Conductor construction</b>	Optical Fibers cabled with high-tensile aramid dampers and especially short pitch length.
	<b>Color code</b>	Optical Fibers: Orange or blue with black numbers.
	<b>Outer jacket</b>	Low-adhesion mixture on the basis of PVC, adapted to suit the requirements in E-Chains®. Color: Jet black (similar to RAL 9005)

## Properties and approvals

	<b>Flame resistance</b>	According to IEC 60332-1-2
	<b>Silicone-free</b>	Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
	<b>UL verified</b>	Certificate No. B129699: igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year
	<b>REACH</b>	In accordance with regulation (EC) No. 1907/2006 (REACH)
	<b>Lead-free</b>	Following 2011/65/EC (RoHS-II/RoHS-III)
	<b>Cleanroom</b>	According to ISO Class 1. The outer jacket material of this series complies with CF240.02.24 - tested by IPA according to standard DIN EN ISO 14644-1
	<b>CE</b>	Following 2014/35/EU

Configurators ► [www.igus.com/CFLG88](http://www.igus.com/CFLG88)

36 month guarantee ... 1,354 types from stock ... no cutting charges



Example image

igus® chainflex® CFLG88

Basic requirements  
Travel distance  
Oil resistance  
Torsion

low	1	2	3	4	5	6	7	highest
unsupported	1	2	3	4	5	6	≥ 1312 ft	
none	1	2	3	4	highest			
none	1	2	3	4	±360°			

CFLG88  
PVC  
7.5 x d

## Class 3.1.1.1

### Guaranteed service life (details see page 26-27)

Cycles*	1 million	3 million	5 million
Temperature, from/to [°F]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]
+41/+59	10	11	12
+59/+140	7.5	8.5	9.5
+140/+158	10	11	12

\* Higher number of cycles? Online lifetime calculation ► [www.chainflex.com/chainflexlife](http://www.chainflex.com/chainflexlife)

### Typical application areas

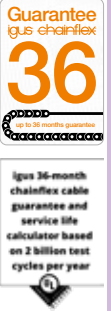
- For low duty flexing applications, Class 3
- Especially for unsupported travels, Class 1
- Without influence of oil, Class 1
- Highest EMC safety
- Preferably indoor applications
- Wood/stone processing, Packaging industry, supply systems, Handling, adjusting equipment

Part No.	Fiber Count	Fiber Diameter approx.	Outer diameter max.		Weight	
			[in.]	[mm]	[lbs/mft]	[kg/km]
CFLG88-2-50/125	2	50/125	0.28	7.0	29.6	44
CFLG88-2-62-5/125 <sup>11)</sup>	2	62,5/125	0.28	7.0	29.6	44

<sup>11)</sup> Phase-out model

Note: The given outer diameters are maximum values.

Part No.	Bandwidth [MHz x km] @ 850 nm	Bandwidth [MHz x km] @ 1300 nm	Attenuation [dB/km] @ 850 nm	Attenuation [dB/km] @ 1300 nm	Fiber identification
	CFLG88-2-50/125	≥ 500	≥ 500	≤ 3.0	≤ 1.0
CFLG88-2-62-5/125	≥ 200	≥ 500	≤ 3.5	≤ 1.5	orange with black numbers



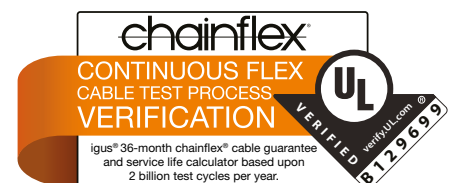
Order example: CFLG88-2-62.5/125 – To your desired length  
CFLG88 chainflex® series .2 Number of fibers .62,5/125 Fiber diameter



Online order ► [www.chainflex.com/CFLG88](http://www.chainflex.com/CFLG88)



Delivery time 24hrs or today.  
Delivery time means time until goods are shipped.



# Fiber optic cable | PUR | chainflex® CFLG-LB-PUR






**36** 10,000,000  
Cycles guaranteed

**5 x d**  
Bend radius E-Chain®






**328.1 ft**  
Travel distance E-Chain®

- Gradient glass-fiber cable for maximum mechanical load requirements
- PUR outer jacket
- Metal-free
- Oil-resistant
- Low-temperature-flexibility
- PVC and halogen-free
- UV-resistant

## Dynamic Information

 <b>Bend radius</b>	<b>E-Chain® linear</b>	min. 5 x d
	<b>flexible</b>	min. 4 x d
	<b>fixed</b>	min. 3 x d
 <b>Temperature</b>	<b>E-Chain® linear</b>	-31 °F to +176 °F (-35 °C to +80 °C)
	<b>flexible</b>	-40 °F to +176 °F (-40 °C to +80 °C)
	<b>fixed</b>	-58 °F to +176 °F (-50 °C to +80 °C)
 <b>v max.</b>	<b>unsupported</b>	32.81 ft/s (10 m/s)
	<b>gliding</b>	19.69 ft/s (6 m/s)
 <b>a max.</b>		65.6 ft/s <sup>2</sup> (20 m/s <sup>2</sup> )
 <b>Travel distance</b>	Unsupported travel distances and for gliding applications up to 328.1 ft (100 m), Class 5	

## Cable structure

 <b>Fibre Optic Cable</b>	50/125 µm, 62.5/125 µm, 9/125 µm.
 <b>Conductor construction</b>	Optical Fibers cabled with high-tensile aramid dampers and especially short pitch length.
 <b>Color code</b>	Orange, blue or yellow with black numbers.
 <b>Overall shield</b>	Extremely bending-resistant aramid braid for torsion-protection.
 <b>Outer jacket</b>	Low-adhesion, halogen-free, highly abrasion-resistant mixture on the basis of PUR, adapted to suit the requirements in E-Chains® (following DIN EN 50363-10-2). Color: Jet black (similar to RAL 9005)



Example image

Configurators ► [www.igus.com/CFLG-LB-PUR](http://www.igus.com/CFLG-LB-PUR)

36 month guarantee ... 1,354 types from stock ... no cutting charges













# Class 6.5.3.1

Basic requirements  
 Travel distance  
 Oil resistance  
 Torsion

low	1	2	3	4	5	6	7	highest
unsupported	1	2	3	4	5	6	≥ 1312 ft	
none	1	2	3	4	highest			
none	1	2	3	4	±360°			

CFLG-  
 LB-PUR  
 PUR  
 5 x d

## Properties and approvals

	<b>UV resistance</b>	High
	<b>Oil resistance</b>	Oil-resistant (following DIN EN 50363-10-2), Class 3
	<b>Offshore</b>	MUD-resistant following NEK 606 - status 2009
	<b>Flame resistance</b>	According to IEC 60332-1-2, FT1, VW-1
	<b>Silicone-free</b>	Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
	<b>Halogen-free</b>	Following DIN EN 60754
	<b>UL verified</b>	Certificate No. B129699: igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year
	<b>DNV-GL</b>	Type approval certificate No. 13 655-14 HH
	<b>REACH</b>	In accordance with regulation (EC) No. 1907/2006 (REACH)
	<b>Lead-free</b>	Following 2011/65/EC (RoHS-II/RoHS-III)
	<b>Cleanroom</b>	According to ISO Class 1. The outer jacket material of this series complies with CF77.UL.05.12.D - tested by IPA according to standard DIN EN ISO 14644-1
	<b>CE</b>	Following 2014/35/EU

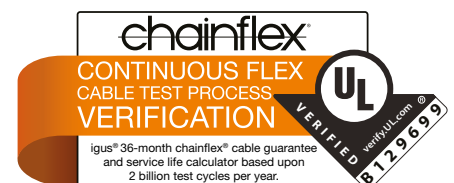
## Guaranteed service life (details see page 26-27)

Cycles*	5 million	7.5 million	10 million
Temperature, from/to [°F]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]
-13/+5	7.5	8.5	9.5
+5/+158	5	6	7
+158/+176	7.5	8.5	9.5

\* Higher number of cycles? Online lifetime calculation ► [www.chainflex.com/chainflexlife](http://www.chainflex.com/chainflexlife)

## Typical application areas

- For maximum mechanical load requirements with 5 x d, Class 6
- Unsupported travel distances and for gliding applications (horizontal + vertical) up to 328 ft (100 m), Class 5
- Almost unlimited resistance to oil, Class 3
- Maximum EMC protection, with high transmission qualities
- Indoor and outdoor applications
- Offshore, ship, Storage and retrieval units for high-bay warehouses, machining units/ packaging machines, quick handling, semiconductor insertion, refrigerating sector



# Fiber optic cable | PUR | chainflex® CFLG-LB-PUR

igus® chainflex® CFLG.LB.PUR



Example image

Part No.	Fiber Count	Fiber Diameter approx. [µm]	Outer diameter max.		Weight	
			[in.]	[mm]	[lbs/mft]	[kg/km]
CFLG-2LB-PUR-62-5/125	2	62,5/125	0.33	8.5	41.7	62
CFLG-4LB-PUR-62-5/125	4	62,5/125	0.35	9.0	45.7	68
CFLG-6LB-PUR-62-5/125	6	62,5/125	0.43	11.0	64.5	96
CFLG-12LB-PUR-62-5/125	12	62,5/125	0.55	14.0	100.8	150
CFLG-2LB-PUR-50/125	2	50/125	0.33	8.5	43.7	65
CFLG-6LB-PUR-50/125	6	50/125	0.43	11.0	63.8	95
CFLG-12LB-PUR-50/125	12	50/125	0.55	14.0	107.5	160
CFLG-6LB-PUR-9/125	6	9/125	0.43	11.0	63.8	95

Note: The given outer diameters are maximum values.  
G = with green-yellow earth core x = without earth core

Part No.	Bandwidth	Bandwidth	Attenuation	Attenuation	Fiber identification
	[MHz x km] @ 850 nm	[MHz x km] @ 1300 nm	[dB/km] @ 850 nm	[dB/km] @ 1300 nm	
CFLG-2LB-PUR-62-5/125	≥ 200	≥ 500	≤ 3.5	≤ 1.5	orange with black numbers
CFLG-4LB-PUR-62-5/125	≥ 200	≥ 500	≤ 3.5	≤ 1.5	orange with black numbers
CFLG-6LB-PUR-62-5/125	≥ 200	≥ 500	≤ 3.5	≤ 1.5	orange with black numbers
CFLG-12LB-PUR-62-5/125	≥ 200	≥ 500	≤ 3.0	≤ 0.7	orange with black numbers
CFLG-2LB-PUR-50/125	≥ 500	≥ 500	≤ 3.0	≤ 1.0	blue with black numbers
CFLG-6LB-PUR-50/125	≥ 500	≥ 500	≤ 3.0	≤ 1.0	blue with black numbers
CFLG-12LB-PUR-50/125	≥ 500	≥ 500	≤ 3.0	≤ 1.0	blue with black numbers

Part No.	Attenuation	Attenuation	Chromatic dispersion	Chromatic dispersion	Fiber identification
	[dB/km] @ 1310 nm	[dB/km] @ 1550 nm	[ps/nm/km] @ 1310 nm	[ps/nm/km] @ 1550 nm	
CFLG-6LB-PUR-9/125	≤ 0.35	≤ 0.25	3.5	18	yellow with black numbers

# Class 6.5.3.1

Basic requirements  
 Travel distance  
 Oil resistance  
 Torsion

low	1	2	3	4	5	6	7	highest
unsupported	1	2	3	4	5	6	≥ 1312 ft	
none	1	2	3	4	highest			
none	1	2	3	4	±360°			

CFLG-  
 LB-PUR  
 PUR  
 5 x d



Guarantee  
 igus chainflex  
**36**  
 up to 36 months guarantee

igus 36-month  
 chainflex cable  
 guarantee and  
 service life  
 calculator based  
 on 2 billion test  
 cycles per year



Order example: **CFLG-4LB-PUR-62,5/125** – To your desired length  
 CFLG-LB-PUR chainflex® series -4 Number of fibers -62,5/125 Fiber diameter



Online order ► [www.chainflex.com/CFLG-LB-PUR](http://www.chainflex.com/CFLG-LB-PUR)



Delivery time 24hrs or today.  
 Delivery time means time until goods are shipped.



Guarantee  
 igus chainflex  
**36**  
 up to 36 months guarantee

chainflex  
 CONTINUOUS FLEX  
 CABLE TEST PROCESS  
 VERIFICATION  
 igus® 36-month chainflex® cable guarantee  
 and service life calculator based upon  
 2 billion test cycles per year.



# Fiber optic cable | TPE | chainflex® CFLG-LB






**36** 10,000,000  
Cycles guaranteed

**5 x d**  
Bend radius E-Chain®






**328.1 ft**  
Travel distance E-Chain®

- Gradient glass-fiber cable for maximum mechanical load requirements
- TPE outer jacket
- Metal-free
- Oil and bio-oil-resistant
- Low-temperature-flexibility
- PVC and halogen-free
- UV-resistant

## Dynamic Information

 Bend radius	<b>E-Chain® linear</b>	min. 5 x d
	<b>flexible</b>	min. 4 x d
	<b>fixed</b>	min. 3 x d
 Temperature	<b>E-Chain® linear</b>	-31 °F to +176 °F (-35 °C to +80 °C)
	<b>flexible</b>	-58 °F to +176 °F (-50 °C to +80 °C)
	<b>fixed</b>	-67 °F to +176 °F (-55 °C to +80 °C)
 v max.	<b>unsupported</b>	32.81 ft/s (10 m/s)
	<b>gliding</b>	19.69 ft/s (6 m/s)
 a max.		65.6 ft/s <sup>2</sup> (20 m/s <sup>2</sup> )
 Travel distance	Unsupported travel distances and for gliding applications up to 328.1 ft (100 m), Class 5	

## Cable structure

 Fibre Optic Cable	50/125 µm, 62.5/125 µm, 200/230 µm special fixed fiber elements with aramid strain relief
 Conductor construction	Optical Fibers cabled with high-tensile aramid dampers and especially short pitch length.
 Color code	Orange or blue with black numbers or black with white numbers.
 Overall shield	Extremely bending-resistant aramid braid for torsion-protection. optical coverage
 Outer jacket	Low-adhesion mixture on the basis of TPE, especially abrasion-resistant and highly flexible, adapted to suit the requirements in E-Chains®. Color: Jet black (similar to RAL 9005)












# Class 7.5.4.1

Basic requirements  
 Travel distance  
 Oil resistance  
 Torsion

low	1	2	3	4	5	6	7	highest
unsupported	1	2	3	4	5	6	≥ 1312 ft	
none	1	2	3	4	highest			
none	1	2	3	4	±360°			

CFGL-LB  
 TPE  
 5 x d

## Properties and approvals

	<b>UV resistance</b>	High
	<b>Oil resistance</b>	Oil-resistant (following DIN EN 60811-404), bio-oil-resistant (following VDMA 24568 with Plantocut 8 S-MB tested by DEA), Class 4
	<b>Silicone-free</b>	Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
	<b>Halogen-free</b>	Following DIN EN 60754
	<b>UL verified</b>	Certificate No. B129699: igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year
	<b>REACH</b>	In accordance with regulation (EC) No. 1907/2006 (REACH)
	<b>Lead-free</b>	Following 2011/65/EC (RoHS-II/RoHS-III)
	<b>Cleanroom</b>	According to ISO Class 1. The outer jacket material of this series complies with CF9.15.07 - tested by IPA according to standard DIN EN ISO 14644-1
	<b>CE</b>	Following 2014/35/EU

## Guaranteed service life (details see page 26-27)

Cycles*	5 million	7.5 million	10 million
Temperature, from/to [°F]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]
-31/-13	7.5	8.5	9.5
-13/+158	5	6	7
+158/+176	7.5	8.5	9.5

\* Higher number of cycles? Online lifetime calculation ► [www.chainflex.com/chainflexlife](http://www.chainflex.com/chainflexlife)

## Typical application areas

- For maximum mechanical load requirements with 5 x d, Class 7
- Unsupported travel distances and for gliding applications (horizontal + vertical) up to 328 ft (100 m), Class 5
- Almost unlimited resistance to oil, also with bio-oils, Class 4
- Maximum EMC protection, with high transmission qualities
- Indoor and outdoor applications
- crane applications, Material handling, Storage and retrieval units for high-bay warehouses, machining units/packaging machines, quick handling, semiconductor insertion, refrigerating sector





# Fiber optic cable | TPE | chainflex® CFLG-LB

igus® chainflex® CFLG.LB



Example image

Part No.	Fiber Count	Fiber Diameter approx. [μm]	Outer diameter max.		Weight	
			[in.]	[mm]	[lbs/mft]	[kg/km]
CFLG-2LB-62-5/125	2	62,5/125	0.33	8.5	38.3	57
CFLG-4LB-62-5/125	4	62,5/125	0.35	9.0	45.7	68
CFLG-6LB-62-5/125	6	62,5/125	0.43	11.0	61.1	91
CFLG-12LB-62-5/125	12	62,5/125	0.55	14.0	100.8	150
CFLG-2LB-50/125	2	50/125	0.33	8.5	36.3	54
CFLG-4LB-50/125	4	50/125	0.35	9.0	43.0	64
CFLG-6LB-50/125	6	50/125	0.43	11.0	57.8	86
CFLG-12LB-50/125	12	50/125	0.55	14.0	100.8	150
CFLG-2LB-200/230	2	200/230	0.33	8.5	36.3	54

**Note:** The given outer diameters are maximum values.  
G = with green-yellow earth core x = without earth core

Part No.	Bandwidth	Bandwidth	Attenuation	Attenuation	Fiber identification
	[MHz x km] @ 850 nm	[MHz x km] @ 1300 nm	[dB/km] @ 850 nm	[dB/km] @ 1300 nm	
CFLG-2LB-62-5/125	≥ 200	≥ 500	≤ 3.5	≤ 1.5	orange with black numbers
CFLG-4LB-62-5/125	≥ 200	≥ 500	≤ 3.5	≤ 1.5	orange with black numbers
CFLG-6LB-62-5/125	≥ 200	≥ 500	≤ 3.5	≤ 1.5	orange with black numbers
CFLG-12LB-62-5/125	≥ 200	≥ 500	≤ 3.0	≤ 0.7	orange with black numbers
CFLG-2LB-50/125	≥ 500	≥ 500	≤ 3.0	≤ 1.0	blue with black numbers
CFLG-4LB-50/125	≥ 500	≥ 500	≤ 3.0	≤ 1.0	blue with black numbers
CFLG-6LB-50/125	≥ 500	≥ 500	≤ 3.0	≤ 1.0	blue with black numbers
CFLG-12LB-50/125	≥ 500	≥ 500	≤ 3.0	≤ 1.0	blue with black numbers
CFLG-2LB-200/230	≥ 20		≤ 6.0		black with white numbers

# Class 7.5.4.1

Basic requirements  
 Travel distance  
 Oil resistance  
 Torsion

low	1	2	3	4	5	6	7	highest
unsupported	1	2	3	4	5	6	≥ 1312 ft	
none	1	2	3	4	highest			
none	1	2	3	4	±360°			

CFLG-LB  
 TPE  
 5 x d



Guarantee  
 igus chainflex  
**36**  
 up to 36 months guarantee

igus 36-month  
 chainflex cable  
 guarantee and  
 service life  
 calculator based  
 on 2 billion test  
 cycles per year



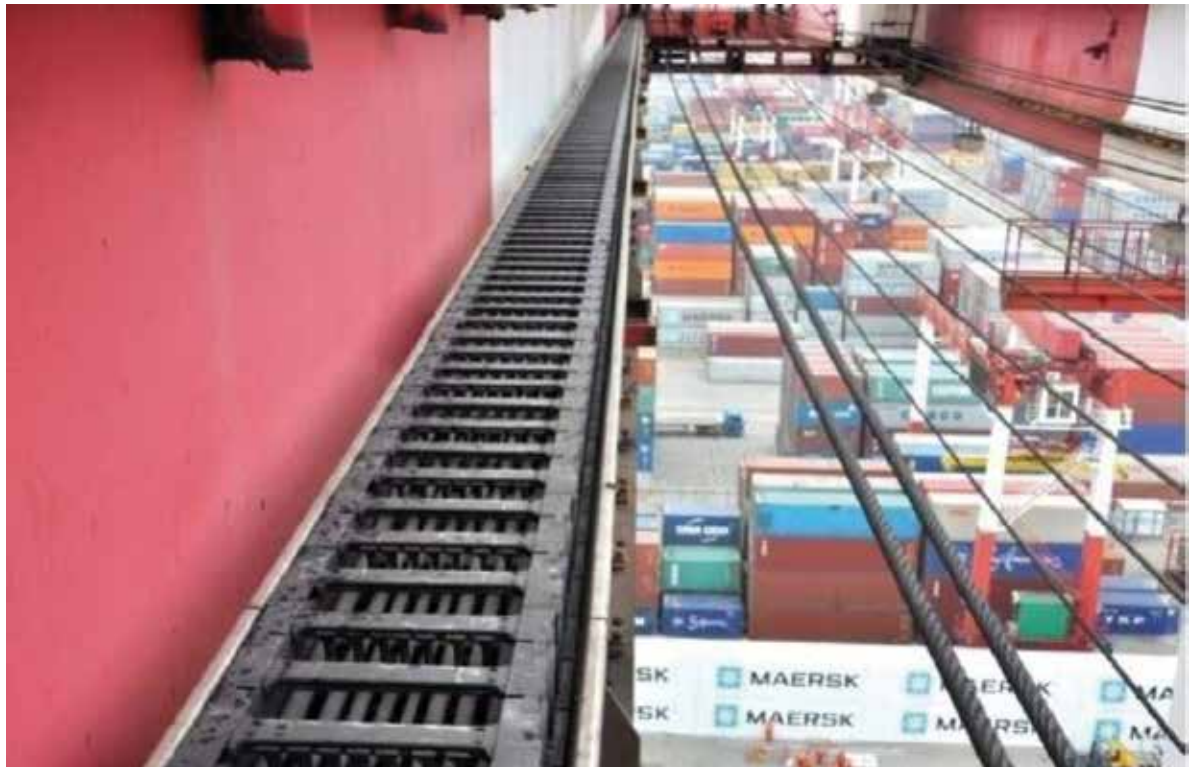
Order example: **CFLG-4LB-62,5/125** – To your desired length  
 CFLG-LB chainflex® series -4 Number of fibers -2,5/125 Fiber diameter



Online order ► [www.chainflex.com/CFLG-LB](http://www.chainflex.com/CFLG-LB)



Delivery time 24hrs or today.  
 Delivery time means time until goods are shipped.



chainflex® Fiber Optic Cables on STS crane

Guarantee  
 igus chainflex  
**36**  
 up to 36 months guarantee

chainflex  
 CONTINUOUS FLEX  
 CABLE TEST PROCESS  
 VERIFICATION  
 UL  
 igus® 36-month chainflex® cable guarantee  
 and service life calculator based upon  
 2 billion test cycles per year.



## Fiber optic cable | TPE | chainflex® CFLG-G






**36** 10,000,000  
Cycles guaranteed

**5 x d**  
Bend radius E-Chain®





**328.1 ft**  
Travel distance E-Chain®

- Glass-fiber cable for maximum mechanical load requirements
- TPE outer jacket
- Oil and bio-oil-resistant
- PVC and halogen-free
- Low-temperature-flexibility
- Hydrolysis and microbe-resistant

### Dynamic Information

 <b>Bend radius</b>	<b>E-Chain® linear</b>	min. 10 x d
	<b>flexible</b>	min. 8 x d
	<b>fixed</b>	min. 5 x d
 <b>Temperature</b>	<b>E-Chain® linear</b>	-40 °F to +176 °F (-40 °C to +80 °C)
	<b>flexible</b>	-58 °F to +176 °F (-50 °C to +80 °C)
	<b>fixed</b>	-67 °F to +176 °F (-55 °C to +80 °C)
 <b>v max.</b>	<b>unsupported</b>	32.81 ft/s (10 m/s)
	<b>gliding</b>	19.69 ft/s (6 m/s)
 <b>a max.</b>		65.6 ft/s <sup>2</sup> (20 m/s <sup>2</sup> )
 <b>Travel distance</b>		Unsupported travel distances and for gliding applications up to 1312 ft (400 m) and more, Class 6

### Cable structure

 <b>Fibre Optic Cable</b>	9/125 µm, 50/125 µm, 62.5/125 µm fibers in gel-filled hollow cores.
 <b>Conductor construction</b>	Strengthening rods with integrated torsion-protection braid in the outer jacket over a central gel-filled fiber tube.
 <b>Color code</b>	Fibers ▶ See P/N Table
 <b>Outer jacket</b>	Low-adhesion mixture on the basis of TPE, especially abrasion-resistant and highly flexible, adapted to suit the requirements in E-Chains®. Color: Jet black (similar to RAL 9005)



Example image

Configurators ▶ [www.igus.com/CFLG-G](http://www.igus.com/CFLG-G)

36 month guarantee ... 1,354 types from stock ... no cutting charges











# Class 7.6.4.1

Basic requirements  
 Travel distance  
 Oil resistance  
 Torsion

low	1	2	3	4	5	6	7	highest
unsupported	1	2	3	4	5	6	≥ 1312 ft	
none	1	2	3	4	highest			
none	1	2	3	4	±360°			

CFLG-G  
 TPE  
 10 x d

## Properties and approvals

	<b>UV resistance</b>	High
	<b>Oil resistance</b>	Oil-resistant (following DIN EN 60811-404), bio-oil-resistant (following VDMA 24568 with Plantocut 8 S-MB tested by DEA), Class 4
	<b>Silicone-free</b>	Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
	<b>Halogen-free</b>	Following DIN EN 60754
	<b>UL verified</b>	Certificate No. B129699: igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year
	<b>REACH</b>	In accordance with regulation (EC) No. 1907/2006 (REACH)
	<b>Lead-free</b>	Following 2011/65/EC (RoHS-II/RoHS-III)
	<b>Cleanroom</b>	According to ISO Class 1. The outer jacket material of this series complies with CF9.15.07 - tested by IPA according to standard DIN EN ISO 14644-1
	<b>CE</b>	Following 2014/35/EU
	<b>Info</b>	For hanging applications, please use cables of the series CFLG-LB – see page 216!

## Guaranteed service life (details see page 26-27)

Cycles*	5 million	7.5 million	10 million
Temperature, from/to [°F]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]
-40/-22	12.5	13.5	14.5
-22/+158	10	11	12
+158/+176	12.5	13.5	14.5

\* Higher number of cycles? Online lifetime calculation ► [www.chainflex.com/chainflexlife](http://www.chainflex.com/chainflexlife)

## Typical application areas

- For maximum mechanical load requirements, Class 7
- Unsupported travel distances and for gliding applications (horizontal) up to 1312 ft (400 m) and more, Class 6
- Almost unlimited resistance to oil, also with bio-oils, Class 4
- Maximum EMC protection, with high transmission qualities
- Indoor and outdoor applications
- crane applications, Material handling, low temperature applications

# Fiber optic cable | TPE | chainflex® CFLG-G

igus chainflex CFLG.G

Example image

Part No.	Fiber Count	Fiber Diameter approx. [μm]	Outer diameter max.		Weight	
			[in.]	[mm]	[lbs/mft]	[kg/km]
CFLG-6G-62.5/125-TC	6	62,5/125	0.39	10.0	53.8	80
CFLG-12G-62.5/125-TC	12	62,5/125	0.39	10.0	53.8	80
CFLG-6G-50/125-TC	6	50/125	0.39	10.0	40.3	60
CFLG-12G-50/125-TC	12	50/125	0.39	10.0	50.4	75
CFLG-12E-9/125-TC	12	9/125	0.39	10.0	50.4	75

Note: The given outer diameters are maximum values.  
G = with green-yellow earth core x = without earth core

Part No.	Bandwidth	Bandwidth	Attenuation	Attenuation
	[MHz x km] @ 850 nm	[MHz x km] @ 1300 nm	[dB/km] @ 850 nm	[dB/km] @ 1300 nm
CFLG-6G-62.5/125-TC	≥ 200	≥ 500	≤ 3.5	≤ 1.0
CFLG-12G-62.5/125-TC	≥ 200	≥ 500	≤ 3.5	≤ 1.0
CFLG-6G-50/125-TC	≥ 500	≥ 500	≤ 3.0	≤ 1.0
CFLG-12G-50/125-TC	≥ 500	≥ 500	≤ 3.0	≤ 1.0

Part No.	Attenuation	Attenuation	Chromatic dispersion	Chromatic dispersion
	[dB/km] @ 1310 nm	[dB/km] @ 1550 nm	[ps/nm/km] @ 1310 nm	[ps/nm/km] @ 1550 nm
CFLG-12E-9/125-TC	≤ 0.35	≤ 0.25	3.5	18

Part No.	Fiber identification	Hollow core identification
CFLG-12E-9/125-TC	ecru, yellow, green, red, violet, blue, lightblue, grey, brown, black, orange, pink	yellow
CFLG-12G-50/125-TC	ecru, yellow, green, red, violet, blue, lightblue, grey, brown, black, orange, pink	blue
CFLG-12G-62.5/125-TC	ecru, yellow, green, red, violet, blue, lightblue, grey, brown, black, orange, pink	orange
CFLG-6G-50/125-TC	ecru, yellow, green, red, violet, blue	blue
CFLG-6G-62.5/125-TC	ecru, yellow, green, red, violet, blue	orange

# Class 7.6.4.1

Basic requirements  
 Travel distance  
 Oil resistance  
 Torsion

low	1	2	3	4	5	6	7	highest
unsupported	1	2	3	4	5	6	≥ 1312 ft	
none	1	2	3	4	highest			
none	1	2	3	4	±360°			

CFLG-G  
 TPE  
 10 x d



Guarantee  
 igus chainflex  
**36**  
 up to 36 months guarantee

igus 36-month  
 chainflex cable  
 guarantee and  
 service life  
 calculator based  
 on 2 billion test  
 cycles per year



Order example: **CFLG-6G-62,5/125-TC** – To your desired length  
 CFLG-G chainflex® series -6G Number of fibers -62,5/125 Fiber diameter -TC Special identification



Online order ► [www.chainflex.com/CFLG-G](http://www.chainflex.com/CFLG-G)



Delivery time 24hrs or today.  
 Delivery time means time until goods are shipped.



cost down...



...life up

**Reduce cost, improve technology, now!**

Do the chainflex® price check now ...

[www.igus.com/info/cable-price-check](http://www.igus.com/info/cable-price-check)

... just one idea for you: Reduce bend radius with CFLG.LB ...



chainflex® Fiber Optic Cable in sea lock