

Fibre optic cables



Chainflex® types



Chainflex® cable	Jacket	Shield	Minimum bending radius, moved [factor x d]	Temperature moved from/to [°C]	Approvals and standards	Oil-resistant	Torsion resistant	v max. [m/s] unsupported	v max. [m/s] gliding	a max. [m/s ²]	Page
Fibre optic cables (FOC)*											
CFLK***	PUR		12,5	-20/ +70	CE	✓		10	5	20	158
CFLG.2H**	PUR		12,5	-20/ +60	CE	✓		10	6	20	160
CFLG.LB**	TPE		5	-40/ +60	CE	✓		10	6	20	162
CFLG. G**	TPE		15	-40/ +60	CE	✓		10	6	20	164

* CFROBOT5, torsionable fibre optic cables ► Page 220

** Multimode/gradient fibres

*** POF-Fiber/plastic FOC

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 course 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 fibre optic cables provide further advantages for even greater data safety.

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

Important fibre types:

- **Multi-mode fibres**

50/125 µm

62,5/125 µm

The ideal fibre 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 fibre and light wave length) of these fibre types, transmission lengths of several hundred metres can be realised quite easily.

- **POF (Plastic fibres)**

980/1000 µm

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

- **PCF (Polymer Cladded Fibre)**

200/230 µm

The ideal compromise for POF fibre. This plastic-coated quartz glass fibre 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.

... no minimum order quantity

Chainflex® FOC offer the operator the following advantages:

1. Greater data security thanks to

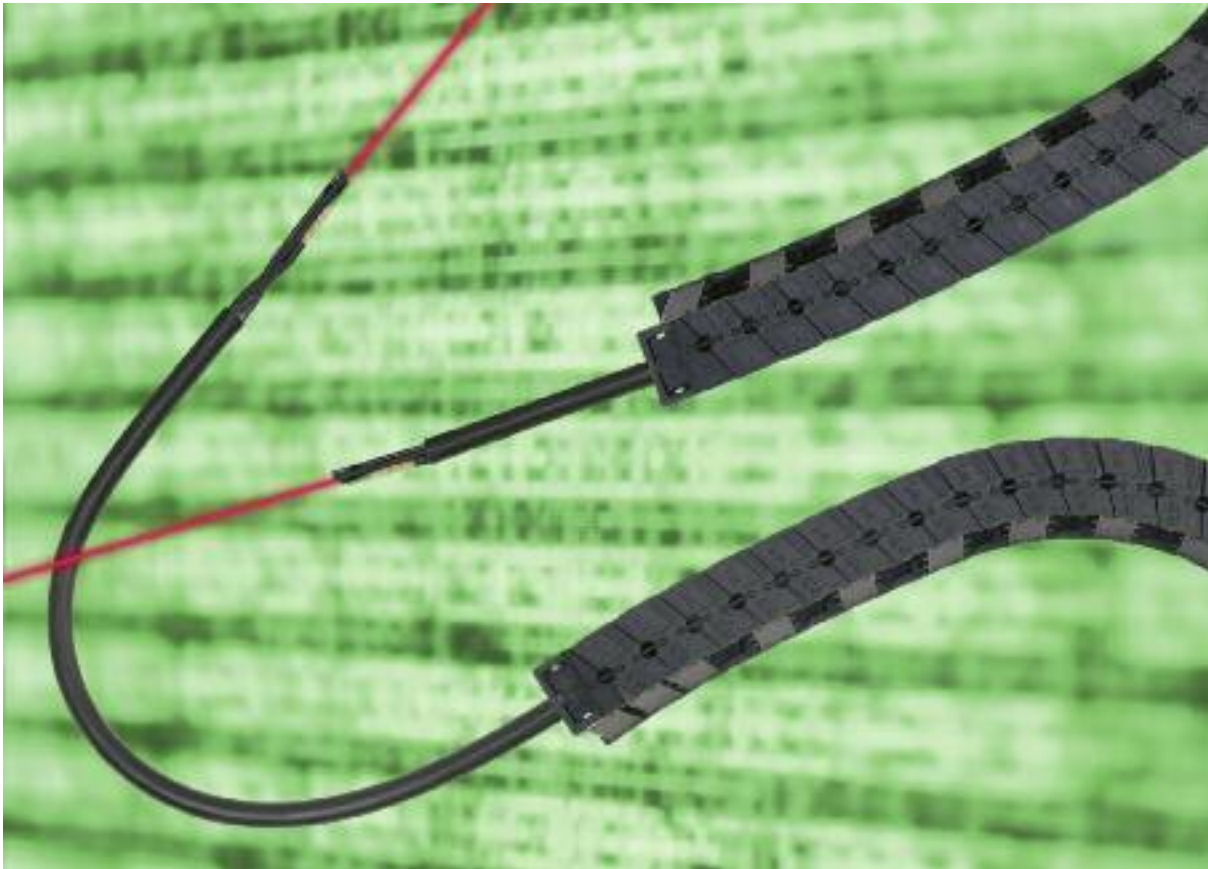
- FOC-typical better transmission characteristics
- Greater possible transmission lengths of several 100 m
- Greater possible data volumes thanks to lower attenuation values
- Maximum EMC protection for the data transmitted
- Future-proof installation (no cable replacement with new bus systems)

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

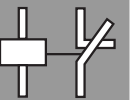
- Bus-independent bus cable wiring
- Longer service life in E-Chains®
- Extendable without transmission limits



Test data ► Page 36

950 types from stock no cutting costs ...
(for up to 10 cuts of the same type)

Tel. +49-2203-96 49-0
Fax +49-2203-96 49-222



PUR Fibre optic cable (FOC) Chainflex® CFLK

- POF fibres for high load requirements and interference-free transmission
- PUR outer jacket
- oil-resistant and coolant-resistant



	Temperature range moved	-20 °C to +70 °C, minimum bending radius 12,5 x d
	Temperature range fixed	-25 °C to +70 °C, minimum bending radius 7,5 x d
	v max. unsupported/gliding	10 m/s, 5 m/s
	a max.	20 m/s ²
	Travel distance	Freely suspended and gliding travel distances up to 15 m, Class 1
	UV-resistant	Medium
	Oil	Oil-resistant (following DIN EN 60811-2-1, DIN EN 50363-10-2), Class 3
	Silicon-free	Free from silicon which can affect paint adhesion (following PV 3.10.7 – status 1992).
	Halogen-free	Following EN 50267-2-1.
	Fibre optic cable	980/1000 µm fibre with PE isolation.
	Core stranding	POF fibre with stranded high-tensile plastic reinforcement.
	Core identification	Black core.
	Outer jacket	Low-adhesion mixture on the basis of PUR, adapted to suit the requirements in Energy Chains® (following DIN VDE 0282 Part 10). Colour: Red lilac (similar to RAL 4001)
	CE	Following 2006/95/EG
	Lead free	Following EC (RoHS) 2002/95/EC.

Typical application area

- for high load requirements
- maximum EMC protection
- almost unlimited resistance to oil
- preferably indoor applications
- especially for freely suspended and gliding travel distances up to 15 m
- wood/stone processing, packaging industry, supply system, handling, adjusting equipment

... no minimum order quantity
eplan download, configurator, PDF catalogues, lifetime ...



Delivery program Part No.	Number of fibres	Fibre diameter approx. [μm]	External diameter approx. [mm]	Weight [kg/km]
CFLK.L1.01	1	980/1000	6,0	25

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

Delivery program Part No.	Bandwidth with 650 nm [MHz x km]	Attenuation with 650 nm [dB/km]	Colour code
CFLK.L1.01	40	200	black



Order example: **CFLK.L1.01** – in your desired length (0,5 m steps)

CFLK Chainflex® series **.L1** Type of fibres **.01** Number of cores



Please use www.chainflex.eu/en/CFLK for your online order.



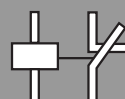
Delivery time 24h or today*

* Delivery time means time until shipping of goods

Fibre optic cable

Tel. +49-2203-96 49-0

Fax +49-2203-96 49-222



Woodworkingmachines with E-Chains® and Chainflex® cables

950 types from stock no cutting costs ...














... and order online ► www.igus.eu/en/CFLK

(for up to 10 cuts of the same type)

CFLG.2H
PUR
12,5 x d

PUR Fibre optic cable (FOC) Chainflex® CFLG.2H

- for high load requirements
- PUR outer jacket
- metal-free
- oil-resistant and coolant-resistant
- UV-resistant

	Temperature range moved	-20 °C to +60 °C, minimum bending radius 12,5 x d
	Temperature range fixed	-25 °C to +60 °C, minimum bending radius 7,5 x d
	v max. unsupported/gliding	10 m/s, 6 m/s
	a max.	20 m/s ²
	Travel distance	Freely suspended and gliding travel distances up to 100 m, Class 3
	UV-resistant	High
	Oil	Oil-resistant (following DIN EN 60811-2-1, DIN EN 50363-10-2), Class 3
	Offshore	MUD-resistant following NEK 606
	Silicon-free	Free from silicon which can affect paint adhesion (following PV 3.10.7 – status 1992).
	Fibre optic cable	50/125 µm, 62,5/125 µm, 200/230 µm fibres in gel-filled hollow cores.
	Core stranding	Hollow cores with integrated FOC-fibres stranded with two strain relief elements.
	Core identification	Cores black with white numerals.
	Outer jacket	Low-adhesion mixture on the basis of PUR, adapted to suit the requirements in Energy Chains® (following DIN VDE 0282 Part 10). Colour: Colour: Jet black (similar to RAL 9005) Following 2006/95/EG
	CE	
	Lead free	Following EC (RoHS) 2002/95/EC.

Typical application area

- for high load requirements
- maximum EMC protection, with high transmission qualities in terms of glass-specific requirements
- almost unlimited resistance to oil
- indoor and outdoor applications
- only for freely suspended and gliding travel distances up to 100 m
- Storage and retrieval units for high-bay warehouses, machining units/packaging machines, quick handling, cranes, refrigerating sector

... no minimum order quantity
eplan download, configurator, PDF catalogues, lifetime ...

FOC-fibres

Plastic covered special fibre

Gel-filled, armored hollow core

Armored hollow cores with optimized pitch length stranded around a strain relief element

Gusset-filled extruded PUR mixture

Image exemplary.

Class 6.3.3





Delivery program Part No.	Number of fibres	Fibre diameter approx. [µm]	External diameter approx. [mm]	Weight [kg/km]
CFLG.2HG.MF.62,5/125	2	62,5/125	9,0	85
CFLG.2HG.MF.50/125	2	50/125	9,0	85
CFLG.2HS.MF.200/230	2	200/230	9,0	85

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

Delivery program 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]	Colour code
CFLG.2HG.MF.62,5/125	160 - 200	3,2	200 - 500	0,9	black with white numbers
CFLG.2HG.MF.50/125	200 - 600	2,5 - 3,5	600 - 1200	0,7 - 1,5	black with white numbers
CFLG.2HS.MF.200/230	20	6,0	-	-	black with white numbers



Order example: **CFLG.2HG.MF.62,5/125** – in your desired length (0,5 m steps)
CFLG.2H Chainflex® series **.MF** Metal-free **.62,5/125** Type of fibres



Please use www.chainflex.eu/en/CFLG2HG for your online order.



Delivery time 24h or today*

* Delivery time means time until shipping of goods

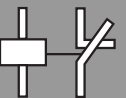
Fibre optic cable

Tel. +49-2203-96 49-0
Fax +49-2203-96 49-222

Test data ▶ Page 36



Metal-free fibre optic cables for fast handling applications. E-Chain®: System E2/000



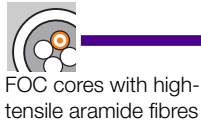
950 types from stock no cutting costs ...

... and order online ▶ www.igus.eu/en/CFLG2HG

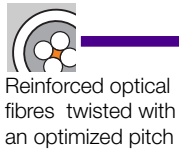
(for up to 10 cuts of the same type)

TPE Fibre optic cable (FOC) Chainflex® CFLG.LB

- Gradient glass-fiber cable for maximum load requirements
- TPE outer jacket
- metal-free
- oil-resistant
- low-temperature-flexible up to -40 °C
- UV-resistant



FOC cores with high-tensile aramide fibres


















Reinforced optical fibres twisted with an optimized pitch



Aramid braid for torsion protection



Pressure extruded, halogen-free TPE blend

	Temperature range moved	-40 °C to +60 °C, minimum bending radius 5 x d
	Temperature range fixed	-40 °C to +60 °C, minimum bending radius 5 x d
	v max. unsupported/gliding	10 m/s, 6 m/s
	a max.	20 m/s ²
	Travel distance	Freely suspended and gliding travel distances up to 100 m and more, Class 3
	UV-resistant	High
	Oil	Oil-resistant (following DIN EN 60811-2-1), bio-oil-resistant (following VDMA 24568 with Plantocut 8 S-MB), Class 4.
	Silicon-free	Free from silicon which can affect paint adhesion (following PV 3.10.7 – status 192).
	Fibre optic cable	50/125 µm, 62.5/125 µm special fixed wire elements with aramide strain relief.
	Core stranding	FOC cores stranded with high-tensile aramide dampers with especially short pitch length.
	Core identification	Cores blue with white numerals.
	Overall shield	Extremely bending-resistant aramid braid for torsion protection.
	Outer jacket	Low-adhesion mixture on the basis of TPE, especially abrasion-resistant and highly flexible, adapted to suit the requirements in Energy Chains®. Colour: Jet black (similar to RAL 9005)
	CE	following 2006/95/EG
	Lead free	Following EC (RoHS) 2002/95/EC.

Typical application area

- for maximum load requirements at 5 x d
- Maximum EMC protection, with high transmission qualities in terms of glass-specific requirements
- almost unlimited resistance to oil, also with bio-oils
- Indoor and outdoor applications
- especially for freely suspended and gliding travel distances up to 100 m and more
- Storage and retrieval units for high-bay warehouses, machining units/packaging machines, quick handling, semiconductor insertion, refrigerating sector

... no minimum order quantity
eplan download, configurator, PDF catalogues, lifetime ...

Image exemplary.



Delivery program Part No.	Number of fibres	Fibre diameter approx. [µm]	External diameter approx. [mm]	Weight [kg/km]
CFLG.2LB.62,5/125	2	62,5/125	8,5	47
CFLG.2LB.50/125	2	50/125	8,5	47

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

Delivery program 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]	Colour code
CFLG.2LB.62,5/125	160 - 200	3,2	200 - 500	0,9	blue with white numbers
CFLG.2LB.50/125	200 - 600	2,5 - 3,5	600 - 1200	0,7 - 1,5	blue with white numbers



Order example: CFLG.2LB.50/125 – in your desired length (0,5 m steps)
CFLG.2LB Chainflex® series **.50/125** Type of fibres



Please use www.chainflex.eu/en/CFLG2LB for your online order.



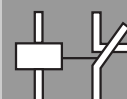
Delivery time 24h or today*

* Delivery time means time until shipping of goods

Fibre optic cable

Tel. +49-2203-96 49-0

Fax +49-2203-96 49-222



950 types from stock no cutting costs ...

... and order online ► www.igus.eu/en/CFLGLB

(for up to 10 cuts of the same type)

TPE Fibre optic cable (FOC) Chainflex® CFLG. G

- Gradient glass-fiber cable for maximum load requirements
- TPE outer jacket
- halogen-free
- low-temperature-flexible up to -40 °C
- hydrolysis-resistant and microbe-resistant



	Temperature range moved	-40 °C to +60 °C, minimum bending radius 15 x d
	Temperature range fixed	-40 °C to +60 °C, minimum bending radius 8.5 x d
	v max. unsupported/gliding	10 m/s, 6 m/s
	a max.	20 m/s ²
	Travel distance	Freely suspended and gliding travel distances up to 500 m and more, Class 4
	UV-resistant	High
	Oil	Oil-resistant (following DIN EN 60811-2-1), bio-oil-resistant (following VDMA 24568 with Plantocut 8 S-MB), Class 4.
	Silicon-free	Free from silicon which can affect paint adhesion (following PV 3.10.7 – status 1992).
	Halogen-free	Following EN 50267-2-1.
	Fibre optic cable	50/125 µm, 62.5/125 µm fibres in gel-filled hollow cores.
	Core stranding	Stranded GRP rods with integrated torsion protection braid in the outer jacket over gel-filled fiber sheath..
	Core identification	► Schedule delivery program
	Outer jacket	Low-adhesion mixture on the basis of TPE, especially abrasion-resistant and highly flexible, adapted to suit the requirements in Energy Chains®. Colour: Colour: Jet black (similar to RAL 9005)
	CE	Following 2006/95/EG
	Lead free	Following EC (RoHS) 2002/95/EC.

Typical application area

- for maximum load requirements
- maximum EMC protection, with high transmission qualities in terms of glass-specific requirements
- almost unlimited resistance to oil, also with bio-oils
- indoor and outdoor applications
- only for freely suspended and gliding travel distances up to 500 m and more
- outdoor ship to shore, crane applications, conveyer technology

... no minimum order quantity
eplan download, configurator, PDF catalogues, lifetime ...



Delivery program Part No.	Number of fibres	Fibre diameter approx. [µm]	External diameter approx. [mm]	Weight [kg/km]
CFLG.6G.62,5/125.TC	6	62,5/125	11,5	110
CFLG.12G.62,5/125.TC	12	62,5/125	11,5	110
CFLG.6G.50/125.TC	6	50/125	11,5	110
CFLG.12G.50/125.TC	12	50/125	11,5	110

Other number of fibers upon inquiry

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

Delivery program 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]	Colour code
CFLG.6G.62,5/125.TC	160 - 200	3,2	200 - 500	0,9	ecru, yellow, green, red, violet, blue
CFLG.12G.62,5/125.TC	160 - 200	3,2	200 - 500	0,9	ecru, yellow, green, red, violet, blue, lightblue, gray, brown, black, orange, pink
CFLG.6G.50/125.TC	200 - 600	2,5 - 3,5	600 - 1200	0,7 - 1,5	ecru, yellow, green, red, violet, blue
CFLG.12G.50/125.TC	200 - 600	2,5 - 3,5	600 - 1200	0,7 - 1,5	ecru, yellow, green, red, violet, blue, lightblue, gray, brown, black, orange, pink



Order example: **CFLG.6G.62,5/125.TC** – in your desired length (0,5 m steps)
CFLG.G Chainflex® series **.6G** Number of cores **.62,5/125** Type of fibres **.TC** Special identification



Please use www.chainflex.eu/en/CFLGGT for your online order.



Delivery time 24h or today*

* Delivery time means time until shipping of goods

Test data ▶ Page 40



igus® fibre optic cables with 441 m travel. E-Chain®: System E4/4

950 types from stock no cutting costs ...

... and order online ▶ www.igus.eu/en/CFLGGT

(for up to 10 cuts of the same type)

Fibre optic cable

Tel. +49-2203-96 49-0
Fax +49-2203-96 49-222

