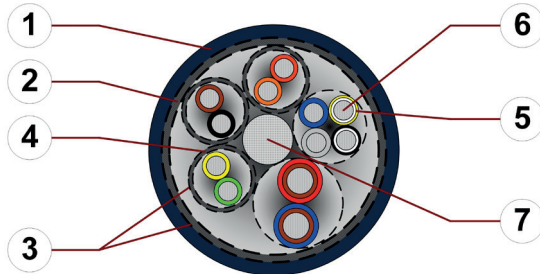


Data sheet

chainflex® CFROBOT4



Measuring system cable (Class 6.1.3.3) ● For torsion applications ● PUR outer jacket
 ● Shielded ● Oil-resistant and coolant-resistant ● Flame-retardant ● PVC and halogen-free
 ● Notch-resistant ● Hydrolysis and microbe-resistant



1. Outer jacket: Pressure extruded PUR mixture
2. Overall shield: Extremely torsion-resistant wrapping made of tinned copper wires
3. Banding: Plastic fleece
4. Element shield: Extremely torsion-resistant wrapping made of tinned copper wires
5. Core insulation: Mechanically high-quality TPE mixture
6. Conductor: Fine-wire strand in especially bending-stable version consisting of tinned copper wires
7. Filling: Plastic yarns

Example image

For detailed overview please see design table

Cable structure



Conductor

Stranded conductor in especially bending-resistant version consisting of tinned copper wires (following DIN EN 60228).



Core insulation

Mechanically high-quality TPE mixture.



Core identification

According to measuring system specification.
 ► Design table



Element shield

Extremely torsion-resistant tinned wound copper shield.



Overall shield

Extremely torsion-resistant tinned wound copper shield.
 Coverage approx. 80% optical



Outer jacket

Low-adhesion, halogen-free, highly abrasion resistant PUR mixture, adapted to suit the requirements in e-chains® (following DIN EN 50363-10-2)

Colour: Steel-blue (similar to RAL 5011)

Printing: white

„00000 m“*** igus chainflex CFROBOT4.---① -----② E310776 cRUus

AWM Style 20236 VW-1 AWM I/II A/B 80°C 30V FT1 CE

RoHS-II conform www.igus.de

+++ chainflex cable works +++

* **Length printing:** Not calibrated. Only intended as an orientation aid.

① / ② Cable identification according to Part No. (see technical table).

Example: chainflex CFROBOT4.009 (4x(2x0.25)+(2x0.5))C



igus 4-year
chainflex cable
guarantee and
service life
calculator based
on 2 billion test
cycles per year



Example image

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Dynamic information

	Bend radius	flexible twisted fixed	minimum 10 x d minimum 5 x d
	Temperature	flexible twisted fixed	-25°C up to +80°C -50°C up to +80°C (following DIN EN 50305)
	v max.	twisted	180°/s
	a max.	twisted	60°/s ²
	Travel distance	Robots and multi-axis movements, Class 1	
	Torsion	Torsion ±180°, with 1m cable length, Class 3	

These values are based on specific applications or tests. They do not represent the limit of what is technically feasible.

Guaranteed service life according to guarantee conditions

Cycles	5 million	7.5 million	10 million
Temperature, from/to [°C]	Torsion max. [°/m]	Torsion max. [°/m]	Torsion max. [°/m]
-25/-15	±150	±90	±30
-15/+70	±180	±120	±60
+70/+80	±150	±90	±30

Minimum guaranteed service life of the cable under the specified conditions.
 The installation of the cable is recommended within the middle temperature range.

Electrical information

	Nominal voltage	50V 30V (following UL)
	Testing voltage	500V

Example image

igus® chainflex® CFROBOT 4



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Properties and approvals

	UV resistance	High
	Oil resistance	Oil-resistant (following DIN EN 50363-10-2), Class 3
	Flame-retardant	According to IEC 60332-1-2, Cable Flame, VW-1, FT1, FT2 / Horizontal Flame
	Silicone-free	Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
	Halogen-free	Following DIN EN 60754
	PTFE-free	The design of these products does not contain PTFE
	UL-verified	Certificate No. V293650: „igus 4-year chainflex cable guarantee and service life calculator based on 2 billion test cycles per year“
	UL/CSA AWM	See table UL/CSA AWM for details
	NFPA	Following NFPA 79-2018, chapter 12.9
	REACH	In accordance with regulation (EC) No. 1907/2006 (REACH)
	Lead-free	Following 2011/65/EC (RoHS-II/RoHS-III)
	Cleanroom	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
	CE	Following 2014/35/EU

Properties and approvals

UL/CSA AWM Details

Part No.	UL style core insulation	UL style outer jacket	UL Voltage Rating [V]	UL Temperature Rating [°C]
CFROBOT4.001	1589	20236	30	80
CFROBOT4.006	1589	20236	30	80
CFROBOT4.009	1589	20236	30	80
CFROBOT4.015	1589	20236	30	80
CFROBOT4.028	1589	20236	30	80



Example image

igus® chainflex® CFROBOT 4

Data sheet

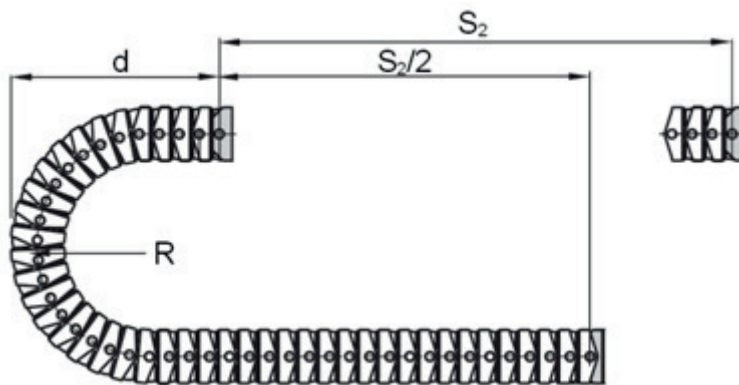
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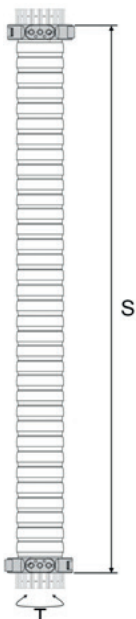
Typical lab test setup for this cable series

Test bend radius R	approx. 75 - 100 mm
Test travel S/S_2	approx. 1 - 12 m
Test duration	minimum 1.5 - 3 million double strokes
Test speed	approx. 0.5 m/s
Test acceleration	approx. 1.5 m/s^2



Typical lab test setup (torsion) for this cable series

Torsion range T	$\pm 180^\circ/\text{m}$
Length 3D e-chain®	1 m
Test duration (torsion)	minimum 3 - 5 million cycles
Test speed (torsion)	approx. 80 - 120 °/s
Test acceleration (torsion)	approx. $40^\circ/\text{s}^2$



Example image



Data sheet

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Typical application areas

- For heaviest duty applications with torsion movements, Class 6
- Especially for robots and multi-axis movements, Class 1
- Almost unlimited resistance to oil, Class 3
- Torsion $\pm 180^\circ$, with 1m cable length, Class 3
- Indoor and outdoor applications, UV-resistant
- Robots, handling, lead screw drives

Technical tables:

Mechanical information

Part No.	Number of cores and conductor nominal cross section [mm ²]	Outer diameter (d) max. [mm]	Copper index [kg/km]	Weight [kg/km]
CFROBOT4.001	(3x(2x0.14)C + (4x0.14)+(2x0.5))C	10.5	62	115
CFROBOT4.006	(3x(2x0.14)C+(4x0.14)+(4x0.22)+(2x0.5))C	11.5	74	135
CFROBOT4.009	(4x(2x0.25)+(2x0.5))C	9.0	48	90
CFROBOT4.015	(4x(2x0.14)+4x0.5)C	9.0	49	91
CFROBOT4.028 ¹³⁾	(2x(2x0.20)+(2x0.38))C	7.5	44	72

¹³⁾ Colour outer jacket: Yellow-green (RAL 6018)

Note: The given outer diameters are maximum values and may tend toward lower tolerance limits.

G = with green-yellow earth core x = without earth core

Technical tables:

Electrical information

Conductor nominal cross section [mm ²]	Maximum conductor resistance at 20 °C (following DIN EN 50289-1-2) [Ω/km]	Maximum current rating at 30 °C [A]
0.14	146.0	2.5
0.2	94.0	3.5
0.22	91.0	4
0.25	86.0	5
0.38	55.0	7
0.5	43.0	10

The final maximum current rating depends among other things on the ambient conditions, the type of the installation and the number of loaded cores.



Example image

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Design table

Part No.	Core group	Colour code	Core design
CFROBOT4.001	3x(2x0.14)C	green/yellow, black/brown, red/orange	
	4x0.14	grey/blue/white-yellow/white-black	
	2x0.5	brown-red/brown-blue	
CFROBOT4.006	3x(2x0.14)C	green/yellow, black/brown, red/orange	
	(4x0.14)	grey/blue/white-yellow/white-black	
	(4x0.22)	yellow-brown/grey-brown/green-black/green-red	
	(2x0.5)	brown-red/brown-blue	
CFROBOT4.009	4x(2x0.25)	brown/green, blue/violet, grey/pink, red/black	
	2x0.5	white, brown	
CFROBOT4.015	4x(2x0.14)	brown/green, yellow/violet, grey/pink, red/black	
	4x0.5	blue, white, brown-green, white-green	
CFROBOT4.028	2x(2x0.20)	green/yellow, pink/blue	
	(2x0.38)	red/black	



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