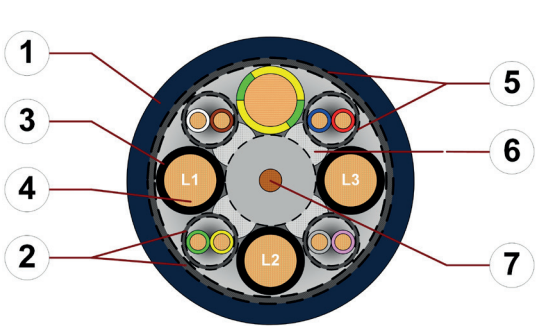
Data sheet
chainflex® CFROBOT7

Motor 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. Shield: Extremely torsion-resistant wrapping made of tinned copper wires
3. Core insulation: Mechanically high-quality TPE mixture
4. Conductor: Stranded conductor in especially bending-resistant version consisting of bare copper wires
5. Banding: Plastic fleece
6. Filling: Plastic yarns
7. Strain relief: Tensile stress-resistant and torsion-resistant centre element

Example image
For detailed overview please see design table

Example image

Cable structure

Conductor	Stranded conductor in especially bending-resistant version consisting of bare copper wires (following DIN EN 60228).
Core insulation	Mechanically high-quality TPE mixture.
Core identification	**Power cores:** Black cores with white numbers, one green-yellow core. **2 Control pairs:** Black cores with white numbers. 1. Control core: 5 2. Control core: 6 3. Control core: 7 4. Control core: 8 **4 Control pairs:** Colour code in accordance with DIN 47100
Overall shield	Extremely torsion-resistant tinned wound copper shield. Coverage optical approx. 85 %
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 CFROBOT7.--.--.C① -----② 600/1000V**

E310776 cЯUus AWM Style 21223 VW-1 AWM I/II A/B 80°C 1000V FT1

EAC CE UKCA 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 **CFROBOT7.15.03.C (3G1.5)C 600/1000V**

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

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Example image

Dynamic information

Bend radius	e-chain® twisted	min. 10 x d
	flexible	min. 8 x d
	fixed	min. 5 x d
Temperature	e-chain® twisted	-25 °C up to +80 °C
	flexible	-40 °C up to +80 °C (following DIN EN 60811-504)
	fixed	-50 °C up to +80 °C (following DIN EN 50305)
v max.	twisted	180 °/s
a max.	twisted	60 °/s²
Travel distance	Robots and 3D movements, Class 1	

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	600/1000 V (following DIN VDE 0298-3) 1000 V (following UL)
Testing voltage	4000 V (following DIN EN 50395)

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Example image

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
UL verified	Certificate No. B129699: „igus 36-month 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
EAC	Zertifikat-Nr. RU C-DE.ME77.B.00863/20
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
UKCA	In accordance with the valid regulations of the United Kingdom (as at 08/2021)

Properties and approvals

UL/CSA AWM Details

Conductor nominal cross section [mm²]	UL style core insulation	UL style outer jacket	UL Voltage Rating [V]	UL Temperature Rating [°C]
0.25	10492	21223	1000	80
0.34	10492	21223	1000	80
0.75	10492	21223	1000	80
1.5	10492	21223	1000	80
2.5	10492	21223	1000	80
4.0	10492	21223	1000	80
6.0	10492	21223	1000	80

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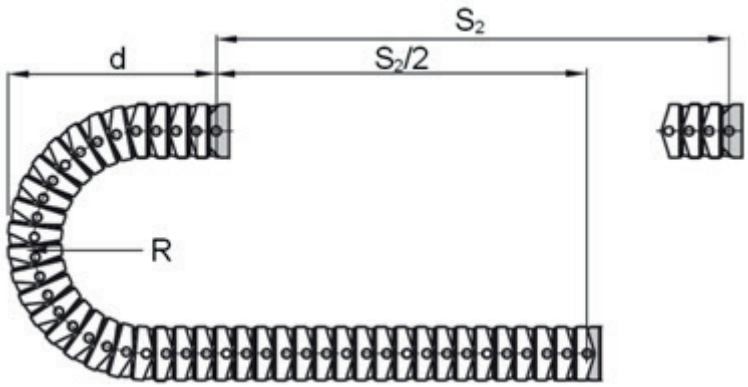
Example image

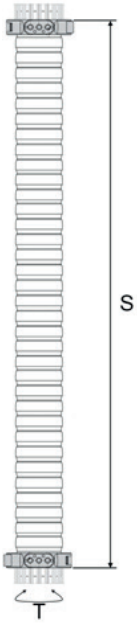
Typical lab test setup for this cable series

Test bend radius R	approx. 90 - 175 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/s²



Typical lab test setup for this cable series

Torsion range T	±180°/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°/s²



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Example image

Typical application areas

- For heaviest duty applications with torsion movements, Class 6
- Especially for robots and 3D movements, Class 1
- Almost unlimited resistance to oil, Class 3
- Torsion ±180°, with 1m cable length, Class 3
- Indoor and outdoor applications, UV-resistant
- Robots, Handling, spindle drives

Technical tables:

Mechanical information

Part No.	Number of cores and conductor nominal cross section [mm²]	Outer diameter (d) max. [mm]	Copper index [kg/km]	Weight [kg/km]
without control pair				
CFROBOT7.15.03.C	(3G1.5)C	8.5	61	98
CFROBOT7.15.04.C	(4G1.5)C	9.5	77	120
CFROBOT7.25.03.C	(3G2.5)C	10.0	93	142
CFROBOT7.25.04.C	(4G2.5)C	11.0	119	173
CFROBOT7.60.04.C	(4G6.0)C	15.0	278	374
2 Control pairs				
CFROBOT7.07.03.02.02.C	(4G0.75+2x(2x0.34)C)C	11.5	88	155
CFROBOT7.15.15.02.02.C	(4G1.5+2x(2x1.5)C)C	16.5	197	304
CFROBOT7.25.15.02.02.C	(4G2.5+2x(2x1.5)C)C	16.5	243	349
4 Control pairs				
CFROBOT7.40.02.02.04.C	(4G4.0+4x(2x0.25)C)C	17.0	253	366

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

Electrical information

Conductor nominal cross section [mm²]	Maximum conductor resistance at 20 °C (following DIN EN 50289-1-2) [Ω/km]	Maximum current rating at 30 °C [A]
0.25	79	5
0.34	57	7
0.75	27	14
1.5	13.3	21
2.5	8	30
4	4.45	41
6	3.3	53

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

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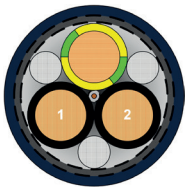
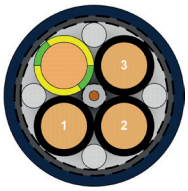
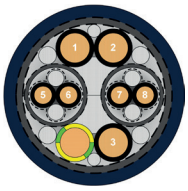
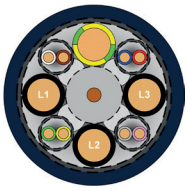
Example image

Design table

Part No.	Number of cores	Core design
CFROBOT7.XX.03.C	3	
CFROBOT7.XX.04.C	4	
CFROBOT7.XX.XX.02.02.C	4+2x2	
CFROBOT7.XX.XX.XX.04.C	4+4x2	

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Colour code in accordance with DIN 47100

Conductor no.	Colours according to DIN ISO 47100
1	white
2	brown
3	green
4	yellow
5	grey
6	pink
7	blue
8	red
9	black
10	violet
11	grey-pink
12	red-blue
13	white-green
14	brown-green
15	white-yellow
16	yellow-brown
17	white-grey
18	grey-brown

Conductor no.	Colours according to DIN ISO 47100
19	white-pink
20	pink-brown
21	white-blue
22	brown-blue
23	white-red
24	brown-red
25	white-black
26	brown-black
27	grey-green
28	yellow-grey
29	pink-green
30	yellow-pink
31	green-blue
32	yellow-blue
33	green-red
34	yellow-red
35	green-black
36	yellow-black

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