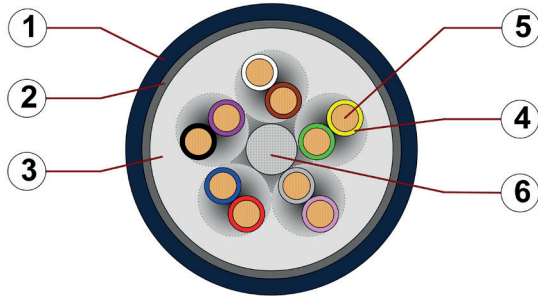# Data sheet
chainflex® CF11

Data cable (Class 6.6.4.1) ● **For extremely heavy duty applications** ● **TPE outer jacket** ● **Shielded** ● **Twisted pair** ● **Oil and bio-oil resistant** ● **PVC and halogen-free** ● **Hydrolysis and microbe-resistant**

1. Outer jacket: Pressure extruded, halogen-free TPE mixture
2. Overall shield: Extremely bending-resistant braiding made of tinned copper wires
3. Inner jacket: Pressure extruded, gusset-filling TPE mixture
4. Core insulation: Mechanically high-quality TPE mixture
5. Conductor: Fine-wire strand in especially bending-stable version consisting of bare copper wires
6. Strain relief: Tensile stress-resistant centre element

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Example image
For detailed overview please see design table

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 structure	Cores twisted in pairs with a short pitch length, core pairs then wound with short pitch lengths.	
Core identification	**Cores < 1.0 mm²:** Colour code in accordance with DIN 47100 **Cores ≥ 1.0 mm²:** Black cores with white numbers.	
Inner jacket	TPE mixture adapted to suit the requirements in e-chains®.	
Overall shield	Extremely bending-resistant braiding made of tinned copper wires. Coverage approx. 70 % linear, approx. 90 % optical	
Outer jacket	Low-adhesion, extremely abrasion-resistant and highly flexible TPE mixture, adapted to suit the requirements in e-chains®. Colour: Steel-blue (similar to RAL 5011) Printing: white	

„00000 m"* igus chainflex CF11.--.--.02① ---② EAC 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 ... **CF11.01.04.02** ... **(4x(2x0.14))C** ... **EAC** ...

EAC

REACH

RoHS

Clean-Room

DESINA

CE

Example image
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Data sheet
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Data cable (Class 6.6.4.1) ● For extremely heavy duty applications ● TPE outer jacket ● Shielded ● Twisted pair ● Oil and bio-oil resistant ● PVC and halogen-free ● Hydrolysis and microbe-resistant

Dynamic information

	Bend radius	e-chain® linear	minimum 6.8 x d
		flexible	minimum 5 x d
		fixed	minimum 4 x d
	Temperature	e-chain® linear	-35 °C up to +100 °C
		flexible	-50 °C up to +100 °C (following DIN EN 60811-504)
		fixed	-55 °C up to +100 °C (following DIN EN 50305)
	v max.	unsupported	10 m/s
		gliding	6 m/s
	a max.		100 m/s^2
	Travel distance		Unsupported travel distances and up to 400 m for gliding applications, Class 6

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

Double strokes	5 million	7.5 million	10 million
Temperature, from/to [°C]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]
-35/-25	7.5	8.5	9.5
-25/+90	6.8	7.5	8.5
+90/+100	7.5	8.5	9.5

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	300/300 V (following DIN VDE 0298-3)
	Testing voltage	1500 V (following DIN EN 50395)

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Example image
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Properties and approvals

UV	**UV resistance**	High
oil	**Oil resistance**	Oil-resistant (following DIN EN 60811-404), bio-oil-resistant (following VDMA 24568 with Plantocut 8 S-MB tested by DEA), Class 4
	Silicone-free	Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
hal	**Halogen-free**	Following DIN EN 60754
UL	**UL verified**	Certificate No. B129699: „igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year"
EAC	**EAC**	Certificate No. RU C-DE.ME77.B.00300/19 (TR ZU)
REACH	**REACH**	In accordance with regulation (EC) No. 1907/2006 (REACH)
RoHS	**Lead-free**	Following 2011/65/EC (RoHS-II/RoHS-III)
Clean-Room	**Cleanroom**	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
CE	**CE**	Following 2014/35/EU

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Typical lab test setup for this cable series

Test bend radius R	approx. 38 - 115 mm
Test travel S	approx. 1 - 15 m
Test duration	minimum 2 - 4 million double strokes
Test speed	approx. 0.5 - 2 m / s
Test acceleration	approx. 0.5 - 1.5 m / s^2

Example image — igus® chainflex® CF11

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Typical application areas

- For extremely heavy duty applications, Class 6
- Unsupported travel distances and up to 400 m and more for gliding applications, Class 6
- Almost unlimited resistance to oil, also with bio-oils, Class 4
- No torsion, Class 1
- Indoor and outdoor applications, UV-resistant
- Storage and retrieval units for high-bay warehouses, Machining units/machine tools, quick handling, Clean room, semiconductor insertion, outdoor cranes, low temperature applications

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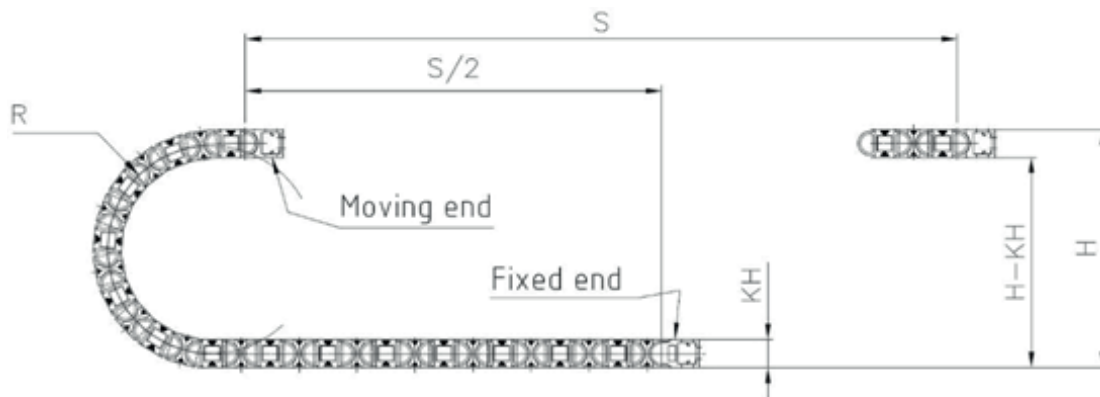
Example image
igus® chainflex® CF11

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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]
CF11.01.04.02	(4x(2x0.14))C	7.5	30	63
CF11.01.18.02	(18x(2x0.14))C	12.5	101	202
CF11.02.01.02	(2x0.25)C	6.0	17	39
CF11.02.02.02 [2]	(2x(2x0.25))C	6.5	26	47
CF11.02.03.02	(3x(2x0.25))C	8.0	35	78
CF11.02.04.02	(4x(2x0.25))C	8.5	42	90
CF11.02.05.02	(5x(2x0.25))C	9.0	49	100
CF11.02.06.02	(6x(2x0.25))C	10.0	69	125
CF11.02.10.02	(10x(2x0.25))C	13.5	103	207
CF11.02.14.02	(14x(2x0.25))C	14.0	124	228
CF11.03.08.02	(8x(2x0.34))C	13.0	106	209
CF11.05.04.02	(4x(2x0.5))C	9.5	77	140
CF11.05.06.02	(6x(2x0.5))C	12.0	103	198
CF11.05.08.02	(8x(2x0.5))C	14.5	135	251
CF11.07.03.02	(3x(2x0.75))C	10.5	83	155
CF11.10.04.02	(4x(2x1.0))C	12.5	125	232
CF11.15.06.02	(6x(2x1.5))C	16.5	247	420

[2] The chainflex® types marked with 2) are cables designed as a star-quad.

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]	Max. current rating at 30 °C [A]
0.14	138	2.5
0.25	79	5
0.34	57	7
0.5	39	10
0.75	26	14
1	19.5	17
1.5	13.3	21

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.	Number of cores	Core design	Part No.	Number of cores	Core design
CF11.XX.01.02	2		CF11.XX.08.02	8x2	
CF11.XX.02.02	4		CF11.XX.09.02	9x2	
CF11.XX.03.02	3x2		CF11.XX.10.02	10x2	
CF11.XX.04.02	4x2		CF11.XX.14.02	14x2	
CF11.XX.05.02	5x2		CF11.XX.18.02	18x2	
CF11.XX.06.02	6x2				

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Colour code in accordance with DIN 47100

Conductor no.	Colours according to DIN ISO 47100	Conductor no.	Colours according to DIN ISO 47100	Conductor no.	Colours according to DIN ISO 47100
1	white	22	brown-blue	43	blue-black
2	brown	23	white-red	44	red-black
3	green	24	brown-red	45	white-brown-black
4	yellow	25	white-black	46	yellow-green-black
5	grey	26	brown-black	47	grey-pink-black
6	pink	27	grey-green	48	red-blue-black
7	blue	28	yellow-grey	49	white-green-black
8	red	29	pink-green	50	brown-green-black
9	black	30	yellow-pink	51	white-yellow-black
10	violet	31	green-blue	52	yellow-brown-black
11	grey-pink	32	yellow-blue	53	white-grey-black
12	red-blue	33	green-red	54	grey-brown-black
13	white-green	34	yellow-red	55	white-pink-black
14	brown-green	35	green-black	56	pink-brown-black
15	white-yellow	36	yellow-black	57	white-blue-black
16	brown-yellow	37	grey-blue	58	brown-blue-black
17	white-grey	38	pink-blue	59	white-red-black
18	brown-grey	39	grey-red	60	brown-red-black
19	white-pink	40	pink-red	61	black-white
20	white-brown	41	grey-black		
21	white-blue	42	pink-black		

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