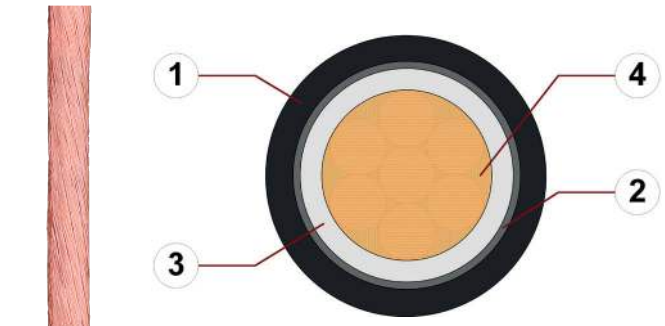
Data sheet
chainflex® CF310.UL

Spindle cable/Single core (Class 6.6.4.1) ● For extremely heavy duty applications ● TPE outer jacket ● Shielded ● Oil and bio-oil resistant ● Flame retardant ● UV-resistant ● Hydrolysis and microbe-resistant



1. Outer jacket: Pressure extruded, flame-retardant TPE mixture
2. Overall shield: Extremely bending-resistant braiding made of tinned copper wires
3. Core insulation: Mechanically high-quality TPE mixture
4. Conductor: Conductor rope in especially bending-stable version consisting of bare copper wires

Example image

Example image
For detailed overview please see design table

Cable structure

Conductor	Conductor cable consisting of pre-leads (following DIN EN 60228).
Core insulation	Mechanically high-quality TPE mixture.
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: Signal black (similar to RAL 9004) Printing: white

„00000 m“* igus chainflex CF310.UL.--.--① ----② 600/1000V E310776

cЯ Uus AWM Style 21218 VW-1 AWM I/II A/B 80°C 1000V FT1 DNV TAE00003XC

EAC CE UKCA DESINA 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 **CF310.UL.40.01 (1x4.0)C 600/1000V** ...

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Example image

Dynamic information

Bend radius	e-chain® linear	minimum 7.5 x d
	flexible	minimum 6 x d
	fixed	minimum 4 x d
Temperature	e-chain® linear	-35 °C up to +90 °C
	flexible	-45 °C up to +90 °C (following DIN EN 60811-504)
	fixed	-50 °C up to +90 °C (following DIN EN 50305)
v max.	unsupported	10 m/s
	gliding	6 m/s
a max.		100 m/s²
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	10	11	12
-25/+80	7.5	8.5	9.5
+80/+90	10	11	12

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 60811-404), bio-oil-resistant (following VDMA 24568 with Plantocut 8 S-MB tested by DEA), Class 4
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)
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 data sheet for details ▶ www.igus.eu/CF310.UL
NFPA	Following NFPA 79-2018, chapter 12.9
DNV	Type approval certificate No. TAE00003XC
EAC	Certificate No. 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 CF34. UL.25.04.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)

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

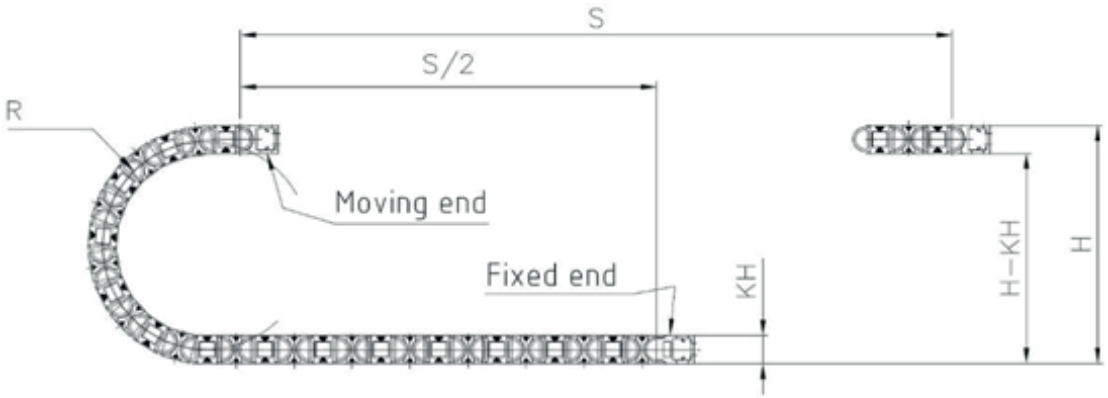
Properties and approvals

UL/CSA AWM Details

Conductor nominal cross section mm²	Number of cores	UL style core insultation	UL style outer jacket	UL Voltage Rating V	UL Temperature Rating °C
2.5	1	10492	11804	1000	80
4	1	10492	11804	1000	80
6	1	10492	11804	1000	80
10	1	10492	11804	1000	80
16	1	10492	21218	1000	80
25	1	10492	21218	1000	80
35	1	10492	21218	1000	80
50	1	10492	21218	1000	80
70	1	10492	21218	1000	80
95	1	10492	21218	1000	80
120	1	10492	21218	1000	80
150	1	10492	21218	1000	80
185	1	10492	21218	1000	80

Typical lab test setup for this cable series

Test bend radius R	approx. 44 - 175 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 / s²



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Example image

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

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]
CF310.UL.25.01	(1x2.5)C	6.0	41	58
CF310.UL.40.01	(1x4.0)C	6.5	57	77
CF310.UL.60.01	(1x6.0)C	7.0	80	101
CF310.UL.100.01	(1x10)C	8.5	121	146
CF310.UL.160.01	(1x16)C	10.0	184	223
CF310.UL.250.01	(1x25)C	12.0	280	329
CF310.UL.350.01	(1x35)C	13.0	395	444
CF310.UL.500.01	(1x50)C	15.0	536	587
CF310.UL.700.01	(1x70)C	18.0	779	851
CF310.UL.950.01	(1x95)C	21.0	1015	1125
CF310.UL.1200.01	(1x120)C	22.0	1270	1378
CF310.UL.1500.01	(1x150)C	24.5	1592	1700
CF310.UL.1850.01	(1x185)C	27.5	2066	2189

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]
2.5	7.98	34
4	4.95	46
6	3.3	58
10	1.91	81
16	1.21	110
25	0.78	144
35	0.56	179
50	0.39	228
70	0.28	285
95	0.21	348
120	0.17	394
150	0.13	466
185	0.11	532

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

Technical tables:

Short circuit capacity (I_{thz}) according to DIN VDE 0298-4 (at T_{Leiter} = 80 °C and $T_{Kurzschluss}$ = 250 °C)

Conductor nominal cross section (S_n) mm²	Short circuit capacity (I_{thz}) [kA] t_k = 1 s	Short circuit capacity (I_{thz}) [kA] t_k = 0,5 s
2.5	0.37	0.84
4	0.59	0.84
6	0.89	1.26
10	1.49	2.10
16	2.38	3.37
25	3.72	5.26
35	5.21	7.37
50	7.45	10.53
70	10.43	14.75
95	14.15	20.01
120	17.88	25.28
150	22.35	31.60
185	27.56	38.98

J_{thr}: Short-time current density = 149 A/mm²
S_n: Nominal cross section
t_{kr}: Rated short-circuit duration = 1 s
t_k: Short-circuit duration
T_{Leiter}: Conductor temperature
$T_{Kurzschluss}$: Short-circuit temperature

$$I_{thz} = J_{thr} \bullet S_n \bullet \sqrt{\frac{t_{kr}}{t_k}}$$