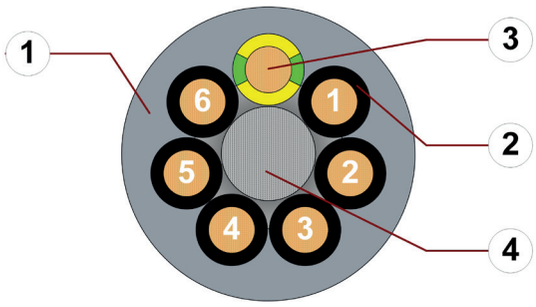
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Data sheet
chainflex® CF77.UL.D

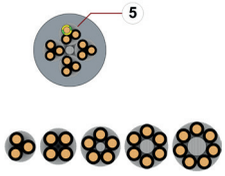
Control cable (Class 5.5.3.3) ● For heavy duty applications ● PUR outer jacket ● Oil resistant and coolant-resistant ● Flame retardant ● PVC and halogen-free ● Notch-resistant ● Hydrolysis and microbe-resistant



Example image



1. Outer jacket: Pressure extruded, gusset-filling PVC mixture
2. Core insulation: Mechanically high-quality TPE mixture
3. Conductor: Fine-wire strand consisting of bare copper wires
4. Strain relief: Tensile stress-resistant centre element
5. 12 cores or more: Bundles with optimised pitch length and pitch direction



Example image
For detailed overview please see design table

Cable structure

Conductor	Finely stranded conductor consisting of bare copper wires (following DIN EN 60228).
Core insulation	Mechanically high-quality TPE mixture.
Core structure	**Number of cores < 12:** Cores wound in a layer with short pitch length. **Number of cores ≥ 12:** Cores wound in bundles which are then wound around a high tensile strength centre element, all with optimised short pitch lengths and directions. Especially low-torsion structure.
Core identification	**Cores < 0.5 mm²:** Colour code in accordance with DIN 47100. **Cores ≥ 0.5 mm²:** Black cores with white numbers, one green-yellow core. **CF77.UL.02.03.INI:** brown, blue, black **CF77.UL.03.04.INI:** brown, blue, black, white
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: Window-grey (similar to RAL 7040) Printing: black

„00000 m“ igus chainflex CF77.UL-.-.D① --② -/-V③ E310776**

cЯUus AWM Style -----④ VW-1 AWM I/II A/B 80°C ---V⑤ FT-1 GL 61 935-14 HH

EAC/CTP CE 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).
③ Printing of nominal voltage (see general electrical values).
④ / ⑤ Printing of the UL Style / Voltage (see certifications for details).
Example: ... chainflex ... **CF77.UL.02.04.D** ... **4x0.25** ... **300 V/500 V** ...

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Control cable (Class 5.5.3.3) ● For heavy duty applications ● PUR outer jacket ● Oil resistant and coolant-resistant ● Flame retardant ● PVC and halogen-free ● Notch-resistant ● Hydrolysis and microbe-resistant



Example image

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	-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.	unsupported	10 m/s
	gliding	5 m/s
a max.		80 m/s²
Travel distance		Unsupported travels and up to 100 m for gliding applications, Class 5
Torsion		± 180°, with 1 m cable length, Class 3 (except for 5-core types ≥ 4.0 mm² Product range table)

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]	< 10 m R min. [factor x d]	≥ 10 m R min. [factor x d]	< 10 m R min. [factor x d]	≥ 10 m R min. [factor x d]	< 10 m R min. [factor x d]	≥ 10 m R min. [factor x d]
-25/-15	8.5	10	9.5	11	10.5	12
-15/+70	6.8	7.5	7.5	8.5	8.5	9.5
+70/+80	8.5	10	9.5	11	10.5	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	300/500 V (following DIN VDE 0298-3)
Testing voltage	2000 V (following DIN EN 50395)

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Example image

Properties and approvals

UV resistance	Medium
Oil resistance	Oil-resistant (following DIN EN 50363-10-2), Class 3
Offshore	MUD-resistant following NEK 606 - status 2009
Flame retardant	According to IEC 60332-1-2, CEI 20-35, FT1, VW-1
Silicone-free	Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
Halogen-free	Following DIN EN 60754
UL/CSA	**Cores < 0.5 mm²:** Style 10493 and 20233, 300 V, 80 °C **Cores ≥ 0.5 mm²:** Style 11323 and 21223, 1000 V, 80 °C
NFPA	Following NFPA 79-2012, chapter 12.9
DNV-GL	Type approval certificate No. 61 935-14 HH
EAC	Certificate No. RU C-DE.ME77.B.01254 (TR ZU)
CTP	Certificate No. C-DE.PB49.B.00416 (Fire protection)
CEI	Following CEI 20-35
Lead-free	Following 2011/65/EC (RoHS-II)
Clean room	According to ISO Class 1, material/cable tested by IPA according to DIN EN ISO standard 14644-1
DESINA	According to VDW, DESINA standardisation
CE	Following 2014/35/EU

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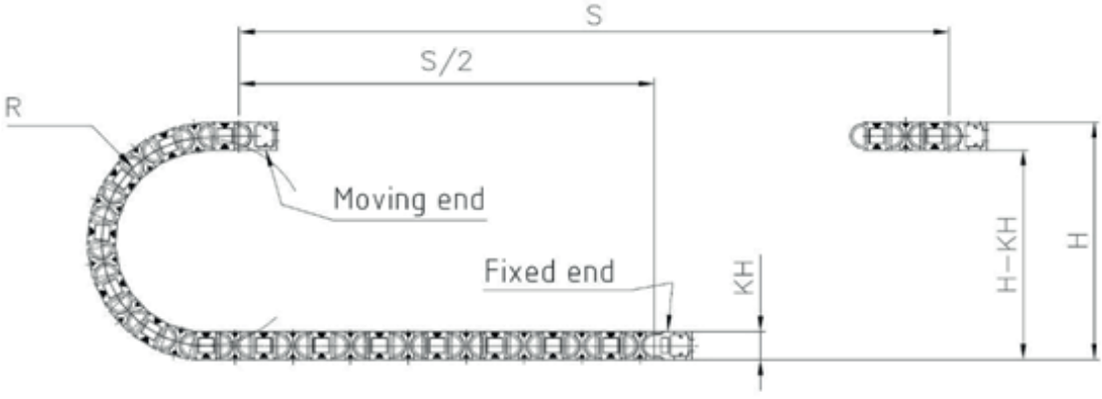
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Example image

Typical lab test setup for this cable series

Test bend radius R	approx. 48 - 200 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



Typical application areas

- For heavy duty applications, Class 5
- Unsupported travel distances and up to 100 m for gliding applications, Class 5
- Almost unlimited resistance to oil, Class 3
- Torsion ± 180°, with 1 m cable length, Class 3
- Indoor and outdoor applications with average sun radiation
- Machining units/machine tools, Storage and retrieval units for high-bay warehouses, Packaging industry, quick handling, refrigerating sector

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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]
CF77.UL.02.03.INI	3x0.25	5.0	8	29
CF77.UL.02.04.D	4x0.25	5.5	11	35
CF77.UL.02.12.D	12x0.25	9.0	30	77
CF77.UL.02.18.D	18x0.25	10.5	45	114
CF77.UL.03.04.INI [12)]	4x0.34	6.0	16	39
CF77.UL.05.04.D	4G0.5	6.0	21	43
CF77.UL.05.05.D	5G0.5	6.5	26	50
CF77.UL.05.07.D	7G0.5	7.5	39	78
CF77.UL.05.12.D	12G0.5	10.0	63	129
CF77.UL.05.18.D	18G0.5	12.0	94	179
CF77.UL.05.25.D	25G0.5	14.0	129	238
CF77.UL.05.30.D	30G0.5	15.0	155	315
CF77.UL.07.03.D	3G0.75	6.5	23	54
CF77.UL.07.04.D	4G0.75	7.0	30	63
CF77.UL.07.05.D	5G0.75	7.5	38	73
CF77.UL.07.07.D	7G0.75	8.5	53	103
CF77.UL.07.12.D	12G0.75	12.0	90	187
CF77.UL.07.18.D	18G0.75	13.5	134	251
CF77.UL.07.20.D	20G0.75	14.5	149	282
CF77.UL.07.25.D	25G0.75	16.0	186	356
CF77.UL.07.36.D	36G0.75	19.0	279	505
CF77.UL.07.42.D	42G0.75	21.0	341	580
CF77.UL.10.02.D	2x1.0	6.5	20	53
CF77.UL.10.03.D	3G1.0	6.5	30	63
CF77.UL.10.04.D	4G1.0	7.0	40	77
CF77.UL.10.05.D	5G1.0	8.0	50	94
CF77.UL.10.07.D	7G1.0	9.0	70	115
CF77.UL.10.12.D	12G1.0	12.5	119	225
CF77.UL.10.18.D	18G1.0	15.0	178	326
CF77.UL.10.25.D	25G1.0	17.5	248	436
CF77.UL.10.42.D	42G1.0	22.5	433	679

[12)] Colour outer jacket: Colza yellow (similar to RAL 1021)

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

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Data sheet
chainflex® CF77.UL.D

Control cable (Class 5.5.3.3) ● For heavy duty applications ● PUR outer jacket ● Oil resistant and coolant-resistant ● Flame retardant ● PVC and halogen-free ● Notch-resistant ● Hydrolysis and microbe-resistant



Example image

Part No.	Number of cores and conductor nominal cross section [mm²]	Outer diameter (d) max. [mm]	Copper index [kg/km]	Weight [kg/km]
CF77.UL.15.03.D	3G1.5	7.5	45	83
CF77.UL.15.04.D	4G1.5	8.0	60	102
CF77.UL.15.05.D	5G1.5	8.5	75	121
CF77.UL.15.07.D [17]	7G1.5	10.5	104	167
CF77.UL.15.12.D	12G1.5	14.0	178	296
CF77.UL.15.18.D	18G1.5	17.0	267	459
CF77.UL.15.25.D	25G1.5	19.5	371	605
CF77.UL.15.36.D	36G1.5	23.5	551	848
CF77.UL.15.42.D	42G1.5	26.5	676	987
CF77.UL.25.03.D	3G2.5	8.5	75	119
CF77.UL.25.04.D	4G2.5	9.5	100	149
CF77.UL.25.05.D	5G2.5	10.5	124	183
CF77.UL.25.07.D [17]	7G2.5	12.5	174	259
CF77.UL.25.12.D	12G2.5	17.0	297	451
CF77.UL.40.04.D	4G4.0	11.5	165	245
CF77.UL.40.05.D	5G4.0	12.0	198	288
CF77.UL.60.05.D	5G6.0	14.0	297	407

[17] When using the cables with “7 G 1.5 mm²” and “7 G 2.5 mm²” minimum bend radius must be 17.5 x d with gliding travel distance ≥ 5 m.

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

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Example image

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 (following DIN VDE 0298-4) [A]
0.25	79.0	5
0.34	57.0	7
0.5	39.0	10
0.75	26.0	14
1	19.5	17
1.5	13.3	21
2.5	8.0	30
4	4.95	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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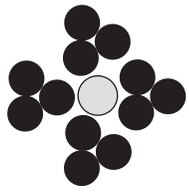
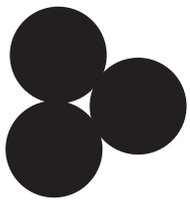
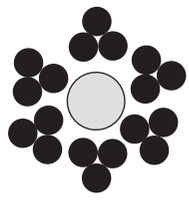
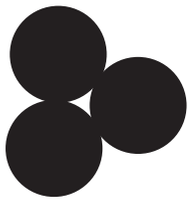
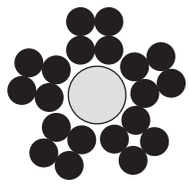
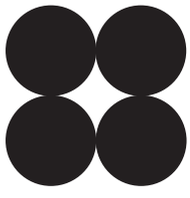
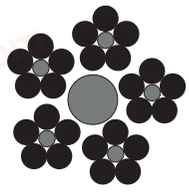
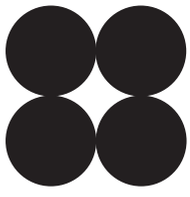
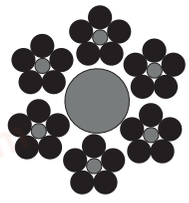
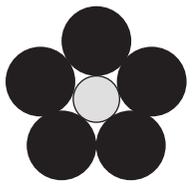
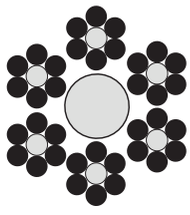
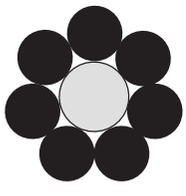
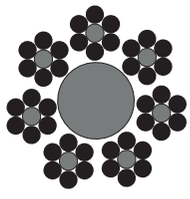
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Example image

Design table

Part No.	Number of cores	Core design	Part No.	Number of cores	Core design
CF77.UL.XX.02.D	2		CF77.UL.XX.12.D	4x3	
CF77.UL.XX.03.INI	3		CF77.UL.XX.18.D	6x3	
CF77.UL.XX.03.D	3		CF77.UL.XX.20.D	5x4	
CF77.UL.XX.04.D	4		CF77.UL.XX.25.D	5x5	
CF77.UL.XX.04.INI	4		CF77.UL.XX.30.D	6x5	
CF77.UL.XX.05.D	5		CF77.UL.XX.36.D	6x5	
CF77.UL.XX.07.D	7		CF77.UL.XX.42.D	7x6	

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Example image

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	brown-yellow
17	white-grey
18	brown-grey
19	white-pink
20	white-brown
21	white-blue

Conductor no.	Colours according to DIN ISO 47100
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
37	grey-blue
38	pink-blue
39	grey-red
40	pink-red
41	grey-black
42	pink-black

Conductor no.	Colours according to DIN ISO 47100
43	blue-black
44	red-black
45	white-brown-black
46	yellow-green-black
47	grey-pink-black
48	red-blue-black
49	white-green-black
50	brown-green-black
51	white-yellow-black
52	yellow-brown-black
53	white-grey-black
54	grey-brown-black
55	white-pink-black
56	pink-brown-black
57	white-blue-black
58	brown-blue-black
59	white-red-black
60	brown-red-black
61	black-white

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