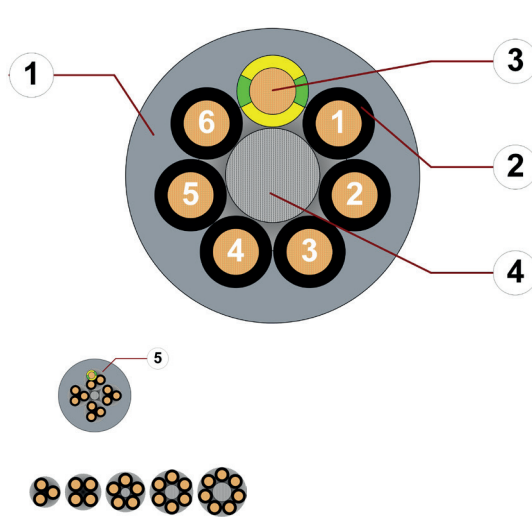


Data sheet

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
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
CF77.UL.03.05.INI: brown, blue, black, white, green-yellow



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

cRUus AWM Style -----④ VW-1 AWM I/II A/B 80°C ---V⑤ FT-1 DNV TAE00003X1

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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Dynamic information

	Bend radius	e-chain® linear flexible fixed	minimum 6.8 x d minimum 5 x d minimum 4 x d
	Temperature	e-chain® linear flexible fixed	-25 °C up to +80 °C -40 °C up to +80 °C (following DIN EN 60811-504) -50 °C up to +80 °C (following DIN EN 50305)
	v max.	unsupported gliding	10 m/s 5 m/s
	a max.		80 m/s ²
	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 mm ² 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	
	< 10 m	≥ 10 m	< 10 m	≥ 10 m	< 10 m	≥ 10 m
Temperature, from/to [°C]	R min. [x d]	R min. [x d]	R min. [x d]	R min. [x d]	R min. [x d]	R min. [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) Number of cores < 12: Cores < 0.5 mm²: 300 V (following UL) Cores ≥ 0.5 mm²: 1000 V (following UL) Number of cores ≥ 12: 1000 V (following UL)
	Testing voltage	2000 V (following DIN EN 50395)



Example image

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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

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, 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
	PFAS-free	Use of PFAS-free materials according to the content of the REACH directive and its rules for the production and processing of chemical substances
	UL verified	Certificate No. V293560: „igus 4-year chainflex cable guarantee and service life calculator based on 2 billion test cycles per year“
	UL/CSA AWM	Details see table UL AWM
	NFPA	Following NFPA 79-2018, chapter 12.9
	DNV	Type approval certificate No. TAE00003X1
	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, material/cable tested by IPA according to DIN EN ISO standard 14644-1
	DESINA	According to VDW, DESINA standardisation
	CE	Following 2014/35/EU



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



Example image

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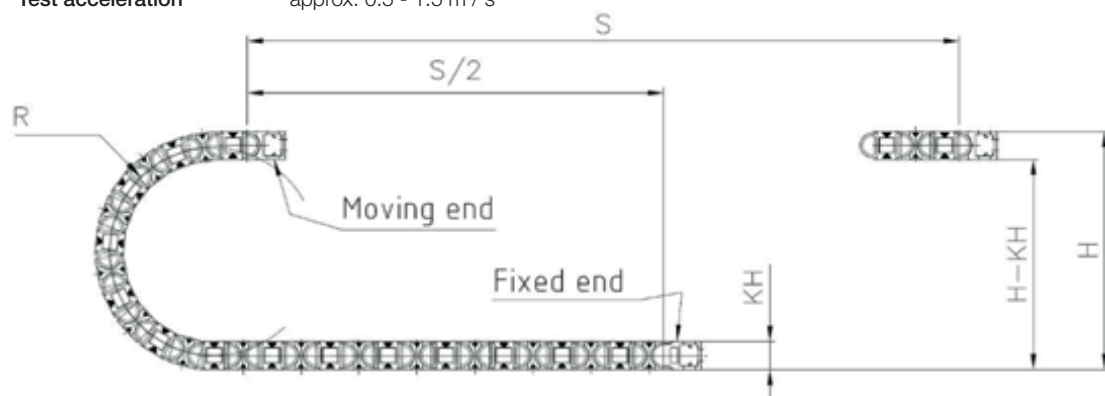
Properties and approvals

UL/CSA AWM Details

Conductor nominal cross section [mm²]	Number of cores	UL style core insulation	UL style outer jacket	UL Voltage Rating [V]	UL Temperature Rating [°C]
0.25	3-7	10493	20549	300	80
0.25	12-25	11323	21223	1000	80
0.34	4-5	10493	20549	300	80
0.5	4-7	11323	20940	1000	80
0.5	12-30	11323	21223	1000	80
0.75	3-7	11323	20940	1000	80
0.75	12-42	11323	21223	1000	80
1	2-7	11323	20940	1000	80
1	12-42	11323	21223	1000	80
1.5	3-36	11323	21223	1000	80
2.5	3-12	11323	21223	1000	80
4	4-5	11323	21223	1000	80
6	5	11323	21223	1000	80

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 / s²



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 $\pm 180^\circ$, 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



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



Example image

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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]
CF77.UL.02.03.INI ¹²⁾	3x0.25	5.0	9	29
CF77.UL.02.04.D	4x0.25	5.5	11	35
CF77.UL.02.12.D	12x0.25	9.0	32	78
CF77.UL.02.18.D	18x0.25	10.5	47	127
CF77.UL.03.04.INI ¹²⁾	4x0.34	6.0	16	39
CF77.UL.03.05.INI ¹²⁾	5x0.34	6.0	17	35
CF77.UL.03.04.INI.D	5x0.34	6.0	17	35
CF77.UL.05.04.D	4G0.5	6.0	21	46
CF77.UL.05.05.D	5G0.5	6.5	26	53
CF77.UL.05.07.D	7G0.5	7.5	39	78
CF77.UL.05.12.D	12G0.5	10.0	63	130
CF77.UL.05.18.D	18G0.5	12.0	94	184
CF77.UL.05.25.D	25G0.5	14.0	129	243
CF77.UL.05.30.D	30G0.5	15.0	155	315
CF77.UL.07.03.D	3G0.75	6.5	23	52
CF77.UL.07.04.D	4G0.75	7.0	31	59
CF77.UL.07.05.D	5G0.75	7.5	38	71
CF77.UL.07.07.D	7G0.75	8.5	54	100
CF77.UL.07.12.D	12G0.75	12.0	91	180
CF77.UL.07.18.D	18G0.75	13.5	134	239
CF77.UL.07.20.D	20G0.75	14.5	149	269
CF77.UL.07.25.D	25G0.75	16.0	186	336
CF77.UL.07.36.D	36G0.75	19.0	279	506
CF77.UL.07.42.D	42G0.75	21.0	341	580
CF77.UL.10.02.D	2x1.0	6.5	21	51
CF77.UL.10.03.D	3G1.0	6.5	31	58
CF77.UL.10.04.D	4G1.0	7.0	41	73
CF77.UL.10.05.D	5G1.0	8.0	50	90
CF77.UL.10.07.D	7G1.0	9.0	71	120
CF77.UL.10.12.D	12G1.0	12.5	120	220
CF77.UL.10.18.D	18G1.0	15.0	179	314
CF77.UL.10.25.D	25G1.0	17.5	248	431
CF77.UL.10.42.D	42G1.0	22.5	433	699

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



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



Example image

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Part No.	Number of cores and conductor nominal cross section [mm ²]	Outer diameter (d) max. [mm]	Copper index [kg/km]	Weight [kg/km]
CF77.UL.15.03.D	3G1.5	7.0	46	71
CF77.UL.15.04.D	4G1.5	7.5	61	88
CF77.UL.15.05.D	5G1.5	8.0	75	105
CF77.UL.15.07.D ¹⁷⁾	7G1.5	9.5	105	152
CF77.UL.15.12.D	12G1.5	13.0	179	297
CF77.UL.15.18.D	18G1.5	17.0	268	405
CF77.UL.15.25.D	25G1.5	19.5	297	564
CF77.UL.15.36.D	36G1.5	23.5	551	848
CF77.UL.25.03.D	3G2.5	8.5	75	132
CF77.UL.25.04.D	4G2.5	9.5	95	167
CF77.UL.25.05.D	5G2.5	10.0	124	196
CF77.UL.25.07.D ¹⁷⁾	7G2.5	12.0	174	270
CF77.UL.25.12.D	12G2.5	17.0	297	479
CF77.UL.40.04.D ⁹⁰⁾	4G4.0	11.5	165	245
CF77.UL.40.05.D ⁹⁰⁾	5G4.0	12.0	198	284
CF77.UL.60.05.D ⁹⁰⁾	5G6.0	13.5	297	412
CF77.UL.02.05.D	5x0.25	6.0	13	39
CF77.UL.02.07.D	7x0.25	6.5	18	51
CF77.UL.02.25.D	25x0.25	11.5	63	155

¹⁷⁾ When using the cables with „7G1.5mm²“ and „G2.5mm²“ minimum bend radius must be 17.5xd with gliding travel distance ≥ 5m.

⁹⁰⁾ Torsion ±90°

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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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]
0.25	79	5
0.34	57	7
0.5	39	10
0.75	26	14
1	19.5	17
1.5	13.3	21
2.5	8	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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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.18.D	6x3	
CF77.UL.XX.03.D CF77.UL.XX.03.INI	3		CF77.UL.XX.20.D	5x4	
CF77.UL.XX.04.D CF77.UL.XX.04.INI	4		CF77.UL.XX.25.D	5x5	
CF77.UL.XX.05.D CF77.UL.XX.05.INI CF77.UL.XX.05.INI.D	5		CF77.UL.XX.30.D	6x5	
CF77.UL.XX.07.D	7		CF77.UL.XX.36.D	6x6	
CF77.UL.XX.12.D	4x3		CF77.UL.XX.42.D	7x6	

Example image



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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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