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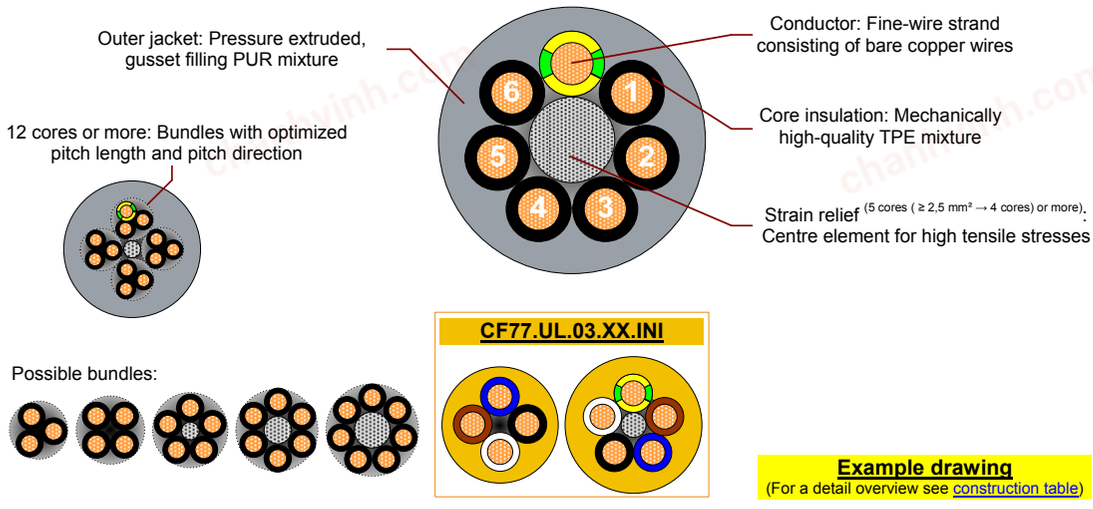
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igus® chainflex® CF77.UL.D

Image exemplary

chainflex® cable works. CF77.UL.D

PUR - e-chain® - control cable for high load requirements (class 5.5.3 (and 5.7.3)): oil- and coolant-resistant, hydrolysis- and microbe-resistant, PVC- and halogen-free, notch-resistant as well as flame-retardant.



Example drawing
(For a detail overview see construction table)

Core design:

Conductor: Fine-wire strand consisting of bare copper wires (following DIN EN 60228).

Core insulation: Mechanically high-quality TPE mixture.

Core identification:
≤ 0,34 mm²: Colour code in accordance with DIN 47100. (see colour code table)
≥ 0,5 mm²: Black cores with white numerals & one core greenyellow*.
** 3 cores and more.*
CF77.UL.03.04.INI: brown, blue, black & white.
CF77.UL.03.05.INI: brown, blue, black, white & greenyellow.

Jacket design:

Outer jacket: Low-adhesion mixture on the basis of PUR (following DIN VDE 0281-10), highly abrasion- and bending-stable, adapted to suit the requirements in e-chains®.

- oil-resistant (following DIN EN 50363-10-2)
- coolant-resistant
- flame-retardant (according to IEC 60332-1-2, CEI 20-35, VW-1, FT-1)
- PVC- and halogen-free (following DIN EN 50267-2-1)
- hydrolysis-resistant (following DIN VDE 0282 Part 10 - A)
- microbe-resistant (following DIN EN 50396)
- MUD-resistant (following NEK 606 - status 2009)
- silicon-free (following PV 3.10.7 - status 1992)
- lead-free (following 2011/65/EU (RoHS-II))
- clean room ISO class 1 (according to DIN ISO 14644-1 tested by IPA)
- UV-resistance: Medium

Colour outer jacket: Window grey (similar to RAL 7040) or
Rape yellow (similar to RAL 1021) **(only CF77.UL.03.XX.INI)**

Cable marking (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 GL 61 935-14 HH

EAC/CTP CE DESINA RoHS-II conform www.igus.de

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**** Length printing:** Not calibrated. Only intended as an orientation aid.*
①/②: Cable identification according to part no. (see technical table for details).
③: Printing of the Nominal Voltage (see general electrical values for details).
Ex.: CF77.UL.02.04.D: ⇒ ...x CF77.UL.02.04.D 4x0,25 300/300V E...
④/⑤: Printing of the UL-Style / -Voltage (see certifications for details).
Ex.: CF77.UL.02.04.D: ⇒ ...Style 20233 VW -1 AWM I/II A/B 90°C 300V FT…

Subject to misprints and errors. Technical modifications are possible at any time.
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Date	Author
04 Feb. 2015	D. Borsberg

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chainflex® cable works. CF77.UL.D

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General mechanical values:

(for individual details see technical table)

Guaranteed lifetime for this series according to the "chainflex® guarantee club" conditions (see chainflex® catalogue and www.igus.eu/chainflex-guarantee)							
Double strokes*		**5 million**		**7,5 million**		**10 million**	
Temperature (from/to) [°C]	**Travel distance (TD)**	Min. bending radius for e-chain® use [Factor multiplied by outer diameter (d)]					
		TD < 10 m	TD ≥ 10 m	TD < 10 m	TD ≥ 10 m	TD < 10 m	TD ≥ 10 m
-35 / -25	≤ 100 m	8,5	10,0	9,5	11,0	10,5	12,0
-25 / +70		6,8	7,5	7,8	8,5	8,8	9,5
+70 / +80		7,5	10,0	9,5	11,0	10,5	12,0
Cycles*		**5 million**		**7,5 million**		**10 million**	
Temperature (from/to) [°C]		Maximum torsion area [°] related to 1 m cable length. (Ex.: At ±180°/m with a 3m long cable, the moving end can twist max. ±540°)					
-25 / -15		±150		±90		±30	
-15 / +70		±180		±120		±60	
+70 / +80		±150		±90		±30	

**: Minimum guarantee lifetime of the cable under the specified conditions.*
The installation of the cable is recommended within the middle temperature range.

Temperature range	**-40 °C ←**	**-35 °C ←**	**-25 °C ←→ +70 °C**	**→ +80 °C**
Min. bending radius for fixed installation	7,5 x d	6,8 x d	4,0 x d	6,8 x d
Torsion (at 1 m cable length)	---	12,5 x d	10 x d	12,5 x d

General electrical values:

(for individual details see technical table)

Nominal voltage:
Less than 12 cores (≤ 0,34 mm²): 300 / 300 V
Less than 12 cores (≥ 0,5 mm²): 300 / 500 V
12 cores or more: 300 / 300 V
⇒ (following DIN VDE 0245)

Test voltage: 2 kV (following VDE 0281-2)

Certifications:
- cULus: **≤ 0,34 mm²:** (E310776: Style 10493 & 20233, 300 V / 80 °C)
  ≥ 0,5 mm²: (E310776: Style 11323 & 21223, 1000 V / 80 °C)
- GL type approval certificate: No. 61 935-14 HH

Guidelines: CE, DESINA, NFPA (following 79-2012 chapter 12.9), EAC & TR (CTP)



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igus® chainflex® CF77.UL.D

Image exemplary

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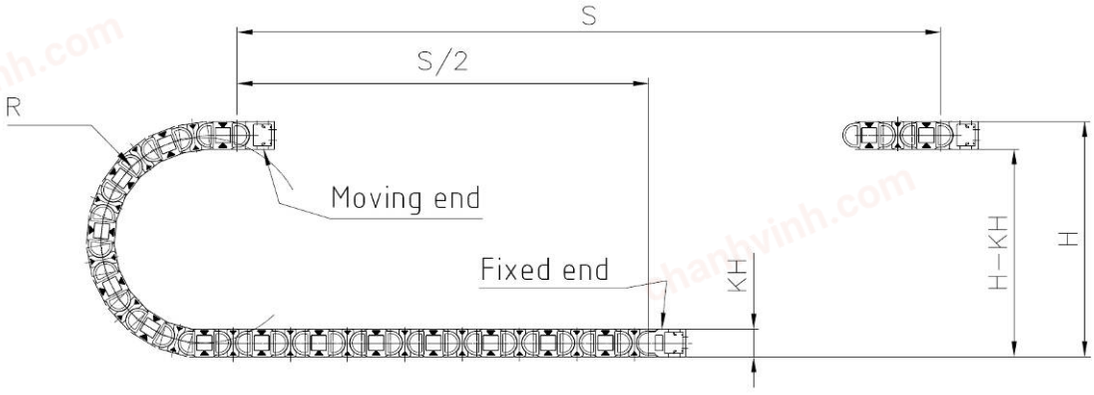
Dynamic values:

Max. speed for e-chain® use:* **	**Unsupported:** v = 10 m / s **Gliding (up to 100 m):** v = 5 m / s
Max. acceleration for e-chain® use:* **	a = 80 m / s²

*** *These values are based on specific applications or tests. They do not represent the limit of what is technically feasible.*

Typical lab test setup for this cable group:

Test bending radius R:	approx. 48 - 200 mm
Test travel S:	approx. 1 - 15 m
Test period:	min. 2 - 4 million double strokes
Test speed:	approx. 0,5 - 2 m / s
Test acceleration:	approx. 0,5 - 1,5 m / s²



e-chain® - control cable for high load requirements:

- highly abrasion stable
- almost unlimited resistance to oil
- for unsupported travel distances and up to 100 m in gliding applications
- CE, RoHS-II, DESINA, cULus, GL type approval certificate, NFPA, EAC & TR (CTP)

Typical application areas:
Indoor and outdoor applications with average sun radiation.
Machining units / machine tools, storage and retrieval units for high-bay warehouses, packing industry, quick handling, refrigerating sector.

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Technical tables:

Mechanical values:

① Part no.	② Number of cores & nominal cross section [mm²]****	External diameter (d)***** [max. mm]	Copper index [kg / km]	Weight [kg / km]
CF77.UL.02.04.D	4x0,25	5,5	11	35
CF77.UL.03.04.INI	4x0,34	6,0	17	40
CF77.UL.03.05.INI	5x0,34	6,0	18	48
CF77.UL.05.04.D	4G0,5	6,0	22	44
CF77.UL.05.05.D	5G0,5	6,5	28	52
CF77.UL.05.07.D	7G0,5	7,5	41	80
CF77.UL.05.12.D	12G0,5	10,0	66	132
CF77.UL.05.18.D	18G0,5	12,0	99	184
CF77.UL.05.25.D	25G0,5	14,0	138	247
CF77.UL.05.30.D	30G0,5	15,0	165	325
CF77.UL.07.03.D	3G0,75	6,5	24	55
CF77.UL.07.04.D	4G0,75	7,0	32	64
CF77.UL.07.05.D	5G0,75	7,5	40	75
CF77.UL.07.07.D	7G0,75	8,5	56	106
CF77.UL.07.12.D	12G0,75	12,0	96	192
CF77.UL.07.18.D	18G0,75	13,5	143	260
CF77.UL.07.20.D	20G0,75	14,5	159	292
CF77.UL.07.25.D	25G0,75	16,0	198	368
CF77.UL.07.36.D	36G0,75	19,0	297	524
CF77.UL.07.42.D	42G0,75	21,0	365	604
CF77.UL.10.02.D	2x1,0	6,5	22	54
CF77.UL.10.03.D	3G1,0	6,5	32	65
CF77.UL.10.04.D	4G1,0	7,0	43	79
CF77.UL.10.05.D	5G1,0	8,0	53	97
CF77.UL.10.07.D	7G1,0	9,0	74	119
CF77.UL.10.12.D	12G1,0	12,5	127	234
CF77.UL.10.18.D	18G1,0	15,0	191	339
CF77.UL.10.25.D	25G1,0	17,5	264	452
CF77.UL.10.42.D	42G1,0	22,5	462	708
CF77.UL.15.03.D	3G1,5	7,5	48	86
CF77.UL.15.04.D	4G1,5	8,0	64	105
CF77.UL.15.05.D	5G1,5	8,5	80	125
CF77.UL.15.07.D******	7G1,5	10,5	111	174
CF77.UL.15.12.D	12G1,5	14,0	191	308
CF77.UL.15.18.D	18G1,5	17,0	286	477
CF77.UL.15.25.D	25G1,5	19,5	396	630
CF77.UL.15.36.D	36G1,5	23,5	594	891
CF77.UL.15.42.D	42G1,5	26,5	729	1040
CF77.UL.25.03.D	3G2,5	8,5	80	124
CF77.UL.25.04.D	4G2,5	9,5	106	155
CF77.UL.25.05.D	5G2,5	10,5	132	192
CF77.UL.25.07.D******	7G2,5	12,5	185	270
CF77.UL.25.12.D	12G2,5	17,5	317	530
CF77.UL.40.04.D	4G4,0	11,5	176	256

**** *G ⇒ Cable contains a greenyellow core.*
***** *External diameters are maximum values and may tend toward lower tolerance limits.*
****** *Using the cables with "7G1,5 mm²" and "7G2,5 mm²" it is essential: Travel distance ≥ 5m ⇒ bending radius ≥ 17 x d*

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Electrical values:

Nominal cross section [mm²]	Conductor resistance [approx. Ω / km] at 20 °C	Max. current rating [A] at 30 °C♦
(following)	DIN IEC 60344	DIN VDE 0298-4
0,25	79	5
0,34	57	7
0,5	39	10
0,75	26	14
1,0	19,5	17
1,5	13,3	21
2,5	8	30
4,0	4,45	41

♦ *The max. current rating depends on factors such as the individual environmental conditions and the type of installation.*

DIN 47100 colour code:

No.	Colour	No.	Colour	No.	Colour
01	white	22	brownblue	43	blueblack
02	brown	23	whitered	44	redblack
03	green	24	brownred	45	whitebrownblack
04	yellow	25	whiteblack	46	yellowgreenblack
05	grey	26	brownblack	47	greypinkblack
06	pink	27	greygreen	48	redblueblack
07	blue	28	yellowgrey	49	whitegreenblack
08	red	29	pinkgreen	50	browngreenblack
09	black	30	yellowpink	51	whiteyellowblack
10	violet	31	greenblue	52	yellowbrownblack
11	greypink	32	yellowblue	53	whitegreyblack
12	redblue	33	greenred	54	greybrownblack
13	whitegreen	34	yellowred	55	whitepinkblack
14	browngreen	35	greenblack	56	pinkbrownblack
15	whiteyellow	36	yellowblack	57	whiteblueblack
16	yellowbrown	37	greyblue	58	brownblueblack
17	whitegrey	38	pinkblue	59	whiteredblack
18	greybrown	39	greyred	60	brownredblack
19	whitepink	40	pinkred	61	blackwhite
20	pinkbrown	41	greyblack		
21	whiteblue	42	pinkblack		

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igus® chainflex® CF77.UL.D

Image exemplary

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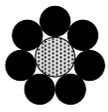
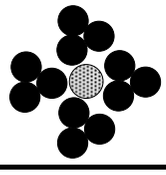
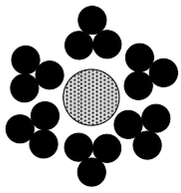
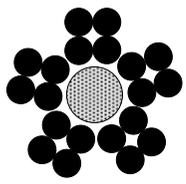
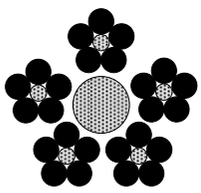
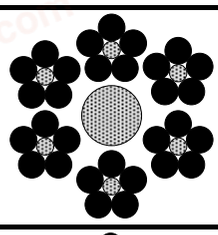
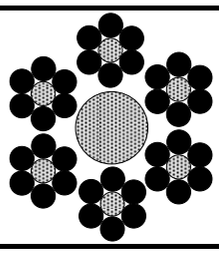
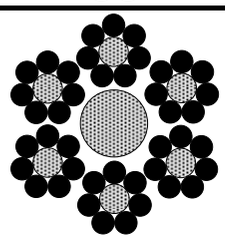
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Construction table:

Part no. No. of cores	Core stranding	Part no. No. of cores	Core stranding
CF77.UL.XX.02.D 2		CF77.UL.XX.03.D 3	
CF77.UL.XX.04.D / .INI 4		CF77.UL.XX.05.D 5	
CF77.UL.XX.07.D 7		CF77.UL.XX.12.D 4x3	
CF77.UL.XX.18.D 6x3		CF77.UL.XX.20.D 5x4	
CF77.UL.XX.25.D 5x5		CF77.UL.XX.30.D 6x5	
CF77.UL.XX.36.D 6x6		CF77.UL.XX.42.D 6x7	

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Head of Business Unit chainflex® cables
RR
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Head of R+D chainflex® cables
MG
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Image exemplary

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