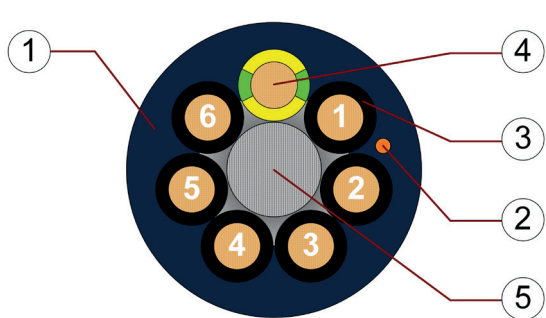


Data sheet

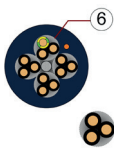
chainflex® CF9



Control cable (Class 7.6.4.2) • For heaviest duty applications • TPE outer jacket • Oil and bio-oil resistant • PVC and halogen-free • Low-temperature-flexible • Hydrolysis and microbe-resistant



1. Outer jacket: Pressure extruded, gusset-filling, halogen-free TPE mixture
2. CFRIP: Tear strip for faster cable stripping
3. Core insulation: Mechanically high-quality TPE mixture
4. Conductor: Stranded conductor in especially bend-resistant version consisting of bare copper wires
5. Strain relief: Tensile stress-resistant centre element
6. 12 cores or more: Bundles with optimised pitch length and pitch direction



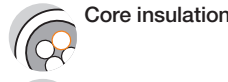
Example image
For detailed overview please see design table

Cable structure



Conductor

Stranded conductor in especially bending-resistant version consisting of bare copper wires (following DIN EN 60228).



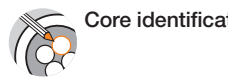
Core insulation

Mechanically high-quality TPE mixture.



Core structure

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 < 0.75 mm²: Colour code in accordance with DIN 47100.
Cores ≥ 0.75 mm²: Black cores with white numbers, one green-yellow core.
CF9.02.03.INI: brown, blue, black
CF9.03.04.INI: brown, blue, black, white
CF9.03.05.INI: brown, blue, black, white, green-yellow
CF9.03.16.07.03.INI:
0.34 mm²: violet/red/grey/red-blue, green/grey-pink/white-green/white-yellow, white-grey/black/yellow-brown/brown-green, white/yellow/pink/grey-brown
0.75 mm²: blue/green-yellow/brown



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



CFRIP®

Strip cables faster: a tear strip is moulded into the outer jacket
Video ► www.igus.eu/CFRIP

„00000 m*** igus chainflex CF9.--.① ----② 300/500V E310776

RU AWM Style ----③ 90°C ---V④ RoHS-II conform EAC CE UKCA

www.igus.eu +++ 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 / ④ Printing of UL information (see related chapter).
Example: ... chainflex ... CF9.02.08 ... 8x0.25 ... 300 V/500 V ...



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Control cable (Class 7.6.4.2) ● For heaviest duty applications ● TPE outer jacket ● Oil and bio-oil resistant ● PVC and halogen-free ● Low-temperature-flexible ● Hydrolysis and microbe-resistant



Dynamic information

	Bend radius	e-chain® linear flexible fixed	minimum 5 x d minimum 4 x d minimum 3 x d
	Temperature	e-chain® linear flexible fixed	-35 °C up to +100 °C -50 °C up to +100 °C (following DIN EN 60811-504) -55 °C up to +100 °C (following DIN EN 50305)
	v max.	unsupported gliding	10 m/s 6 m/s
	a max.		100 m/s²
	Travel distance		Unsupported travel distances and up to 400 m for gliding applications, Class 6
	Torsion		± 90°, with 1 m cable length, Class 2

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	12.5 million
Temperature, from/to [°C]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]
-35/-25	6.8	7.5	8.5
-25/+90	5	6	7
+90/+100	6.8	7.5	8.5

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	300/500 V (following DIN VDE 0298-3) Cores < 0.5 mm²: 300 V (following UL) Cores ≥ 0.5 mm²: 1000 V (following UL)
	Testing voltage	2000 V (following DIN EN 50395)



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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
- Silicone-free** Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
- Halogen-free** Following DIN EN 60754
- UL verified** Certificate No. B129699: „igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year“
- UL AWM** Details see table UL AWM
- EAC** Certificate No. RU C-DE.ME77.B.00300/19 (TR ZU)
- 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
- CE** Following 2014/35/EU
- UKCA** In accordance with the valid regulations of the United Kingdom (as at 08/2021)

Properties and approvals

UL 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	2-25	11884	22357	300	90
0.34	4-16	11884	22357	300	90
0.5	2-36	11886	22351	1000	90
0.75	4-25	11886	22351	1000	90
1	3-25	11886	22351	1000	90
1.5	2-36	11886	22351	1000	90
2.5	4-25	11886	22351	1000	90
4	4	11886	22351	1000	90
6	4-5	11886	22351	1000	90
10	4	11886	22351	1000	90
16	4	11886	22351	1000	90



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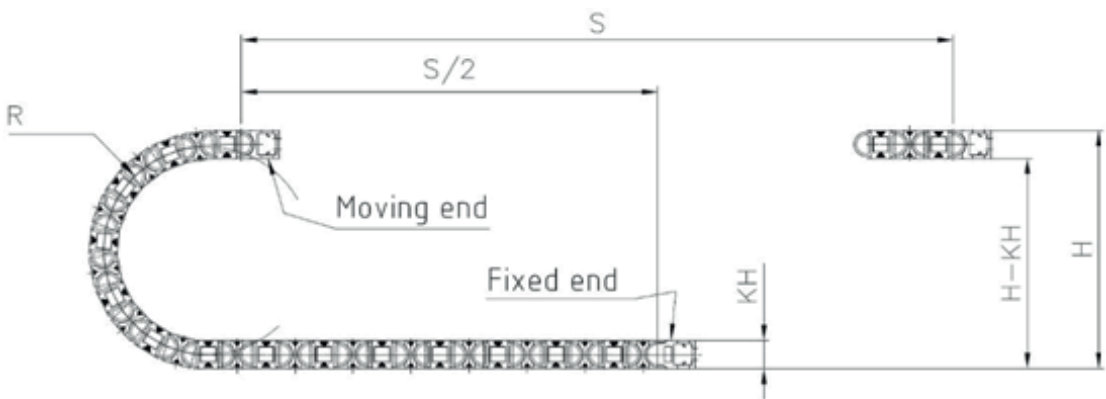
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Control cable (Class 7.6.4.2) ● For heaviest duty applications ● TPE outer jacket ● Oil and bio-oil resistant ● PVC and halogen-free ● Low-temperature-flexible ● Hydrolysis and microbe-resistant

Typical lab test setup for this cable series

Test bend radius R	approx. 18 - 125 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 heaviest duty applications, Class 7
- 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
- Torsion $\pm 90^\circ$, with 1 m cable length, Class 2
- 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



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]
CF9.02.02	2x0.25	4.5	5	18
CF9.02.03.INI	3x0.25	4.5	8	22
CF9.02.06	6x0.25	5.5	15	36
CF9.02.07	7x0.25	6.5	18	43
CF9.02.08	8x0.25	6.5	20	49
CF9.02.12	12x0.25	8.0	30	71
CF9.02.18	18x0.25	9.0	45	100
CF9.02.20	20x0.25	9.5	50	113
CF9.02.25	25x0.25	10.5	63	138
CF9.03.04.INI	4x0.34	5.0	14	31
CF9.03.05.INI	5x0.34	5.5	17	36
CF9.03.06	6x0.34	6.0	21	43
CF9.03.08	8x0.34	7.0	28	57
CF9.03.16.07.03.INI	16x0.34+3x0.75	11.0	77	152
CF9.05.02	2x0.5	5.0	10	28
CF9.05.03	3x0.5	5.5	15	34
CF9.05.04	4x0.5	6.0	20	41
CF9.05.05	5x0.5	6.5	25	50
CF9.05.07	7x0.5	7.5	35	69
CF9.05.12	12x0.5	10.0	60	123
CF9.05.18	18x0.5	11.5	90	179
CF9.05.25	25x0.5	13.5	124	240
CF9.05.36	36x0.5	16.5	178	345
CF9.07.04	4G0.75	6.5	30	56
CF9.07.05	5G0.75	7.0	38	69
CF9.07.07	7G0.75	8.0	53	94
CF9.07.12	12G0.75	11.0	90	176
CF9.07.20	20G0.75	13.5	149	270
CF9.07.25	25G0.75	15.0	186	330
CF9.10.03	3G1.0	6.0	30	54
CF9.10.04	4G1.0	6.5	40	68
CF9.10.05	5G1.0	7.5	50	84
CF9.10.12	12G1.0	12.0	120	212
CF9.10.18	18G1.0	14.0	179	303
CF9.10.25	25G1.0	16.5	248	417
CF9.15.02	2x1.5	6.5	30	55

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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Control cable (Class 7.6.4.2) ● For heaviest duty applications ● TPE outer jacket ● Oil and bio-oil resistant ● PVC and halogen-free ● Low-temperature-flexible ● Hydrolysis and microbe-resistant



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]
CF9.15.04	4G1.5	7.5	60	90
CF9.15.05	5G1.5	8.0	75	111
CF9.15.07 ¹⁷⁾	7G1.5	9.5	104	159
CF9.15.12	12G1.5	13.0	178	280
CF9.15.18	18G1.5	16.0	267	412
CF9.15.25	25G1.5	19.0	371	585
CF9.15.36	36G1.5	22.5	534	816
CF9.25.04	4G2.5	9.0	100	144
CF9.25.05	5G2.5	9.5	124	176
CF9.25.07 ¹⁷⁾	7G2.5	12.0	174	253
CF9.25.12	12G2.5	17.0	297	465
CF9.25.16	16G2.5	19.0	396	616
CF9.25.18 ⁷⁾	18G2.5	22.5	445	795
CF9.25.25	25G2.5	23.0	612	926
CF9.40.04	4G4.0	10.5	159	212
CF9.60.04	4G6.0	12.0	238	308
CF9.60.05	5G6.0	13.0	297	378
CF9.100.04	4G10	16.5	396	550
CF9.160.04	4G16	20.5	633	843

⁷⁾ Nominal voltage 600/1000 V

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

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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chainflex® CF9



Control cable (Class 7.6.4.2) ● For heaviest duty applications ● TPE outer jacket ● Oil and bio-oil resistant ● PVC and halogen-free ● Low-temperature-flexible ● Hydrolysis and microbe-resistant



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	37
6	3.3	53
10	1.91	74
16	1.21	99

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
CF9.XX.02	2		CF9.XX.05	5	
CF9.XX.03.INI	3		CF9.XX.06	6	
CF9.XX.03	3		CF9.XX.07	7	
CF9.XX.04.INI	4		CF9.XX.08	8	
CF9.XX.04	4		CF9.XX.12	4x3	
CF9.XX.05.INI	5		CF9.XX.16	4x4	



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Part No.	Number of cores	Core design	Part No.	Number of cores	Core design
CF9.XX.18	6x3		CF9.XX.36	6x6	
CF9.XX.20	5x4		CF9.03.16.07.03.INI	4x4x0.34 +3x0.75	
CF9.XX.25	5x5				



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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

