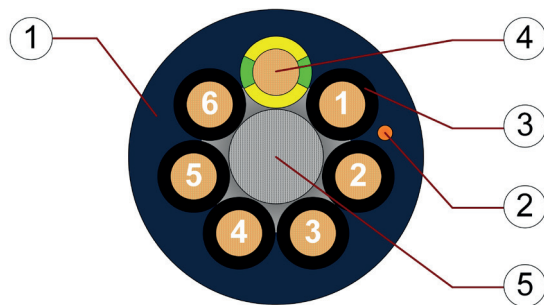


Data sheet

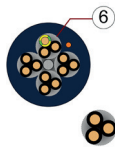
chainflex® CF9



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 < 0.75mm²: Colour code in accordance with DIN 47100.
Cores ≥ 0.75mm²: 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:
 0.34mm²: violet/red/grey/red-blue, green/grey-pink/white-green/white-yellow,
 white-grey/black/yellow-brown/brown-green, white/yellow/pink/grey-brown
 0.75mm²: 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 CE

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 ...



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

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	10m/s 6m/s
	a max.		100m/s²
	Travel distance		Unsupported travels and up to 400m for gliding applications, Class 6
	Torsion		Torsion ±90°, with 1m 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. [x d]	R min. [x d]	R min. [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	300/500V (following DIN VDE 0298-3) Cores < 0.5mm²: 300V (following UL) Cores ≥ 0.5mm²: 1000V (following UL)
	Testing voltage	2000V (following DIN EN 50395)

Example image



Data sheet

chainflex® CF9



Control cable (Class 7.6.4.2) ● For heaviest duty applications ● TPE outer jacket
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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
	PTFE-free	The design of these products does not contain PTFE
	UL-verified	Certificate No. V293650: „igus 4-year chainflex cable guarantee and service life calculator based on 2 billion test cycles per year“
	UL AWM	Details see table UL AWM
	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
	Dry cleanroom	Tested in „dry cleanroom“ according to DIN EN ISO 14644-1, Report No. IG 2405-1526
	CE	Following 2014/35/EU

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



Data sheet

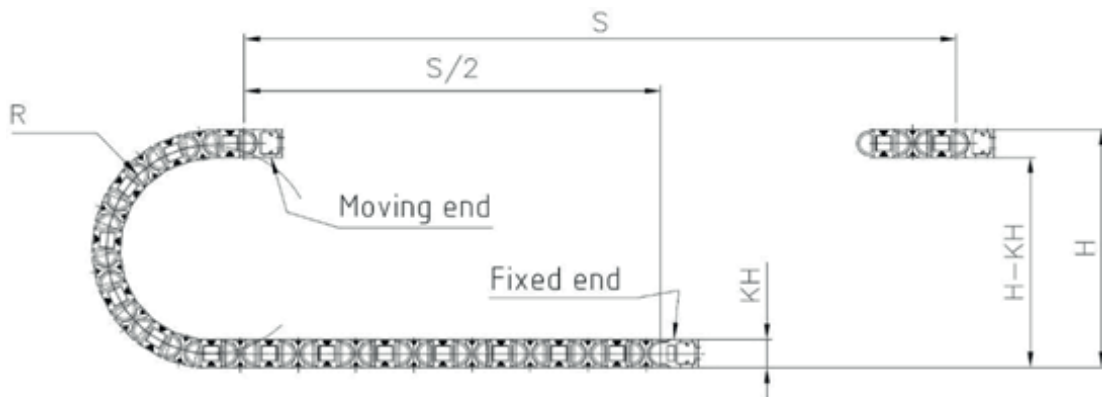
chainflex® CF9



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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 heavy-duty applications, Class 7
- Unsupported travels and up to 400m and more for gliding applications, Class 6
- Almost unlimited resistance to oil, also with bio-oils, Class 4
- Torsion $\pm 90^\circ$, with 1m cable length, Class 2
- Indoor and outdoor applications, UV-resistant
- Storage and retrieval units for high-bay warehouses, machining units/machine tools, quick handling, cleanroom, semiconductor insertion, outdoor cranes, low-temperature applications

Example image



Data sheet

chainflex® CF9



Control cable (Class 7.6.4.2) ● For heaviest duty applications ● TPE outer jacket
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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	5.0	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

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

Example image



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



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

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]
CF9.15.02	2x1.5	6.5	30	55
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 „G2.5mm²“ 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



Example image



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



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



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.



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



Data sheet

chainflex® CF9



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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	



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



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Example image igus® chainflex® CF9	Part No.	Number of cores	Core design	Part No.	Number of cores	Core design	Guarantee igus chainflex 4 YEARS igus 4-year chainflex cable guarantee and service life calculator based on 2 billion test cycles per year UL CFRIP PTFE FREE CUL US LISTED RU nec NFPA NFPA CUPA DNV REACH RoHS clean-room dry cleanroom DESMA CE
	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					

Data sheet

chainflex® CF9



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Colour code in accordance with DIN 47100

Conductor no.	Colours according to DIN ISO 47100	Conductor no.	Colours according to DIN ISO 47100
1	white	19	white-pink
2	brown	20	pink-brown
3	green	21	white-blue
4	yellow	22	brown-blue
5	grey	23	white-red
6	pink	24	brown-red
7	blue	25	white-black
8	red	26	brown-black
9	black	27	grey-green
10	violet	28	yellow-grey
11	grey-pink	29	pink-green
12	red-blue	30	yellow-pink
13	white-green	31	green-blue
14	brown-green	32	yellow-blue
15	white-yellow	33	green-red
16	yellow-brown	34	yellow-red
17	white-grey	35	green-black
18	grey-brown	36	yellow-black



Example image