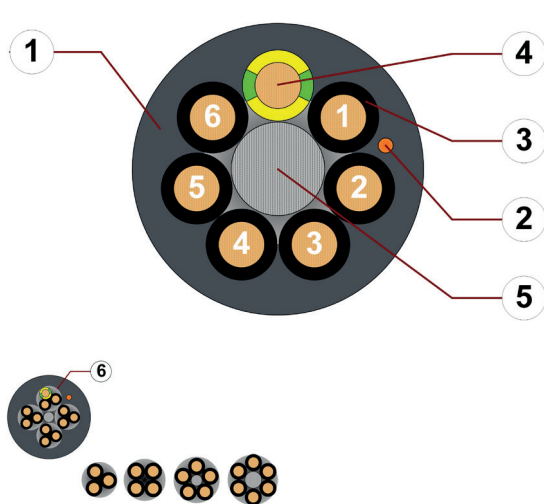


Data sheet

chainflex® CF9.UL



Control cable (Class 6.6.4.2) • For extremely heavy duty applications • TPE outer jacket
 • Oil and bio-oil resistant • Flame retardant • PVC-free • Low-temperature-flexible
 • Hydrolysis and microbe-resistant



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.UL.02.03.INI: brown, blue, black
CF9.UL.03.04.INI: brown, blue, black, white
CF9.UL.03.05.INI: brown, blue, black, white, green-yellow



Outer jacket

Low-adhesion, extremely abrasion-resistant and highly flexible TPE mixture, adapted to suit the requirements in e-chains®.
 Colour: Slate grey (similar to RAL 7015)
 Printing: white



CFRIP®

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

1. Outer jacket: Pressure extruded, gusset-filling, flame-retardant 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



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



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

cRUus AWM Style -----③ VW-1 AWM I/II A/B 90°C ---V④ FT1 DNV TAE00003X2

EAC CE UKCA RoHS-II conform 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 the UL style (see related chapter).

Example: ... chainflex **CF9.UL.02.02 2x0,25 300/500 V** ...

Data sheet

chainflex® CF9.UL



Control cable (Class 6.6.4.2) ● For extremely heavy duty applications ● TPE outer jacket
 ● Oil and bio-oil resistant ● Flame retardant ● PVC-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 -45 °C up to +100 °C (following DIN EN 60811-504) -50 °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	10 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	300/500 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)



Example image

igus® chainflex® CF9.UL

Data sheet

chainflex® CF9.UL



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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
	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)
	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	See table UL/CSA for details
	NFPA	Following NFPA 79-2018, chapter 12.9
	DNV	Type approval certificate No. TAE00003X2
	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. The outer jacket material of this series complies with CF34. UL25.04.D - tested by IPA according to standard DIN EN ISO 14644-1
	CE	Following 2014/35/EU



Data sheet

chainflex® CF9.UL



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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	2-8	11884	22345	300	90
0.25	12	11884	22344	300	90
0.34	4-8	11884	22345	300	90
0.5	2-7	11886	22022	1000	90
0.5	12-25	11886	22021	1000	90
0.75	5-7	11886	22022	1000	90
0.75	12-25	11886	22021	1000	90
1	3-4	11886	22022	1000	90
1	12-25	11886	22021	1000	90
1.5	4-7	11886	22022	1000	90
1.5	12-25	11886	22021	1000	90
2.5	4-7	11886	22022	1000	90
2.5	12-25	11886	22021	1000	90
4	4	11886	22022	1000	90
6	4	11886	22022	1000	90



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



Example image

Data sheet

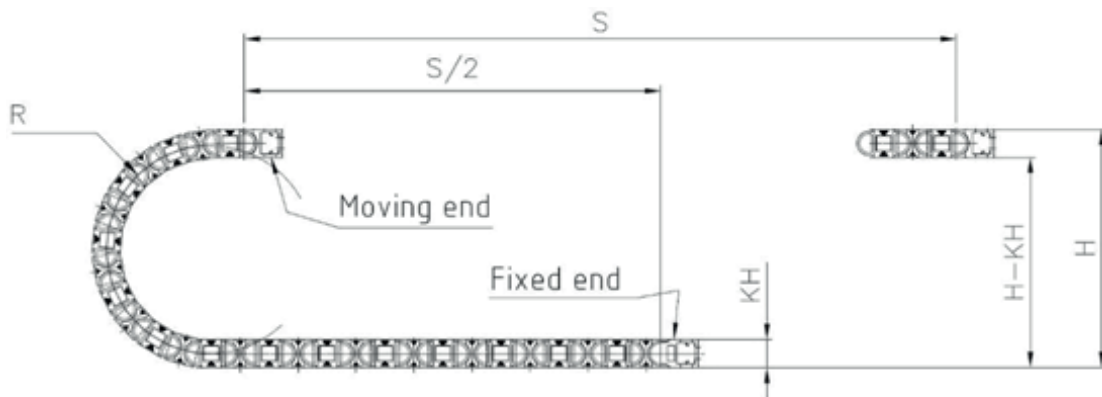
chainflex® CF9.UL



Control cable (Class 6.6.4.2) ● For extremely heavy duty applications ● TPE outer jacket
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Typical lab test setup for this cable series

Test bend radius R	approx. 28 - 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 6
- 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, Ship to shore, outdoor cranes, low temperature applications

Example image



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



Data sheet

chainflex® CF9.UL



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 ● Oil and bio-oil resistant ● Flame retardant ● PVC-free ● Low-temperature-flexible
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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.UL.02.02	2x0.25	5.0	5	24
CF9.UL.02.03.INI	3x0.25	5.0	8	28
CF9.UL.02.04	4x0.25	5.5	10	32
CF9.UL.02.06	6x0.25	6.0	15	42
CF9.UL.02.08	8x0.25	7.0	20	57
CF9.UL.02.12	12x0.25	7.5	30	81
CF9.UL.03.04.INI	4x0.34	5.5	14	38
CF9.UL.03.05.INI	5x0.34	6.0	17	46
CF9.UL.03.06	6x0.34	6.5	21	51
CF9.UL.03.08	8x0.34	7.5	28	67
CF9.UL.05.02	2x0.5	5.5	10	35
CF9.UL.05.03	3x0.5	6.0	15	42
CF9.UL.05.04	4x0.5	6.0	20	50
CF9.UL.05.05	5x0.5	6.5	25	56
CF9.UL.05.07	7x0.5	7.5	35	79
CF9.UL.05.12	12x0.5	9.5	60	137
CF9.UL.05.18	18x0.5	12.0	90	201
CF9.UL.07.05	5G0.75	7.0	38	77
CF9.UL.07.07	7G0.75	8.5	53	105
CF9.UL.07.12	12G0.75	11.0	90	191
CF9.UL.07.25	25G0.75	15.0	186	366
CF9.UL.10.03	3G1.0	6.5	30	62
CF9.UL.10.04	4G1.0	7.0	40	78
CF9.UL.10.12	12G1.0	11.5	119	228
CF9.UL.10.18	18G1.0	14.5	178	332
CF9.UL.10.25	25G1.0	16.0	248	447
CF9.UL.15.04	4G1.5	8.0	60	102
CF9.UL.15.05	5G1.5	8.5	75	124
CF9.UL.15.07 ¹⁷⁾	7G1.5	10.0	104	171
CF9.UL.15.12	12G1.5	13.5	178	309
CF9.UL.15.18	18G1.5	16.0	267	449
CF9.UL.15.25	25G1.5	19.0	371	650

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



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



Data sheet

chainflex® CF9.UL



Control cable (Class 6.6.4.2) ● For extremely heavy duty applications ● TPE outer jacket
 ● Oil and bio-oil resistant ● Flame retardant ● PVC-free ● Low-temperature-flexible
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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.UL.25.04	4G2.5	9.0	100	159
CF9.UL.25.05	5G2.5	10.0	124	194
CF9.UL.25.07 ¹⁷⁾	7G2.5	12.0	174	270
CF9.UL.25.12	12G2.5	16.0	297	502
CF9.UL.25.18	18G2.5	20.0	445	737
CF9.UL.25.25	25G2.5	23.5	612	1011
CF9.UL.40.04	4G4.0	10.5	159	231

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

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.



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



Example image

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Data sheet

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Design table

Example image igus® chainflex® CF9.UL	Part No.	Number of cores	Core design	Part No.	Number of cores	Core design
	CF9.UL.XX.02	2		CF9.UL.XX.06	6	
	CF9.UL.XX.03.INI	3		CF9.UL.XX.07	7	
	CF9.UL.XX.03	3		CF9.UL.XX.08	8	
	CF9.UL.XX.04	4		CF9.UL.XX.12	4x3	
	CF9.UL.XX.04.INI	4		CF9.UL.XX.18	6x3	
	CF9.UL.XX.05.INI	5		CF9.UL.XX.25	5x5	
	CF9.UL.XX.05	5				

Guarantee
igus chainflex
4 YEARS
igus 4-year guarantee calculator

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

CFRIP
iF
DESIGN AWARD 2016

UL
LISTED
US

UL
LISTED
CANADA

nec
NFPA

NFPA

CUPA

DNV
DEULCOGNIT

REACH

RoHS

clean-room

DESIGN

CE

Data sheet

chainflex® CF9.UL



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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



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[CF9.UL.25.12](#) [CF9.UL.25.18](#) [CF9.UL.25.25](#) [CF9.UL.40.04](#)