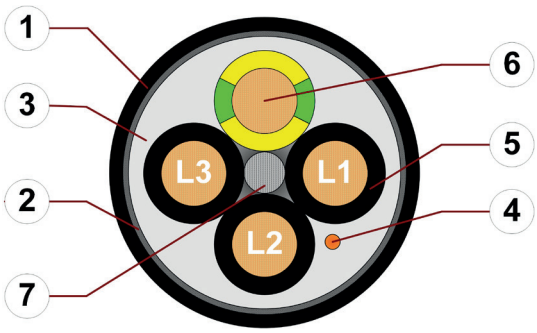
Data sheet
chainflex® CF33.UL

Motor cable (Class 5.4.2.1) ● For heavy duty applications ● PVC outer jacket ● Shielded ● Oil-resistant ● Flame-retardant ● Flexible Motor Supply Cable according to UL 2277

Example image



1. Outer jacket: Pressure extruded, oil-resistant PVC mixture
2. Overall shield: Extremely bending-resistant braiding made of tinned copper wires
3. Inner jacket: Pressure extruded, gusset-filling PVC mixture
4. CFRIP: Tear strip for faster cable stripping
5. Core insulation: Mechanically high-quality, especially low-capacitance XLPE mixture
6. Conductor: Especially bending-stable version consisting of bare copper wires
7. Strain relief: Tensile stress-resistant centre element

Example image
For detailed overview please see design table

Cable structure

Conductor	**Cores < 10 mm²:** Stranded conductor in especially bending-resistant version consisting of bare copper wires (following DIN EN 60228). **Cores ≥ 10 mm²:** Conductor cable consisting of pre-leads (following DIN EN 60228).
Core insulation	Mechanically high-quality, especially low-capacitance XLPE mixture.
Core structure	Cores wound with a short pitch length around a high tensile strength centre element.
Core identification	Black cores with white numbers, one green-yellow core. 1. Core: U / L1 / C / L+ 2. Core: V / L2 3. Core: W / L3 / D / L- 4. Core: 4 / N
Inner jacket	PVC mixture adapted to suit the requirements in e-chains®.
Overall shield	Extremely bending-resistant braiding made of tinned copper wires. Coverage approx. 70 % linear, approx. 90 % optical
Outer jacket	Low-adhesion, oil-resistant PVC mixture, adapted to suit the requirements in e-chains® (following DIN EN 50363-4-1). Colour: Jet black (similar to RAL 9005) Printing: white
CFRIP®	Strip cables faster: a tear strip is moulded into the inner jacket Video ▶ www.igus.eu/CFRIP

„00000 m“* igus chainflex CF33.UL--.--① ----② 600/1000V VFD

E****** C(UL) TC 1000 V ----------③ or FLEXIBLE MOTOR SUPPLY CABLE

or c(UL) CONTROL CIC/TC FT4 XLPE OR AWM Style 20886 90° 1000 V

CE 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 **≤ 1.5mm²:** Type FFHH-2 75°C DRY SUN RES OIL RES I
≥ 2.5mm²: Type XHHW-2 90°C DRY 90°C WET SUN RES DIR BUR OIL RES I
Example: ... chainflex **CF33.UL.15.04 (4G1,5)C 600/1000V** ...

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Dynamic information

Bend radius	e-chain® linear	minimum 7.5 x d
	flexible	minimum 6 x d
	fixed	minimum 4 x d
Temperature	e-chain® linear	+5 °C up to +70 °C
	flexible	-5 °C up to +70 °C (following DIN EN 60811-504)
	fixed	-15 °C up to +70 °C (following DIN EN 50305)
v max.	unsupported	10 m/s
	gliding	5 m/s
a max.		80 m/s²
Travel distance		Unsupported travels and up to 50 m for gliding applications, Class 4

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. [factor x d]	R min. [factor x d]	R min. [factor x d]
+5/+15	10	11	12
+15/+60	7.5	8.5	9.5
+60/+70	10	11	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	600/1000 V (following DIN VDE 0298-3) 1000 V TC, 1000 V AWM
Testing voltage	4000 V (following DIN EN 50395)

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Example image

Properties and approvals

UV resistance	Medium
Oil resistance	Oil-resistant (following DIN EN 50363-4-1), Class 2
Flame-retardant	According to IEC 60332-1-2, Cable Flame, VW-1, FT1, FT2 / Horizontal Flame, FT4
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. B129699: “igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year”
UL listed	Flexible Motor Supply Cable UL 2277, XHHW-2 UL 44, FFHH-2 UL 66, TC UL 1277
UL/CSA AWM	Details see table UL/CSA AWM
NFPA	Following NFPA 79-2018, chapter 12.9
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 2. The outer jacket material of this series complies with CF5.10.07 - tested by IPA according to standard DIN EN ISO 14644-1
CE	Following 2014/35/EU

Properties and approvals

UL/CSA AWM Details

Conductor nominal cross section [mm²]	Number of cores	UL style core insultation	UL style outer jacket	UL Voltage Rating [V]	UL Temperature Rating [°C]
1.5	4	30052	20886	1000	90
2.5	4	30052	20886	1000	90
4.0	4	30052	20886	1000	90
6.0	4	30052	20886	1000	90
10	4	30052	20886	1000	90
16	4	30052	20886	1000	90
25	4	30052	20886	1000	90

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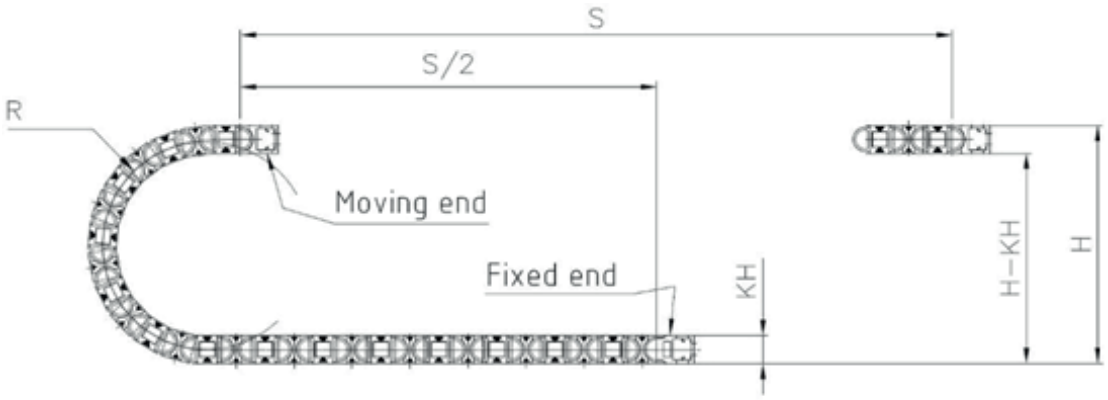
Example image

Typical lab test setup for this cable series

Test bend radius R	approx. 75 - 300 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

- Flexible Motor Supply Cable according to UL 2277 for continuous movement in energy chains
- For heavy-duty applications, Class 5
- Unsupported travels and up to 50m for gliding applications, Class 4
- Light oil influence, Class 2
- No torsion, Class 1
- Preferably indoor applications, but also outdoor ones at temperatures > 5 °C
- Storage and retrieval units, machining units/packaging machines, quick handling, indoor cranes

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Example image

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]
CF33.UL.15.04	(4G1.5)C	12.5	99	214
CF33.UL.25.04	(4G2.5)C	13.5	144	279
CF33.UL.40.04	(4G4.0)C	16.5	211	391
CF33.UL.60.04	(4G6.0)C	20.0	320	605
CF33.UL.100.04	(4G10)C	24.0	500	870
CF33.UL.160.04	(4G16)C	28.0	781	1276
CF33.UL.250.04	(4G25)C	32.0	1173	1783

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]
1.5	13.3	19
2.5	7.98	27
4.0	4.95	37
6.0	3.3	48
10	1.91	69
16	1.21	92
25	0.78	121

The final maximum current rating depends among other things on the ambient conditions, the type of the installation and the number of loaded cores.

Design table

Part No.	Number of cores	Core design
CF33.UL.XX.04	4