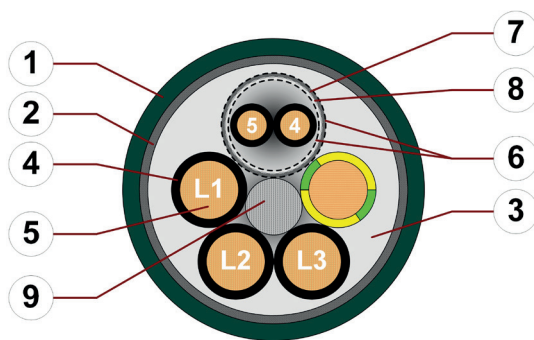


# Data sheet

## chainflex® CF21.UL



Servo cable (Class 5.5.2.1) • For heavy duty applications • PVC outer jacket • Shielded  
• Oil-resistant • Flame retardant



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. Core insulation: Mechanically high-quality, especially low-capacitance XLPE mixture
5. Conductor: Especially bending-resistant version consisting of bare copper wires
6. Element banding: Plastic foil
7. Element shield: Extremely bending-resistant wrapping made of tinned copper wires
8. Shield foil: Aluminium-coated plastic foil
9. Strain relief: Tensile stress-resistant centre element

### 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, especially low-capacitance XLPE mixture.



#### Core structure

Power cores with control pair elements wound with elements for high tensile stresses.



#### Core identification

**Power cores:** 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-

**1 Control pair:** Black cores with white numbers.

1. Control core: 4 2. Control core: 5

**2 Control pairs:** Black cores with white numbers.

1. Control core: 5 2. Control core: 6

3. Control core: 7 4. Control core: 8



#### Element shield

Extremely bending-resistant wrapping made of tinned copper wires.



#### 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:** Moss green (similar to RAL 6005)

**Printing:** white



#### CFRIP®

Strip cables faster: a tear strip is moulded into the inner jacket  
Video ► [www.igus.eu/CFRIP](http://www.igus.eu/CFRIP)



„00000 m\*\* igus chainflex CF21.-.-.-.UL① ---② 600/1000V E310776

cRUus AWM Style 2570 VW-1 AWM I/II A/B 80°C 1000V FT1 EAC/CTP

CE RoHS-II conform [www.igus.de](http://www.igus.de) +++ chainflex cable works +++

\* **Length printing:** Not calibrated. Only intended as an orientation aid.

① / ② Cable identification according to Part No. (see technical table).

Example: chainflex CF21.15.15.02.01.UL (4G1.5+(2x1.5)C) 600/1000V

# Data sheet

## chainflex® CF21.UL



Servo cable (Class 5.5.2.1) • For heavy duty applications • PVC outer jacket • Shielded  
• Oil-resistant • Flame retardant

### Dynamic information

|                                                                                   |                        |                                                                       |                                                                                                                       |
|-----------------------------------------------------------------------------------|------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
|  | <b>Bend radius</b>     | <b>e-chain® linear</b><br>flexible<br>fixed                           | min. 7,5 x d<br>min. 6 x d<br>min. 4 x d                                                                              |
|  | <b>Temperature</b>     | <b>e-chain® linear</b><br>flexible<br>fixed                           | +5 °C up to +70 °C<br>-5 °C up to +70 °C (following DIN EN 60811-504)<br>-15 °C up to +70 °C (following DIN EN 50305) |
|  | <b>v max.</b>          | <b>unsupported</b><br><b>gliding</b>                                  | 10 m/s<br>5 m/s                                                                                                       |
|  | <b>a max.</b>          |                                                                       | 80 m/s <sup>2</sup>                                                                                                   |
|  | <b>Travel distance</b> | Unsupported travels and up to 100 m for gliding applications, Class 5 |                                                                                                                       |

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

|                                                                                     |                        |                                                                |
|-------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------|
|  | <b>Nominal voltage</b> | 600/1000 V (following DIN VDE 0298-3)<br>1000 V (following UL) |
|  | <b>Testing voltage</b> | 4000 V (following DIN EN 50395)                                |



Example image

igus® chainflex® CF21.UL

# Data sheet

## chainflex® CF21.UL



Servo cable (Class 5.5.2.1) • For heavy duty applications • PVC outer jacket • Shielded  
• Oil-resistant • Flame retardant

### 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, FT1, VW-1                                                                                                               |
|  | Silicone-free   | Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)                                                              |
|  | UL verified     | Certificate No. B129699: „igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year“              |
|  | UL/CSA AWM      | See table UL/CSA AWM for details                                                                                                                    |
|  | NFPA            | Following NFPA 79-2018, chapter 12.9                                                                                                                |
|  | EAC             | Certificate No. RU C-DE.ME77.B.02324 (TR ZU)                                                                                                        |
|  | CTP             | Certificate No. C-DE.PB49.B.00420 (Fire protection)                                                                                                 |
|  | 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] | UL style core insulation | UL style outer jacket | UL Voltage Rating [M] | UL Temperature Rating [°C] |
|---------------------------------------|--------------------------|-----------------------|-----------------------|----------------------------|
| 0.34                                  | 3446                     | 2570                  | 1000                  | 80                         |
| 0.5                                   | 3446                     | 2570                  | 1000                  | 80                         |
| 0.75                                  | 3446                     | 2570                  | 1000                  | 80                         |
| 1                                     | 3446                     | 2570                  | 1000                  | 80                         |
| 1.5                                   | 3446                     | 2570                  | 1000                  | 80                         |
| 2.5                                   | 3446                     | 2570                  | 1000                  | 80                         |
| 4                                     | 3446                     | 2570                  | 1000                  | 80                         |
| 6                                     | 3446                     | 2570                  | 1000                  | 80                         |
| 10                                    | 3446                     | 2570                  | 1000                  | 80                         |
| 16                                    | 3446                     | 2570                  | 1000                  | 80                         |



Example image

# Data sheet

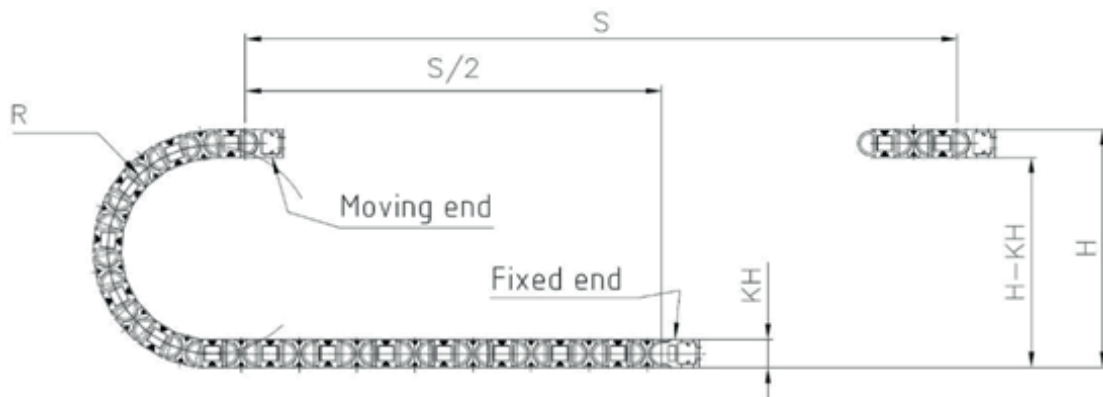
## chainflex® CF21.UL



Servo cable (Class 5.5.2.1) • For heavy duty applications • PVC outer jacket • Shielded  
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### Typical lab test setup for this cable series

|                     |                                      |
|---------------------|--------------------------------------|
| Test bend radius R  | approx. 75 - 250 mm                  |
| Test travel $S/S_2$ | 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 <sup>2</sup> |



### Typical application areas

- For heavy duty applications, Class 5
- Unsupported travel distances and up to 100 m for gliding applications, Class 5
- Light oil influence, Class 2
- No torsion, Class 1
- Preferably indoor applications, but also outdoor ones at temperatures > 5 °C
- Storage and retrieval units for high-bay warehouses, machining units/packages machines, quick handling, indoor cranes



igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year



Example image

igus® chainflex® CF21.UL

# Data sheet

## chainflex® CF21.UL



Servo cable (Class 5.5.2.1) ● For heavy duty applications ● PVC outer jacket ● Shielded  
● Oil-resistant ● Flame retardant

### 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] |
|---------------------------------|-----------------------------------------------------------|------------------------------|----------------------|----------------|
| <b>1 Control pair shielded</b>  |                                                           |                              |                      |                |
| CF21.07.05.02.01.UL             | (4G0.75+(2x0.5)C)C                                        | 11.0                         | 76                   | 159            |
| CF21.15.15.02.01.UL             | (4G1.5+(2x1.5)C)C                                         | 13.0                         | 145                  | 256            |
| CF21.25.15.02.01.UL             | (4G2.5+(2x1.5)C)C                                         | 14.5                         | 199                  | 330            |
| CF21.40.15.02.01.UL             | (4G4.0+(2x1.5)C)C                                         | 16.0                         | 256                  | 406            |
| CF21.60.15.02.01.UL             | (4G6.0+(2x1.5)C)C                                         | 18.0                         | 343                  | 546            |
| CF21.100.15.02.01.UL            | (4G10+(2x1.5)C)C                                          | 21.5                         | 536                  | 828            |
| <b>2 Control pairs shielded</b> |                                                           |                              |                      |                |
| CF21.07.03.02.02.UL             | (4G0.75+2x(2x0.34)C)C                                     | 12.5                         | 103                  | 208            |
| CF21.10.07.02.02.UL             | (4G1.0+2x(2x0.75)C)C                                      | 13.5                         | 148                  | 269            |
| CF21.15.07.02.02.UL             | (4G1.5+2x(2x0.75)C)C                                      | 14.5                         | 167                  | 309            |
| CF21.25.15.02.02.UL             | (4G2.5+2x(2x1.5)C)C                                       | 17.0                         | 254                  | 434            |
| CF21.40.15.02.02.UL             | (4G4.0+2x(2x1.5)C)C                                       | 18.0                         | 308                  | 515            |
| CF21.60.15.02.02.UL             | (4G6.0+2x(2x1.5)C)C                                       | 21.0                         | 412                  | 695            |
| CF21.100.15.02.02.UL            | (4G10+2x(2x1.5)C)C                                        | 23.0                         | 592                  | 925            |
| CF21.160.15.02.02.UL            | (4G16+2x(2x1.5)C)C                                        | 26.5                         | 878                  | 1287           |

**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] |
|---------------------------------------|---------------------------------------------------------------------------|----------------------------------|
| 0.34                                  | 57                                                                        | 7                                |
| 0.5                                   | 39                                                                        | 10                               |
| 0.75                                  | 26                                                                        | 13                               |
| 1                                     | 19.5                                                                      | 15                               |
| 1.5                                   | 13.3                                                                      | 19                               |
| 2.5                                   | 8                                                                         | 27                               |
| 4                                     | 4.95                                                                      | 37                               |
| 6                                     | 3.3                                                                       | 48                               |
| 10                                    | 1.91                                                                      | 69                               |
| 16                                    | 1.21                                                                      | 92                               |

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



Example image

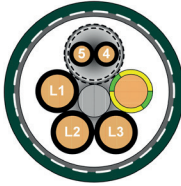
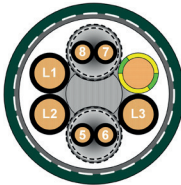
# Data sheet

## chainflex® CF21.UL



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### Design table

| Part No.            | Number of cores | Core design                                                                        |
|---------------------|-----------------|------------------------------------------------------------------------------------|
| CF21.XX.XX.02.01.UL | 4+1x2           |  |
| CF21.XX.XX.02.02.UL | 4+2x2           |  |

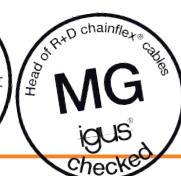


igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year



Example image

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