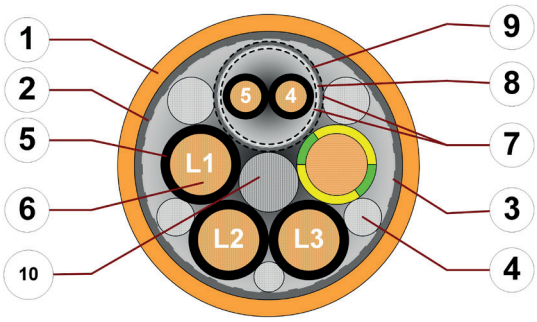
# Data sheet
# chainflex® CF210.UL

**Servo cable (Class 4.2.2.1) ● For medium duty applications ● PVC outer jacket ● Shielded ● Oil-resistant ● Flame-retardant**

Example image




**Example image**
For detailed overview please see design table

1. Outer jacket: Pressure extruded, oil-resistant PVC mixture
2. Overall shield: Bending-resistant braiding made of tinned copper wires.
3. Banding: Plastic fleece
4. Filling: Plastic yarns
5. Core insulation: Mechanically high-quality, especially low-capacitance XLPE mixture
6. Conductor: Especially bending-resistant version consisting of bare copper wires
7. Element banding: Plastic foil
8. Shield foil: Aluminium-coated polyester foil
9. Element shield: Bending-resistant braiding made of tinned copper wires.
10. Strain relief: Tensile stress-resistant centre element

## Cable structure

| | |
|---|---|
| **Conductor** | Stranded conductor in 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 and control pair elements wound with a short pitch length around a high tensile strength centre element. |
| **Core identification** | **Power cores:** Black cores with white numbers, one green-yellow core.<br>1. Core: U / L1 / C / L+<br>2. Core: V / L2<br>3. Core: W / L3 / D / L-<br>**1 Control pair:** Black cores with white numbers.<br>1. Control core: 4 2. Control core: 5<br>**2 Control pairs:** Black cores with white numbers.<br>1. Control core: 5 2. Control core: 6<br>3. Control core: 7 4. Control core: 8 |
| **Element shield** | Bending-resistant braiding made of tinned copper wires. |
| **Intermediate layer** | Foil taping over the outer layer. |
| **Overall shield** | Bending-resistant braiding made of tinned copper wires.<br>Coverage linear approx. 55%, optical approx. 80% |
| **Outer jacket** | Low-adhesion, oil-resistant PVC mixture, adapted to suit the requirements in e-chains® (following DIN EN 50363-4-1).<br>**Colour:** Pastel orange (similar to RAL 2003)<br>**Printing:** black |

**„00000 m“* igus chainflex CF210.UL.-.-.-.-① ---② 600/1000V E310776**

**cЯUus AWM Style 20886 VW-1 AWM I/II A/B 90°C 1000V FT1**

**CE RoHS-II conform 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 **CF210.UL.15.15.02.01 (4G1.5+(2x1.5)C)C 600/1000V** ...

# Data sheet
# chainflex® CF210.UL

**Servo cable (Class 4.2.2.1) ● For medium duty applications ● PVC outer jacket ● Shielded ● Oil-resistant ● Flame-retardant**

Example image

## Dynamic information

| | | | |
|---|---|---|---|
| Bend radius | e-chain® linear | minimum 10 x d |
| | flexible | minimum 8 x d |
| | fixed | minimum 5 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 | 10m/s |
| | gliding | 2m/s |
| a max. | | 50m/s² |
| Travel distance | | Unsupported travels and up to 10m for gliding applications, 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] |
| +5/+15 | 12.5 | 13.5 | 14.5 |
| +15/+60 | 10 | 11 | 12 |
| +60/+70 | 12.5 | 13.5 | 14.5 |

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

Guarantee igus chainflex 4 YEARS up to 4 years guarantee

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

# Data sheet
# chainflex® CF210.UL

**Servo cable (Class 4.2.2.1) ● For medium duty applications ● PVC outer jacket ● Shielded ● Oil-resistant ● Flame-retardant**

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 |
| **Silicone-free** | Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992) |
| **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/CSA AWM** | See table UL/CSA AWM for details |
| **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] | UL style core insulation | UL style outer jacket | UL Voltage Rating [V] | UL Temperature Rating [°C] |
|---|---|---|---|---|
| 0.34 | 30052 | 20886 | 1000 | 90 |
| 0.75 | 30052 | 20886 | 1000 | 90 |
| 1.5 | 30052 | 20886 | 1000 | 90 |
| 2.5 | 30052 | 20886 | 1000 | 90 |
| 4.0 | 30052 | 20886 | 1000 | 90 |
| 6.0 | 30052 | 20886 | 1000 | 90 |

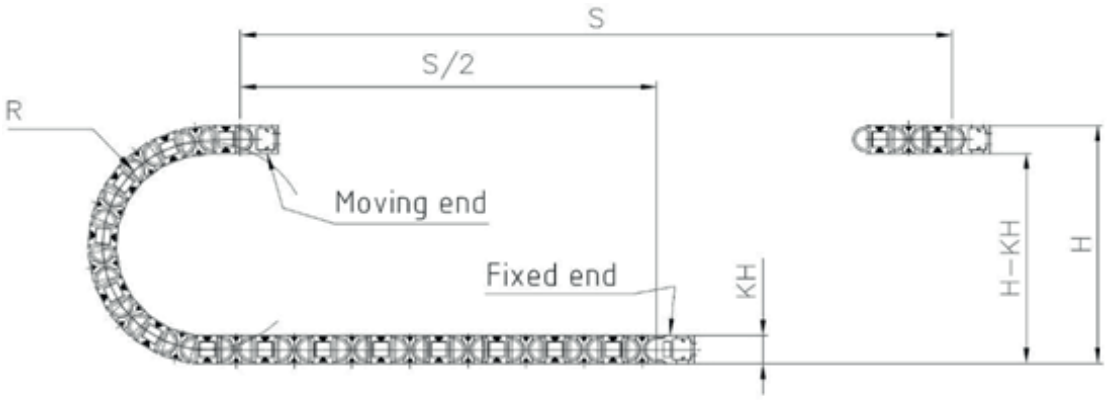
# Data sheet
# chainflex® CF210.UL

**Servo cable (Class 4.2.2.1) ● For medium duty applications ● PVC outer jacket ● Shielded ● Oil-resistant ● Flame-retardant**


Example image

## Typical lab test setup for this cable series

| | |
|---|---|
| **Test bend radius R** | approx. 75 - 250 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

- For medium duty applications, Class 4
- Unsupported travels and up to 10m for gliding applications, Class 2
- Light oil influence, Class 2
- No torsion, Class 1
- Preferably indoor applications, but also outdoor ones at temperatures > 5°C
- Wood/stone processing, packaging industry, feeding, handling, adjusting devices

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

# Data sheet
# chainflex® CF210.UL

**Servo cable (Class 4.2.2.1) ● For medium duty applications ● PVC outer jacket ● Shielded ● Oil-resistant ● Flame-retardant**

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] |
|---|---|---|---|---|
| **1 Control pair shielded** | | | | |
| **CF210.UL.07.03.02.01** | (4G0.75+(2x0.34)C)C | 9.0 | 72 | 108 |
| **CF210.UL.15.15.02.01** | (4G1.5+(2x1.5)C)C | 12.5 | 154 | 245 |
| **CF210.UL.25.15.02.01** | (4G2.5+(2x1.5)C)C | 14.0 | 210 | 299 |
| **CF210.UL.40.15.02.01** | (4G4.0+(2x1.5)C)C | 15.0 | 255 | 383 |
| **CF210.UL.60.15.02.01** | (4G6.0+(2x1.5)C)C | 16.5 | 343 | 488 |
| **2 Control pairs shielded** | | | | |
| **CF210.UL.15.07.02.02** | (4G1.5+2x(2x0.75)C)C | 13.5 | 161 | 278 |
| **CF210.UL.25.15.02.02** | (4G2.5+2x(2x1.5)C)C | 16.0 | 244 | 381 |
| **CF210.UL.40.15.02.02** | (4G4.0+2x(2x1.5)C)C | 17.0 | 332 | 428 |
| **CF210.UL.60.15.02.02** | (4G6.0+2x(2x1.5)C)C | 19.0 | 403 | 598 |
| **without control pair** | | | | |
| **CF210.UL.05.04** | (4G0.5)C | 7.0 | 34 | 63 |
| **CF210.UL.15.04** | (4G1.5)C | 10.0 | 86 | 140 |
| **CF210.UL.25.04** | (4G2.5)C | 11.5 | 146 | 209 |
| **CF210.UL.40.04** | (4G4.0)C | 13.0 | 195 | 288 |

**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 |
| 0.75 | 26 | 14 |
| 1.5 | 13.3 | 19 |
| 2.5 | 8 | 27 |
| 4.0 | 4.95 | 37 |
| 6.0 | 3.3 | 48 |

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

# Data sheet
# chainflex® CF210.UL

**Servo cable (Class 4.2.2.1) ● For medium duty applications ● PVC outer jacket ● Shielded ● Oil-resistant ● Flame-retardant**


Example image

## Capacity

| Part No. | Power cores | | Control cores | |
|---|---|---|---|---|
| | Core/Core | Core/Shield | Core/Core | Core/Shield |
| | Capacity [approx. pF / m] | Capacity [approx. pF / m] | Capacity [approx. pF / m] | Capacity [approx. pF / m] |
| **1 Control pair shielded** | | | | |
| CF210.UL.07.03.02.01 | 60 | 105 | 75 | 130 |
| CF210.UL.15.15.02.01 | 80 | 140 | 120 | 215 |
| CF210.UL.25.15.02.01 | 105 | 180 | 120 | 215 |
| CF210.UL.40.15.02.01 | 115 | 200 | 120 | 215 |
| CF210.UL.60.15.02.01 | 120 | 210 | 120 | 215 |
| **2 Control pairs shielded** | | | | |
| CF210.UL.15.07.02.02 | 80 | 140 | 100 | 165 |
| CF210.UL.25.15.02.02 | 105 | 180 | 120 | 215 |
| CF210.UL.40.15.02.02 | 115 | 200 | 120 | 215 |
| CF210.UL.60.15.02.02 | 120 | 210 | 120 | 215 |
| **without control pair** | | | | |
| CF210.UL.05.04 | 75 | 135 | - | - |
| CF210.UL.15.04 | 80 | 140 | - | - |
| CF210.UL.25.04 | 105 | 180 | - | - |
| CF210.UL.40.04 | 115 | 200 | - | - |

Guarantee igus chainflex 4 YEARS up to 4 years guarantee

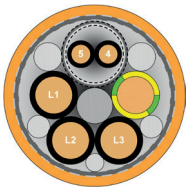
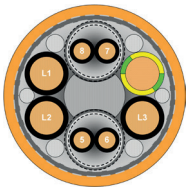
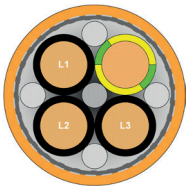
igus 4-year chainflex cable guarantee and service life calculator based on 2 billion test cycles per year

# Data sheet
# chainflex® CF210.UL

**Servo cable (Class 4.2.2.1) ● For medium duty applications ● PVC outer jacket ● Shielded ● Oil-resistant ● Flame-retardant**


Example image

## Design table

| Part No. | Number of cores | Core design |
|---|---|---|
| CF210.UL.XX.XX.02.01 | 4+1x2 |  |
| CF210.UL.XX.XX.02.02 | 4+2x2 |  |
| CF210.UL.XX.04 | 4 |  |