HELU

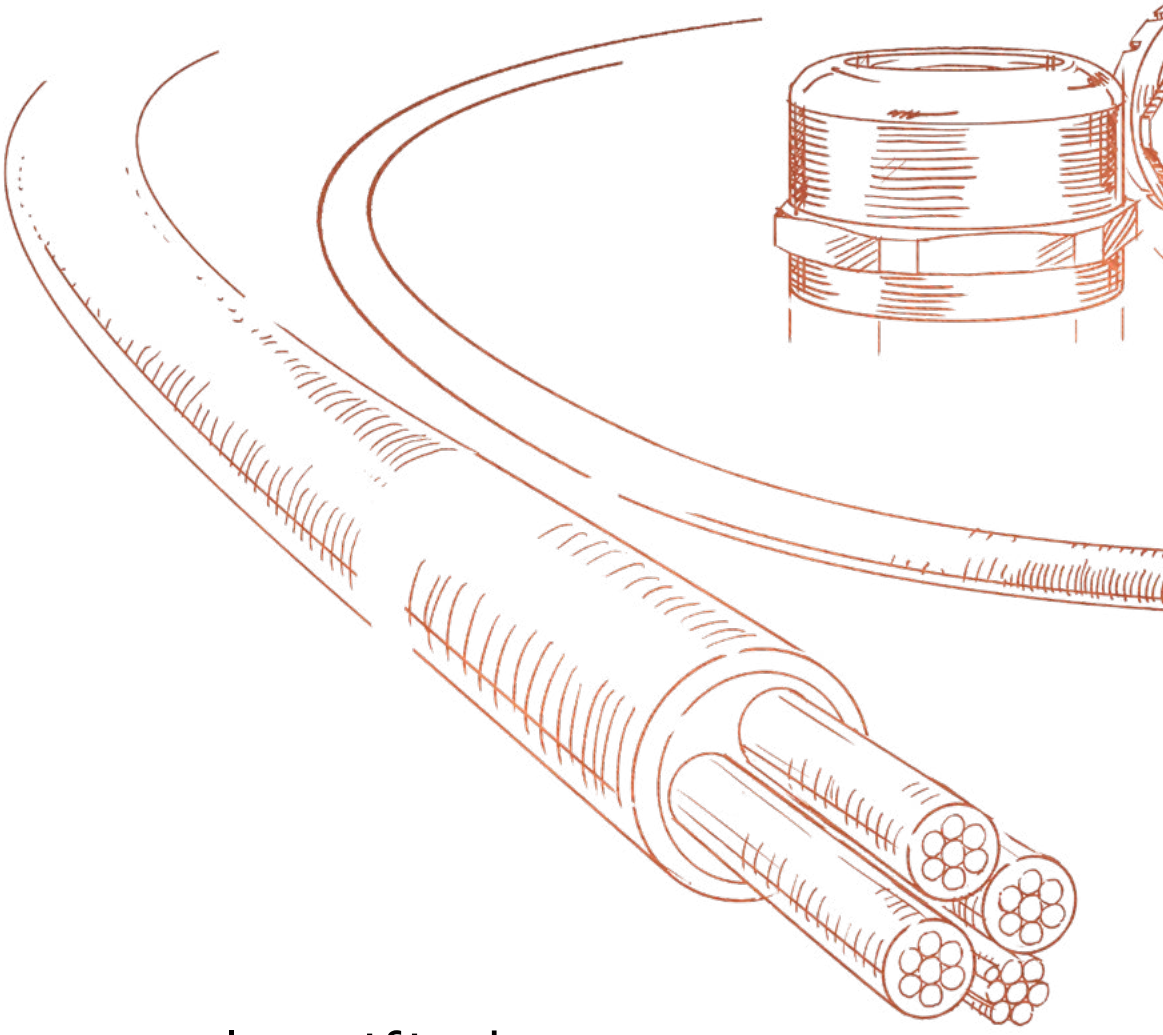
Drag Chain Systems Portfolio

HELUCHAIN DRAG CHAIN CABLES

Ed. 1 // EN

Always stay electrified.

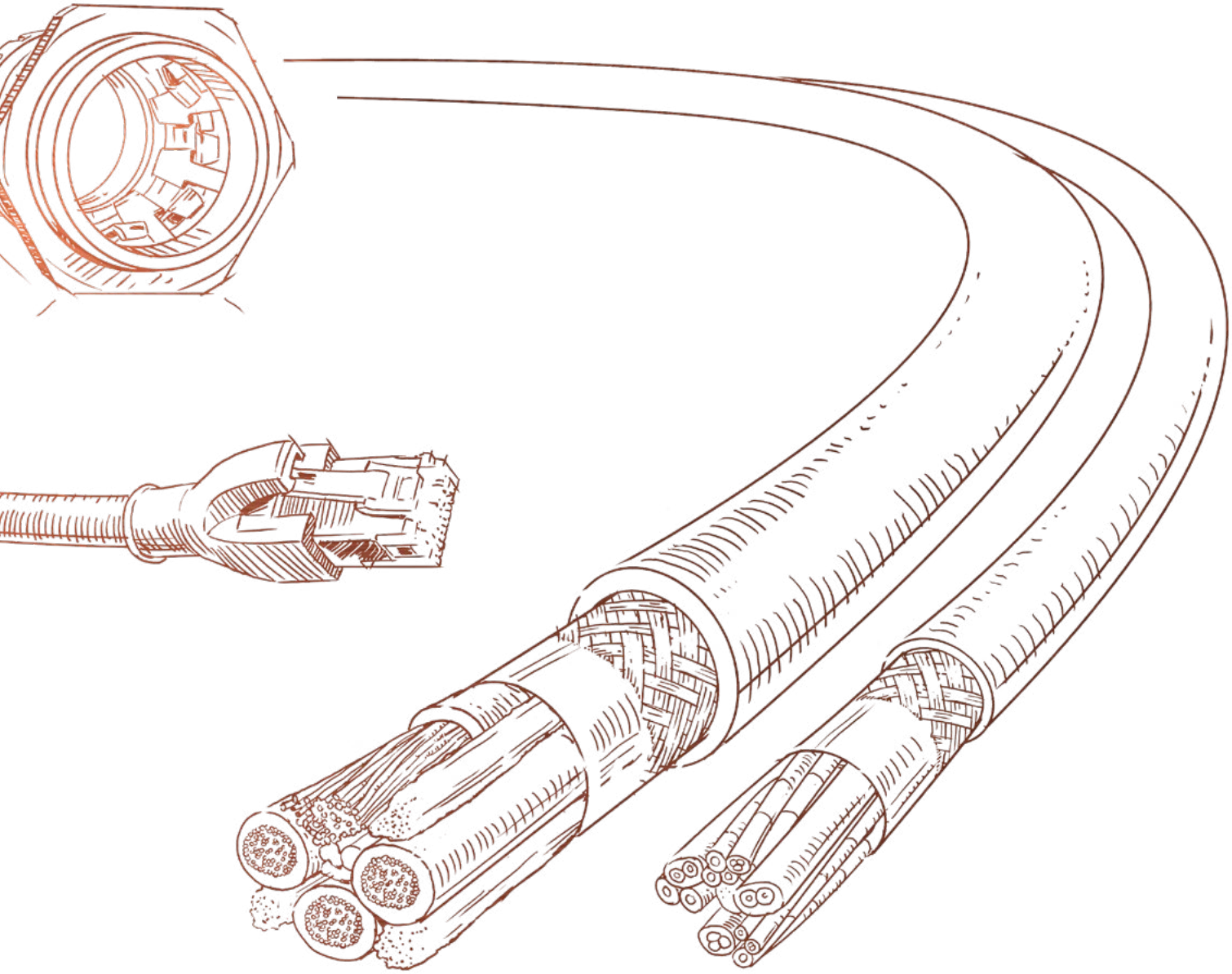
Content



Always stay electrified.

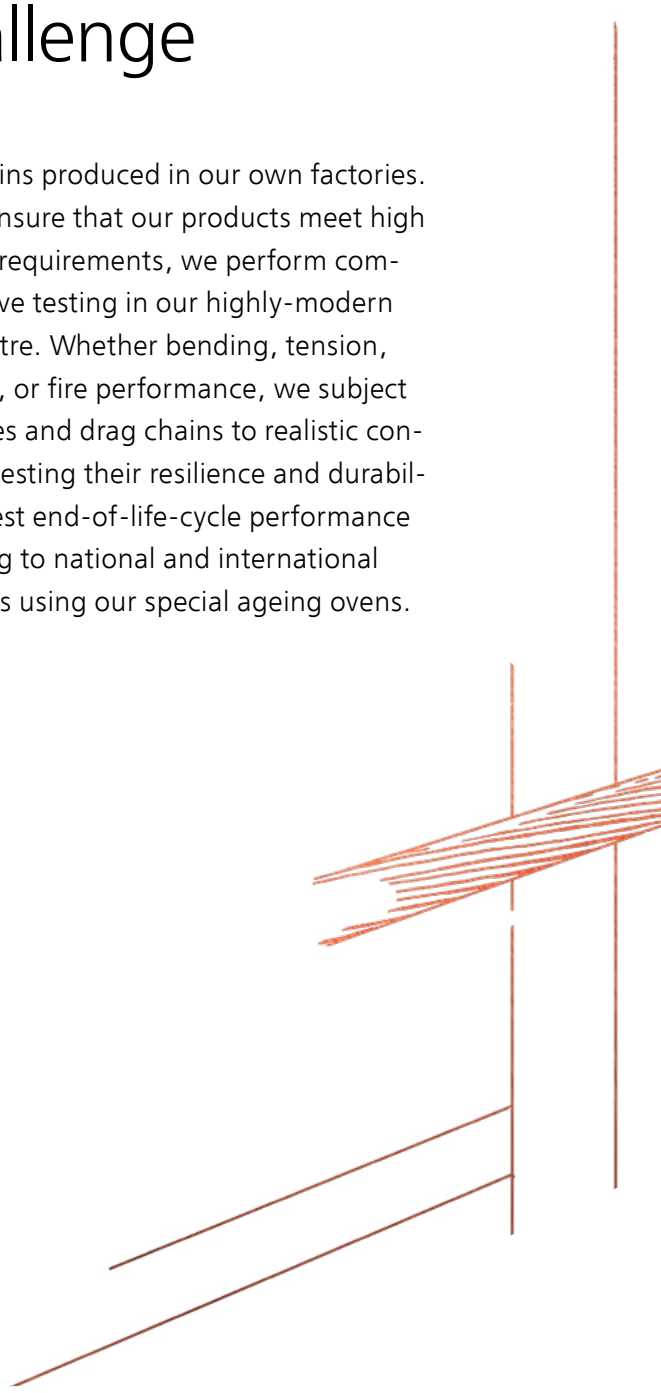
Electrical connections are the vital supply lines of complex machines, plants, and systems. From the outside, they are barely visible, but every day, they must withstand the highest mechanical loads and extreme operating conditions, sometimes around the clock or for decades without rest.
At HELU, it is our mission to provide our customers and their applications with custom, ready-to-use solutions for power and data transmission, including cables, wires, drag chains, assemblies, pre-installed modules, and complete systems.

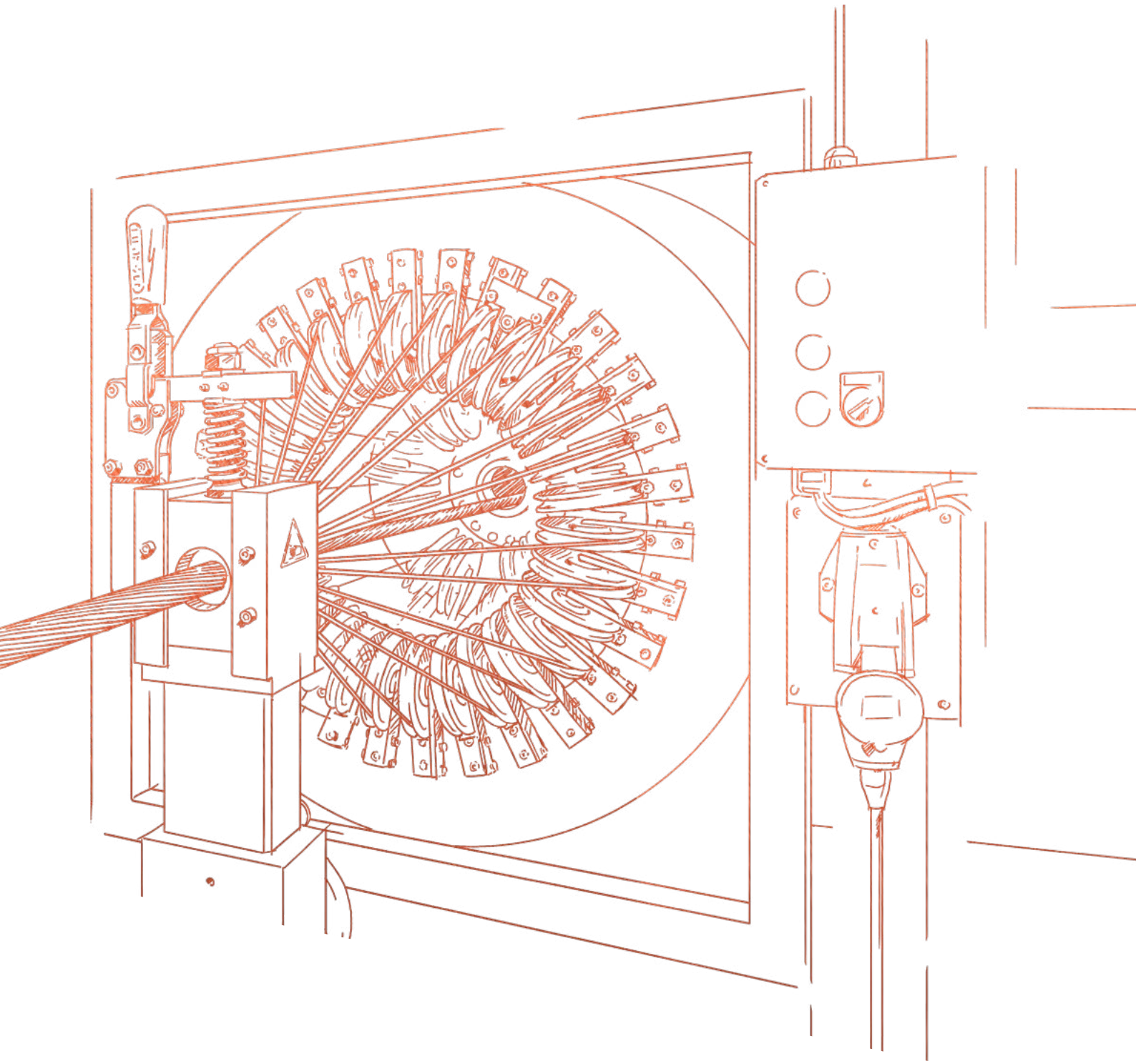
Over 2,500 employees at 76 locations in 43 countries do their best to achieve this. Our aim is to gain a precise understanding of your individual requirements and to provide you with exactly the solution that delivers the greatest added value for you—reliable, flexible, and from a single source. Creating connections that electrify both you and your application—this is what our claim "Always stay electrified." stands for.

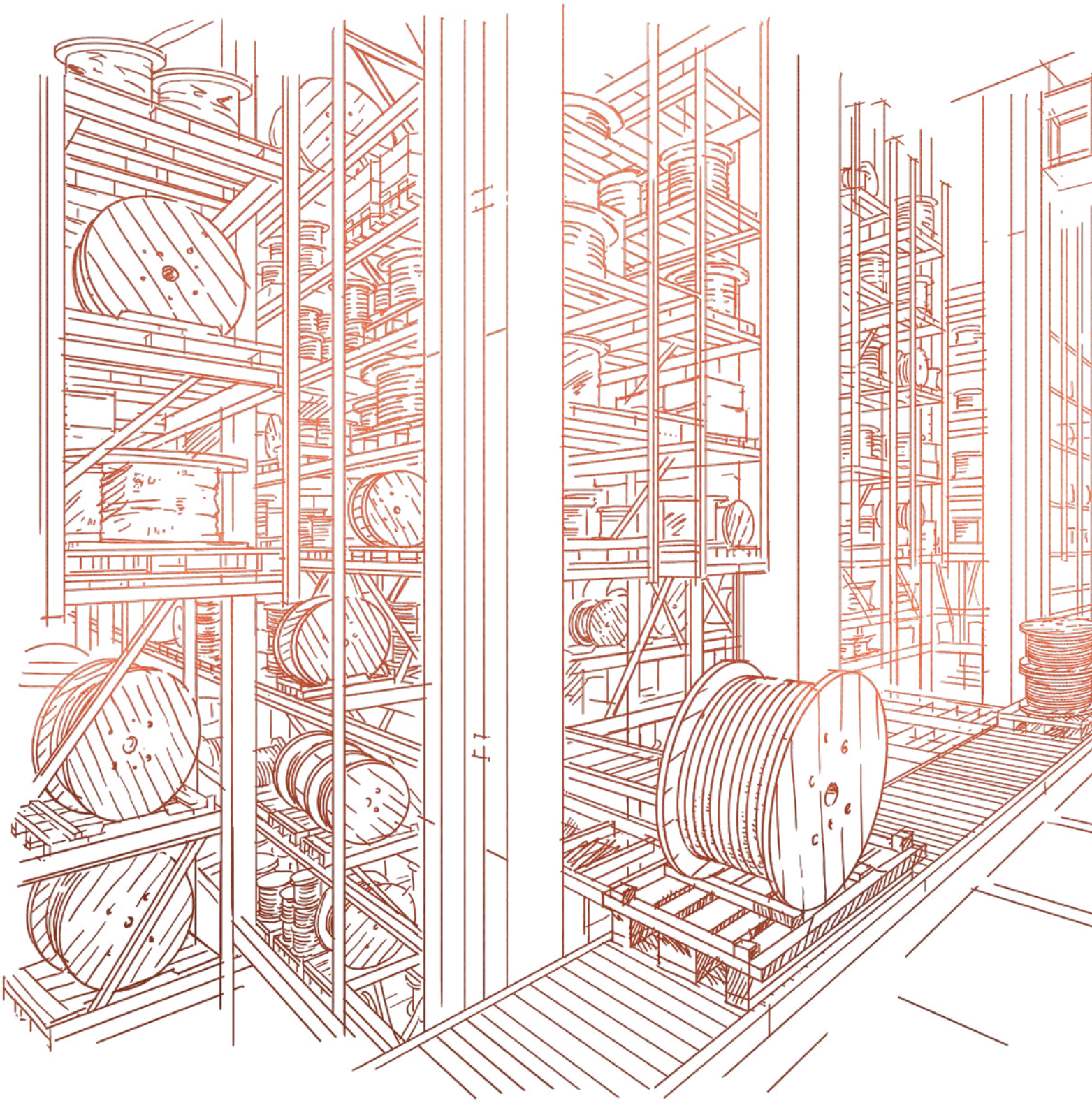


Overcoming Every Challenge

To develop ideal solutions for even the most complex and exotic applications, it is important to ask the right questions from the start—and then find intelligent solutions for them. Our HELU experts are here to do exactly that. Thanks to their ideas and industry expertise, creating solutions designed to withstand millions of movement cycles, extreme mechanical and chemical loads, tricky bending radii, and tight spaces are no problem. We are a one-stop-shop for cables, assemblies, and drag chains produced in our own factories. And to ensure that our products meet high industry requirements, we perform comprehensive testing in our highly-modern R&D centre. Whether bending, tension, abrasion, or fire performance, we subject our cables and drag chains to realistic conditions, testing their resilience and durability. We test end-of-life-cycle performance according to national and international standards using our special ageing ovens.

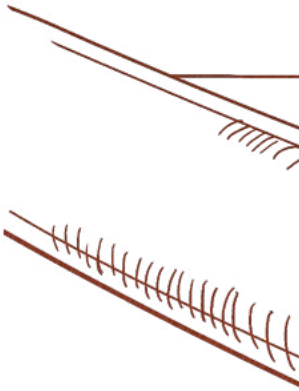






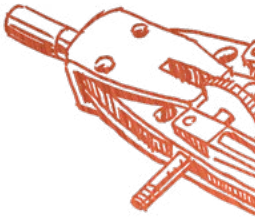
Wherever You Need Us, We're There

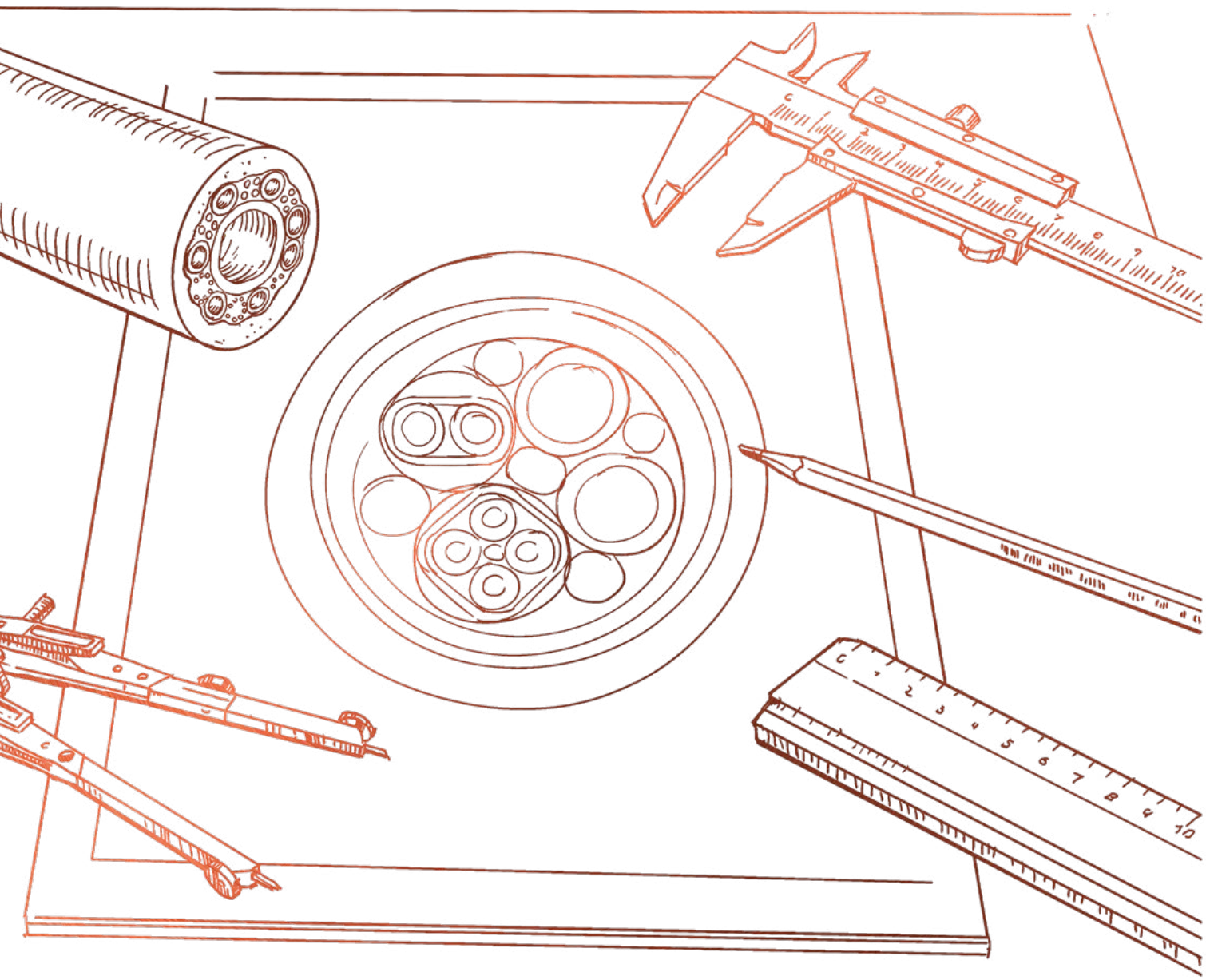
Electrical connection technology often exists inconspicuously in the background. But without it, neither data nor electricity flow. This fact becomes reality when machines experience disruptions or construction cannot be completed on time, creating a time-sensitive and stressful situation for everyone involved. At HELU, we do our best to alleviate this stress as quickly and as thoroughly as possible. In our fully automated logistics centre—the largest of its kind in all of Europe—we stock over 33,000 articles so that we can react to any and all requests as quickly as possible, supplying you with the exact solution you need. Our "known shipper" status with German Federal Aviation Office ensures that your goods are able to be checked and pass security control directly in our warehouse, speeding up the shipping process considerably. Furthermore, we have 33 warehouse locations on 5 continents making us a reliable and efficient partner for your projects, regardless of where you are located.

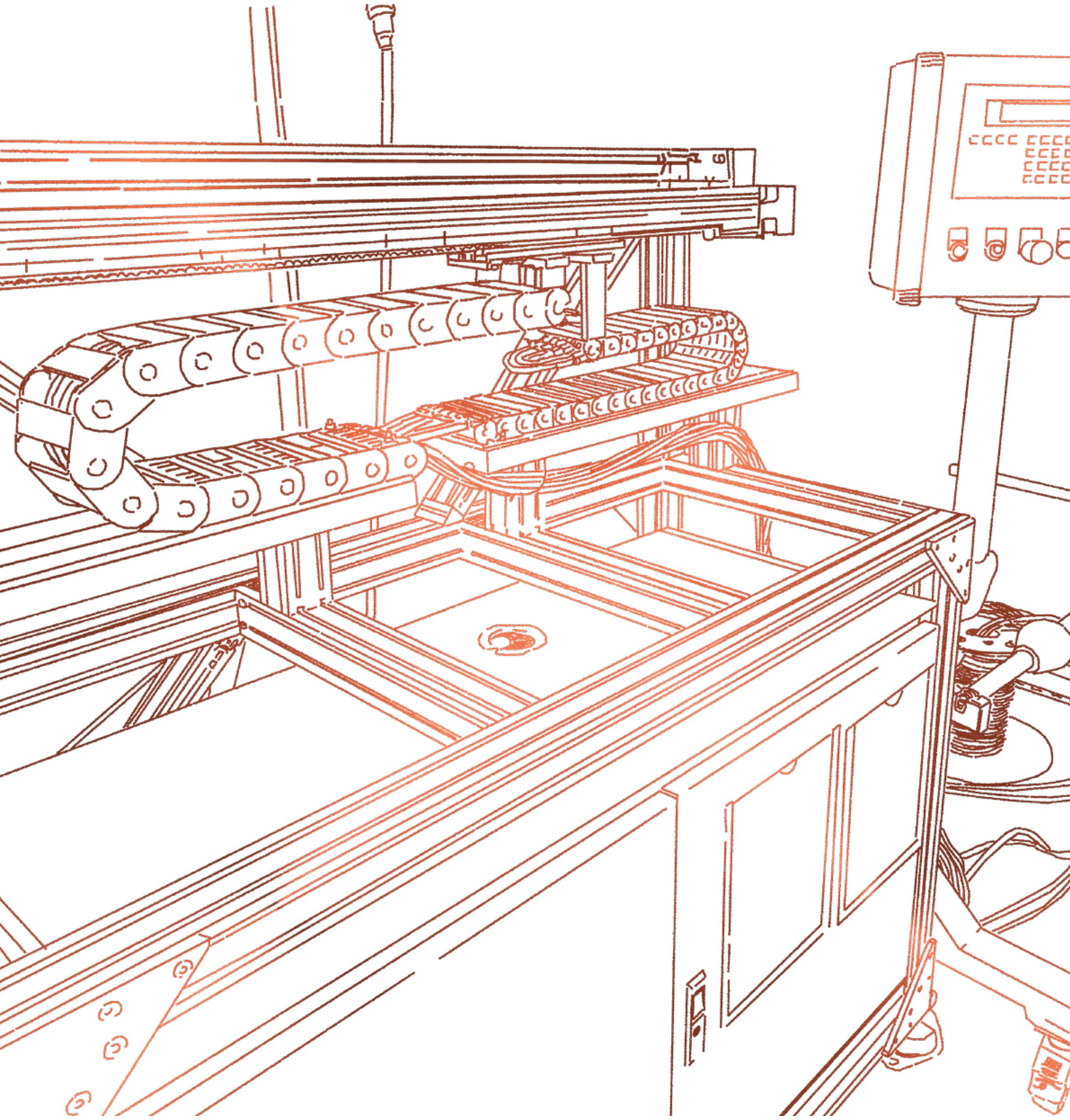


As Unique as Your Application

From technical intricacies to custom colouring, there are certain cases that are still not able to be completely covered by our comprehensive standard assortment. But this is what we specialise in. Our experienced specialists are happy to develop and manufacture the optimum connection solution for your exact requirements. We start by understanding the electrical, chemical, and mechanical demands your cable must meet in real-world conditions, then carefully define every detail including the construction of the individual cable, the selection of plugs, and the design & construction of drag chains. Only when our solution meets all of your requirements are our engineers satisfied—and we hope you will be too. This is how we master even the most complex and unique jobs together with our customers.
The results of this collaboration range from the small and inconspicuous to the enormous and spectacular. HELU specialty solutions are found, for example, in the aerial ladders of fire engines, sewer robots, tunnel drilling machines, on oil platforms, or in wind-power & biogas plants. Because when it comes to electrical connection technology, there is almost nothing we cannot do.







Proven Quality for Dynamic Applications

Drag chain cables are always in motion, subjected to constant challenges such as quick accelerations, tight bending radii, and constant abrasion around the clock. In many applications, cables must withstand millions of bending cycles without damage and, at the same time, be resistant to oil, heat, or chemicals. To ensure that our drag chain cables meet these high requirements in practice, we perform comprehensive tests in our test lab. Here, we are able to realistically simulate different drag chain radii, travel distances, accelerations, and speeds under different conditions.
As part of these tests, electrical parameters such as resistance and data transmission are measured and documented over the duration of the test.

At the end of the test, the cable is dissected, and each component is visually assessed. Only the products that are able to perform exceptionally well in this strict test environment make it into our portfolio. This is how we ensure that our HELUCHAIN drag chain cables remain economical and efficient for your machines and systems, even with long-term operation in harsh conditions.

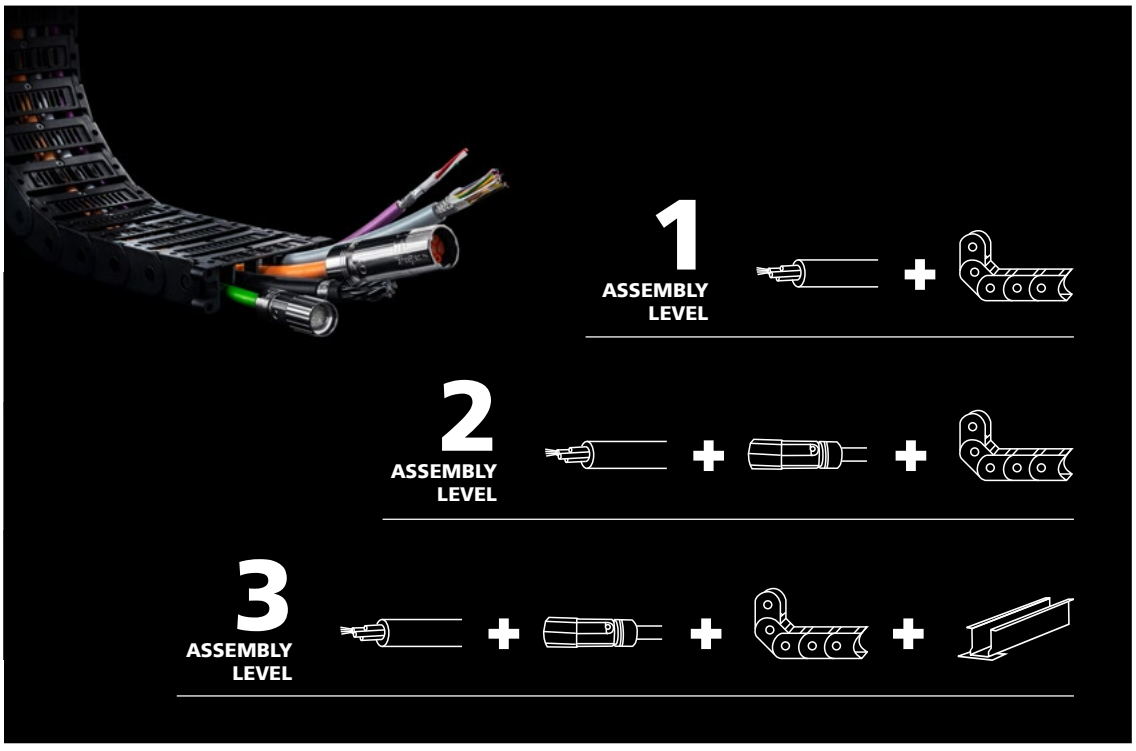
For more information on our testing procedures and the exceptional performance of our HELUCHAIN cables, visit our website!

HELUCHAIN SYSTEM

MODULAR SYSTEM FOR MORE FLEXIBILITY

The HELUCHAIN SYSTEM is HELU's modular system for drag chain applications with linear movements. It combines cables, drag chains, and standard-compliant & custom assemblies, as well as accessories into optimally coordinated, complete solutions. From the most basic combination of cable and chain, to a completely integrated and assembled drag chain system with accessories, the clearly structured, three-tier configuration (assembly levels 1-3) makes it possible for the HELUCHAIN SYSTEM to be precisely tailored to each individual application. For maximal efficiency and reliability, we supply everything from a single source—precisely manufactured, rigorously inspected, and ready for immediate installation.

Overview of our modular system with 3 different Assembly Levels

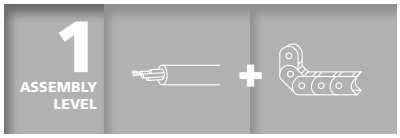


The advantages of our HELUCHAIN SYSTEM:

- Less work: One part number, one delivery, one invoice—saving you time and overhead.
- No individual parts: Complete systems instead of individual pieces keeps your ERP manageable.
- Better reliability: Coordinated components—tested, documented, & installation ready
- Readily available: Global delivery and expert advise on location.
- Flexible planning: Adjustable to your cycle times.
- Efficient purchasing: Consolidate volumes for better conditions and fewer processes.

HELUCHAIN SYSTEM – Assembly Level 1

Included components:
Unassembled drag chain cables
Drag chain

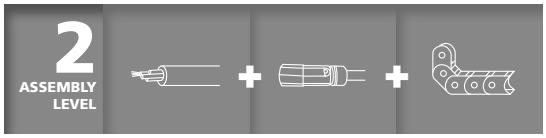


Suited for:
- Easy and quick integration into existing machine designs
- Self-assembly and in-house processing
- Reduced planning requirements for projects

Advantages:
- Standard solution with high compatibility
- Configurable connections
- No extra material or minimum quantity surcharges for cables
- A single contact person for both engineering and procurement

HELUCHAIN SYSTEM – Assembly Level 2

Included components:
Drag chain cables
Cable assemblies or hydraulic hoses
Drag chain

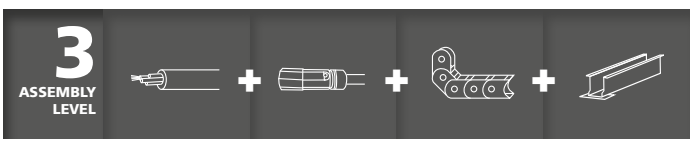


Suited for:
- Low production depth in machine manufacturing
- For use in series and specialty machines
- Short installation times with documented quality

Advantages:
- 100% tested and ready for immediate installation
- Reduced installation times
- Custom assembly solutions

HELUCHAIN SYSTEM – Assembly Level 3

Included components:
Drag chain cables
Cable assemblies or hydraulic hoses
Drag chain
Accessories (e.g., troughs, floating supports, support trestles, transport racks)

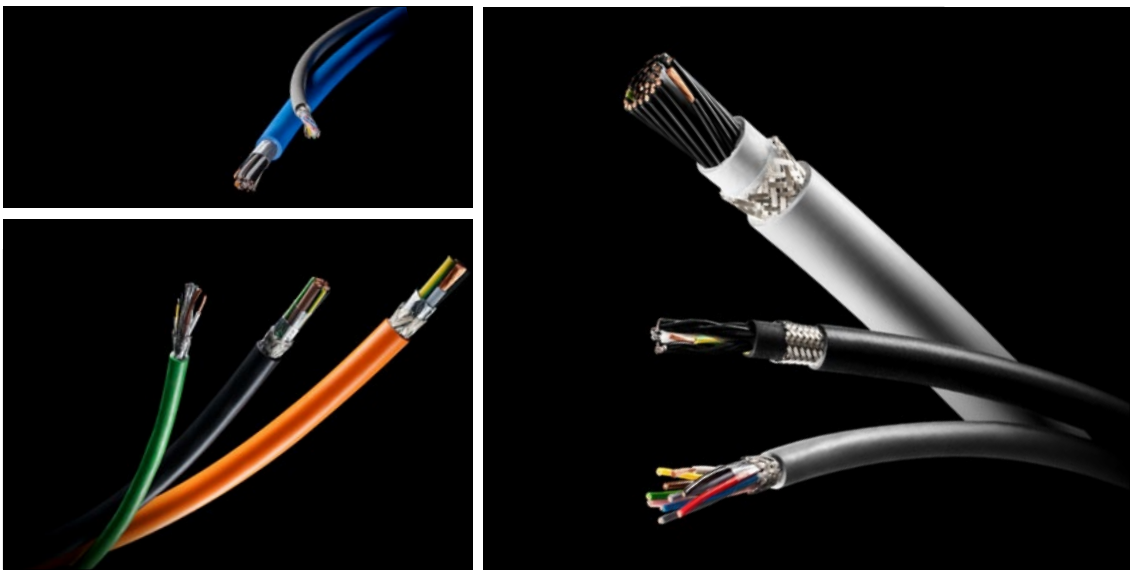


Suited for:
- Reducing the number of contact persons across the trades
- Use in the construction of series or specialty machines
- Systems with the highest efficiency and safety requirements

Advantages:
- Immediately integrable system solution
- Ideal for standardised or recurrent applications
- Save time and money with simplified installation

Our Cables for Moving Drag Chain Applications

HELUCHAIN Cables



In demanding, industrial environments, cables must simultaneously withstand extreme loads and transmit energy and data. Our drag chain cables are specially developed to tackle dynamic applications. Whether in fast-moving machine tools with tight assembly spaces, or in harbour applications with long travel distances, every application presents its own requirements for materials, construction, and functionality.

Our cables are the results of decades of experience have a proven track record of quality. They are manufactured in our own factories according to the most modern technical standards and tested in our own test centres. We offer custom solutions without compromising on performance, durability, or affordability. Whether with or without a plug, you'll find the right solution at HELU.

What sets our cables apart

- **Expansive product portfolio.** High-performance and durable solutions for various travel distances and bending radii.
- **Broad material diversity.** PVC, PUR, and TPE sheaths for the greatest cost-effectiveness in every application.
- **The highest quality.** Specifically optimised designs and compounds produced in our own factories and tested in state-of-the-art test centres.
- **Technological competence.** Decades of experience in manufacturing cables combined with a keen mind for innovation and a high manufacturing depth.
- **International certifications.** Fulfils international standards such as UL/CSA or NFPA79 for global use.
- **Global reach, local availability.** Fast delivery thanks to the most modern logistics systems and global product availability thanks to local warehouse capacities.

Our Drag Chain Cables: An Overview

PERFECT TRANSMISSION WITH EVERY MOVEMENT

Our drag chain cables from the HELUCHAIN range are designed specifically for use in demanding drag chain systems. They are able to withstand millions of bending cycles, abrasion, and other loads.

The HELUCHAIN portfolio includes sheathed, single-core cables, control & motor cables, data & hybrid cables, and fibre-optic cables. You are sure to find the most ideal solution for your connection needs.

HELUCHAIN CABLES

Data cables

Cable name	Sheath material	Bending factor x Ø	Max. travel distance (m)	Core count	Area of cross-section (mm²)	UL/ CSA	Page
SUPERTRONIC®-PVC	PVC	5	5	2–25	0.14–0.34		22
SUPERTRONIC®-C-PVC	PVC	7.5	5	2–25	0.14–0.34		23
SUPERTRONIC®-310-PVC	PVC	5	5	2–25	0.14–0.34	x	24
SUPERTRONIC®-310-C-PVC	PVC	7.5	5	2–25	0.14–0.34	x	25
HELUCHAIN® TRONIC 320-HF-TP-C-PVC UL/CSA	PVC	7.5	15	2–28	0.14–1	x	26
HELUCHAIN® SUPERTRONIC®-PURö	PUR	5	5	2–25	0.14–0.34		28
SUPERTRONIC®-C-PURö	PUR	7.5	15	2–25	0.14–0.34		30
SUPERTRONIC®-330-PURö	PUR	5	15	2–25	0.14–0.34	x	32
SUPERTRONIC®-330-C-PURö	PUR	7.5	15	2–25	0.14–0.34	x	33
SUPER-PAAR-TRONIC-340-C-PUR	PUR	10	30	2–28	0.14–1	x	35

Bus cables

Cable name	Sheath material	Bending factor x Ø	Max. travel distance (m)	Core count	Area of cross-section (mm²)	UL/ CSA	Page
HELUKAT® Ind. Ethernet CAT 7 SF/FTP PUR CHAIN	PUR	15	50	4x2x	AWG24/7	x	40
HELUKAT® Ind. Ethernet CAT 6A SF/FTP SLIM PUR CHAIN	PUR	10	50	4x2x	AWG26/7	x	41
HELUKAT® PROFINET Type C CAT 5e SF/UTP PUR CHAIN	PUR	12	50	2x2x	AWG22/7	x	42
PROFIBUS SK PUR CHAIN	PUR	12.5	50	2	0.65	x	41
CAN BUS PUR CHAIN	PUR	15	50	2	0.5	x	44
DeviceNet™ PUR CHAIN	PUR	15	50	4	AWG24 / AWG22	x	45
AS-Interface PUR	PUR	10	50	2	2.5	x	46
HELUCHAIN® HELUKAT® 600S CAT 7 S/SFTP TPE	TPE	7.5	100	4x2x	AWG26/19	x	47
HELUCHAIN® HELUKAT® 500S CAT 6A S/SFTP TPE	TPE	7.5	100	4x2x	AWG26/19	x	48
HELUCHAIN® HELUKAT® 250S CAT 6 S/SFTP TPE	TPE	7.5	100	4x2x	AWG25/19	x	49
HELUCHAIN® HELUKAT® 100S CAT 5e 4P SF/UTP TPE	TPE	7.5	100	4x2x	AWG25/19	x	50
HELUCHAIN® HELUKAT® 100S CAT 5e 4C SF/UTP TPE	TPE	7.5	100	2x2x	AWG24/19	x	51
HELUCHAIN® HELUKAT® PROFINET C CAT 5e SF/UTP TPE	TPE	7.5	100	2x2x	AWG22/19	x	52
HELUCHAIN® PROFIBUS TPE	TPE	7.5	100	1x2x	AWG24/19	x	53
HELUCHAIN® CAN-BUS 2-PAIR/QUAD TPE	TPE	7.5	100	2x2x	AWG24/19	x	54
HELUCHAIN® CAN-BUS 1-PAIR TPE	TPE	7.5	100	1x2x	AWG20/19	x	55

Control Cables

Cable name	Sheath material	Bending factor x Ø	Max. travel distance in m	Core count	Area of cross-section in mm²	UL/ CSA	Page
JZ-HF / OZ-HF	PVC	7.5	10	2–65	0.5–16		58
JZ-HF-CY / OZ-HF-CY	PVC	10	10	2–65	0.5–16		60
HELUCHAIN® JZ(OZ)-602-HF PVC UL/CSA	PVC	7.5	10	3–34	0.5–35	x	62
HELUCHAIN® JZ-602-HF-C PVC UL/CSA	PVC	10	10	3–34	0.5–35	x	64
HELUCHAIN® MULTISPEED® 520-PVC UL/CSA	PVC	6.8	100	2–42	0.5–6	x	66
HELUCHAIN® MULTISPEED® 520-C-PVC UL/CSA	PVC	6.8	100	2–42	0.5–6	x	68
PURö-JZ-HF / PURö-J-HF / PURö-OZ-HF	PUR	7.5	15	2–65	0.5–95		70
PURö-JZ-HF-YCP / PURö-OZ-HF-YCP	PUR	10	15	2–65	0.5–16		72
HELUCHAIN® MULTIFLEX 512®-PUR UL/CSA	PUR	5	100	2–65	0.5–16	x	74
HELUCHAIN® MULTIFLEX 512®-C-PUR UL/CSA	PUR	7.5	100	2–65	0.5–16	x	76
HELUCHAIN® MULTISPEED® 521-PUR UL/CSA	PUR	6.8	450	2–42	0.5–6	x	78
HELUCHAIN® MULTISPEED® 521-C-PUR UL/CSA	PUR	6.8	450	2–42	0.5–6	x	80
HELUCHAIN® MULTISPEED® 522-TPE UL/CSA	TPE	5	450	2–42	0.5–6	x	82
HELUCHAIN® MULTISPEED® 522-C-TPE UL/CSA	TPE	5	450	2–42	0.5–6	x	84

Motor Cables

Cable name	Sheath material	Bending factor x Ø	Max. travel distance (m)	Core count	Area of cross-section (mm²)	UL/ CSA	Page
HELUCHAIN® MULTISPEED® PWR 520-PVC UL/CSA	PVC	7.5	100	4–5	10–35	x	88
HELUCHAIN® MULTISPEED® PWR 520-C-PVC UL/CSA	PVC	7.5	100	4–5	10–35	x	89
TOPFLEX® 611-PUR	PUR	7.5	30	4	1.5–120		90
TOPFLEX® 611-C-PUR	PUR	10	30	4	1.5–120		91
HELUCHAIN® MULTISPEED® PWR 521-PUR UL/CSA	PUR	7.5	450	4–5	10–35	x	92
HELUCHAIN® MULTISPEED® PWR 521-C-PUR UL/CSA	PUR	7.5	450	4–5	10–35	x	93
HELUCHAIN® MULTISPEED® PWR 522-TPE UL/CSA	TPE	7.5	450	4–5	10–35	x	94
HELUCHAIN® MULTISPEED® PWR 522-C-TPE UL/CSA	TPE	7.5	450	4–5	10–35	x	95

Sheathed Single-Core Cables

Cable name	Sheath material	Bending factor x Ø	Max. travel distance (m)	Core count	Area of cross-section (mm²)	UL/ CSA	Page
HELUCHAIN® SINGLE 602-HF-J(O)PVC UL/CSA	PVC	7.5	5	1	10–300	x	98
HELUCHAIN® SINGLE 602-HF-CY-J(O)PVC UL/CSA	PVC	7.5	5	1	10–300	x	99
TOPFLEX® 304	PVC	7.5	5	1	10–300	x	100
MULTISPEED® 600-PUR-J / MULTISPEED® 600-PUR-O	PUR	5	450	1	6–300	x	101
MULTISPEED® 600-C-PUR-J / MULTISPEED® 600-C-PUR-O	PUR	5	450	1	6–300	x	102
MULTISPEED® 600-TPE-J / MULTISPEED® 600-TPE-O	TPE	5	450	1	6–185	x	104
MULTISPEED® 600-C-TPE-J / MULTISPEED® 600-C-TPE-O	TPE	5	450	1	6–185	x	105

Servo and Hybrid Cables

Cable name	Sheath material	Bending factor x Ø	Max. travel distance (m)	Core count	Area of cross-section (mm²)	UL/ CSA	Page
HELUCHAIN® TOPSERV® 201-PVC UL/CSA	PVC	7.5	100	6	1.5–6.0	x	108
TOPSERV® 109 PUR	PUR	7.5	30	4	1.5–95	x	109
TOPSERV® 113 PUR	PUR	7.5	30	6	1.5–50	x	110
TOPSERV® 121 PUR	PUR	7.5	30	8	1–50	x	112
HELUCHAIN® TOPSERV® 211-PUR UL/CSA	PUR	7.5	100	6	1.5–6.0	x	114
TOPSERV® Hybrid PVC/PUR	PVC/PUR	7.5	30	8	0.5–16	x	115

Feedback Cables

Cable name	Sheath material	Bending factor x Ø	Max. travel distance (m)	Core count	Area of cross-section (mm²)	UL/ CSA	Page
TOPGEBER® 512 PUR	PUR	10	30	18	0.14–1	x	118

Fibre-Optic Cables

Cable name	Sheath material	Bending factor x Ø	Max. travel distance (m)	Core count	Area of cross-section (mm²)	UL/ CSA	Page
HELUCOM® A-V(ZN)11Y	PUR	15	10	2–8	9 / 50 / 62.5		122
HELUCOM® I-V2Y(ZN)11Y	PUR	12.5	10	2	980		123

More information is available in our data sheet overview at **helu.com/heluchain-cables**

Data cables are multi-core cables that are used to transmit digital and analogue information. Depending on the requirements, there are screened and unscreened versions. The cores are stranded differently depending on the applications specific requirements. Often, a twisted pair strand is used that prevents crosstalk with neighbouring cores. The cores are typically colour coded according to relevant standards to improve users ability to differentiate them.

Data cables

SUPERTRONIC®-PVC

colour code DIN 47100

TECHNICAL DATA

PVC drag chain cable in alignment with DIN VDE 0285-525-1 / DIN EN 50525-1

Temperature range	flexible -5°C to +70°C fixed -40°C to +70°C
Nominal voltage	AC U 350 V
Test voltage core/core	1500 V
Breakdown voltage	3000 V
Minimum bending radius	flexible 5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded
- Wire structure:
  0.14 mm²: approx. 18 x 0.1 mm
  0.25 mm²: approx. 32 x 0.1 mm
  0.34 mm²: approx. 42 x 0.1 mm
- Core insulation: PVC acc. to DIN VDE 0207-363-3 / DIN EN 50363-3 (compound type TI2)
- Core identification acc. to DIN 47100, colour coded
- x = without protective conductor
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping
- Outer sheath: Special-PVC in alignment with DIN VDE 0207-363-4-1 / DIN EN 50363-4-1 (compound type TM2)
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- largely resistant to: oil,
  for details, see "Technical Information"
- low adhesion
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2
- certifications and approvals:
  EAC

APPLICATION

Proven in drag chain applications; suitable for frequent and fast lifting and bending stresses in machine and tool construction, in robotics and on permanently moving machine parts. Reliable operation ensures a long service life and high efficiency.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49550	2 x 0.14	26	3.5	2.8	23.0
49551	3 x 0.14	26	3.7	4.1	25.0
49552	4 x 0.14	26	3.9	5.6	30.0
49553	5 x 0.14	26	4.2	7.0	35.0
49554	7 x 0.14	26	4.8	9.8	49.0
49555	10 x 0.14	26	6.2	14.0	64.0
49556	12 x 0.14	26	6.3	16.8	71.0
49557	14 x 0.14	26	6.6	19.6	77.0
49558	18 x 0.14	26	7.2	25.2	90.0
49559	24 x 0.14	26	8.5	33.6	119.0
49560	25 x 0.14	26	8.6	35.0	124.0
49561	2 x 0.25	24	4.2	5.0	28.0
49562	3 x 0.25	24	4.4	7.5	33.0
49563	4 x 0.25	24	4.7	10.0	39.0
49564	5 x 0.25	24	5.6	12.5	50.0
49565	7 x 0.25	24	6.1	17.5	63.0
49566	10 x 0.25	24	7.2	25.0	83.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49567	12 x 0.25	24	7.5	30.1	95.0
49568	14 x 0.25	24	7.9	35.0	107.0
49569	18 x 0.25	24	8.9	45.0	130.0
49570	24 x 0.25	24	10.4	60.0	170.0
49571	25 x 0.25	24	10.5	62.5	177.0
49572	2 x 0.34	22	4.6	6.8	33.0
49573	3 x 0.34	22	4.8	10.2	42.0
49574	4 x 0.34	22	5.2	13.6	56.0
49575	5 x 0.34	22	6.1	17.0	64.0
49576	7 x 0.34	22	7.0	23.8	84.0
49577	10 x 0.34	22	8.4	34.0	116.0
49578	12 x 0.34	22	8.5	40.8	133.0
49579	14 x 0.34	22	9.0	47.6	150.0
49580	18 x 0.34	22	10.1	61.2	182.0
49581	24 x 0.34	22	12.0	81.5	240.0
49582	25 x 0.34	22	12.2	85.0	250.0

SUPERTRONIC®-C-PVC

colour code DIN 47100, EMC-preferred type

TECHNICAL DATA

PVC drag chain cable in alignment with DIN VDE 0285-525-1 / DIN EN 50525-1

Temperature range	flexible -5°C to +70°C fixed -40°C to +70°C
Nominal voltage	AC U 350 V
Test voltage core/core	1500 V
Breakdown voltage	3000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 7.5x Outer-Ø fixed 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded
- Wire structure:
  0.14 mm²: approx. 18 x 0.10 mm
  0.25 mm²: approx. 32 x 0.10 mm
  0.34 mm²: approx. 42 x 0.10 mm
- Core insulation: PVC acc. to DIN VDE 0207-363-3 / DIN EN 50363-3 (compound type TI2)
- Core identification acc. to DIN 47100, colour coded
- x = without protective conductor
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping
- Screen: braided screen of tinned copper, approx. coverage 85%
- Outer sheath: Special-PVC acc. to DIN VDE 0207-363-4-1 / DIN EN 50363-4-1 (compound type TM2)
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- largely resistant to: oil,
  for details, see "Technical Information"
- low adhesion
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2

APPLICATION

These cables are ideal for the use in drag chain applications; for frequent lifting and bending stress in machine and tool construction, in robotics and on permanently moving machine parts. A long service life also guarantees reliable function and high efficiency. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49620	2 x 0.14	26	3.9	11.2	33.0
49621	3 x 0.14	26	4.3	14.1	36.0
49622	4 x 0.14	26	4.6	15.5	41.0
49623	5 x 0.14	26	4.9	18.3	46.0
49624	7 x 0.14	26	5.7	27.6	70.0
49625	10 x 0.14	26	6.6	39.3	88.0
49626	12 x 0.14	26	6.6	41.1	97.0
49627	14 x 0.14	26	7.1	45.3	105.0
49628	18 x 0.14	26	7.7	54.1	122.0
49629	24 x 0.14	26	8.9	66.3	156.0
49630	25 x 0.14	26	9.5	68.4	162.0
49631	2 x 0.25	24	4.6	14.9	39.0
49632	3 x 0.25	24	4.8	18.8	45.0
49633	4 x 0.25	24	5.2	21.3	52.0
49634	5 x 0.25	24	5.8	31.0	70.0
49635	7 x 0.25	24	6.6	39.6	88.0
49636	10 x 0.25	24	7.8	53.9	114.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49637	12 x 0.25	24	7.8	59.1	128.0
49638	14 x 0.25	24	8.4	64.2	140.0
49639	18 x 0.25	24	9.2	78.4	166.0
49640	24 x 0.25	24	10.8	89.9	210.0
49641	25 x 0.25	24	11.2	101.0	220.0
49642	2 x 0.34	22	5.0	16.1	46.0
49643	3 x 0.34	22	5.3	28.7	62.0
49644	4 x 0.34	22	5.9	35.7	80.0
49645	5 x 0.34	22	6.3	39.1	88.0
49646	7 x 0.34	22	7.5	52.7	116.0
49647	10 x 0.34	22	8.9	67.4	156.0
49648	12 x 0.34	22	8.9	76.4	167.0
49649	14 x 0.34	22	9.5	85.3	195.0
49650	18 x 0.34	22	10.4	99.7	225.0
49651	24 x 0.34	22	12.2	147.1	312.0
49652	25 x 0.34	22	12.7	155.0	325.0

SUPERTRONIC®-310-PVC

TECHNICAL DATA

PVC drag chain cable acc. to UL-Std. 758 (AWM) Style 2464, CSA-Std. C22.2 No. 210 - AWM I/II A/B

Temperature range	flexible -5°C to +80°C fixed -40°C to +80°C
Nominal voltage	UL (AWM) AC 300 V
Test voltage core/core	1500 V
Breakdown voltage	3000 V
Minimum bending radius	flexible 5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, finely stranded, unilay with short lay lengths
- Core insulation: Special-PVC acc. to UL-Std. 1581 Tab. 50.183 (semirigid)
- Core identification acc. to DIN 47100, colour coded
- x = without protective conductor
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping
- Outer sheath: oil-resistant special PVC acc. to DIN VDE 0207-363-4-1 / DIN EN 50363-4-1 (compound type TM5), UL-Std. 1581
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil
- low adhesion
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- certifications and approvals:
  EAC

APPLICATION

Used as a highly flexible PVC drag chain cable suitable for frequent and fast lifting and bending stress in machine and tool construction, robotics, and in permanently moving machine parts. A long service life guarantees reliable function and high efficiency. Designed for the export-oriented machine construction industry, specifically for the USA and Canada.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49885	2 x 0.14	26	3.8	2.8	24.0
49886	3 x 0.14	26	4.0	4.1	26.0
49887	4 x 0.14	26	4.3	5.6	31.0
49888	5 x 0.14	26	4.6	7.0	36.0
49889	7 x 0.14	26	5.3	9.8	50.0
49890	10 x 0.14	26	6.2	14.0	65.0
49891	12 x 0.14	26	6.2	16.8	72.0
49892	14 x 0.14	26	6.5	19.6	78.0
49893	18 x 0.14	26	7.1	25.2	91.0
49894	24 x 0.14	26	8.1	33.6	120.0
49895	25 x 0.14	26	8.5	35.0	125.0
49896	2 x 0.25	24	4.1	5.0	29.0
49897	3 x 0.25	24	4.3	7.5	34.0
49898	4 x 0.25	24	4.6	10.0	40.0
49899	5 x 0.25	24	5.0	12.5	51.0
49900	7 x 0.25	24	5.8	17.5	65.0
49901	10 x 0.25	24	6.8	25.0	85.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49902	12 x 0.25	24	6.8	30.1	97.0
49903	14 x 0.25	24	7.1	35.0	109.0
49904	18 x 0.25	24	7.9	45.0	132.0
49905	24 x 0.25	24	9.3	60.0	171.0
49906	25 x 0.25	24	9.7	62.5	178.0
49907	2 x 0.34	22	4.3	6.8	34.0
49908	3 x 0.34	22	4.5	10.2	43.0
49909	4 x 0.34	22	4.9	13.6	58.0
49910	5 x 0.34	22	5.3	17.0	65.0
49911	7 x 0.34	22	6.1	23.8	85.0
49912	10 x 0.34	22	7.2	34.0	117.0
49913	12 x 0.34	22	7.2	40.8	134.0
49914	14 x 0.34	22	7.6	47.6	152.0
49915	18 x 0.34	22	8.4	61.2	184.0
49916	24 x 0.34	22	9.9	81.5	242.0
49917	25 x 0.34	22	10.3	85.0	252.0

SUPERTRONIC®- 310-C-PVC

EMC-preferred type

TECHNICAL DATA

PVC drag chain cable acc. to UL-Std. 758 (AWM) Style 2464, CSA-Std. C22.2 No. 210 - AWM I/II A/B

Temperature range	flexible -5°C to +80°C fixed -40°C to +80°C
Nominal voltage	UL (AWM) AC 300 V
Test voltage core/core	1500 V
Test voltage core/screen	1000 V
Breakdown voltage	3000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 7.5x Outer-Ø fixed 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, finely stranded, unilay with short lay lengths
- Core insulation: Special-PVC acc. to UL-Std. 1581 Tab. 50.183 (semirigid)
- Core identification acc. to DIN 47100, colour coded
- x = without protective conductor
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping over each stranding layer
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Fleece wrapping
- Outer sheath: oil-resistant special PVC acc. to DIN VDE 0207-363-4-1 / DIN EN 50363-4-1 (compound type TM5), UL-Std. 1581
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil
- low adhesion
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

Used as a highly flexible PVC drag chain cable suitable for frequent and fast lifting and bending stress in machine and tool construction, robotics, and in permanently moving machine parts. A long service life guarantees reliable function and high efficiency. The copper screening effectively protects against internal and external interference. Designed for the export-oriented machine construction industry, specifically for the USA and Canada. EMC = Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49920	2 x 0.14	26	4.4	11.3	33.0
49921	3 x 0.14	26	4.6	14.2	36.0
49922	4 x 0.14	26	4.9	15.5	41.0
49923	5 x 0.14	26	5.2	18.4	46.0
49924	7 x 0.14	26	5.8	27.9	70.0
49925	10 x 0.14	26	6.8	39.1	88.0
49926	12 x 0.14	26	6.8	42.2	97.0
49927	14 x 0.14	26	7.1	45.4	105.0
49928	18 x 0.14	26	7.7	54.2	116.0
49929	24 x 0.14	26	8.7	66.5	150.0
49930	25 x 0.14	26	9.1	68.5	157.0
49931	2 x 0.25	24	4.7	14.8	39.0
49932	3 x 0.25	24	4.9	18.9	45.0
49933	4 x 0.25	24	5.2	21.4	52.0
49934	5 x 0.25	24	5.6	31.2	70.0
49935	7 x 0.25	24	6.3	39.8	80.0
49936	10 x 0.25	24	7.4	53.9	114.0
49937	12 x 0.25	24	7.4	59.2	123.0
49938	14 x 0.25	24	7.7	64.3	138.0
49939	18 x 0.25	24	8.5	78.6	165.0
49940	24 x 0.25	24	9.8	89.8	200.0
49941	25 x 0.25	24	10.2	101.2	204.0
49942	2 x 0.34	22	4.9	18.2	44.0
49943	3 x 0.34	22	5.1	28.8	60.0
49944	4 x 0.34	22	5.5	35.8	76.0
49945	5 x 0.34	22	5.9	39.2	80.0
49946	7 x 0.34	22	6.7	52.8	104.0
49947	10 x 0.34	22	7.8	67.5	150.0
49948	12 x 0.34	22	7.8	76.5	160.0
49949	14 x 0.34	22	8.2	85.9	180.0
49950	18 x 0.34	22	9.0	99.9	211.0
49951	24 x 0.34	22	10.4	147.0	290.0
49952	25 x 0.34	22	11.0	155.0	304.0

HELUCHAIN® TRONIC 320-HF-TP-C-PVC UL/CSA

oil resistant, colour code DIN 47100, EMC-preferred type

TECHNICAL DATA

PVC drag chain cable acc. to UL-Std. 758 (AWM) Style 2464, CSA-Std. C22.2 No. 210 - AWM I/II A/B

Temperature range	flexible -5°C to +80°C fixed -40°C to +80°C
Nominal voltage	UL (AWM) AC 300 V
Test voltage core/core	1500 V
Test voltage core/screen	1000 V
Mutual capacitance core/core	at 800 Hz, approx. 60 pF/m
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 0.14 - 0.25 mm²: 7.5 x Outer-Ø 0.34 - 1 mm²: 10 x Outer-Ø fixed 0.14 - 0.25 mm²: 4 x Outer-Ø 0.34 - 1 mm²: 5 x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded, 0.5 - 1 mm²: acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Wire structure:
  0.14 mm²: approx. 18 x 0.1 mm
  0.25 mm²: approx. 32 x 0.1 mm
  0.34 mm²: approx. 42 x 0.1 mm
- Core insulation: PP
- Core identification acc. to DIN 47100 (paired stranding), colour coded
- x = without protective conductor
- Cores stranded in pairs with optimally matched lay lengths, Pairs stranded in layers with optimally matched lay lengths
- Fleece wrapping
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Fleece wrapping
- Outer sheath: PVC acc. to DIN VDE 0207-363-4-1 / DIN EN 50363-4-1 (compound type TM5), UL-Std. 1581 Tab. 50.182
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, weathering effects
- for outdoor use
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2

APPLICATION

Highly flexible PVC drag chain cable, suitable for frequent and fast lifting and bending stresses; for applications in machine and tool construction, robotics and permanently moving machine parts. Reliable function ensures long service life and economic efficiency. The copper shield effectively protects against interferences inwards and outwards. EMC = Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- 2-pair cables: cores stranded to a star quad
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11020964	1 x 2 x 0.14	26	4.3	13.0	25.0
11020965	2 x 2 x 0.14	26	4.7	19.0	40.0
11020966	3 x 2 x 0.14	26	5.8	23.0	50.0
11020967	4 x 2 x 0.14	26	6.2	27.0	60.0
11020968	5 x 2 x 0.14	26	6.7	38.0	70.0
11020969	6 x 2 x 0.14	26	7.2	49.0	90.0
11020970	8 x 2 x 0.14	26	8.4	55.0	115.0
11020971	10 x 2 x 0.14	26	9.1	60.0	125.0
11020972	14 x 2 x 0.14	26	9.8	70.0	150.0
11020973	1 x 2 x 0.25	24	4.9	14.0	28.0
11020974	2 x 2 x 0.25	24	5.5	33.0	60.0
11020975	3 x 2 x 0.25	24	6.9	39.0	73.0
11020976	4 x 2 x 0.25	24	7.5	43.0	90.0
11020977	5 x 2 x 0.25	24	8.1	52.0	105.0
11020978	6 x 2 x 0.25	24	8.8	72.0	135.0
11020979	8 x 2 x 0.25	24	10.4	75.0	160.0
11020980	10 x 2 x 0.25	24	11.3	90.0	190.0
11020981	14 x 2 x 0.25	24	12.4	111.0	225.0
11020982	1 x 2 x 0.34	22	5.1	20.0	58.0
11020983	2 x 2 x 0.34	22	5.7	41.0	65.0
11020984	3 x 2 x 0.34	22	7.3	52.0	78.0
11020985	4 x 2 x 0.34	22	7.9	59.0	90.0
11020986	5 x 2 x 0.34	22	8.6	67.0	110.0
11020987	6 x 2 x 0.34	22	9.5	86.4	125.0

HELUCHAIN® TRONIC 320-HF-TP-C-PVC UL/CSA

oil resistant, colour code DIN 47100, EMC-preferred type

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11020988	8 x 2 x 0.34	22	11.2	108.0	140.0
11020989	10 x 2 x 0.34	22	12.1	131.0	150.0
11020990	14 x 2 x 0.34	22	13.5	150.0	200.0
11020991	1 x 2 x 0.5	20	5.7	23.0	47.0
11020992	2 x 2 x 0.5	20	6.5	53.0	100.0
11020993	3 x 2 x 0.5	20	8.4	73.0	130.0
11020994	4 x 2 x 0.5	20	9.3	76.0	150.0
11020995	5 x 2 x 0.5	20	10.1	86.0	169.0
11020996	6 x 2 x 0.5	20	11.2	103.0	196.0
11020997	8 x 2 x 0.5	20	13.6	184.0	290.0
11020998	10 x 2 x 0.5	20	14.7	180.0	350.0
11020999	14 x 2 x 0.5	20	16.3	218.0	390.0
11021000	1 x 2 x 0.75	19	6.4	35.0	65.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11021001	2 x 2 x 0.75	19	7.3	61.0	115.0
11021002	3 x 2 x 0.75	19	9.8	87.0	160.0
11021003	4 x 2 x 0.75	19	10.9	92.0	175.0
11021004	5 x 2 x 0.75	19	12.1	115.0	210.0
11021005	6 x 2 x 0.75	19	13.5	137.0	235.0
11021006	8 x 2 x 0.75	19	16.1	184.0	345.0
11021007	10 x 2 x 0.75	19	17.4	260.0	475.0
11021008	14 x 2 x 0.75	19	19.2	314.0	545.0
11021009	1 x 2 x 1	18	6.9	42.0	71.0
11021010	2 x 2 x 1	18	8.1	73.0	130.0
11021011	3 x 2 x 1	18	10.9	94.0	170.0
11021012	4 x 2 x 1	18	12.1	118.0	210.0
11021013	5 x 2 x 1	18	13.6	139.0	250.0

HELUCHAIN® SUPERTRONIC®-PURö

colour code DIN 47100

TECHNICAL DATA

PUR drag chain cable in alignment with DIN VDE 0285-525-1 / DIN EN 50525-1

Temperature range	flexible -30°C to +90°C fixed -40°C to +90°C
Nominal voltage	0.14 mm² : AC U 350 V 0.25 - 0.34 mm² : AC U 500 V
Test voltage core/core	1500 V
Mutual capacitance core/core	at 800 Hz, approx. 80 pF/m
Minimum bending radius	flexible 5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded
- Strand construction:
  0.14 mm²: approx. 18 x 0.1 mm
  0.25 mm²: approx. 32 x 0.1 mm
  0.34 mm²: approx. 42 x 0.1 mm
- Core insulation: PP
- Core identification acc. to DIN 47100, colour coded
- x = without protective conductor
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping
- Outer sheath: Special grade of full polyurethane acc. to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TMPU)
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater
- highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- for outdoor use
- suitable for use in drag chains
- halogen-free
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- halogen-free acc. to DIN VDE 0482-754-1 / DIN EN 60754-1 / IEC 60754-1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2
- certifications and approvals:
  EAC

APPLICATION

Used for installation in dry, damp and wet rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, these cables have proven their reliable performance in drag chain applications, for frequent lifting and bending stress in machine and tool construction, in robotics and on permanently moving machine parts. A long service life and high economic efficiency are also guaranteed.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
49583	2 x 0.14	26	3.6	2.8	22.0
49584	3 x 0.14	26	3.8	4.1	24.0
49585	4 x 0.14	26	4.1	5.6	29.0
49586	5 x 0.14	26	4.5	7.0	33.0
49587	7 x 0.14	26	5.4	9.8	47.0
49588	10 x 0.14	26	6.6	14.0	59.0
49589	12 x 0.14	26	6.6	16.8	67.0
49590	14 x 0.14	26	6.9	19.6	74.0
49591	18 x 0.14	26	7.6	25.2	86.0
49592	24 x 0.14	26	9.0	33.6	115.0
49593	25 x 0.14	26	9.3	35.0	120.0
49594	2 x 0.25	24	3.9	5.0	27.0
49595	3 x 0.25	24	4.1	7.5	33.0
49596	4 x 0.25	24	4.7	10.0	40.0
49597	5 x 0.25	24	5.1	12.5	48.0
49598	7 x 0.25	24	6.1	17.5	60.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
49599	10 x 0.25	24	7.4	25.0	79.0
49600	12 x 0.25	24	7.4	30.1	91.0
49601	14 x 0.25	24	7.8	35.0	102.0
49602	18 x 0.25	24	8.8	45.0	125.0
49603	24 x 0.25	24	10.1	60.0	163.0
49604	25 x 0.25	24	10.7	62.5	170.0
49605	2 x 0.34	22	4.1	6.8	32.0
49606	3 x 0.34	22	4.3	10.2	40.0
49607	4 x 0.34	22	4.9	13.6	55.0
49608	5 x 0.34	22	5.3	17.0	60.0
49609	7 x 0.34	22	6.4	23.8	80.0
49610	10 x 0.34	22	7.8	34.0	112.0
49611	12 x 0.34	22	7.8	40.8	127.0
49612	14 x 0.34	22	8.4	47.6	142.0
49613	18 x 0.34	22	9.3	61.2	175.0
49614	24 x 0.34	22	10.9	81.5	229.0

HELUCHAIN® SUPERTRONIC®-PURö

colour code DIN 47100

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
49615	25 x 0.34	22	11.5	85.0	238.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.

SUPERTRONIC®-C-PURö

colour code DIN 47100, EMC-preferred type

TECHNICAL DATA

PUR drag chain cable in alignment with DIN VDE 0285-525-1 / DIN EN 50525-1

Temperature range	flexible -30°C to +90°C fixed -40°C to +90°C
Nominal voltage	0.14 mm²: AC U 350 V 0.25 - 0.34 mm²: AC U 500 V
Test voltage core/core	1500 V
Test voltage core/screen	1000 V
Mutual capacitance core/core	at 800 Hz, approx. 80 pF/m
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 7.5x Outer-Ø fixed 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded
- Wire structure:
  0.14 mm²: approx. 18 x 0.1 mm
  0.25 mm²: approx. 32 x 0.1 mm
  0.34 mm²: approx. 42 x 0.1 mm
- Core insulation: PP
- Core identification acc. to DIN 47100, colour coded
- x = without protective conductor
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Fleece wrapping
- Outer sheath: Special grade of full polyurethane acc. to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TMPU)
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater
- highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- for outdoor use
- suitable for use in drag chains
- halogen-free
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- halogen-free acc. to DIN VDE 0482-754-1 / DIN EN 60754-1 / IEC 60754-1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2
- certifications and approvals:
  EAC

APPLICATION

Used for installation in dry, damp and wet rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, these cables have proven their reliable performance in drag chain applications, for frequent lifting and bending stress in machine and tool construction, in robotics and on permanently moving machine parts. A long service life and high economic efficiency are also guaranteed. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49653	2 x 0.14	26	4.2	11.2	32.0
49654	3 x 0.14	26	4.4	14.1	35.0
49655	4 x 0.14	26	4.7	15.5	40.0
49656	5 x 0.14	26	5.3	18.3	45.0
49657	7 x 0.14	26	6.0	27.8	66.0
49658	10 x 0.14	26	7.2	39.3	86.0
49659	12 x 0.14	26	7.2	42.1	94.0
49660	14 x 0.14	26	7.5	45.3	102.0
49661	18 x 0.14	26	8.4	54.1	118.0
49662	24 x 0.14	26	9.7	66.3	149.0
49663	25 x 0.14	26	10.1	68.4	156.0
49664	2 x 0.25	24	4.5	14.9	38.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49665	3 x 0.25	24	4.9	18.8	44.0
49666	4 x 0.25	24	5.3	21.3	51.0
49667	5 x 0.25	24	5.7	31.0	68.0
49668	7 x 0.25	24	6.7	39.6	82.0
49669	10 x 0.25	24	8.0	53.9	110.0
49670	12 x 0.25	24	8.0	59.1	124.0
49671	14 x 0.25	24	8.4	64.2	135.0
49672	18 x 0.25	24	9.4	78.4	160.0
49673	24 x 0.25	24	10.8	89.9	202.0
49674	25 x 0.25	24	11.2	101.0	211.0
49675	2 x 0.34	22	4.9	18.1	45.0
49676	3 x 0.34	22	5.2	28.7	60.0

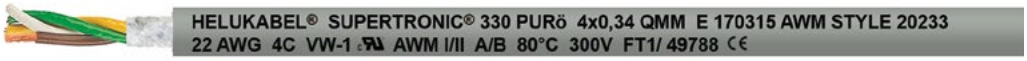
SUPERTRONIC®-C-PURö

colour code DIN 47100, EMC-preferred type

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49677	4 x 0.34	22	5.5	35.7	76.0
49678	5 x 0.34	22	6.1	39.1	82.0
49679	7 x 0.34	22	7.0	52.7	110.0
49680	10 x 0.34	22	8.5	67.4	148.0
49681	12 x 0.34	22	8.5	76.4	166.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49682	14 x 0.34	22	8.8	85.5	185.0
49683	18 x 0.34	22	9.9	99.7	216.0
49684	24 x 0.34	22	11.4	147.1	300.0
49685	25 x 0.34	22	11.9	155.0	313.0

SUPERTRONIC®-330-PURö



TECHNICAL DATA

PUR drag chain cable acc. to UL-Std. 758 (AWM) Style 20233, CSA-Std. C22.2 No. 210 - AWM I/II A/B

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
Nominal voltage	UL (AWM) AC 300 V
Test voltage core/core	1500 V
Mutual capacitance core/core	at 800 Hz, approx. 60 pF/m
Minimum bending radius	flexible 5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded
- Wire structure:
  0.14 mm²: approx. 18 x 0.1 mm
  0.25 mm²: approx. 32 x 0.1 mm
  0.34 mm²: approx. 42 x 0.1 mm
- Core insulation: PP
- Core identification acc. to DIN 47100, colour coded
- x = without protective conductor
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping
- Outer sheath: Special grade of full polyurethane acc. to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TMPU), UL-Std. 1581
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater
- highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- for outdoor use
- suitable for use in drag chains
- halogen-free
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2

APPLICATION

For installation in dry, damp and wet rooms, as well as outdoors with free movement, without tensile stress and without forced motion control. Suitable for frequent and fast lifting and bending stress in machine and tool construction, robotics, and in permanently moving machine parts. A long service life ensures reliable operation and high economic efficiency. It is also well-suited for for use in the export-oriented mechanical engineering industry.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49764	2 x 0.14	26	3.9	2.8	22.0
49765	3 x 0.14	26	4.0	4.1	24.0
49766	4 x 0.14	26	4.3	5.6	29.0
49767	5 x 0.14	26	4.7	7.0	33.0
49768	7 x 0.14	26	5.3	9.8	47.0
49769	10 x 0.14	26	6.1	14.0	57.0
49770	12 x 0.14	26	6.2	16.8	63.0
49771	14 x 0.14	26	6.5	19.6	72.0
49772	18 x 0.14	26	7.2	25.2	80.0
49773	24 x 0.14	26	8.2	33.6	110.0
49774	25 x 0.14	26	8.6	35.0	115.0
49775	2 x 0.25	24	4.3	5.0	26.0
49776	3 x 0.25	24	4.5	7.5	30.0
49777	4 x 0.25	24	4.8	10.0	39.0
49778	5 x 0.25	24	5.2	12.5	44.0
49779	7 x 0.25	24	6.0	17.5	52.0
49780	10 x 0.25	24	6.9	25.0	70.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49781	12 x 0.25	24	7.1	30.1	84.0
49782	14 x 0.25	24	7.4	35.0	97.0
49783	18 x 0.25	24	8.2	45.0	114.0
49784	24 x 0.25	24	9.6	60.0	157.0
49785	25 x 0.25	24	10.1	62.5	160.0
49786	2 x 0.34	22	4.6	6.8	31.0
49787	3 x 0.34	22	4.8	10.2	38.0
49788	4 x 0.34	22	5.2	13.6	51.0
49789	5 x 0.34	22	5.6	17.0	54.0
49790	7 x 0.34	22	6.5	23.8	77.0
49791	10 x 0.34	22	7.5	34.0	104.0
49792	12 x 0.34	22	7.7	40.8	122.0
49793	14 x 0.34	22	8.1	47.6	140.0
49794	18 x 0.34	22	9.2	61.2	162.0
49795	24 x 0.34	22	10.7	81.5	204.0
49796	25 x 0.34	22	11.2	85.0	229.0

SUPERTRONIC®-330-C-PURö

EMC-preferred type

TECHNICAL DATA

PUR drag chain cable acc. to UL-Std. 758 (AWM) Style 20233, CSA-Std. C22.2 No. 210 - AWM I/II A/B

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
Nominal voltage	UL (AWM) AC 300 V
Test voltage core/core	1500 V
Test voltage core/screen	1000 V
Mutual capacitance core/core	at 800 Hz, approx. 60 pF/m
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 7.5x Outer-Ø fixed 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded
- Wire structure:
  0.14 mm²: approx. 18 x 0.1 mm
  0.25 mm²: approx. 32 x 0.1 mm
  0.34 mm²: approx. 42 x 0.1 mm
- Core insulation: PP
- Core identification acc. to DIN 47100, colour coded
- x = without protective conductor
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Fleece wrapping
- Outer sheath: Special grade of full polyurethane acc. to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TMPU), UL-Std. 1581
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater
- highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- for outdoor use
- suitable for use in drag chains
- halogen-free
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2

APPLICATION

For installation in dry, damp and wet rooms, as well as outdoors with free movement, without tensile stress and without forced motion control. Suitable for frequent and fast lifting and bending stress in machine and tool construction, robotics, and in permanently moving machine parts. A long service life guarantees reliable function and high efficiency. The high screening density ensures interference-free transmission of signals or pulses. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49797	2 x 0.14	26	4.4	11.2	32.0
49798	3 x 0.14	26	4.5	14.1	35.0
49799	4 x 0.14	26	4.8	15.5	40.0
49800	5 x 0.14	26	5.0	18.3	45.0
49801	7 x 0.14	26	5.8	27.8	66.0
49802	10 x 0.14	26	6.7	39.3	86.0
49803	12 x 0.14	26	6.8	42.1	94.0
49804	14 x 0.14	26	7.1	45.3	102.0
49805	18 x 0.14	26	7.8	54.1	118.0
49806	24 x 0.14	26	8.8	66.3	149.0
49807	25 x 0.14	26	9.2	68.4	156.0
49808	2 x 0.25	24	4.8	14.9	38.0
49809	3 x 0.25	24	5.0	18.8	44.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49810	4 x 0.25	24	5.3	21.3	51.0
49811	5 x 0.25	24	5.7	31.0	68.0
49812	7 x 0.25	24	6.6	39.6	82.0
49813	10 x 0.25	24	7.5	53.9	110.0
49814	12 x 0.25	24	7.7	59.1	124.0
49815	14 x 0.25	24	8.0	64.2	135.0
49816	18 x 0.25	24	8.8	78.4	150.0
49817	24 x 0.25	24	10.2	89.9	194.0
49818	25 x 0.25	24	10.7	101.0	204.0
49819	2 x 0.34	22	5.1	18.1	45.0
49820	3 x 0.34	22	5.3	28.7	60.0
49821	4 x 0.34	22	5.7	35.7	76.0
49822	5 x 0.34	22	6.1	39.1	82.0

SUPERTRONIC®-330-C-PURö

EMC-preferred type

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49823	7 x 0.34	22	7.1	52.7	110.0
49824	10 x 0.34	22	8.1	67.4	148.0
49825	12 x 0.34	22	8.3	76.4	166.0
49826	14 x 0.34	22	8.7	85.5	185.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49827	18 x 0.34	22	9.8	99.7	216.0
49828	24 x 0.34	22	11.3	147.1	291.0
49829	25 x 0.34	22	11.8	155.0	305.0

SUPER-PAAR-TRONIC-340-C-PUR

colour code DIN 47100, EMC-preferred type

TECHNICAL DATA

PUR drag chain cable acc. to UL-Std. 758 (AWM) Style 20233, CSA-Std. C22.2 No. 210 - AWM I/II A/B

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
Nominal voltage	UL (AWM) AC 300 V
Test voltage core/core	1500 V
Test voltage core/screen	1000 V
Mutual capacitance core/core	at 800 Hz, approx. 60 pF/m
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 0.14 - 0.25 mm²: 7.5 x Outer-Ø 0.34 - 1 mm²: 10 x Outer-Ø fixed 0.14 - 0.25 mm²: 4 x Outer-Ø 0.34 - 1 mm²: 5 x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded, 0.5 - 1 mm²: acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Wire structure:
  0.14 mm²: approx. 18 x 0.1 mm
  0.25 mm²: approx. 32 x 0.1 mm
  0.34 mm²: approx. 42 x 0.1 mm
- Core insulation: PP
- Core identification acc. to DIN 47100 (paired stranding), colour coded
- x = without protective conductor
- Cores stranded in pairs with optimally matched lay lengths, Pairs stranded in layers with optimally matched lay lengths
- Fleece wrapping
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Fleece wrapping
- Outer sheath: Special grade of full polyurethane in alignment with DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TMPU), UL-Std. 1581
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater
- highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- for outdoor use
- suitable for use in drag chains
- halogen-free
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- halogen-free acc. to DIN VDE 0482-754-1 / DIN EN 60754-1 / IEC 60754-1
- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2
- certifications and approvals:
  EAC

APPLICATION

Stranded in pairs, this fully-screened special drag chain cable can also be used where external, high-frequency interference influences pulse transfer. It is used for permanently flexible stresses in machine and tool building, in robotics, on constantly moving machine components and for extended use in multi-shift operations. This two-approval cable is preferred for use in export-oriented mechanical engineering, in machine tools, production lines and systems engineering. Allows for extended use in multi-shift operations with extremely high bending stresses. EMC = Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49536	1 x 2 x 0.14	26	4.3	13.0	24.0
49537	2 x 2 x 0.14	26	5.5	19.2	41.0
49538	3 x 2 x 0.14	26	5.8	23.3	52.0
49539	4 x 2 x 0.14	26	6.2	27.0	59.0
49540	5 x 2 x 0.14	26	6.7	37.6	72.0
49541	6 x 2 x 0.14	26	7.2	49.2	89.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49542	8 x 2 x 0.14	26	8.4	54.6	107.0
49543	10 x 2 x 0.14	26	9.1	60.0	116.0
49830	1 x 2 x 0.25	24	4.9	14.0	26.0
49831	2 x 2 x 0.25	24	6.6	32.0	61.0
49832	3 x 2 x 0.25	24	6.9	38.4	70.0
49833	4 x 2 x 0.25	24	7.5	43.2	82.0

SUPER-PAAR-TRONIC-340-C-PUR

colour code DIN 47100, EMC-preferred type

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
49834	5 x 2 x 0.25	24	8.1	51.5	99.0
49835	6 x 2 x 0.25	24	8.8	71.8	126.0
49836	8 x 2 x 0.25	24	10.4	74.4	147.0
49837	10 x 2 x 0.25	24	11.3	90.0	179.0
49838	14 x 2 x 0.25	24	12.4	111.2	210.0
49839	1 x 2 x 0.34	22	5.1	20.0	35.0
49840	2 x 2 x 0.34	22	6.9	41.0	80.0
49841	3 x 2 x 0.34	22	7.3	52.2	100.0
49842	4 x 2 x 0.34	22	7.9	59.1	118.0
49843	5 x 2 x 0.34	22	8.6	67.0	134.0
49844	6 x 2 x 0.34	22	9.5	86.4	162.0
49845	8 x 2 x 0.34	22	11.2	107.5	214.0
49846	10 x 2 x 0.34	22	12.1	131.0	270.0
49847	14 x 2 x 0.34	22	13.5	150.0	304.0
49848	1 x 2 x 0.5	20	5.7	22.5	47.0
49849	2 x 2 x 0.5	20	7.9	53.0	100.0
49850	3 x 2 x 0.5	20	8.4	72.8	131.0
49851	4 x 2 x 0.5	20	9.3	75.6	149.0
49852	5 x 2 x 0.5	20	10.1	85.7	169.0
49853	6 x 2 x 0.5	20	11.2	103.0	181.0
49854	8 x 2 x 0.5	20	13.6	148.4	274.0
49855	10 x 2 x 0.5	20	14.7	180.0	332.0
49856	14 x 2 x 0.5	20	16.3	218.3	390.0
49857	1 x 2 x 0.75	19	6.4	35.2	56.0
49858	2 x 2 x 0.75	19	9.1	61.4	102.0
49859	3 x 2 x 0.75	19	9.8	87.1	144.0
49860	4 x 2 x 0.75	19	10.9	95.2	160.0
49861	5 x 2 x 0.75	19	12.1	115.0	193.0
49862	6 x 2 x 0.75	19	13.5	137.1	216.0
49863	8 x 2 x 0.75	19	16.1	184.4	327.0
49864	10 x 2 x 0.75	19	17.4	259.8	451.0
49865	14 x 2 x 0.75	19	19.2	318.4	521.0
49866	1 x 2 x 1	18	6.9	42.0	64.0
49867	2 x 2 x 1	18	10.1	73.0	120.0
49868	3 x 2 x 1	18	10.9	93.6	160.0
49869	4 x 2 x 1	18	12.1	117.8	184.0
49870	5 x 2 x 1	18	13.6	139.0	217.0

The specialty data cables of bus systems are an integral part of automation. Bus cables are specifically constructed for certain bus systems to fulfil all electrical transmission parameters and to ensure correct colour coding for proper connection.
In the industry, many different Ethernet systems are in place, however CAN bus, PROFIBUS, or PROFINET are also often used. For specialty applications, there are a number of other bus systems that all require specific cable technology to function reliably.

Bus cables

HELUKAT® 600S CAT.7 SF/FTP PUR CHAIN

CC-Link IE Field certified

TECHNICAL DATA

Industrial Ethernet cable / Cat. 7 acc. to ISO/IEC 11801, DIN EN 50173, IEC 61156-6, DIN EN 50288-4-2, UL-Std. 444 (CMX), CSA-Std. C22.2 No. 214 - CMX, UL-Std. 758 (AWM) Style 20940

Temperature range	flexible -30°C to +70°C fixed installation -40°C to +80°C UL (CMX) to +75°C UL (AWM) to +80°C
Peak operating voltage	125 V (not for high power current installation purposes)
Test voltage core/core	750 V
Conductor resistance at 20°C	max. 87.6 Ohm/km
Loop resistance at 20°C	max. 175.2 Ohm/km
Insulation resistance	min. 5.0 GOhm x km
Mutual capacitance core/core	at 800 Hz, approx. 45 pF/m
Rel. Velocity of Propagation	approx. 77%
Characteristic impedance	at 1 to 100 MHz, 100 Ohm ± 15 Ohm at 101 to 600 MHz, 100 Ohm ± 20 Ohm
Caloric load	approx. 0.80 MJ/m
Minimum bending radius	flexible 15x Outer-Ø fixed installation 8x Outer-Ø

CABLE STRUCTURE

- Copper wire tinned, AWG sizes
- Core insulation: Foam PE
- Core identification: colour coded, pairs:
  No. 1: white / blue
  No. 2: white / orange
  No. 3: white / green
  No. 4: white / brown
- Cores stranded in pairs with optimal lay lengths
- Screening element: pairs, plastic-coated aluminium foil (St)
- Pairs with optimal lay lengths stranded around a central cross-shaped filler
- 1. Screen: metallised conductive fleece
  2. Screen: braided screen of tinned copper wires
- Outer sheath: PUR
- Sheath colour: green
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, hydrolysis, microbes, coolants, greases
- abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- suitable for use in drag chains
- halogen-free
- flame-retardant

TESTS

- halogen-free acc. to DIN VDE 0482-754-1 / DIN EN 60754-1 / IEC 60754-1
- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2
- certifications and approvals:
  CC-Link IE

APPLICATION

HELUKAT® 600S CAT.7 SF/FTP PUR CHAIN is designed for use in cable carriers and the recurring loads caused by moving machine components. It provides excellent transmission characteristics under extremely difficult conditions.

NOTES

- Conductor sizes are based on the AWG measurement system, metric conductor sizes (mm²) are approximated and are for reference only
- UL Voltage Rating: 600 V

TYPICAL VALUES

Frequency (MHz)	10	16	62.5	100	250	500	600
Attenuation (dB/100m)	7.0	9.0	17.5	22.5	36.0	50.0	58.5
NEXT (dB)	100.0	100.0	100.0	100.0	97.0	90.0	89.0
ACR (dB/100m)	93.0	91.0	82.5	77.5	61.0	40.0	30.5

Part no.	No. cores x AWG-No.	Cross-sec. mm², approx.	Conductor Ø mm, approx.	Core Ø mm, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
805614	4 x 2 x AWG 24 /7	0.22	0.6	1.3	8.7	46.0	95.0

HELUKAT 500S CAT.6A SF/FTP SLIM PUR CHAIN

halogen-free, flame-retardant

TECHNICAL DATA

Industrial Ethernet cable / Cat. 6A acc. to ISO/IEC 11801, DIN EN 50173, IEC 61156-6, DIN EN 50288-10-2, UL-Std. 444 (CMX), CSA-Std. C22.2 No. 214 - CMX, UL-Std. 758 (AWM) Style 21576

Temperature range	flexible -20°C to +70°C fixed installation -40°C to +80°C UL (CMX) to +75°C UL (AWM) to +80°C
Peak operating voltage	125 V (not for high power current installation purposes)
Test voltage core/core	2000 V
Conductor resistance at 20°C	max. 150.0 Ohm/km
Loop resistance at 20°C	max. 300.0 Ohm/km
Insulation resistance	min. 5.0 GOhm x km
Mutual capacitance core/core	at 800 Hz, approx. 50 pF/m
Rel. Velocity of Propagation	approx. 76%
Characteristic impedance	at 1 to 100 MHz, 100 Ohm ± 15 Ohm at 101 to 500 MHz, 100 Ohm ± 20 Ohm
Caloric load	approx. 1.35 MJ/m
Minimum bending radius	flexible 10x Outer-Ø fixed installation 8x Outer-Ø

CABLE STRUCTURE

- Copper wire tinned, AWG sizes
- Core insulation: Foam PE
- Core identification: colour coded, pairs:
  No. 1: white / blue
  No. 2: white / orange
  No. 3: white / green
  No. 4: white / brown
- Cores stranded in pairs with optimal lay lengths
- Screening element: pairs, plastic-coated aluminium foil (St)
- Pairs with optimal lay lengths stranded around a central cross-shaped filler
- 1. Screen: plastic-coated aluminium foil (St)
  2. Screen: braided screen of tinned copper wires
- Outer sheath: PUR
- Sheath colour: green
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, hydrolysis, microbes, coolants, greases
- abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- suitable for use in drag chains
- halogen-free
- flame-retardant

TESTS

- halogen-free acc. to DIN VDE 0482-754-1 / DIN EN 60754-1 / IEC 60754-1
- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2

APPLICATION

HELUKAT® 500S CAT.6A SF/FTP SLIM PUR CHAIN is designed for use in cable carriers and the recurring loads caused by moving machine components. It provides excellent transmission characteristics under extremely difficult conditions.

NOTES

- Conductor sizes are based on the AWG measurement system, metric conductor sizes (mm²) are approximated and are for reference only
- UL Voltage Rating: 1000 V

TYPICAL VALUES

Frequency (MHz)	10	16	62.5	100	300	500
Attenuation (dB/100m)	9.0	11.0	23.0	29.0	51.0	68.0
NEXT (dB)	60.3	57.2	48.4	45.3	38.1	34.8
ACR (dB/100m)	59.4	56.1	46.1	42.6	33.0	28.0

Part no.	No. cores x AWG-No.	Cross-sec. mm², approx.	Conductor Ø mm, approx.	Core Ø mm, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
805548	4 x 2 x AWG 26 /7	0.14	0.55	1.05	7.8	34.0	81.0

HELUKAT® PROFInet C CAT.5e SF/UTP PUR CHAIN

PROFInet Type C, FastConnect (SK) capable, flame-retardant

TECHNICAL DATA

Industrial Ethernet cable / Cat. 5e acc. to ISO/IEC 11801, DIN EN 50173, IEC 61156-6, PROFInet Guidline, UL-Std. 444 (CMX), CSA-Std. C22.2 No. 214 - CMX

Temperature range	flexible -30°C to +75°C fixed installation -40°C to +80°C UL (CMX) to +75°C
Peak operating voltage	125 V (not for high power current installation purposes)
Test voltage core/core	2500 V
Conductor resistance at 20°C	max. 58.6 Ohm/km
Loop resistance at 20°C	max. 117.1 Ohm/km
Insulation resistance	min. 5.0 GOhm x km
Mutual capacitance core/core	at 800 Hz, approx. 50 pF/m
Rel. Velocity of Propagation	approx. 66%
Characteristic impedance	at 1 to 100 MHz, 100 Ohm ± 15 Ohm
Caloric load	approx. 0.85 MJ/m
Minimum bending radius	flexible 12x Outer-Ø fixed installation 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, AWG sizes
- Core insulation: PE
- Core identification: white, yellow, blue, orange
- Cores twisted into a star quad with optimal lay lengths
- Foil wrapping
- Inner sheath: halogen-free, flame retardant compound (FRNC)
- 1. Screen: plastic-coated aluminium foil (St)
  2. Screen: braided screen of tinned copper wires
- Outer sheath: PUR
- Sheath colour: green
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, hydrolysis, microbes, coolants, greases
- abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- suitable for use in drag chains
- halogen-free
- flame-retardant

TESTS

- halogen-free acc. to DIN VDE 0482-754-1 / DIN EN 60754-1 / IEC 60754-1
- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2
- certifications and approvals:
  EAC

APPLICATION

HELUKAT® PROFInet C CAT.5e SF/UTP PUR CHAIN for use on moving parts and in cable carriers. The cable listed here correspond to the PROFInet classifications Type C for moving cables and is designed to withstand mechanical loads. This PUR version has UL CMX listing and offers higher values in chain and chemical resistance.

NOTES

- Conductor sizes are based on the AWG measurement system, metric conductor sizes (mm²) are approximated and are for reference only

TYPICAL VALUES

Frequency (MHz)	10	16	62.5	100
Attenuation (dB/100m)	6.3	8.0	16.5	21.3
NEXT (dB)	70.0	65.0	55.0	50.0
ACR (dB/100m)	64.0	57.4	39.0	29.0

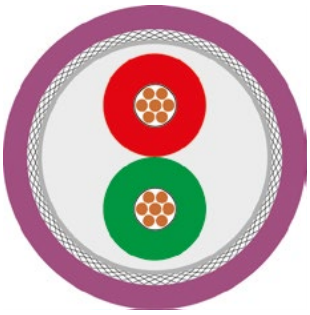
Part no.	No. cores x AWG-No.	Cross-sec. mm², approx.	Conductor Ø mm, approx.	Core Ø mm, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
800655	2 x 2 x AWG 22 /7	0.35	0.75	1.5	6.5	32.0	61.0

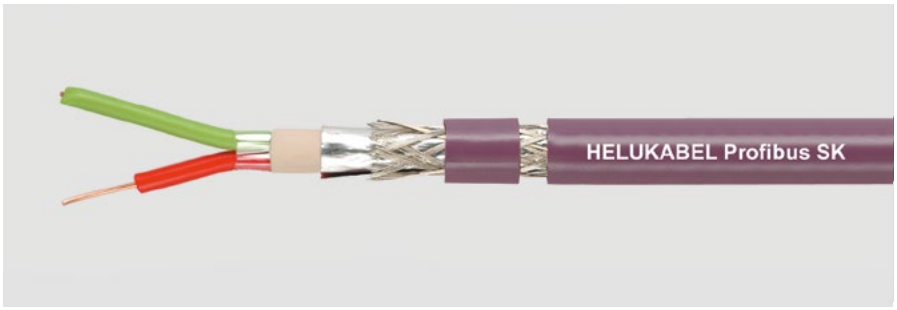
BUS Cables

Profibus SK drag chain

HELUKABEL®

PUR





Type	**Drag chain applications 1x2x0.65 mm (stranded)**	**Drag chain applications 1x2x0.65 mm (stranded)**
Cable structure		
Inner conductor diameter:	Copper, bare (AWG 24/19)	Copper, bare (AWG 24/19)
Core insulation:	Foam-skin-PE	Foam-skin-PE
Core colours:	rd, gn	rd, gn
Stranding element:	Double core	Double core
Separator:	Polyester foil over stranded bundle	Polyester foil over stranded bundle
Inner sheath material:	PVC	PVC
Shielding 1:	Al-Foil	Al-Foil
Total shielding:	Cu braid, tinned	Cu braid, tinned
Outer sheath material:	PUR	PUR
Cable external diameter:	app. 8,0 mm ± 0,4 mm	app. 8,0 mm ± 0,4 mm
Outer sheath colour:	Violet similar to RAL 4001	Petrol similar to RAL 5018
Electrical data		
Characteristic impedance:	150 Ohm ± 10 %	150 Ohm ± 10 %
Conductor resistance, max.:	67 Ohm/km	67 Ohm/km
Insulation resistance, min.:	1 GOhm x km	1 GOhm x km
Loop resistance:	134 Ohm/km max.	134 Ohm/km max.
Mutual capacitance:	35 nF/km nom.	35 nF/km nom.
Test voltage:	1,5 kV	1,5 kV
Attenuation:	9,6 kHz < 3,0 dB/km 38,4 kHz < 5,0 dB/km 4 MHz < 25,0 dB/km 16 MHz < 49,0 dB/km	9,6 kHz < 3,0 dB/km 38,4 kHz < 5,0 dB/km 4 MHz < 25,0 dB/km 16 MHz < 49,0 dB/km
Technical data		
Weight:	app. 70 kg/km	app. 70 kg/km
bending radius, repeated:	100 mm	100 mm
Operating temperature range min.:	-40°C	-40°C
Operating temperature range max.:	+70°C	+70°C
Caloric load, approx. value:	1,53 MJ/m	1,53 MJ/m
Copper weight:	25,00 kg/km	25,00 kg/km
Norms		
Applicable standards:	Profibus acc. to DIN 19245 T3 and EN50170 Flame-retardant acc. to IEC 60332-1-2	Profibus acc. to DIN 19245 T3 and EN50170 Flame-retardant acc. to IEC 60332-1-2
UL Style:	CMX 75°C (shielded)	CMX 75°C (shielded)
CSA standard:	CSA FT1	CSA FT1

Application

HELUKABEL® Profibus SK drag chain is designed for continous motion in cable carriers and has a special structure for processing with the Fast Connect Stripping Tool from Siemens. Thanks to the PU sheath, it also offers excellent resistance to common mineral oils, greases and cooling lubricants. Depending on the application, the colour petrol or violet is availiable.

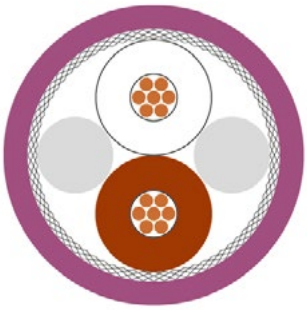
Part no.	**801659,** Profibus SK	**81906,** Profibus SK

Dimensions and specifications may be changed without prior notice.

BUS-Leitungen

CAN Bus Schleppkette, UL

PUR



Typ	**Schleppketteneinsatz 1x2x0,5 mm² (Litze)**	**Schleppketteneinsatz 4x1x0,5 mm² (Litze)**
Aufbau		
Innenleiterdurchmesser:	Kupfer, blank (AWG 20/30)	Kupfer, blank (AWG 20/30)
Aderisolation:	Foam-Skin-PE	Foam-Skin-PE
Aderfarben:	ws, br	ws, br, gn, ge
Verseilelement:	Doppelader	Sternvierer
Bewicklung:	Polyesterfolie über Verseilverbund	Polyesterfolie über Verseilverbund
Schirmung 1:	-	-
Gesamtschirmung:	Cu-Geflecht vz	Cu-Geflecht vz
Außenmantelmaterial:	PUR	PUR
Kabelaußendurchmesser:	ca. 7,9 mm ± 0,2 mm	ca. 8,1 mm ± 0,2 mm
Außenmantelfarbe:	violett ähnlich RAL 4001	violett ähnlich RAL 4001
Elektrische Daten		
Wellenwiderstand:	120 Ohm ± 10 %	120 Ohm ± 10 %
Leiterwiderstand, max.:	39 Ohm/km	39 Ohm/km
Isolationswiderstand, min.:	5 GOhm x km	5 GOhm x km
Schleifenwiderstand:	78 Ohm/km max.	78 Ohm/km max.
Betriebskapazität:	40 nF/km nom.	40 nF/km nom.
Prüfspannung:	1,5 kV	1,5 kV
Technische Daten		
Gewicht:	ca. 76 kg/km	ca. 87 kg/km
Biegeradius, mehrmalig:	120 mm	122 mm
Temperaturbereich Betrieb min.:	-30°C	-30°C
Temperaturbereich Betrieb max.:	+70°C	+70°C
Brandlast, Richtwert:	1,41 MJ/m	1,51 MJ/m
Cu-Zahl:	41,00 per km	55,00 per km
Normen		
Geltende Normen:	CAN Bus gem. ISO 11898-2 Gem. ISO/IEC 11801 Halogenfreiheit nach IEC 60754-1 Flammwidrig nach IEC 60332-1-2	CAN Bus gem. ISO 11898-2 Gem. ISO/IEC 11801 Halogenfreiheit nach IEC 60754-1 Flammwidrig nach IEC 60332-1-2
UL-Style:	CMX 75°C (shielded)	CMX 75°C (shielded)
CSA - Norm:	CSA FT1	CSA FT1

Anwendung

HELUKABEL® CAN Bus Schleppkette für die geführte permanente Bewegung. Für große Leitungslängen gem. ISO 11898 (CAN Vorgaben sind zu beachten).
Als 1- bzw. 2-paarige (Sternvierer) Ausführung verfügbar.

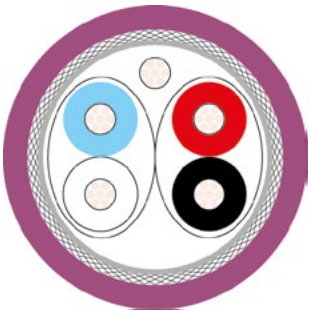
Artikelnummer		
	805685, CAN BUS hochflexibel	**805696,** CAN BUS hochflexibel

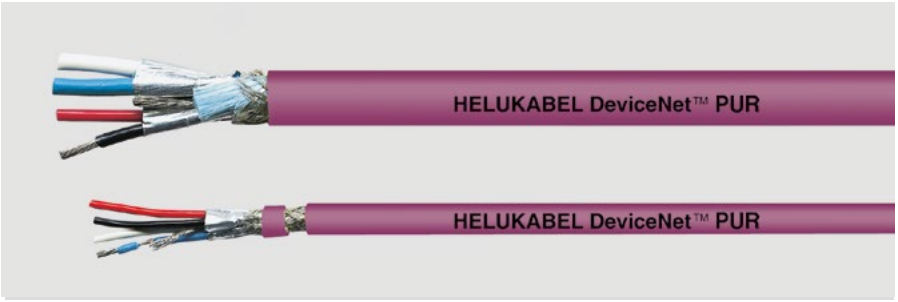
Technische Änderungen vorbehalten.

BUS Cables

DeviceNet™ high flexible thick + thin

PUR, high flexible





Type Cable structure	Drag chain applications 1x2xAWG18 + 1x2xAWG15	Drag chain applications 1x2xAWG24 + 1x2xAWG22
Inner conductor diameter 1:	Copper, tinned (AWG 18/40)	Copper, tinned (AWG 24/19)
Inner conductor diameter 2:	Copper, tinned (AWG 15/84)	Copper, tinned (AWG 22/19)
Core insulation 1:	Cell PE	Cell PE
Core insulation 2:	PE	PE
Core colours 1:	light bu, wh	light bu, wh
Core colours 2:	rd, bk	rd, bk
Stranding element 1:	Double core	Double core
Separator:	-	-
Shielding 1:	Al-Foil	Al-Foil
Total shielding:	Cu braid, tinned	Cu braid, tinned
Drain wire:	yes	yes
Outer sheath material:	PUR	PUR
Cable external diameter:	app. 12,2 mm ± 0,3 mm	app. 6,9 mm ± 0,3 mm
Outer sheath colour:	Violet similar to RAL 4001	Violet similar to RAL 4001
Electrical data		
Characteristic impedance:	120 Ohm ± 10 %	120 Ohm ± 10 %
Conductor resistance, max.:	22,6 Ohm/km	90 Ohm/km
Insulation resistance, min.:	0,2 GOhm x km	0,2 GOhm x km
Loop resistance:	45,2 Ohm/km max.	45,2 Ohm/km max.
Mutual capacitance:	39,8 nF/km nom.	39,8 nF/km nom.
Test voltage:	2 kV	2 kV
Attenuation:	125 kHz < 4.1 dB/km 500 kHz < 8.2 dB/km	125 kHz < 9.5 dB/km 500 kHz < 16.4 dB/km
Technical data		
Weight:	app. 185 kg/km	app. 68 kg/km
bending radius, repeated:	200 mm	70 mm
Operating temperature range min.:	-40°C	-40°C
Operating temperature range max.:	+80°C	+80°C
Caloric load, approx. value:	2,54 MJ/m	0,76 MJ/m
Copper weight:	90,00 kg/km	35,00 kg/km
Norms		
Applicable standards:	ODVA DeviceNet Halogen-free acc. to 60754-1 Flame-retardant acc. IEC 60332-2-1	ODVA DeviceNet Halogen-free acc. to 60754-1 Flame-retardant acc. IEC 60332-2-1
UL Style:	CMX 75°C CL2X	CMX 75°C CL2X

Application

HELUKABEL® DeviceNet™ PUR highly flexible for use in cable carriers with outstanding resistance to common coolants/lubricants. The special aspect of this bus system is that a data pair and a power supply pair are **always** integrated in one cable. The small cross-section is used for short distances or as a point-to- point connection; the large cross-section as main conductor for long distances and frequently in combination with the thin conductor as drain wire.

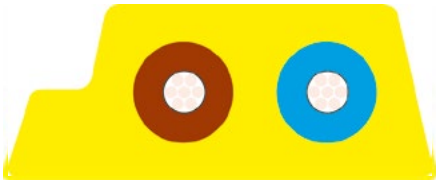
Part no.		
	81909, DeviceNet PUR	**81910,** DeviceNet PUR

Dimensions and specifications may be changed without prior notice.

BUS Cables

A-BUS PUR 2X2.5 PUR, Long Distance, UL/CSA

PUR



Type	Drag chain applications 2x2.5 mm²	Drag chain applications 2x2.5 mm²
Cable structure		
Inner conductor:	Copper, tinned	Copper, tinned
Core insulation:	PO	PO
Core colours:	bu, bn	bu, bn
Separator:	-	-
Shielding 1:	-	-
Total shielding:	-	-
Outer sheath material:	PUR	PUR
Outer sheath colour:	Yellow similar to RAL 1023	Black similar to RAL 9005
Electrical data		
Conductor resistance, max.:	8,21 Ohm/km	8,21 Ohm/km
Loop resistance:	16,42 Ohm/km max.	16,42 Ohm/km max.
Nominal voltage:	32 V	48 V
Technical data		
Weight:	app. 140 kg/km	app. 140 kg/km
bending radius, repeated:	30 mm	30 mm
Operating temperature range min.:	-40°C	-40°C
Operating temperature range max.:	+80°C	+80°C
Caloric load, approx. value:	0,90 MJ/m	0,90 MJ/m
Copper weight:	49,00 kg/km	49,00 kg/km
Norms		
Applicable standards:	ASI standard Halogen-free acc. to 60754-1 Flame-retardant CSA FT2	ASI standard Halogen-free acc. to 60754-1 Flame-retardant CSA FT2
UL Style:	AWM Style 20549	AWM Style 20549
CSA standard:	CSA FT2	CSA FT2

Application

AS components are interconnected with this special system cable. With the AS interface, the cable assembly from the control system to the sensor/actuator is not needed. The AS interface is the field bus system that transmitts both data and power in one single cable. With fast contacting in penetration technique, the possibility of errors in cabling is largely reduced. The special outer jacket provides protection against oil, grease, and refrigerant lubricants, and the cable is therefore even suitable for applications in wet surroundings, in machinery and plant construction, as well as in the machine tool and automotive industry. The PUR variant is suitable for heavy-duty industrial environments.
Because of the cross section 2,5qmm it is possible to realize longer distances.
These types are certified for the American market (UL 1581, FT2) through the use of special materials.

Part no.	**804410,** A-BUS PUR	**804411,** A-BUS PUR

Dimensions and specifications may be changed without prior notice.

HELUCHAIN® HELUKAT® 600S CAT.7 S/SFTP TPE

high abrasion resistance with a tight bending radius

TECHNICAL DATA

TPE drag chain cable acc. to UL-Std. 758 (AWM) Style 22541

Temperature range	flexible -35°C to +90°C fixed -50°C to +90°C
Nominal voltage	UL (AWM) AC 1000 V
Peak operating voltage	125 V (not for high power current installation purposes)
Test voltage	3000 V
Conductor resistance at 20°C	max. 134.0 Ohm/km
Insulation resistance	min. 5.0 GOhm x km
Mutual capacitance core/core	at 800 Hz, approx. 50 pF/m
Rel. Velocity of Propagation	approx. 70%
Characteristic impedance	at 100 MHz, 100 Ohm ± 5 Ohm
Minimum bending radius	flexible 7.5x Outer-Ø fixed installation 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare
- Core insulation: PP
- Core identification: colour coded, pairs:
  No. 1: white-blue / blue
  No. 2: white-orange / orange
  No. 3: white-green / green
  No. 4: white-brown / brown
- Cores stranded to form a pair
- Foil wrapping of the pairs
- Screening element: pairs, plastic-coated copper foil (St), braided screen of tinned copper wires, approx. coverage 85%
- 4 pairs stranded into bundle with optimal lay lengths
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: TPE
- Sheath colour: violet (RAL 4001)
- Length marking: in metres

PROPERTIES

- resistant to: hydrolysis, microbes
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- Cable Flame Test acc. to UL Std. 1581 Sec. 1061

APPLICATION

The HELUCHAIN® HELUKAT® 600S CAT.7 S/SFTP TPE for applications with long travel distances and the highest requirements for acceleration, abrasion resistance, and minimum bending radii. Has an extended functional temperature range while moving of -35°C to +90°C.

NOTES

- Conductor sizes are based on the AWG measurement system, metric conductor sizes (mm²) are approximated and are for reference only

TYPICAL VALUES

Frequency (MHz)	1	4	10	16	20	31.25	62.5	100	155	200	250	300	400	500	600
Attenuation (dB/100m)	2.3	4.7	7.1	9.1	10.2	12.7	18.2	23.3	29.2	33.4	37.6	42.6	48.4	54.6	60.7
NEXT (dB)	125.3	116.5	112.2	111.5	110.6	109.8	109.4	109.2	108.5	108.3	108.0	107.8	107.6	106.9	105.7

Part no.	No. cores x AWG-No.	Cross-sec. mm², approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11027809	4 x 2 x AWG 26 /19	0.15	9.8	71.0	137.0

HELUCHAIN® HELUKAT® 500S CAT.6A S/SFTP TPE

high abrasion resistance with a tight bending radius

TECHNICAL DATA

TPE drag chain cable acc. to UL-Std. 758 (AWM) Style 22541

Temperature range	flexible -35°C to +90°C fixed -50°C to +90°C
Nominal voltage	UL (AWM) AC 1000 V
Peak operating voltage	125 V (not for high power current installation purposes)
Test voltage	3000 V
Conductor resistance at 20°C	max. 134.0 Ohm/km
Insulation resistance	min. 5.0 GOhm x km
Mutual capacitance core/core	at 800 Hz, approx. 50 pF/m
Rel. Velocity of Propagation	approx. 70%
Characteristic impedance	at 100 MHz, 100 Ohm ± 5 Ohm
Minimum bending radius	flexible 7.5x Outer-Ø fixed installation 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare
- Core insulation: PP
- Core identification: colour coded, pairs:
  No. 1: white-blue / blue
  No. 2: white-orange / orange
  No. 3: white-green / green
  No. 4: white-brown / brown
- Cores stranded to form a pair
- Foil wrapping of the pairs
- Screening element: pairs, plastic-coated copper foil (St), braided screen of tinned copper wires, approx. coverage 85%
- 4 pairs stranded into bundle with optimal lay lengths
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: TPE
- Sheath colour: violet (RAL 4001)
- Length marking: in metres

PROPERTIES

- resistant to: hydrolysis, microbes
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- Cable Flame Test acc. to UL Std. 1581 Sec. 1061

APPLICATION

The HELUCHAIN® HELUKAT® 500S CAT.6A S/SFTP TP for applications with long travel distances and the highest requirements for acceleration, abrasion resistance, and minimum bending radii. Has an extended functional temperature range while moving of -35°C to +90°C.

NOTES

- Conductor sizes are based on the AWG measurement system, metric conductor sizes (mm²) are approximated and are for reference only

TYPICAL VALUES

Frequency (MHz)	1	4	10	16	20	31.25	62.5	100	155	200	250	300	400	500
Attenuation (dB/100m)	2.3	4.7	7.1	9.1	10.2	12.7	18.2	23.3	29.2	33.4	37.6	42.6	48.4	54.6
NEXT (dB)	125.3	116.5	112.2	111.5	110.6	109.8	109.4	109.2	108.5	108.3	108.0	107.8	107.6	106.9

Part no.	No. cores x AWG-No.	Cross-sec. mm², approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11027794	4 x 2 x AWG 26 /19	0.15	9.8	71.0	137.0

HELUCHAIN® HELUKAT® 250S CAT.6 SF/UTP TPE

high abrasion resistance, with inner sheath for long travel distances

TECHNICAL DATA

TPE drag chain cable acc. to UL-Std. 758 (AWM) Style 22541

Temperature range	flexible -35°C to +90°C fixed -50°C to +90°C
Nominal voltage	UL (AWM) AC 1000 V
Peak operating voltage	125 V (not for high power current installation purposes)
Test voltage	3000 V
Conductor resistance at 20°C	max. 94.0 Ohm/km
Insulation resistance	min. 5.0 GOhm x km
Mutual capacitance core/core	at 800 Hz, approx. 50 pF/m
Rel. Velocity of Propagation	approx. 67%
Characteristic impedance	at 100 MHz, 100 Ohm ± 5 Ohm
Minimum bending radius	flexible 7.5x Outer-Ø fixed installation 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare
- Core insulation: PP
- Core identification: colour coded, pairs:
  No. 1: white-blue / blue
  No. 2: white-orange / orange
  No. 3: white-green / green
  No. 4: white-brown / brown
- 4 pairs stranded into bundle with optimal lay lengths
- Foil wrapping
- Inner sheath: TPE, undyed
- Screen: plastic-coated aluminium foil (St), braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: TPE
- Sheath colour: violet (RAL 4001)
- Length marking: in metres

PROPERTIES

- resistant to: hydrolysis, microbes
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- Cable Flame Test acc. to UL Std. 1581 Sec. 1061

APPLICATION

The HELUCHAIN® HELUKAT® 250S CAT.6 SF/UTP TPE features an additional inner sheath for applications with long travel distances and the highest requirements for acceleration, abrasion resistance, and minimum bending radii. Has an extended functional temperature range while moving of -35°C to +90°C.

NOTES

- Conductor sizes are based on the AWG measurement system, metric conductor sizes (mm²) are approximated and are for reference only

TYPICAL VALUES

Frequency (MHz)	1	4	10	16	20	31.25	62.5	100	155	200	250
Attenuation (dB/100m)	1.6	4.0	6.9	9.1	10.2	13.4	19.5	26.2	34.1	40.1	46.4
NEXT (dB)	96.2	79.9	75.2	74.8	74.1	73.2	72.5	70.6	64.8	58.4	52.9

Part no.	No. cores x AWG-No.	Cross-sec. mm², approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11027808	4 x 2 x AWG 25 /19	0.18	8.0	38.0	80.0

HELUCHAIN® HELUKAT® 100S CAT.5e 4P SF/UTP TPE

high abrasion resistance, with inner sheath for long travel distances

TECHNICAL DATA

TPE drag chain cable acc. to UL-Std. 758 (AWM) Style 22541

Temperature range	flexible -35°C to +90°C fixed -50°C to +90°C
Nominal voltage	UL (AWM) AC 1000 V
Peak operating voltage	125 V (not for high power current installation purposes)
Test voltage	3000 V
Conductor resistance at 20˚C	max. 94.0 Ohm/km
Insulation resistance	min. 5.0 GOhm x km
Mutual capacitance core/core	at 800 Hz, approx. 50 pF/m
Rel. Velocity of Propagation	approx. 67%
Characteristic impedance	at 100 MHz, 100 Ohm ± 5 Ohm
Minimum bending radius	flexible 7.5x Outer-Ø fixed installation 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare
- Core insulation: PP
- Core identification: colour coded, pairs:
  No. 1: white-blue / blue
  No. 2: white-orange / orange
  No. 3: white-green / green
  No. 4: white-brown / brown
- Cores stranded in pairs with optimal lay lengths
- Foil wrapping
- 4 pairs stranded into bundle with optimal lay lengths
- Inner sheath: TPE, undyed
- Screen: plastic-coated aluminium foil (St), braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: TPE
- Sheath colour: violet (RAL 4001)
- Length marking: in metres

PROPERTIES

- resistant to: hydrolysis, microbes
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- Cable Flame Test acc. to UL Std. 1581 Sec. 1061

APPLICATION

The HELUCHAIN® HELUKAT® 100S CAT.5e 4P SF/UTP TPE features an additional inner sheath for applications with long travel distances and the highest requirements for acceleration, abrasion resistance, and minimum bending radii. Has an extended functional temperature range while moving of -35°C to +90°C.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only

TYPICAL VALUES

Frequency (MHz)	1	4	10	16	20	31.25	62.5	100	155
Attenuation (dB/100m)	1.6	4.0	6.9	9.1	10.2	13.4	19.5	26.2	34.1
NEXT (dB)	96.2	79.9	75.2	74.8	74.1	73.2	72.5	70.6	64.8

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11027792	4 x 2 x 0.18 /19	25	8.0	38.0	80.0

HELUCHAIN® HELUKAT® 100S CAT.5e 4C SF/UTP TPE

high abrasion resistance, with inner sheath for long travel distances

TECHNICAL DATA

TPE drag chain cable acc. to UL-Std. 758 (AWM) Style 22541

Temperature range	flexible -35°C to +90°C fixed -50°C to +90°C
Nominal voltage	UL (AWM) AC 1000 V
Peak operating voltage	125 V (not for high power current installation purposes)
Test voltage	3000 V
Conductor resistance at 20˚C	max. 66.5 Ohm/km
Insulation resistance	min. 5.0 GOhm x km
Mutual capacitance core/core	at 800 Hz, approx. 50 pF/m
Rel. Velocity of Propagation	approx. 67%
Characteristic impedance	at 100 MHz, 100 Ohm ± 15 Ohm
Minimum bending radius	flexible 7.5x Outer-Ø fixed installation 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare
- Core insulation: PP
- Core identification: white, green, brown, yellow
- Cores twisted into a star quad with optimal lay lengths
- Foil wrapping
- Inner sheath: TPE, undyed
- Screen: plastic-coated aluminium foil (St), braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: TPE
- Sheath colour: violet (RAL 4001)
- Length marking: in metres

PROPERTIES

- resistant to: hydrolysis, microbes
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- Cable Flame Test acc. to UL Std. 1581 Sec. 1061

APPLICATION

The HELUCHAIN® HELUKAT® 100S CAT.5e 4C SF/UTP TPE features an additional inner sheath for applications with long travel distances and the highest requirements for acceleration, abrasion resistance, and minimum bending radii. Has an extended functional temperature range while moving of -35°C to +90°C.

NOTES

- Conductor sizes are based on the AWG measurement system, metric conductor sizes (mm²) are approximated and are for reference only

TYPICAL VALUES

Frequency (MHz)	1	4	10	16	20	31.25	62.5	100
Attenuation (dB/100m)	1.6	4.1	6.7	8.7	9.9	17.7	18.9	24.6
NEXT (dB)	91.5	80.5	74.8	73.2	61.7	60.9	53.5	51.6

Part no.	No. cores x AWG-No.	Cross-sec. mm², approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11027793	2 x 2 x AWG 24 /19	0.25	6.5	30.0	58.0

HELUCHAIN® HELUKAT® PROFInet C CAT.5e SF/UTP TPE

high abrasion resistance, with inner sheath for long travel distances

TECHNICAL DATA

TPE drag chain cable acc. to UL-Std. 758 (AWM) Style 22541

Temperature range	flexible -35°C to +90°C fixed -50°C to +90°C
Nominal voltage	UL (AWM) AC 1000 V
Peak operating voltage	125 V (not for high power current installation purposes)
Test voltage	3000 V
Conductor resistance at 20˚C	max. 55.2 Ohm/km
Insulation resistance	min. 5.0 GOhm x km
Mutual capacitance core/core	at 800 Hz, approx. 50 pF/m
Rel. Velocity of Propagation	approx. 67%
Characteristic impedance	at 100 MHz, 100 Ohm ± 5 Ohm
Minimum bending radius	flexible 7.5x Outer-Ø fixed installation 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare
- Core insulation: PP
- Core identification: white, yellow, blue, orange
- Cores twisted into a star quad with optimal lay lengths
- Foil wrapping
- Inner sheath: TPE, undyed
- Screen: plastic-coated aluminium foil (St), braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: TPE
- Sheath colour: green (RAL 6018)
- Length marking: in metres

PROPERTIES

- resistant to: hydrolysis, microbes
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- Cable Flame Test acc. to UL Std. 1581 Sec. 1061

APPLICATION

The HELUCHAIN® HELUKAT® PROFInet C CAT.5e SF/UTP TPE features an additional inner sheath for applications with long travel distances and the highest requirements for acceleration, abrasion resistance, and minimum bending radii. Has an extended functional temperature range while moving of -35°C to +90°C.

NOTES

- Conductor sizes are based on the AWG measurement system, metric conductor sizes (mm²) are approximated and are for reference only

TYPICAL VALUES

Frequency (MHz)	1	4	10	16	20	31.25	62.5	100
Attenuation (dB/100m)	1.5	4.0	6.5	8.5	9.6	12.4	18.5	24.5
NEXT (dB)	85.0	71.5	66.7	63.3	61.4	60.8	53.3	49.2

Part no.	No. cores x AWG-No.	Cross-sec. mm², approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11027791	2 x 2 x AWG 22 /19	0.38	7.2	37.0	75.0

HELUCHAIN® PROFIBUS TPE

for use in drag chains, TPE outer sheath, UL +90°C

TECHNICAL DATA

PROFIBUS cable acc. to UL-Std. 758 (AWM) Style 22541

Temperature range	flexible -35°C to +90°C fixed -50°C to +90°C
Peak operating voltage	125 V (not for high power current installation purposes)
Test voltage	3000 V
Conductor resistance at 20°C	max. 66.5 Ohm/km
Insulation resistance	min. 5.0 GOhm x km
Mutual capacitance core/core	at 800 Hz, approx. 30 pF/m
Rel. Velocity of Propagation	approx. 76%
Characteristic impedance	at 20 MHz, 150 Ohm ± 10 Ohm
Minimum bending radius	flexible 7.5x Outer-Ø fixed installation 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare
- Core insulation: Foam PP
- Core identification: green, red
- Cores stranded with optimal lay lengths
- Foil wrapping
- Inner sheath: TPE, beige
- Screen: plastic-coated aluminium foil (St), braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: TPE
- Sheath colour: violet (RAL 4001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, hydrolysis, microbes
- abrasion-resistant
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- Cable Flame Test acc. to UL Std. 1581 Sec. 1061

APPLICATION

HELUCHAIN® PROFIBUS TPE with inner sheath is the best solution for the highest demands for long travel distances, acceleration, abrasion resistance, and minimum bending radii in drag chains. The material exhibits exceptional oil resistance, coupled with a UL approval for 90°C.

NOTES

- Conductor sizes are based on the AWG measurement system, metric conductor sizes (mm²) are approximated and are for reference only

Part no.	No. cores x AWG-No.	Cross-sec. mm², approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11027798	1 x 2 x AWG 24 /19	0.25	8.4	32.0	85.0

HELUCHAIN® CAN-BUS 2-PAIR/QUAD TPE

for use in drag chains, TPE outer sheath, UL +90°C

TECHNICAL DATA

CAN bus cable acc. to UL-Std. 758 (AWM) Style 22541

Temperature range	flexible -35°C to +90°C fixed -50°C to +90°C
Peak operating voltage	125 V (not for high power current installation purposes)
Test voltage	3000 V
Conductor resistance at 20˚C	20 AWG: 39.0 Ohm/km 24 AWG: 87.7 Ohm/km
Insulation resistance	min. 5.0 GOhm x km
Mutual capacitance core/core	at 800 Hz, approx. 40 pF/m
Rel. Velocity of Propagation	approx. 75%
Characteristic impedance	at 1 MHz, 120 Ohm ± 10 Ohm
Minimum bending radius	flexible 7.5x Outer-Ø fixed installation 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare
- Core insulation: Foam PP
- Core identification: colour coded, pairs:
  No. 1: white / brown
  No. 2: green / yellow
- Cores stranded with optimal lay lengths
- Inner sheath: TPE, beige
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: TPE
- Sheath colour: violet (RAL 4001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, hydrolysis, microbes
- abrasion-resistant
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- Cable Flame Test acc. to UL Std. 1581 Sec. 1061

APPLICATION

HELUCHAIN® CAN-BUS 2-PAIR/QUAD TPE with inner sheath is the best solution for the highest demands for long travel distances, acceleration, abrasion resistance, and minimum bending radii in drag chains. The material exhibits exceptional oil resistance, coupled with a UL approval for 90°C.

NOTES

- Conductor sizes are based on the AWG measurement system, metric conductor sizes (mm²) are approximated and are for reference only

Part no.	No. cores x AWG-No.	Cross-sec. mm², approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11027795	2 x 2 x AWG 24 /19	0.25	6.4	26.0	55.0
11027797	2 x 2 x AWG 20 /19	0.50	7.7	40.0	83.0

HELUCHAIN® CAN-BUS 1-PAIR TPE

for use in drag chains, TPE outer sheath, UL +90°C

TECHNICAL DATA

CAN bus cable acc. to UL-Std. 758 (AWM) Style 22541

Temperature range	flexible -35°C to +90°C fixed -50°C to +90°C
Peak operating voltage	125 V (not for high power current installation purposes)
Test voltage	3000 V
Conductor resistance at 20˚C	max. 39.0 Ohm/km
Insulation resistance	min. 5.0 GOhm x km
Mutual capacitance core/core	at 800 Hz, approx. 40 pF/m
Rel. Velocity of Propagation	approx. 77%
Characteristic impedance	at 1 MHz, 120 Ohm ± 10 Ohm
Minimum bending radius	flexible 7.5x Outer-Ø fixed installation 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare
- Core insulation: Foam PP
- Core identification: white, brown
- Cores stranded with optimal lay lengths
- Inner sheath: TPE, beige
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: TPE
- Sheath colour: violet (RAL 4001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, hydrolysis, microbes
- abrasion-resistant
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- Cable Flame Test acc. to UL Std. 1581 Sec. 1061

APPLICATION

HELUCHAIN® CAN-BUS 1-PAIR TPE with inner sheath is the best solution for the highest demands for long travel distances, acceleration, abrasion resistance, and minimum bending radii in drag chains. The material exhibits exceptional oil resistance, coupled with a UL approval for 90°C.

NOTES

- Conductor sizes are based on the AWG measurement system, metric conductor sizes (mm²) are approximated and are for reference only

Part no.	No. cores x AWG-No.	Cross-sec. mm², approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11027796	1 x 2 x AWG 20 /19	0.50	7.7	34.0	74.0

Control cables are one of the most frequently used cable types in the world. They typically have a green/yellow protective conductor and multiple numbered, black cores. For applications that do not require a protective conductor, there are also designs with only black cores. In the European AC mains system, these cables are designed for the 300/500 V voltage range. Screened versions are also available.

Control Cables

JZ-HF / OZ-HF

oil resistant

TECHNICAL DATA

PVC drag chain cable, in alignment with DIN VDE 0285-525-2-51 / DIN EN 50525-2-51

Temperature range	flexible -10°C to +80°C fixed -40°C to +80°C
Nominal voltage	AC U_0/U 300/500 V
Test voltage core/core	4000 V
Breakdown voltage	8000 V
Minimum bending radius	flexible 7.5x Outer-Ø fixed 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PVC, compound type Z 7225
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores,
  G = with protective conductor GN-YE, in the outer layer,
  x = without protective conductor (OZ)
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping over each stranding layer
- Outer sheath: oil-resistant special PVC acc. to DIN VDE 0207-363-4-1 / DIN EN 50363-4-1 (compound type TM5)
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- certifications and approvals:
  EAC

APPLICATION

A highly flexible PVC drag chain cable used for installation in dry and damp rooms, but not outdoors. Used for frequent lifting and bending stress in machine and tool construction, in robotics and on permanently moving machine parts. With free movement, without tensile stress and without forced motion control capabilities, these cables have proven their reliable performance in drag chain applications.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- cleanroom qualification tested on analog types; please note "cleanroom qualification" in your order
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
15001	2 x 0.5	20	5.0	9.6	38.0
15002	3 G 0.5	20	5.3	14.0	44.0
15003	4 G 0.5	20	5.7	19.0	52.0
15004	5 G 0.5	20	6.3	24.0	67.0
15005	7 G 0.5	20	7.6	34.0	91.0
15090	7 x 0.5	20	7.6	34.0	91.0
15006	10 G 0.5	20	9.3	48.0	128.0
15007	12 G 0.5	20	9.3	58.0	137.0
15008	14 G 0.5	20	9.8	67.0	158.0
15009	16 G 0.5	20	10.3	77.0	182.0
15010	18 G 0.5	20	11.2	86.0	207.0
15011	20 G 0.5	20	11.6	96.0	226.0
15012	25 G 0.5	20	13.8	120.0	292.0
15013	30 G 0.5	20	13.7	144.0	330.0
15014	34 G 0.5	20	15.0	163.0	387.0
15015	36 G 0.5	20	15.0	173.0	399.0
15016	42 G 0.5	20	16.3	202.0	449.0
15017	50 G 0.5	20	17.9	240.0	573.0
15018	61 G 0.5	20	19.7	290.0	682.0
15019	2 x 0.75	19	5.5	14.0	44.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
15020	3 G 0.75	19	5.7	22.0	53.0
15021	4 G 0.75	19	6.5	29.0	67.0
15022	5 G 0.75	19	7.0	36.0	81.0
15023	7 G 0.75	19	8.4	50.0	111.0
15024	10 G 0.75	19	10.3	72.0	159.0
15025	12 G 0.75	19	10.3	86.0	174.0
14070	12 x 0.75	19	10.3	86.0	174.0
15026	14 G 0.75	19	11.1	101.0	201.0
13944	14 x 0.75	19	11.1	101.0	201.0
15027	16 G 0.75	19	11.6	115.0	225.0
15028	18 G 0.75	19	12.4	130.0	249.0
15029	20 G 0.75	19	13.0	144.0	282.0
15030	25 G 0.75	19	15.3	180.0	375.0
15031	30 G 0.75	19	15.5	216.0	411.0
15032	34 G 0.75	19	16.8	245.0	473.0
15033	36 G 0.75	19	16.8	259.0	509.0
15034	42 G 0.75	19	18.5	302.0	602.0
15035	50 G 0.75	19	20.3	360.0	706.0
15036	61 G 0.75	19	22.2	432.0	886.0
15091	65 G 0.75	19	23.1	439.0	899.0

JZ-HF / OZ-HF

oil resistant

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
15037	2 x 1	18	5.7	19.0	62.0
15038	3 G 1	18	6.1	29.0	64.0
15039	4 G 1	18	6.8	38.0	80.0
15040	5 G 1	18	7.5	48.0	97.0
15041	7 G 1	18	9.0	67.0	132.0
15042	10 G 1	18	11.2	96.0	187.0
15043	12 G 1	18	11.2	115.0	206.0
15044	14 G 1	18	11.7	134.0	239.0
15045	16 G 1	18	12.5	154.0	274.0
15046	18 G 1	18	13.2	173.0	307.0
15047	20 G 1	18	13.9	192.0	336.0
15048	25 G 1	18	16.5	240.0	443.0
15049	30 G 1	18	16.6	288.0	558.0
15050	34 G 1	18	18.1	326.0	601.0
15051	36 G 1	18	18.1	346.0	623.0
15052	41 G 1	18	19.6	403.0	710.0
15214	42 G 1	18	19.6	403.0	730.0
15053	50 G 1	18	21.7	480.0	868.0
15092	61 G 1	18	23.9	586.0	1044.0
15054	65 G 1	18	24.7	624.0	1195.0
15055	2 x 1.5	16	6.5	29.0	69.0
15056	3 G 1.5	16	6.9	43.0	84.0
15057	4 G 1.5	16	7.5	58.0	103.0
15058	5 G 1.5	16	8.5	72.0	129.0
15059	7 G 1.5	16	10.2	101.0	177.0
11017475	8 G 1.5	16	11.1	115.0	206.0
15060	10 G 1.5	16	12.4	144.0	248.0
15061	12 G 1.5	16	12.6	173.0	283.0
15062	14 G 1.5	16	13.2	202.0	327.0
15063	16 G 1.5	16	14.2	230.0	372.0
15064	18 G 1.5	16	14.9	259.0	418.0
15065	20 G 1.5	16	15.9	288.0	469.0
15066	25 G 1.5	16	18.6	360.0	631.0
15067	30 G 1.5	16	18.9	432.0	701.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
15068	34 G 1.5	16	20.6	490.0	800.0
15069	36 G 1.5	16	20.6	518.0	831.0
15070	42 G 1.5	16	22.3	605.0	987.0
15071	50 G 1.5	16	24.6	720.0	1241.0
15072	60 G 1.5	16	26.3	864.0	1431.0
15215	61 G 1.5	16	27.1	878.0	1495.0
15216	65 G 1.5	16	28.0	936.0	1566.0
15073	2 x 2.5	14	8.1	48.0	102.2
15074	3 G 2.5	14	8.6	72.0	129.0
15075	4 G 2.5	14	9.6	96.0	160.0
15076	5 G 2.5	14	10.5	120.0	201.0
15077	7 G 2.5	14	12.9	168.0	278.0
15078	10 G 2.5	14	15.5	240.0	398.0
15079	12 G 2.5	14	15.5	288.0	444.0
15080	14 G 2.5	14	16.8	336.0	512.0
15081	16 G 2.5	14	17.7	384.0	615.0
15082	18 G 2.5	14	18.8	432.0	678.0
15083	20 G 2.5	14	20.0	480.0	752.0
15084	25 G 2.5	14	23.7	600.0	1060.0
15085	30 G 2.5	14	24.0	720.0	1197.0
15086	34 G 2.5	14	26.0	816.0	1337.0
15087	36 G 2.5	14	26.0	864.0	1384.0
15088	42 G 2.5	14	28.5	1008.0	1599.0
15089	50 G 2.5	14	30.6	1200.0	1854.0
15142	3 G 4	12	10.5	115.0	213.0
15143	4 G 4	12	11.6	154.0	265.0
15144	5 G 4	12	12.9	192.0	328.0
15145	4 G 6	10	13.4	230.0	382.0
15146	5 G 6	10	14.7	288.0	461.0
15147	4 G 10	8	17.8	384.0	652.0
15148	5 G 10	8	19.7	480.0	790.0
15149	4 G 16	6	20.8	614.0	1007.0
15150	5 G 16	6	23.3	768.0	1304.0

JZ-HF-CY / OZ-HF-CY

oil resistant, with inner sheath, EMC-preferred type

TECHNICAL DATA

PVC drag chain cable, in alignment with DIN VDE 0285-525-2-51 / DIN EN 50525-2-51

Temperature range	flexible -10°C to +80°C fixed -40°C to +80°C
Nominal voltage	AC U_0/U 300/500 V
Test voltage core/core	4000 V
Breakdown voltage	8000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 10x Outer-Ø fixed 5x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PVC, compound type Z 7225
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores,
  G = with protective conductor GN-YE, in the outer layer,
  x = without protective conductor (OZ)
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping over each stranding layer
- Inner sheath: PVC
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: oil-resistant special PVC acc. to DIN VDE 0207-363-4-1 / DIN EN 50363-4-1 (compound type TM5)
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- certifications and approvals:
  EAC

APPLICATION

Used for installation in dry and damp rooms, but not outdoors. With free movement, without tensile stress and without forced motion control capabilities, these cables have proven their reliable performance in standard drag chain applications, automatic handling machines, robots and permanently moving machine parts. These screened cables have been developed for interference-free data signal transmission for all areas in electronics, measurement and control technology. Also available in paired version. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- cleanroom qualification tested on analog types; please note "cleanroom qualification" in your order
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
15930	2 x 0.5	20	7.1	30.0	90.0
15931	3 G 0.5	20	7.4	38.0	115.0
15932	4 G 0.5	20	8.1	48.0	140.0
15933	5 G 0.5	20	8.6	64.0	168.0
15934	7 G 0.5	20	10.0	70.0	217.0
15935	12 G 0.5	20	11.5	100.0	274.0
15876	14 G 0.5	20	12.2	135.0	332.0
15877	16 G 0.5	20	12.9	145.0	388.0
15936	18 G 0.5	20	13.8	154.0	445.0
15937	20 G 0.5	20	14.3	160.0	497.0
15878	21 G 0.5	20	14.9	175.0	500.0
15938	25 G 0.5	20	16.5	240.0	505.0
15879	30 G 0.5	20	16.8	280.0	515.0
15880	34 G 0.5	20	17.9	290.0	530.0
15881	36 G 0.5	20	17.9	300.0	572.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
15882	42 G 0.5	20	19.4	330.0	605.0
15883	50 G 0.5	20	21.1	393.0	742.0
15945	2 x 0.75	19	7.8	39.0	105.0
15946	3 G 0.75	19	8.1	49.0	128.0
15947	4 G 0.75	19	8.7	60.0	184.0
15948	5 G 0.75	19	9.4	70.0	200.0
15949	7 G 0.75	19	10.9	95.0	269.0
15885	10 G 0.75	19	12.7	110.0	327.0
15950	12 G 0.75	19	12.7	140.0	366.0
15886	14 G 0.75	19	13.7	163.0	426.0
15887	16 G 0.75	19	14.4	187.0	487.0
15951	18 G 0.75	19	15.0	211.0	547.0
15888	20 G 0.75	19	15.9	216.0	551.0
15889	21 G 0.75	19	16.5	272.0	590.0
15952	25 G 0.75	19	18.1	322.0	600.0

JZ-HF-CY / OZ-HF-CY

oil resistant, with inner sheath, EMC-preferred type

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
15890	30 G 0.75	19	18.5	414.0	650.0
15891	34 G 0.75	19	20.0	473.0	685.0
15892	36 G 0.75	19	20.0	500.0	720.0
15893	42 G 0.75	19	21.6	583.0	800.0
15894	50 G 0.75	19	23.3	695.0	954.0
15961	2 x 1	18	8.1	50.0	115.0
15962	3 G 1	18	8.5	60.0	142.0
15963	4 G 1	18	9.2	73.0	196.0
15964	5 G 1	18	9.9	81.0	271.0
15965	7 G 1	18	11.4	114.0	307.0
15966	12 G 1	18	13.8	186.0	474.0
15967	18 G 1	18	16.0	254.0	622.0
15968	25 G 1	18	19.5	365.0	828.0
15969	34 G 1	18	21.3	500.0	1049.0
15970	41 G 1	18	22.8	576.0	1257.0
15971	50 G 1	18	25.0	681.0	1437.0
15972	65 G 1	18	28.1	932.0	1823.0
15976	2 x 1.5	16	8.7	64.0	170.0
15977	3 G 1.5	16	9.1	84.0	203.0
15978	4 G 1.5	16	10.0	99.0	243.0
15979	5 G 1.5	16	10.7	120.0	288.0
15980	7 G 1.5	16	12.8	148.0	403.0
15981	12 G 1.5	16	15.4	274.0	592.0
15982	18 G 1.5	16	17.7	386.0	844.0
15983	25 G 1.5	16	21.8	584.0	1155.0
15152	41 G 1.5	16	25.9	867.0	1227.0
15153	50 G 1.5	16	28.0	970.0	1445.0
15154	61 G 1.5	16	30.9	1028.0	1724.0
15925	3 G 2.5	14	11.1	140.0	215.0
15926	4 G 2.5	14	11.8	159.0	264.0
15927	5 G 2.5	14	13.3	194.0	344.0
15928	7 G 2.5	14	15.6	234.0	410.0
15929	12 G 2.5	14	18.6	390.0	721.0
15155	3 G 4	12	13.0	178.0	292.0
15156	4 G 4	12	14.4	222.0	372.0
15157	5 G 4	12	15.7	328.0	448.0
15158	4 G 6	10	16.0	305.0	526.0
15159	5 G 6	10	17.5	441.0	632.0
15160	4 G 10	8	21.1	485.0	838.0
15161	5 G 10	8	23.0	610.0	998.0
15162	4 G 16	6	24.1	840.0	1225.0
15163	5 G 16	6	27.0	1050.0	1560.0

HELUCHAIN® JZ-602-HF PVC UL/CSA / HELUCHAIN® OZ-602-HF PVC UL/CSA

TECHNICAL DATA

PVC drag chain cable acc. to UL-Std. 758 (AWM) Style 21179, CSA-Std. C22.2 No. 210 - AWM I/II A/B

Temperature range	flexible -5°C to +80°C fixed -40°C to +80°C
Nominal voltage	UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Minimum bending radius	flexible 7.5x Outer-Ø fixed 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores, G = with protective conductor GN-YE, in the outer layer, x = without protective conductor (OZ)
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping over each stranding layer
- Outer sheath: Special-PVC acc. to UL-Std. 758 (AWM) Style 21179, CSA-Std. C22.2 No. 210
- Sheath colour: black (RAL 9005)
- Length marking: in metres

PROPERTIES

- resistant to: UV radiation, weathering effects
- largely resistant to: acids, alkalis, at room temperature
- low adhesion
- for outdoor use
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2
- certifications and approvals: EAC

APPLICATION

For installation in dry, damp and wet rooms as well as outdoors; for applications involving free movement, no tensile stress and no forced movement guidance. Suitable for frequent lifting and bending stresses in machine and tool construction and on permanently moving machine parts.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
89900	3 G 0.5	20	5.8	16.1	45.0
89901	4 G 0.5	20	6.2	21.5	54.0
89902	5 G 0.5	20	6.7	27.0	63.0
89903	7 G 0.5	20	7.8	37.6	83.0
89904	9 G 0.5	20	8.9	48.4	96.0
89905	12 G 0.5	20	9.3	64.5	119.0
89906	18 G 0.5	20	11.0	97.0	172.0
89907	25 G 0.5	20	13.6	134.5	249.0
89908	34 G 0.5	20	15.0	182.8	276.0
11020415	2 x 0.75	19	6.0	14.4	45.0
11020416	5 G 0.75	19	7.4	36.0	81.0
11020417	7 G 0.75	19	8.6	50.4	107.0
11020418	12 G 0.75	19	10.5	86.4	162.0
11020419	18 G 0.75	19	12.4	129.6	234.0
11020420	25 G 0.75	19	15.3	180.0	337.0
89909	3 G 1	18	6.7	28.8	72.0
89910	4 G 1	18	7.2	38.4	95.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
89911	5 G 1	18	7.8	48.0	104.0
89912	7 G 1	18	9.2	67.2	153.0
89913	9 G 1	18	10.7	86.4	194.0
89914	12 G 1	18	11.2	115.2	252.0
89915	15 G 1	18	12.5	144.0	294.0
89916	18 G 1	18	13.4	172.8	393.0
47000	21 G 1	18	14.9	201.6	450.0
89917	25 G 1	18	16.5	240.0	550.0
89918	34 G 1	18	18.3	326.4	730.0
89919	3 G 1.5	16	7.3	44.0	91.0
89920	4 G 1.5	16	7.9	58.0	111.0
89921	5 G 1.5	16	8.7	72.0	136.0
89922	7 G 1.5	16	10.4	101.0	202.0
89923	9 G 1.5	16	12.1	129.7	244.0
89924	12 G 1.5	16	12.6	173.0	312.0
89925	18 G 1.5	16	15.1	260.0	524.0
89926	25 G 1.5	16	18.6	360.0	694.0

HELUCHAIN® JZ-602-HF PVC UL/CSA / HELUCHAIN® OZ-602-HF PVC UL/CSA

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
89927	34 G 1.5	16	20.8	490.0	879.0
89932	3 G 2.5	14	8.6	72.0	140.0
89928	4 G 2.5	14	9.4	96.0	176.0
89933	5 G 2.5	14	10.5	120.0	228.0
89929	7 G 2.5	14	12.6	168.0	309.0
89934	12 G 2.5	14	15.5	288.0	558.0
89935	3 G 4	12	9.9	115.0	227.0
89930	4 G 4	12	11.1	154.0	317.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
89936	5 G 4	12	12.3	192.0	329.0
89931	7 G 4	12	15.0	269.0	507.0
89937	4 G 6	10	12.7	231.0	425.0
89938	4 G 10	8	16.5	384.0	655.0
89939	4 G 16	6	19.3	615.0	1149.0
89940	4 G 25	4	24.1	960.0	1530.0
89941	4 G 35	2	30.2	1344.0	2154.0

HELUCHAIN® JZ-602-HF-C PVC UL/CSA

EMC-preferred type

TECHNICAL DATA

PVC drag chain cable acc. to UL-Std. 758 (AWM) Style 21179, CSA-Std. C22.2 No. 210 - AWM I/II A/B

Temperature range	flexible -5°C to +80°C fixed -40°C to +80°C
Nominal voltage	UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 10x Outer-Ø fixed 5x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- G = with protective conductor GN-YE, in the outer layer
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping between stranded layers, foil wrapping over the outer layer
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Fleece wrapping
- Outer sheath: Special-PVC acc. to UL-Std. 758 (AWM) Style 21179, CSA-Std. C22.2 No. 210
- Sheath colour: black (RAL 9005)
- Length marking: in metres

PROPERTIES

- resistant to: UV radiation, weathering effects
- largely resistant to: acids, alkalis, at room temperature
- low adhesion
- for outdoor use
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2
- certifications and approvals: EAC

APPLICATION

For installation in dry, damp and wet rooms as well as outdoors; for applications involving free movement, no tensile stress and no forced movement guidance. Suitable for frequent lifting and bending stresses in machine and tool construction and on permanently moving machine parts. EMC = Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
89950	3 G 0.5	20	6.5	42.0	62.0
89951	4 G 0.5	20	7.0	47.0	73.0
89952	5 G 0.5	20	7.5	56.0	85.0
89953	7 G 0.5	20	8.5	69.0	111.0
89954	9 G 0.5	20	9.6	88.0	125.0
89955	12 G 0.5	20	10.0	108.0	157.0
89956	15 G 0.5	20	11.2	122.0	205.0
89957	18 G 0.5	20	11.9	145.0	227.0
89958	25 G 0.5	20	14.4	220.0	307.0
89959	3 G 1	18	7.4	60.0	84.0
89960	4 G 1	18	7.9	71.0	95.0
89961	5 G 1	18	8.6	88.0	113.0
89962	7 G 1	18	9.9	111.0	157.0
89963	9 G 1	18	11.4	138.0	219.0
89964	12 G 1	18	12.1	184.0	242.0
89965	15 G 1	18	13.7	202.0	337.0
89966	18 G 1	18	14.3	260.0	380.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
89967	25 G 1	18	17.4	349.0	475.0
89968	34 G 1	18	19.6	434.0	648.0
89969	3 G 1.5	16	8.0	80.0	106.0
89970	4 G 1.5	16	8.7	97.0	129.0
89971	5 G 1.5	16	9.4	119.0	159.0
89972	7 G 1.5	16	11.1	147.0	213.0
89973	9 G 1.5	16	12.8	189.0	254.0
89974	12 G 1.5	16	13.7	267.0	330.0
89975	18 G 1.5	16	16.2	374.0	504.0
89976	25 G 1.5	16	19.9	526.0	679.0
89977	34 G 1.5	16	22.1	638.0	870.0
89984	3 G 2.5	14	9.3	129.0	167.0
89978	4 G 2.5	14	10.3	148.0	186.0
89985	5 G 2.5	14	11.2	181.0	233.0
89979	7 G 2.5	14	13.7	255.0	344.0
89986	12 G 2.5	14	16.6	368.0	545.0
89980	18 G 2.5	14	19.8	570.0	681.0

HELUCHAIN® JZ-602-HF-C PVC UL/CSA

EMC-preferred type

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
89987	3 G 4	12	10.8	174.0	218.0
89981	4 G 4	12	12.0	230.0	275.0
89988	5 G 4	12	13.2	273.0	368.0
89982	7 G 4	12	15.9	316.0	477.0
89983	4 G 6	10	13.8	305.0	417.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
89989	4 G 10	8	17.6	490.0	703.0
89990	4 G 16	6	20.6	740.0	1052.0
89991	4 G 25	4	25.6	1140.0	1487.0
89992	4 G 35	2	31.7	1576.0	2177.0

HELUCHAIN® MULTISPEED® 520-PVC UL/CSA

for high mechanical stress, oil resistant

TECHNICAL DATA

PVC drag chain cable acc. to UL-Std. 758 (AWM) Style 21179, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-51 / DIN EN 50525-2-51

Temperature range	flexible -5°C to +80°C fixed -30°C to +80°C
Nominal voltage	AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Minimum bending radius	flexible 6.8x Outer-Ø fixed 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores,
  G = with protective conductor GN-YE,
  x = without protective conductor
- Stranding:
  2 - 5 core(s): cores stranded into one layer with an optimally matched short lay length
  7 - 42 core(s): cores stranded into bundles/pairs with optimally matched, short lay lengths; bundles/pairs stranded together around a tensile core
- Ripcord
- Outer sheath: PVC, extruded filler
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone
- low adhesion
- longer service life due to low frictional resistance of the PP-insulated cores
- for outdoor use
- suitable for use in drag chains
- Drag chain parameters
  Acceleration (max.): 50 m/s²
  Velocity (max.), gliding: 5 m/s
  Traverse path (max.): 100 m
- highly restistant to alternate bending strength
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

This UL/CSA approved cable is used when high demands are placed on the cable. Designed for export-oriented mechanical engineers, specifically in the USA and Canada. Gearing to the needs of the industry, materials and stranding techniques permit continuous use as highly flexible drag chain cables with long travelling distance capabilities at high or low speeds. For installation in dry and damp rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, these highly flexible PVC drag chain cables are suitable for frequent lifting and bending stress in machine and tool construction.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001528	2 x 0.5	21	5.5	9.6	37.0
11001529	3 G 0.5	21	5.7	14.4	42.0
11001530	4 G 0.5	21	6.1	19.2	49.0
11001531	5 G 0.5	21	6.6	24.0	59.0
11001532	7 G 0.5	21	8.8	33.6	90.0
11001533	12 G 0.5	21	10.2	57.6	132.0
11001534	16 G 0.5	21	11.3	76.8	166.0
11001535	18 G 0.5	21	12.1	86.4	183.0
11001536	20 G 0.5	21	12.4	96.0	198.0
11001537	25 G 0.5	21	13.6	120.0	242.0
11001538	36 G 0.5	21	16.9	172.8	353.0
11001539	42 G 0.5	21	18.6	201.6	417.0
11001540	2 x 0.75	19	5.9	14.4	44.0
11001541	3 G 0.75	19	6.2	21.6	52.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001542	4 G 0.75	19	6.6	28.8	62.0
11001543	5 G 0.75	19	7.2	36.0	75.0
11001544	7 G 0.75	19	9.6	50.4	119.0
11001545	12 G 0.75	19	11.1	86.4	171.0
11001546	16 G 0.75	19	12.4	115.2	215.0
11001547	18 G 0.75	19	13.3	129.6	239.0
11001548	20 G 0.75	19	13.7	144.0	268.0
11001549	25 G 0.75	19	15.1	180.0	323.0
11001550	36 G 0.75	19	19.2	259.2	482.0
11001551	42 G 0.75	19	20.8	302.4	561.0
11001552	2 x 1	18	6.3	19.2	53.0
11001553	3 G 1	18	6.6	28.8	63.0
11001554	4 G 1	18	7.1	38.4	76.0
11001555	5 G 1	18	7.7	48.0	91.0

HELUCHAIN® MULTISPEED® 520-PVC UL/CSA

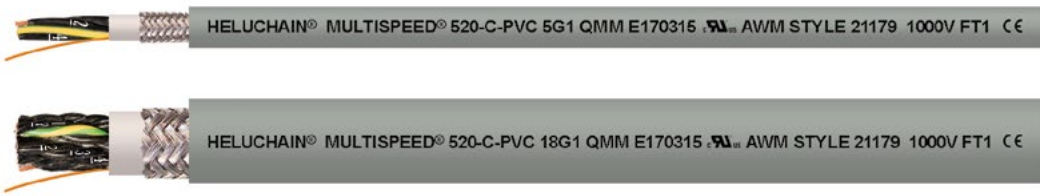
for high mechanical stress, oil resistant

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001556	7 G 1	18	10.4	67.2	143.0
11001557	12 G 1	18	12.2	115.2	210.0
11001558	16 G 1	18	13.6	153.6	275.0
11001559	18 G 1	18	14.8	172.8	309.0
11001560	20 G 1	18	15.2	192.0	338.0
11001561	25 G 1	18	17.0	240.0	416.0
11001562	36 G 1	18	21.4	345.6	622.0
11001563	42 G 1	18	23.5	403.2	739.0
11001564	2 x 1.5	16	6.9	28.8	67.0
11001565	3 G 1.5	16	7.3	43.2	82.0
11001566	4 G 1.5	16	7.9	57.6	101.0
11001567	5 G 1.5	16	8.6	72.0	121.0
11001568	7 G 1.5	16	11.7	100.8	190.0
11001569	12 G 1.5	16	13.7	172.8	290.0
11001570	16 G 1.5	16	15.6	230.4	385.0
11001571	18 G 1.5	16	17.0	259.2	420.0
11001572	20 G 1.5	16	17.6	288.0	470.0
11001573	25 G 1.5	16	19.7	360.0	586.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001574	36 G 1.5	16	24.7	518.4	874.0
11001575	42 G 1.5	16	27.1	604.8	1020.0
11001576	2 x 2.5	14	7.9	48.0	95.0
11001577	3 G 2.5	14	8.4	72.0	119.0
11001578	4 G 2.5	14	9.1	96.0	147.0
11001579	5 G 2.5	14	10.0	120.0	179.0
11001580	7 G 2.5	14	13.8	168.0	296.0
11001581	12 G 2.5	14	16.7	288.0	440.0
11001582	16 G 2.5	14	18.9	384.0	581.0
11001583	18 G 2.5	14	20.6	432.0	652.0
11001584	20 G 2.5	14	21.2	480.0	723.0
11001585	25 G 2.5	14	23.8	600.0	896.0
11001586	3 G 4	12	9.7	115.2	173.0
11001587	4 G 4	12	10.6	153.6	218.0
11001588	5 G 4	12	11.6	192.0	265.0
11001589	3 G 6	10	11.0	172.8	239.0
11001590	4 G 6	10	12.1	230.4	305.0
11001591	5 G 6	10	13.3	288.0	373.0

HELUCHAIN® MULTISPEED® 520-C-PVC UL/CSA

for high mechanical stress, oil resistant



TECHNICAL DATA

PVC drag chain cable acc. to UL-Std. 758 (AWM) Style 21179, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-51 / DIN EN 50525-2-51

Temperature range	flexible -5°C to +80°C fixed -30°C to +80°C
Nominal voltage	AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Test voltage core/screen	3000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 6.8x Outer-Ø fixed 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores,
  G = with protective conductor GN-YE,
  x = without protective conductor
- Stranding:
  2 - 5 core(s): cores stranded into one layer with an optimally matched short lay length
  7 - 42 core(s): cores stranded into bundles/pairs with optimally matched, short lay lengths; bundles/pairs stranded together around a tensile core
- Ripcord
- Inner sheath: TPE, extruded filler
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: PVC
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone
- low adhesion
- longer service life due to low frictional resistance of the PP-insulated cores
- for outdoor use
- suitable for use in drag chains
- Drag chain parameters
  Acceleration (max.): 50 m/s²
  Velocity (max.), gliding: 5 m/s
  Traverse path (max.): 100 m
- highly restistant to alternate bending strength
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

This UL/CSA approved cable is used when high demands are placed on the cable. Designed for export-oriented mechanical engineers, specifically in the USA and Canada. Gearing to the needs of the industry, materials and stranding techniques permit continuous use as highly flexible drag chain cables with long travelling distance capabilities at high or low speeds. For installation in dry and damp rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, these highly flexible PVC drag chain cables are suitable for frequent lifting and bending stress in machine and tool construction. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001602	2 x 0.5	21	7.2	28.5	73.0
11001603	3 G 0.5	21	7.4	33.1	78.0
11001604	4 G 0.5	21	7.8	40.8	89.0
11001605	5 G 0.5	21	8.3	48.0	103.0
11001606	7 G 0.5	21	10.8	73.6	160.0
11001607	12 G 0.5	21	12.4	103.4	216.0
11001608	16 G 0.5	21	13.5	128.0	258.0
11001609	18 G 0.5	21	14.5	138.0	285.0
11001610	20 G 0.5	21	14.8	149.0	302.0
11001611	25 G 0.5	21	16.4	182.6	367.0
11001612	36 G 0.5	21	19.9	250.4	522.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001613	42 G 0.5	21	22.0	309.5	637.0
11001614	2 x 0.75	19	7.6	36.2	85.0
11001615	3 G 0.75	19	7.9	43.4	93.0
11001616	4 G 0.75	19	8.3	52.8	106.0
11001617	5 G 0.75	19	8.9	62.7	123.0
11001618	7 G 0.75	19	11.6	90.8	186.0
11001619	12 G 0.75	19	13.3	137.8	261.0
11001620	16 G 0.75	19	14.8	172.4	323.0
11001621	18 G 0.75	19	16.1	187.2	358.0
11001622	20 G 0.75	19	16.5	206.8	386.0
11001623	25 G 0.75	19	18.1	248.8	465.0

HELUCHAIN® MULTISPEED® 520-C-PVC UL/CSA

for high mechanical stress, oil resistant

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001624	36 G 0.75	19	22.4	366.7	690.0
11001625	42 G 0.75	19	24.4	425.1	818.0
11001626	2 x 1	18	8.0	41.2	94.0
11001627	3 G 1	18	8.3	53.5	107.0
11001628	4 G 1	18	8.8	62.8	122.0
11001629	5 G 1	18	9.7	81.9	152.0
11001630	7 G 1	18	12.6	113.5	225.0
11001631	12 G 1	18	14.6	167.0	315.0
11001632	16 G 1	18	16.4	217.0	398.0
11001633	18 G 1	18	17.6	236.3	438.0
11001634	20 G 1	18	18.0	260.0	472.0
11001635	25 G 1	18	20.0	314.9	584.0
11001636	36 G 1	18	24.8	472.3	872.0
11001637	42 G 1	18	27.3	541.0	1035.0
11001638	2 x 1.5	16	8.6	53.4	112.0
11001639	3 G 1.5	16	9.0	68.1	129.0
11001640	4 G 1.5	16	9.9	92.0	163.0
11001641	5 G 1.5	16	10.6	111.5	190.0
11001642	7 G 1.5	16	13.9	152.9	282.0
11001643	12 G 1.5	16	16.5	235.6	414.0
11001644	16 G 1.5	16	18.6	299.7	527.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001645	18 G 1.5	16	20.0	337.0	587.0
11001646	20 G 1.5	16	20.4	366.7	634.0
11001647	25 G 1.5	16	23.1	483.1	823.0
11001648	36 G 1.5	16	28.5	656.9	1185.0
11001649	42 G 1.5	16	31.3	758.4	1383.0
11001650	2 x 2.5	14	9.9	82.4	156.0
11001651	3 G 2.5	14	10.4	106.8	182.0
11001652	4 G 2.5	14	11.1	135.9	219.0
11001653	5 G 2.5	14	12.0	165.5	259.0
11001654	7 G 2.5	14	16.6	230.4	403.0
11001655	12 G 2.5	14	19.7	363.7	607.0
11001656	16 G 2.5	14	22.5	491.7	809.0
11001657	18 G 2.5	14	24.2	554.9	904.0
11001658	20 G 2.5	14	24.6	602.2	968.0
11001659	25 G 2.5	14	27.6	737.8	1197.0
11001660	3 G 4	12	11.7	155.8	247.0
11001661	4 G 4	12	12.8	199.6	306.0
11001662	5 G 4	12	13.8	243.9	362.0
11001663	3 G 6	10	13.2	224.0	332.0
11001664	4 G 6	10	14.5	282.0	411.0
11001665	5 G 6	10	16.1	345.6	494.0

PURö-JZ-HF / PURö-J-HF / PURö-OZ-HF

oil-resistant PVC core insulation

TECHNICAL DATA

PUR drag chain cable in alignment with DIN VDE 0285-525-1 / DIN EN 50525-1

Temperature range	flexible -20°C to +80°C fixed -40°C to +80°C
Nominal voltage	AC U_0/U 300/500 V
Test voltage core/core	4000 V
Breakdown voltage	8000 V
Minimum bending radius	flexible 7.5x Outer-Ø fixed 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: oil-resistant PVC in alignment with DIN VDE 0207-363-3 / DIN EN 50363-3 (compound type TI2)
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- G = with protective conductor GN-YE, in the outer layer, x = without protective conductor (OZ)
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping
- Outer sheath: Special grade of full polyurethane acc. to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TMPU)
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater
- highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- for outdoor use
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2
- certifications and approvals:
  EAC

APPLICATION

Extremely robust drag chain cable, which is distinguished by its high abrasion resistance and notch-tensile strength properties. Due to its resistance to mineral oils, notably against coolant emulsions, it is suited for use in particularly critical locations in machine, tool and plant construction, rolling mills and steelworks. Due to its high abrasion resistance and small bending radius, it is ideally suited for use in drag chain systems.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
15520	2 x 0.5	20	4.9	9.6	45.0
15521	3 G 0.5	20	5.2	14.4	56.0
15522	4 G 0.5	20	5.6	19.1	69.0
15523	5 G 0.5	20	6.3	24.0	92.0
15524	7 G 0.5	20	7.6	33.6	126.0
16161	7 x 0.5	20	7.6	33.6	126.0
15525	8 G 0.5	20	8.2	38.0	136.0
15526	10 G 0.5	20	9.3	48.0	158.0
15527	12 G 0.5	20	9.3	58.0	176.0
15528	14 G 0.5	20	9.7	67.0	212.0
15529	18 G 0.5	20	11.0	86.4	283.0
15530	21 G 0.5	20	12.3	96.0	310.0
15531	25 G 0.5	20	13.6	120.0	330.0
15532	30 G 0.5	20	13.8	144.0	390.0
15533	34 G 0.5	20	15.1	163.0	420.0
15534	42 G 0.5	20	16.4	202.0	500.0
15535	50 G 0.5	20	17.9	240.0	580.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
15538	2 x 0.75	19	5.4	14.4	57.0
15539	3 G 0.75	19	5.7	21.6	72.0
15540	4 G 0.75	19	6.5	29.0	97.0
15541	5 G 0.75	19	7.0	36.0	119.0
15542	7 G 0.75	19	8.4	50.0	165.0
15543	8 G 0.75	19	9.3	58.0	189.0
15544	10 G 0.75	19	10.5	72.0	214.0
15545	12 G 0.75	19	10.5	86.0	247.0
15546	14 G 0.75	19	11.1	101.0	283.0
15547	18 G 0.75	19	12.4	130.0	356.0
15548	21 G 0.75	19	13.9	151.0	502.0
15549	25 G 0.75	19	15.3	180.0	698.0
15550	30 G 0.75	19	15.7	216.0	720.0
15551	34 G 0.75	19	17.0	245.0	770.0
15552	42 G 0.75	19	18.5	302.0	840.0
15553	50 G 0.75	19	20.3	360.0	990.0
15556	2 x 1	18	5.7	19.2	64.0

PURö-JZ-HF / PURö-J-HF / PURö-OZ-HF

oil-resistant PVC core insulation

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
15557	3 G 1	18	6.3	29.0	83.0
15558	4 G 1	18	6.8	38.5	113.0
15559	5 G 1	18	7.6	48.0	137.0
15560	7 G 1	18	9.2	67.0	191.0
15561	8 G 1	18	9.8	77.0	218.0
15562	10 G 1	18	11.2	96.0	251.0
15563	12 G 1	18	11.2	115.0	294.0
15564	14 G 1	18	11.9	134.0	337.0
15565	18 G 1	18	13.4	173.0	420.0
15566	21 G 1	18	14.9	196.0	504.0
15567	25 G 1	18	16.5	240.0	600.0
15568	32 G 1	18	17.6	308.0	732.0
15569	34 G 1	18	18.3	326.0	776.0
15570	41 G 1	18	19.8	394.0	925.0
15571	42 G 1	18	19.8	403.0	949.0
15572	50 G 1	18	21.7	480.0	1092.0
15573	65 G 1	18	24.9	624.0	1400.0
15575	2 x 1.5	16	6.5	29.0	90.0
15576	3 G 1.5	16	6.9	43.0	117.0
15577	4 G 1.5	16	7.7	58.0	147.0
15578	5 G 1.5	16	8.5	72.0	181.0
15579	7 G 1.5	16	10.4	101.0	274.0
15580	8 G 1.5	16	11.1	115.0	313.0
15581	10 G 1.5	16	12.6	144.0	344.0
15582	12 G 1.5	16	12.6	173.0	391.0
15583	14 G 1.5	16	13.4	202.0	457.0
15584	18 G 1.5	16	15.1	259.0	589.0
15585	21 G 1.5	16	16.8	302.0	680.0
15586	25 G 1.5	16	18.6	360.0	801.0
15587	30 G 1.5	16	19.1	410.0	938.0
15588	34 G 1.5	16	20.8	490.0	1048.0
15589	42 G 1.5	16	22.5	605.0	1290.0
15590	50 G 1.5	16	24.8	720.0	1520.0
15591	61 G 1.5	16	27.3	889.0	1850.0
15592	65 G 1.5	16	28.2	940.0	1970.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
15620	2 x 2.5	14	7.9	48.0	128.0
15621	3 G 2.5	14	8.4	72.0	160.0
15622	4 G 2.5	14	9.4	96.0	200.0
15623	5 G 2.5	14	10.5	120.0	268.0
15624	7 G 2.5	14	12.6	168.0	357.0
15625	12 G 2.5	14	15.5	288.0	571.0
15626	14 G 2.5	14	16.5	336.0	612.0
15627	18 G 2.5	14	18.5	432.0	800.0
15628	25 G 2.5	14	23.0	600.0	1100.0
15630	2 x 4	12	9.3	77.0	190.0
15631	3 G 4	12	9.9	115.0	250.0
15632	4 G 4	12	11.1	154.0	320.0
15633	5 G 4	12	12.3	192.0	400.0
15634	7 G 4	12	15.0	269.0	550.0
15653	1 G 6	10	6.0	58.0	81.0
15636	3 G 6	10	12.0	173.0	350.0
15637	4 G 6	10	13.4	230.0	500.0
15638	5 G 6	10	14.9	288.0	580.0
15639	7 G 6	10	18.1	403.0	800.0
15654	1 G 10	8	7.5	96.0	152.0
15641	3 G 10	8	15.3	288.0	660.0
15642	4 G 10	8	17.0	384.0	750.0
15643	5 G 10	8	19.1	480.0	990.0
15644	7 G 10	8	23.0	672.0	1300.0
15655	1 G 16	6	8.5	154.0	215.0
15645	4 G 16	6	19.8	614.0	1200.0
15646	5 G 16	6	22.2	768.0	1500.0
15647	7 G 16	6	27.0	1075.0	1900.0
15656	1 G 25	4	10.4	240.0	320.0
15648	4 G 25	4	24.1	960.0	1700.0
15649	4 G 35	2	30.2	1344.0	2300.0
15650	4 G 50	1	34.2	1920.0	2500.0
15651	4 G 70	2/0	38.5	2688.0	4600.0
15652	4 G 95	3/0	44.9	3648.0	6400.0

PURö-JZ-HF-YCP / PURö-OZ-HF-YCP

oil-resistant PVC core insulation, with inner sheath, EMC-preferred type

TECHNICAL DATA

PUR drag chain cable in alignment with DIN VDE 0285-525-1 / DIN EN 50525-1

Temperature range	flexible -20°C to +80°C fixed -40°C to +80°C
Nominal voltage	AC U_o/U 300/500 V
Test voltage core/core	4000 V
Breakdown voltage	8000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 10x Outer-Ø fixed 5x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: oil-resistant PVC in alignment with DIN VDE 0207-363-3 / DIN EN 50363-3 (compound type TI2)
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores, G = with protective conductor GN-YE, in the outer layer, x = without protective conductor (OZ)
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping
- Inner sheath: PVC
- Screen: braided screen of tinned copper, approx. coverage 85%
- Fleece wrapping
- Outer sheath: Special grade of full polyurethane acc. to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TMPU)
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater
- highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- for outdoor use
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2

APPLICATION

Extremely robust drag chain cable, which is distinguished by its high abrasion resistance and notch-tensile strength properties. Due to its resistance to mineral oils, notably against coolant emulsions, it is suited for use in particularly critical locations in machine, tool and plant construction, rolling mills and steelworks. Due to its high abrasion resistance and small bending radius, it is ideally suited for use in drag chain systems. These screened cables are ideally suited for interference-free data signal transmission in measurement and control technology. EMC = Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
22400	2 x 0.5	20	6.9	30.0	90.0
22401	3 G 0.5	20	7.2	38.0	104.0
22402	4 G 0.5	20	7.8	48.0	123.0
22403	5 G 0.5	20	8.3	65.0	131.0
22404	7 G 0.5	20	9.6	70.0	172.0
22405	8 G 0.5	20	10.5	81.0	195.0
22406	10 G 0.5	20	11.5	94.0	230.0
22407	12 G 0.5	20	11.5	110.0	250.0
22408	14 G 0.5	20	12.1	135.0	280.0
22409	18 G 0.5	20	13.6	157.0	321.0
22410	21 G 0.5	20	15.0	175.0	380.0
22411	25 G 0.5	20	16.3	240.0	445.0
22412	30 G 0.5	20	16.6	275.0	509.0
22413	34 G 0.5	20	18.1	305.0	560.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
22414	42 G 0.5	20	19.5	330.0	780.0
22415	50 G 0.5	20	21.3	393.0	960.0
22416	61 G 0.5	20	23.5	541.0	1050.0
22417	2 x 0.75	19	7.6	39.0	106.0
22418	3 G 0.75	19	7.9	49.0	120.0
22419	4 G 0.75	19	8.5	60.0	150.0
22420	5 G 0.75	19	9.2	70.0	158.0
22421	7 G 0.75	19	10.8	95.0	205.0
22422	8 G 0.75	19	11.5	104.0	272.0
22423	10 G 0.75	19	12.7	110.0	290.0
22424	12 G 0.75	19	12.7	141.0	304.0
22425	14 G 0.75	19	13.9	163.0	380.0
22426	18 G 0.75	19	15.2	211.0	418.0
22427	21 G 0.75	19	16.7	274.0	485.0

PURö-JZ-HF-YCP / PURö-OZ-HF-YCP

oil-resistant PVC core insulation, with inner sheath, EMC-preferred type

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
22428	25 G 0.75	19	18.3	322.0	578.0
22429	30 G 0.75	19	18.7	414.0	630.0
22430	34 G 0.75	19	20.6	473.0	720.0
22431	42 G 0.75	19	22.1	583.0	780.0
22432	50 G 0.75	19	24.1	626.0	954.0
22433	61 G 0.75	19	26.4	763.0	1085.0
22434	2 x 1	18	7.9	50.0	116.0
22435	3 G 1	18	8.3	60.0	135.0
22436	4 G 1	18	9.0	73.0	178.0
22437	5 G 1	18	9.6	81.0	188.0
22438	7 G 1	18	11.3	114.0	235.0
22439	8 G 1	18	12.2	130.0	270.0
22440	10 G 1	18	14.0	178.0	340.0
22441	12 G 1	18	14.0	186.0	358.0
22442	14 G 1	18	14.7	231.0	415.0
22443	18 G 1	18	16.2	254.0	500.0
22444	21 G 1	18	17.9	328.0	525.0
22445	25 G 1	18	19.6	378.0	678.0
22446	32 G 1	18	21.0	450.0	777.0
22447	34 G 1	18	21.7	478.0	825.0
22448	41 G 1	18	23.6	576.0	980.0
22449	42 G 1	18	23.6	590.0	998.0
22450	50 G 1	18	25.7	702.0	1160.0
22451	65 G 1	18	28.9	913.0	1670.0
22452	2 x 1.5	16	8.5	64.0	141.0
22453	3 G 1.5	16	9.1	84.0	164.0
22454	4 G 1.5	16	9.7	99.0	220.0
22455	5 G 1.5	16	10.9	120.0	233.0
22456	7 G 1.5	16	12.5	148.0	323.0
22457	8 G 1.5	16	13.9	191.0	369.0
22458	10 G 1.5	16	15.4	240.0	461.0
22459	12 G 1.5	16	15.4	274.0	481.0
22460	14 G 1.5	16	16.2	340.0	561.0
22461	18 G 1.5	16	18.1	395.0	672.0
22462	21 G 1.5	16	20.2	461.0	780.0
22463	25 G 1.5	16	22.1	533.0	927.0
22464	30 G 1.5	16	22.5	608.0	1030.0
22465	34 G 1.5	16	24.4	702.0	1180.0
22466	42 G 1.5	16	26.5	867.0	1458.0
22467	50 G 1.5	16	28.8	1033.0	1857.0
22468	61 G 1.5	16	31.6	1233.0	2250.0
22469	65 G 1.5	16	32.6	1315.0	2401.0
22470	2 x 2.5	14	9.9	96.0	185.0
22471	3 G 2.5	14	10.8	150.0	278.0
22472	4 G 2.5	14	11.8	159.0	370.0
22473	5 G 2.5	14	12.7	195.0	412.0
22474	7 G 2.5	14	15.3	240.0	470.0
22475	12 G 2.5	14	18.5	390.0	738.0
22476	14 G 2.5	14	19.7	480.0	870.0
22477	18 G 2.5	14	22.1	620.0	1100.0
22478	25 G 2.5	14	27.1	821.0	1512.0
22479	2 x 4	12	11.5	135.0	235.0
22480	3 G 4	12	12.3	178.0	350.0
22481	4 G 4	12	13.9	222.0	460.0
22482	5 G 4	12	15.1	328.0	550.0
22483	7 G 4	12	18.0	360.0	700.0
22484	3 G 6	10	15.2	250.0	525.0
22485	4 G 6	10	16.6	305.0	700.0
22486	5 G 6	10	18.3	441.0	800.0
22487	7 G 6	10	22.2	505.0	1100.0
22488	3 G 10	8	18.7	370.0	855.0
22489	4 G 10	8	21.0	485.0	1140.0
22490	5 G 10	8	22.8	610.0	1310.0
22491	7 G 10	8	28.4	820.0	1630.0
22492	4 G 16	6	24.0	840.0	1391.0
22493	5 G 16	6	26.6	1050.0	1810.0
22494	7 G 16	6	32.3	1510.0	2166.0

HELUCHAIN® MULTIFLEX 512®-PUR UL/CSA

for extreme mechanical stress

TECHNICAL DATA

PUR drag chain cable acc. to UL-Std. 758 (AWM) Style 21209, CSA-Std. C22.2 No. 210 - AWM I/II A/B

Temperature range	flexible -30°C to +90°C fixed -40°C to +90°C
Permissible operating temperature of the conductor	+90°C
Nominal voltage	UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Minimum bending radius	flexible 5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: Special-PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores, G = with protective conductor GN-YE, in the outer layer, x = without protective conductor
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping over each stranding layer, from 4 mm² without fleece wrapping
- Outer sheath: Special grade of full polyurethane acc. to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TMPU), UL-Std. 758 (AWM) Style 21209
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater
- highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- for outdoor use
- suitable for use in drag chains
- halogen-free
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- halogen-free acc. to DIN VDE 0482-754-1 / DIN EN 60754-1 / IEC 60754-1
- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2
- Alternate bending test: tested on approx. 10 million cycles
- certifications and approvals: EAC

APPLICATION

Industrial application: UL/CSA approved drag chain cable for use in machine and tool manufacturing, in robotics and in other constantly moving machine parts; for permanently flexible applications moving freely without tensile stress and without movement control in dry, damp and wet rooms as well as outdoors. A slippery PP core insulation, cut-resistance and a low-adhesion PUR outer sheath guarantee an optimum durability and excellent cost-efficiency.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
21559	2 x 0.5	20	6.1	10.8	38.0
21560	3 G 0.5	20	6.4	16.1	46.0
21561	4 G 0.5	20	6.9	21.5	59.0
21562	5 G 0.5	20	7.4	27.0	68.0
21563	7 G 0.5	20	8.5	37.6	88.0
21564	12 G 0.5	20	9.9	64.5	131.0
21565	18 G 0.5	20	11.4	97.0	197.0
21566	20 G 0.5	20	12.0	107.5	260.0
21567	25 G 0.5	20	13.6	134.5	282.0
21568	30 G 0.5	20	13.9	161.3	315.0
21569	36 G 0.5	20	15.1	193.5	374.0
21570	2 x 0.75	19	6.8	14.4	47.0
21571	3 G 0.75	19	7.2	21.6	58.0
21572	4 G 0.75	19	7.7	29.0	69.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
21573	5 G 0.75	19	8.3	36.0	85.0
21574	7 G 0.75	19	9.6	50.0	118.0
21575	12 G 0.75	19	11.4	86.0	183.0
21576	18 G 0.75	19	13.2	130.0	270.0
21577	20 G 0.75	19	13.8	144.0	290.0
21523	21 G 0.75	19	14.7	151.0	302.0
21578	25 G 0.75	19	16.3	180.0	374.0
21579	30 G 0.75	19	16.5	216.0	420.0
21580	36 G 0.75	19	18.0	259.0	498.0
21581	2 x 1	18	7.1	19.2	55.0
21582	3 G 1	18	7.5	29.0	70.0
21583	4 G 1	18	8.1	38.0	86.0
21584	5 G 1	18	8.7	48.0	102.0
21585	7 G 1	18	10.2	67.0	143.0

HELUCHAIN® MULTIFLEX 512®-PUR UL/CSA

for extreme mechanical stress

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
21586	12 G 1	18	12.0	115.0	225.0
21587	18 G 1	18	13.9	173.0	334.0
21588	20 G 1	18	14.9	192.0	370.0
21589	25 G 1	18	17.2	240.0	460.0
21590	30 G 1	18	17.7	288.0	530.0
21591	36 G 1	18	19.2	346.0	625.0
21592	41 G 1	18	20.9	410.0	779.0
21593	50 G 1	18	22.8	498.0	953.0
21594	65 G 1	18	26.0	650.0	1205.0
21595	2 x 1.5	16	7.9	29.0	70.0
21596	3 G 1.5	16	8.4	43.0	90.0
21597	4 G 1.5	16	9.1	58.0	106.0
21598	5 G 1.5	16	9.8	72.0	145.0
21599	7 G 1.5	16	11.5	101.0	205.0
21600	12 G 1.5	16	13.7	173.0	320.0
21601	18 G 1.5	16	16.4	259.0	465.0
21602	20 G 1.5	16	17.2	288.0	510.0
21603	25 G 1.5	16	20.2	360.0	650.0
21604	30 G 1.5	16	20.7	432.0	750.0
21605	36 G 1.5	16	22.5	518.0	880.0
21606	42 G 1.5	16	24.4	628.0	1209.0
21607	50 G 1.5	16	26.8	749.0	1449.0
21608	61 G 1.5	16	29.6	912.0	1712.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
21609	2 x 2.5	14	8.7	48.0	115.0
21610	3 G 2.5	14	9.2	72.0	162.0
21611	4 G 2.5	14	10.0	96.0	196.0
21612	5 G 2.5	14	10.9	120.0	230.0
21613	7 G 2.5	14	12.9	168.0	312.0
21614	12 G 2.5	14	15.5	288.0	532.0
21615	18 G 2.5	14	18.6	432.0	762.0
21616	20 G 2.5	14	19.8	480.0	858.0
21617	25 G 2.5	14	23.1	600.0	998.0
21618	4 G 4	12	11.4	154.0	283.0
21619	5 G 4	12	12.5	192.0	349.0
21620	7 G 4	12	15.0	269.0	498.0
11017371	3 G 6	10	11.7	173.0	350.0
21621	4 G 6	10	12.9	230.0	432.0
21622	5 G 6	10	14.1	288.0	529.0
21623	7 G 6	10	17.2	403.0	782.0
21624	4 G 10	8	16.7	384.0	685.0
21625	5 G 10	8	18.6	480.0	817.0
21626	7 G 10	8	22.8	672.0	1023.0
11017372	3 G 16	6	17.6	461.0	792.0
21627	4 G 16	6	19.6	614.0	1042.0
21628	5 G 16	6	21.9	768.0	1292.0
21629	7 G 16	6	26.8	1075.0	1709.0

HELUCHAIN® MULTIFLEX 512®-C-PUR UL/CSA

EMC-preferred type, for extreme mechanical stress

TECHNICAL DATA

PUR drag chain cable acc. to UL-Std. 758 (AWM) Style 21209, CSA-Std. C22.2 No. 210 - AWM I/II A/B

Temperature range	flexible -30°C to +90°C fixed -40°C to +90°C
Permissible operating temperature of the conductor	+90°C
Nominal voltage	UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 7.5x Outer-Ø fixed 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: Special-PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores, G = with protective conductor GN-YE, in the outer layer, x = without protective conductor
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping over each stranding layer, from 4 mm² without fleece wrapping
- Inner sheath: TPE
- Fleece wrapping
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Fleece wrapping
- Outer sheath: Special grade of full polyurethane acc. to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TMPU), UL-Std. 758 (AWM) Style 21209
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater
- highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- for outdoor use
- suitable for use in drag chains
- halogen-free
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- halogen-free acc. to DIN VDE 0482-754-1 / DIN EN 60754-1 / IEC 60754-1
- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2
- Alternate bending test: tested on approx. 10 million cycles
- certifications and approvals: EAC

APPLICATION

Industrial application: UL/CSA approved drag chain cable for use in machine and tool manufacturing, in robotics and in other constantly moving machine parts; for permanently flexible applications moving freely without tensile stress and without movement control in dry, damp and wet rooms as well as outdoors. A slippery PP core insulation, cut-resistance and a low-adhesion PUR outer sheath guarantee an optimum durability and excellent cost-efficiency. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
21630	2 x 0.5	20	8.0	30.0	90.0
21631	3 G 0.5	20	8.3	38.0	105.0
21632	4 G 0.5	20	8.8	50.0	124.0
21633	5 G 0.5	20	9.3	65.0	132.0
21634	7 G 0.5	20	10.4	70.0	175.0
21635	12 G 0.5	20	12.0	100.0	250.0
21636	18 G 0.5	20	13.9	157.0	325.0
21637	20 G 0.5	20	14.7	167.0	350.0
21638	25 G 0.5	20	16.6	240.0	450.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
21639	30 G 0.5	20	17.0	273.0	510.0
21640	36 G 0.5	20	18.2	306.0	580.0
21641	2 x 0.75	19	8.7	39.0	110.0
21642	3 G 0.75	19	9.1	49.0	120.0
21643	4 G 0.75	19	9.6	60.0	148.0
21644	5 G 0.75	19	10.3	70.0	160.0
21645	7 G 0.75	19	11.8	95.0	205.0
21646	12 G 0.75	19	13.9	140.0	308.0
21647	18 G 0.75	19	15.9	220.0	420.0

HELUCHAIN® MULTIFLEX 512®-C-PUR UL/CSA

EMC-preferred type, for extreme mechanical stress

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
21648	20 G 0.75	19	16.8	249.0	450.0
21649	25 G 0.75	19	19.6	313.0	579.0
21650	30 G 0.75	19	19.8	470.0	630.0
21651	36 G 0.75	19	21.5	500.0	745.0
21652	2 x 1	18	9.0	50.0	120.0
21653	3 G 1	18	9.4	60.0	135.0
21654	4 G 1	18	10.0	73.0	173.0
21655	5 G 1	18	10.7	81.0	187.0
21656	7 G 1	18	12.3	114.0	240.0
21657	12 G 1	18	14.7	186.0	360.0
21658	18 G 1	18	17.1	254.0	498.0
21659	20 G 1	18	18.0	322.0	568.0
21660	25 G 1	18	20.9	377.0	670.0
21661	30 G 1	18	21.2	429.0	774.0
21662	36 G 1	18	22.8	516.0	895.0
21663	41 G 1	18	24.6	610.0	1032.0
21664	50 G 1	18	27.1	690.0	1160.0
21665	65 G 1	18	30.7	852.0	1660.0
21666	2 x 1.5	16	9.9	64.0	145.0
21667	3 G 1.5	16	10.3	84.0	168.0
21668	4 G 1.5	16	11.2	99.0	217.0
21669	5 G 1.5	16	12.0	129.0	235.0
21670	7 G 1.5	16	14.0	148.0	325.0
21671	12 G 1.5	16	16.6	279.0	481.0
21672	18 G 1.5	16	19.7	393.0	675.0
21673	25 G 1.5	16	24.1	584.0	927.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
21674	30 G 1.5	16	24.4	607.0	1025.0
21675	36 G 1.5	16	26.6	702.0	1210.0
21676	42 G 1.5	16	28.7	829.0	1441.0
21677	50 G 1.5	16	31.3	1025.0	1709.0
21678	61 G 1.5	16	34.3	1190.0	2025.0
21679	2 x 2.5	14	10.7	104.0	198.0
21680	3 G 2.5	14	11.3	140.0	284.0
21681	4 G 2.5	14	12.2	164.0	378.0
21682	5 G 2.5	14	13.1	190.0	423.0
21683	7 G 2.5	14	15.6	236.0	486.0
21684	12 G 2.5	14	18.6	390.0	756.0
21685	18 G 2.5	14	22.3	607.0	1127.0
21686	20 G 2.5	14	23.7	661.0	1210.0
21687	25 G 2.5	14	27.4	796.0	1530.0
21688	4 G 4	12	13.9	222.0	448.0
21689	5 G 4	12	15.2	328.0	533.0
21690	7 G 4	12	18.1	360.0	678.0
21691	4 G 6	10	15.6	305.0	636.0
21692	5 G 6	10	17.3	441.0	772.0
21693	7 G 6	10	20.9	505.0	1028.0
21694	4 G 10	8	20.0	485.0	1052.0
21695	5 G 10	8	22.3	610.0	1096.0
21696	7 G 10	8	27.1	820.0	1530.0
21697	4 G 16	6	23.1	840.0	1386.0
21698	5 G 16	6	25.9	1050.0	1759.0
21699	7 G 16	6	31.3	1510.0	2087.0

HELUCHAIN® MULTISPEED® 521-PUR UL/CSA

for increased mechanical stress, oil resistant

TECHNICAL DATA

PUR drag chain cable acc. to UL-Std. 758 (AWM) Style 21223, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-51 / DIN EN 50525-2-51

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
Nominal voltage	AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Minimum bending radius	flexible 6.8x Outer-Ø fixed 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores,
  G = with protective conductor GN-YE,
  x = without protective conductor
- Stranding:
  2 - 5 core(s): cores stranded into one layer with an optimally matched short lay length
  7 - 42 core(s): cores stranded into bundles/pairs with optimally matched, short lay lengths; bundles/pairs stranded together around a tensile core
- Outer sheath: PUR, extruded filler
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone
- low adhesion
- longer service life due to low frictional resistance of the PP-insulated cores
- for outdoor use
- suitable for use in drag chains
- Drag chain parameters
  Acceleration (max.): 50 m/s²
  Velocity (max.), gliding: 5 m/s
  Traverse path (max.): 450 m
- highly restistant to alternate bending strength
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

This UL/CSA approved cable is used when high demands are placed on the cable. Designed for export-oriented mechanical engineers, specifically in the USA and Canada. Gearing to the needs of the industry, materials and stranding techniques permit continuous use as highly flexible drag chain cables with long travelling distance capabilities at high or low speeds. For installation in dry and damp rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, these highly flexible PUR drag chain cables are suitable for frequent lifting and bending stress in machine and tool construction.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001676	2 x 0.5	21	5.5	9.6	38.0
11001677	3 G 0.5	21	5.7	14.4	43.0
11001678	4 G 0.5	21	6.1	19.2	51.0
11001679	5 G 0.5	21	6.6	24.0	61.0
11001680	7 G 0.5	21	8.8	33.6	94.0
11001681	12 G 0.5	21	10.2	57.6	137.0
11001682	16 G 0.5	21	11.3	76.8	172.0
11001683	18 G 0.5	21	12.1	86.4	190.0
11001684	20 G 0.5	21	12.4	96.0	205.0
11001685	25 G 0.5	21	13.6	120.0	251.0
11001686	36 G 0.5	21	16.9	172.8	366.0
11001687	42 G 0.5	21	18.6	201.6	432.0
11001688	2 x 0.75	19	5.9	14.4	46.0
11001689	3 G 0.75	19	6.2	21.6	54.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001690	4 G 0.75	19	6.6	28.8	64.0
11001691	5 G 0.75	19	7.2	36.0	77.0
11001692	7 G 0.75	19	9.6	50.4	123.0
11001693	12 G 0.75	19	11.1	86.4	177.0
11001694	16 G 0.75	19	12.4	115.2	223.0
11001695	18 G 0.75	19	13.3	129.6	248.0
11001696	20 G 0.75	19	13.7	144.0	278.0
11001697	25 G 0.75	19	15.1	180.0	335.0
11001698	36 G 0.75	19	19.2	259.2	499.0
11001699	42 G 0.75	19	20.8	302.4	582.0
11001700	2 x 1	18	6.3	19.2	55.0
11001701	3 G 1	18	6.6	28.8	65.0
11001702	4 G 1	18	7.1	38.4	79.0
11001703	5 G 1	18	7.7	48.0	95.0

HELUCHAIN® MULTISPEED® 521-PUR UL/CSA

for increased mechanical stress, oil resistant

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001704	7 G 1	18	10.4	67.2	148.0
11001705	12 G 1	18	12.2	115.2	217.0
11001706	16 G 1	18	13.6	153.6	285.0
11001707	18 G 1	18	14.8	172.8	321.0
11001708	20 G 1	18	15.2	192.0	350.0
11001709	25 G 1	18	17.0	240.0	432.0
11001710	36 G 1	18	21.4	345.6	645.0
11001711	42 G 1	18	23.5	403.2	766.0
11001712	2 x 1.5	16	6.9	28.8	69.0
11001713	3 G 1.5	16	7.3	43.2	85.0
11001714	4 G 1.5	16	7.9	57.6	105.0
11001715	5 G 1.5	16	8.6	72.0	126.0
11001716	7 G 1.5	16	11.7	100.8	197.0
11001717	12 G 1.5	16	13.7	172.8	301.0
11001718	16 G 1.5	16	15.6	230.4	399.0
11001719	18 G 1.5	16	17.0	259.2	435.0
11001720	20 G 1.5	16	17.6	288.0	487.0
11001721	25 G 1.5	16	19.7	360.0	607.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001722	36 G 1.5	16	24.7	518.4	906.0
11001723	42 G 1.5	16	27.1	604.8	1057.0
11001724	2 x 2.5	14	7.9	48.0	99.0
11001725	3 G 2.5	14	8.4	72.0	123.0
11001726	4 G 2.5	14	9.1	96.0	153.0
11001727	5 G 2.5	14	10.0	120.0	185.0
11001728	7 G 2.5	14	13.8	168.0	306.0
11001729	12 G 2.5	14	16.7	288.0	456.0
11001730	16 G 2.5	14	18.9	384.0	602.0
11001731	18 G 2.5	14	20.6	432.0	676.0
11001732	20 G 2.5	14	21.2	480.0	749.0
11001733	25 G 2.5	14	23.8	600.0	929.0
11001734	3 G 4	12	9.7	115.2	179.0
11001735	4 G 4	12	10.6	153.6	226.0
11001736	5 G 4	12	11.6	192.0	275.0
11001737	3 G 6	10	11.0	172.8	247.0
11001738	4 G 6	10	12.1	230.4	316.0
11001739	5 G 6	10	13.3	288.0	387.0

HELUCHAIN® MULTISPEED® 521-C-PUR UL/CSA

for increased mechanical stress, oil resistant

TECHNICAL DATA

PUR drag chain cable acc. to UL-Std. 758 (AWM) Style 21223, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-51 / DIN EN 50525-2-51

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
Nominal voltage	AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Test voltage core/screen	3000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 6.8x Outer-Ø fixed 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores,
  G = with protective conductor GN-YE,
  x = without protective conductor
- Stranding:
  2 - 5 core(s): cores stranded into one layer with an optimally matched short lay length
  7 - 42 core(s): cores stranded into bundles/pairs with optimally matched, short lay lengths; bundles/pairs stranded together around a tensile core
- Ripcord
- Inner sheath: TPE, extruded filler
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: PUR, extruded filler
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone
- low adhesion
- longer service life due to low frictional resistance of the PP-insulated cores
- for outdoor use
- suitable for use in drag chains
- Drag chain parameters
  Acceleration (max.): 50 m/s²
  Velocity (max.), gliding: 5 m/s
  Traverse path (max.): 450 m
- highly restistant to alternate bending strength
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

This UL/CSA approved cable is used when high demands are placed on the cable. Designed for export-oriented mechanical engineers, specifically in the USA and Canada. Gearing to the needs of the industry, materials and stranding techniques permit continuous use as highly flexible drag chain cables with long travelling distance capabilities at high or low speeds. For installation in dry and damp rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, these highly flexible PUR drag chain cables are suitable for frequent lifting and bending stress in machine and tool construction. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001750	2 x 0.5	21	7.2	28.5	70.0
11001751	3 G 0.5	21	7.4	33.1	75.0
11001752	4 G 0.5	21	7.8	40.8	85.0
11001753	5 G 0.5	21	8.3	48.0	98.0
11001754	7 G 0.5	21	10.8	73.6	153.0
11001755	12 G 0.5	21	12.4	103.4	207.0
11001756	16 G 0.5	21	13.5	128.0	247.0
11001757	18 G 0.5	21	14.5	138.0	273.0
11001758	20 G 0.5	21	14.8	149.0	290.0
11001759	25 G 0.5	21	16.4	182.6	352.0
11001760	36 G 0.5	21	19.9	250.4	500.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001761	42 G 0.5	21	22.0	309.5	611.0
11001762	2 x 0.75	19	7.6	36.2	81.0
11001763	3 G 0.75	19	7.9	43.4	89.0
11001764	4 G 0.75	19	8.3	52.8	101.0
11001765	5 G 0.75	19	8.9	62.7	118.0
11001766	7 G 0.75	19	11.6	90.8	179.0
11001767	12 G 0.75	19	13.3	137.8	251.0
11001768	16 G 0.75	19	14.8	172.4	310.0
11001769	18 G 0.75	19	16.1	187.2	343.0
11001770	20 G 0.75	19	16.5	206.8	370.0
11001771	25 G 0.75	19	18.1	248.8	446.0

HELUCHAIN® MULTISPEED® 521-C-PUR UL/CSA

for increased mechanical stress, oil resistant

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001772	36 G 0.75	19	22.4	366.7	662.0
11001773	42 G 0.75	19	24.4	425.1	784.0
11001774	2 x 1	18	8.0	41.2	90.0
11001775	3 G 1	18	8.3	53.5	103.0
11001776	4 G 1	18	8.8	62.8	117.0
11001777	5 G 1	18	9.7	81.9	146.0
11001778	7 G 1	18	12.6	113.5	216.0
11001779	12 G 1	18	14.6	167.0	303.0
11001780	16 G 1	18	16.4	217.0	382.0
11001781	18 G 1	18	17.6	236.3	420.0
11001782	20 G 1	18	18.0	260.0	453.0
11001783	25 G 1	18	20.0	314.9	560.0
11001784	36 G 1	18	24.8	472.3	837.0
11001785	42 G 1	18	27.3	541.0	993.0
11001786	2 x 1.5	16	8.6	53.4	107.0
11001787	3 G 1.5	16	9.0	68.1	124.0
11001788	4 G 1.5	16	9.9	92.0	157.0
11001789	5 G 1.5	16	10.6	111.5	183.0
11001790	7 G 1.5	16	13.9	152.9	271.0
11001791	12 G 1.5	16	16.5	235.6	397.0
11001792	16 G 1.5	16	18.6	299.7	506.0
11001793	18 G 1.5	16	20.0	337.0	563.0
11001794	20 G 1.5	16	20.4	366.7	608.0
11001795	25 G 1.5	16	23.1	483.1	790.0
11001796	36 G 1.5	16	28.5	656.9	1137.0
11001797	42 G 1.5	16	31.3	758.4	1326.0
11001798	2 x 2.5	14	9.9	82.4	150.0
11001799	3 G 2.5	14	10.4	106.8	175.0
11001800	4 G 2.5	14	11.1	135.9	210.0
11001801	5 G 2.5	14	12.0	165.5	248.0
11001802	7 G 2.5	14	16.6	230.4	387.0
11001803	12 G 2.5	14	19.7	363.7	582.0
11001804	16 G 2.5	14	22.5	491.7	776.0
11001805	18 G 2.5	14	24.2	554.9	867.0
11001806	20 G 2.5	14	24.6	602.2	929.0
11001807	25 G 2.5	14	27.6	737.8	1148.0
11001808	3 G 4	12	11.7	155.8	237.0
11001809	4 G 4	12	12.8	199.6	294.0
11001810	5 G 4	12	13.8	243.9	347.0
11001811	3 G 6	10	13.2	224.0	318.0
11001812	4 G 6	10	14.5	282.0	395.0
11001813	5 G 6	10	16.1	345.6	474.0

HELUCHAIN® MULTISPEED® 522-TPE UL/CSA

for extreme mechanical stress, oil resistant

TECHNICAL DATA

TPE drag chain cable acc. to UL-Std. 758 (AWM) Style 21387, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-51 / DIN EN 50525-2-51

Temperature range	flexible -40°C to +90°C fixed -40°C to +90°C
Nominal voltage	AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Minimum bending radius	flexible 5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores,
  G = with protective conductor GN-YE,
  x = without protective conductor
- Stranding:
  2 - 5 core(s): cores stranded into one layer with an optimally matched short lay length
  7 - 42 core(s): cores stranded into bundles/pairs with optimally matched, short lay lengths; bundles/pairs stranded together around a tensile core
- Ripcord
- Outer sheath: TPE, extruded filler
- Sheath colour: black (RAL 9004)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone
- low adhesion
- longer service life due to low frictional resistance of the PP-insulated cores
- for outdoor use
- suitable for use in drag chains
- Drag chain parameters
  Acceleration (max.): 50 m/s²
  Velocity (max.), gliding: 5 m/s
  Traverse path (max.): 450 m
- highly restistant to alternate bending strength
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL-VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

This UL/CSA approved cable is used when extreme demands are placed on the cable. Designed for export-oriented mechanical engineers, specifically in the USA and Canada. Gearing to the needs of the industry, materials and stranding techniques permit continuous use as highly flexible drag chain cables with long travelling distance capabilities at high or low speeds. For installation in dry and damp rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, these highly flexible TPE drag chain cables are suitable for frequent lifting and bending stress in machine and tool construction.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001824	2 x 0.5	21	5.5	9.6	37.0
11001825	3 G 0.5	21	5.7	14.4	42.0
11001826	4 G 0.5	21	6.1	19.2	49.0
11001827	5 G 0.5	21	6.6	24.0	59.0
11001828	7 G 0.5	21	8.8	33.6	91.0
11001829	12 G 0.5	21	10.2	57.6	133.0
11001830	16 G 0.5	21	11.3	76.8	167.0
11001831	18 G 0.5	21	12.1	86.4	184.0
11001832	20 G 0.5	21	12.4	96.0	199.0
11001833	25 G 0.5	21	13.6	120.0	244.0
11001834	36 G 0.5	21	16.9	172.8	355.0
11001835	42 G 0.5	21	18.6	201.6	419.0
11001836	2 x 0.75	19	5.9	14.4	45.0
11001837	3 G 0.75	19	6.2	21.6	53.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001838	4 G 0.75	19	6.6	28.8	62.0
11001839	5 G 0.75	19	7.2	36.0	75.0
11001840	7 G 0.75	19	9.6	50.4	119.0
11001841	12 G 0.75	19	11.1	86.4	172.0
11001842	16 G 0.75	19	12.4	115.2	216.0
11001843	18 G 0.75	19	13.3	129.6	240.0
11001844	20 G 0.75	19	13.7	144.0	269.0
11001845	25 G 0.75	19	15.1	180.0	325.0
11001846	36 G 0.75	19	19.2	259.2	484.0
11001847	42 G 0.75	19	20.8	302.4	564.0
11001848	2 x 1	18	6.3	19.2	53.0
11001849	3 G 1	18	6.6	28.8	63.0
11001850	4 G 1	18	7.1	38.4	77.0
11001851	5 G 1	18	7.7	48.0	92.0

HELUCHAIN® MULTISPEED® 522-TPE UL/CSA

for extreme mechanical stress, oil resistant

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001852	7 G 1	18	10.4	67.2	143.0
11001853	12 G 1	18	12.2	115.2	211.0
11001854	16 G 1	18	13.6	153.6	276.0
11001855	18 G 1	18	14.8	172.8	311.0
11001856	20 G 1	18	15.2	192.0	339.0
11001857	25 G 1	18	17.0	240.0	419.0
11001858	36 G 1	18	21.4	345.6	625.0
11001859	42 G 1	18	23.5	403.2	742.0
11001860	2 x 1.5	16	6.9	28.8	67.0
11001861	3 G 1.5	16	7.3	43.2	82.0
11001862	4 G 1.5	16	7.9	57.6	101.0
11001863	5 G 1.5	16	8.6	72.0	122.0
11001864	7 G 1.5	16	11.7	100.8	191.0
11001865	12 G 1.5	16	13.7	172.8	291.0
11001866	16 G 1.5	16	15.6	230.4	386.0
11001867	18 G 1.5	16	17.0	259.2	422.0
11001868	20 G 1.5	16	17.6	288.0	472.0
11001869	25 G 1.5	16	19.7	360.0	589.0
11001870	36 G 1.5	16	24.7	518.4	878.0
11001871	42 G 1.5	16	27.1	604.8	1025.0
11001872	2 x 2.5	14	7.9	48.0	96.0
11001873	3 G 2.5	14	8.4	72.0	119.0
11001874	4 G 2.5	14	9.1	96.0	148.0
11001875	5 G 2.5	14	10.0	120.0	180.0
11001876	7 G 2.5	14	13.8	168.0	297.0
11001877	12 G 2.5	14	16.7	288.0	442.0
11001878	16 G 2.5	14	18.9	384.0	584.0
11001879	18 G 2.5	14	20.6	432.0	655.0
11001880	20 G 2.5	14	21.2	480.0	726.0
11001881	25 G 2.5	14	23.8	600.0	901.0
11001882	3 G 4	12	9.7	115.2	174.0
11001883	4 G 4	12	10.6	153.6	219.0
11001884	5 G 4	12	11.6	192.0	266.0
11001885	3 G 6	10	11.0	172.8	240.0
11001886	4 G 6	10	12.1	230.4	306.0
11001887	5 G 6	10	13.3	288.0	375.0

HELUCHAIN® MULTISPEED® 522-C-TPE UL/CSA

for extreme mechanical stress, oil resistant, EMC-preferred type

TECHNICAL DATA

TPE drag chain cable acc. to UL-Std. 758 (AWM) Style 21387, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-51 / DIN EN 50525-2-51

Temperature range	flexible -40°C to +90°C fixed -40°C to +90°C
Nominal voltage	AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Test voltage core/screen	3000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores,
  G = with protective conductor GN-YE,
  x = without protective conductor
- Stranding:
  2 - 5 core(s): cores stranded into one layer with an optimally matched short lay length
  7 - 42 core(s): cores stranded into bundles/pairs with optimally matched, short lay lengths; bundles/pairs stranded together around a tensile core
- Ripcord
- Inner sheath: TPE, extruded filler
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: TPE
- Sheath colour: black (RAL 9004)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone
- low adhesion
- longer service life due to low frictional resistance of the PP-insulated cores
- for outdoor use
- suitable for use in drag chains
- Drag chain parameters
  Acceleration (max.): 50 m/s²
  Velocity (max.), gliding: 5 m/s
  Traverse path (max.): 450 m
- highly restistant to alternate bending strength
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL-VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

This UL/CSA approved cable is used when extreme demands are placed on the cable. Designed for export-oriented mechanical engineers, specifically in the USA and Canada. Gearing to the needs of the industry, materials and stranding techniques permit continuous use as highly flexible drag chain cables with long travelling distance capabilities at high or low speeds. For installation in dry and damp rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, these highly flexible TPE drag chain cables are suitable for frequent lifting and bending stress in machine and tool construction. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001898	2 x 0.5	21	7.2	28.5	71.0
11001899	3 G 0.5	21	7.4	33.1	77.0
11001900	4 G 0.5	21	7.8	40.8	88.0
11001901	5 G 0.5	21	8.3	48.0	101.0
11001902	7 G 0.5	21	10.8	73.6	157.0
11001903	12 G 0.5	21	12.4	103.4	212.0
11001904	16 G 0.5	21	13.5	128.0	254.0
11001905	18 G 0.5	21	14.5	138.0	280.0
11001906	20 G 0.5	21	14.8	149.0	297.0
11001907	25 G 0.5	21	16.4	182.6	361.0
11001908	36 G 0.5	21	19.9	250.4	513.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001909	42 G 0.5	21	22.0	309.5	626.0
11001910	2 x 0.75	19	7.6	36.2	83.0
11001911	3 G 0.75	19	7.9	43.4	91.0
11001912	4 G 0.75	19	8.3	52.8	104.0
11001913	5 G 0.75	19	8.9	62.7	121.0
11001914	7 G 0.75	19	11.6	90.8	183.0
11001915	12 G 0.75	19	13.3	137.8	257.0
11001916	16 G 0.75	19	14.8	172.4	317.0
11001917	18 G 0.75	19	16.1	187.2	352.0
11001918	20 G 0.75	19	16.5	206.8	379.0
11001919	25 G 0.75	19	18.1	248.8	457.0

HELUCHAIN® MULTISPEED® 522-C-TPE UL/CSA

for extreme mechanical stress, oil resistant, EMC-preferred type

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001920	36 G 0.75	19	22.4	366.7	678.0
11001921	42 G 0.75	19	24.4	425.1	804.0
11001922	2 x 1	18	8.0	41.2	92.0
11001923	3 G 1	18	8.3	53.5	105.0
11001924	4 G 1	18	8.8	62.8	120.0
11001925	5 G 1	18	9.7	81.9	149.0
11001926	7 G 1	18	12.6	113.5	221.0
11001927	12 G 1	18	14.6	167.0	310.0
11001928	16 G 1	18	16.4	217.0	391.0
11001929	18 G 1	18	17.6	236.3	430.0
11001930	20 G 1	18	18.0	260.0	464.0
11001931	25 G 1	18	20.0	314.9	574.0
11001932	36 G 1	18	24.8	472.3	857.0
11001933	42 G 1	18	27.3	541.0	1017.0
11001934	2 x 1.5	16	8.6	53.4	110.0
11001935	3 G 1.5	16	9.0	68.1	127.0
11001936	4 G 1.5	16	9.9	92.0	161.0
11001937	5 G 1.5	16	10.6	111.5	187.0
11001938	7 G 1.5	16	13.9	152.9	277.0
11001939	12 G 1.5	16	16.5	235.6	407.0
11001940	16 G 1.5	16	18.6	299.7	518.0
11001941	18 G 1.5	16	20.0	337.0	577.0
11001942	20 G 1.5	16	20.4	366.7	623.0
11001943	25 G 1.5	16	23.1	483.1	809.0
11001944	36 G 1.5	16	28.5	656.9	1165.0
11001945	42 G 1.5	16	31.3	758.4	1359.0
11001946	2 x 2.5	14	9.9	82.4	154.0
11001947	3 G 2.5	14	10.4	106.8	179.0
11001948	4 G 2.5	14	11.1	135.9	215.0
11001949	5 G 2.5	14	12.0	165.5	254.0
11001950	7 G 2.5	14	16.6	230.4	397.0
11001951	12 G 2.5	14	19.7	363.7	597.0
11001952	16 G 2.5	14	22.5	491.7	795.0
11001953	18 G 2.5	14	24.2	554.9	889.0
11001954	20 G 2.5	14	24.6	602.2	952.0
11001955	25 G 2.5	14	27.6	737.8	1177.0
11001956	3 G 4	12	11.7	155.8	242.0
11001957	4 G 4	12	12.8	199.6	301.0
11001958	5 G 4	12	13.8	243.9	356.0
11001959	3 G 6	10	13.2	224.0	326.0
11001960	4 G 6	10	14.5	282.0	404.0
11001961	5 G 6	10	16.1	345.6	485.0

Motor cables typically have four cores, as three phase conductors supply the motor windings and the fourth provides the protective conductor. The three black cores can be labelled with L1, L2, and L3 for the different phases, or be labelled with U, V, and W.
These cables typically require a voltage level of 600/1000 V to be used with the converter. Depending on the requirements, screened and unscreened versions are available.

Motor Cables

HELUCHAIN® MULTISPEED® PWR 520-PVC UL/CSA

for high mechanical stress, oil resistant

TECHNICAL DATA

PVC drag chain cable acc. to UL-Std. 758 (AWM) Style 21179, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-51 / DIN EN 50525-2-51

Temperature range	flexible -5°C to +80°C fixed -30°C to +80°C
Nominal voltage	AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Minimum bending radius	flexible 7.5x Outer-Ø fixed 5x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- G = with protective conductor GN-YE
- cores stranded into one layer with an optimally matched short lay length
- Ripcord
- Outer sheath: PVC, extruded filler
- Sheath colour: black (RAL 9005)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone
- low adhesion
- longer service life due to low frictional resistance of the PP-insulated cores
- for outdoor use
- suitable for use in drag chains
- Drag chain parameters
  Acceleration (max.): 50 m/s²
  Velocity (max.), gliding: 5 m/s
  Traverse path (max.): 100 m
- highly restistant to alternate bending strength
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

This UL/CSA approved cable is used when high demands are placed on the cable. Designed for export-oriented mechanical engineers, specifically in the USA and Canada. Gearing to the needs of the industry, materials and stranding techniques permit continuous use as highly flexible drag chain cables with long travelling distance capabilities at high or low speeds. For installation in dry and damp rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, these highly flexible PVC drag chain cables are suitable for frequent lifting and bending stress in machine and tool construction.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001592	4 G 10	8	16.7	384.0	536.0
11001593	5 G 10	8	18.6	480.0	662.0
11001594	4 G 16	6	19.8	614.4	807.0
11001595	5 G 16	6	22.1	768.0	1003.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001596	4 G 25	4	25.1	960.0	1270.0
11001597	5 G 25	4	28.2	1200.0	1588.0
11001598	4 G 35	2	28.5	1344.0	1783.0
11001599	5 G 35	2	31.9	1680.0	2173.0

HELUCHAIN® MULTISPEED® PWR 520-C-PVC UL/CSA

for high mechanical stress, oil resistant

TECHNICAL DATA

PVC drag chain cable acc. to UL-Std. 758 (AWM) Style 21179, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-51 / DIN EN 50525-2-51

Temperature range	flexible -5°C to +80°C fixed -30°C to +80°C
Nominal voltage	AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Test voltage core/screen	3000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 7.5x Outer-Ø fixed 5x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- G = with protective conductor GN-YE
- cores stranded into one layer with an optimally matched short lay length
- Ripcord
- Inner sheath: TPE, extruded filler
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: PVC
- Sheath colour: black (RAL 9005)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone
- low adhesion
- longer service life due to low frictional resistance of the PP-insulated cores
- for outdoor use
- suitable for use in drag chains
- Drag chain parameters
  Acceleration (max.): 50 m/s²
  Velocity (max.), gliding: 5 m/s
  Traverse path (max.): 100 m
- highly restistant to alternate bending strength
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

This UL/CSA approved cable is used when high demands are placed on the cable. Designed for export-oriented mechanical engineers, specifically in the USA and Canada. Gearing to the needs of the industry, materials and stranding techniques permit continuous use as highly flexible drag chain cables with long travelling distance capabilities at high or low speeds. For installation in dry and damp rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, these highly flexible PVC drag chain cables are suitable for frequent lifting and bending stress in machine and tool construction. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001666	4 G 10	8	19.7	453.9	701.0
11001667	5 G 10	8	22.0	587.9	880.0
11001668	4 G 16	6	23.2	721.9	1040.0
11001669	5 G 16	6	25.9	893.5	1283.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001670	4 G 25	4	29.1	1099.7	1604.0
11001671	5 G 25	4	32.4	1357.2	1970.0
11001672	4 G 35	2	32.7	1504.1	2152.0
11001673	5 G 35	2	36.5	1904.0	2680.0

TOPFLEX® 611-PUR

TECHNICAL DATA

PUR motor supply cable in alignment with DIN VDE 0285-525-1 / DIN EN 50525-1

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
Nominal voltage	AC U_0/U 600/1000 V
Test voltage core/core	4000 V
Minimum bending radius	flexible 7.5x Outer-Ø fixed 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- G = with protective conductor GN-YE
- Cores stranded with optimally matched lay lengths
- Fleece wrapping
- Outer sheath: Special grade of full polyurethane acc. to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TMPU)
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater
- highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- for outdoor use
- suitable for use in drag chains
- halogen-free
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2
- certifications and approvals:
  EAC

APPLICATION

Used as an optimal supply cable for motor supply especially for DNC and servo motors. The cables are specially designed for use in energy supply chains, automatic handling machines, robots, machine tools and processing machines. Optimal materials for insulation ensure resistance to oils (including mineral oils), greases, coolants, hydraulic fluids and numerous alkalis and solvents. Favourable outer diameters, reduced weights and improved torsional behaviour ensure use in multi-shift operations with extremely high alternating bending stress. Suitable for outdoor installation.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
22870	4 G 1.5	16	8.3	58.0	125.0
22871	4 G 2.5	14	10.4	96.0	215.0
22872	4 G 4	12	12.1	154.0	310.0
22873	4 G 6	10	14.9	231.0	470.0
22874	4 G 10	8	18.6	384.0	760.0
22875	4 G 16	6	22.8	615.0	1250.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
22876	4 G 25	4	26.3	960.0	1510.0
22877	4 G 35	2	32.4	1344.0	2100.0
22978	4 G 50	1	36.6	1920.0	2950.0
22979	4 G 70	2/0	41.8	2688.0	4090.0
22980	4 G 95	3/0	46.2	3648.0	5580.0
22981	4 G 120	4/0	50.9	4608.0	7040.0

TOPFLEX® 611-C-PUR

EMC-preferred type, with inner sheath

TECHNICAL DATA

PUR motor supply cable in alignment with DIN VDE 0285-525-1 / DIN EN 50525-1

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
Nominal voltage	AC U_0/U 600/1000 V
Test voltage core/core	4000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 10x Outer-Ø fixed 5x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- G = with protective conductor GN-YE
- Cores stranded with optimally matched lay lengths
- Fleece wrapping
- Inner sheath: TPE
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: Special grade of full polyurethane acc. to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TMPU)
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater
- highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- for outdoor use
- suitable for use in drag chains
- halogen-free
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2
- certifications and approvals:
  EAC

APPLICATION

Used as an optimal supply cable for motor supply especially for DNC and servo motors. The cables are specially designed for use in energy supply chains, automatic handling machines, robots, machine tools and processing machines. Optimal materials for insulation ensure resistance to oils (including mineral oils), greases, coolants, hydraulic fluids and numerous alkalis and solvents. Favourable outer diameters, reduced weights and improved torsional behaviour ensure use in multi-shift operations with extremely high alternating bending stress. Suitable for outdoor installation. EMC = Electromagnetic compatibility; in order to optimise the EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
22970	4 G 1.5	16	10.7	99.0	220.0
22971	4 G 2.5	14	13.2	169.0	340.0
22972	4 G 4	12	15.1	234.0	490.0
22973	4 G 6	10	18.3	316.0	680.0
22974	4 G 10	8	22.4	549.0	1035.0
22975	4 G 16	6	27.0	807.0	1460.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
22976	4 G 25	4	31.0	1169.0	1990.0
22977	4 G 35	2	37.7	1680.0	2535.0
22982	4 G 50	1	43.2	2370.0	3360.0
22983	4 G 70	2/0	47.9	3257.0	4650.0
22984	4 G 95	3/0	53.0	4060.0	6090.0
22985	4 G 120	4/0	58.4	5231.0	7380.0

HELUCHAIN® MULTISPEED® PWR 521-PUR UL/CSA

for increased mechanical stress, oil resistant

TECHNICAL DATA

PUR drag chain cable acc. to UL-Std. 758 (AWM) Style 21223, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-51 / DIN EN 50525-2-51

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
Nominal voltage	AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Minimum bending radius	flexible 7.5x Outer-Ø fixed 5x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- G = with protective conductor GN-YE
- cores stranded into one layer with an optimally matched short lay length
- Outer sheath: PUR, extruded filler
- Sheath colour: black (RAL 9005)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone
- low adhesion
- longer service life due to low frictional resistance of the PP-insulated cores
- for outdoor use
- suitable for use in drag chains
- Drag chain parameters
  Acceleration (max.): 50 m/s²
  Velocity (max.), gliding: 5 m/s
  Traverse path (max.): 450 m
- highly restistant to alternate bending strength
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

This UL/CSA approved cable is used when high demands are placed on the cable. Designed for export-oriented mechanical engineers, specifically in the USA and Canada. Gearing to the needs of the industry, materials and stranding techniques permit continuous use as highly flexible drag chain cables with long travelling distance capabilities at high or low speeds. For installation in dry and damp rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, these highly flexible PUR drag chain cables are suitable for frequent lifting and bending stress in machine and tool construction.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001740	4 G 10	8	16.7	384.0	555.0
11001741	5 G 10	8	18.6	480.0	687.0
11001742	4 G 16	6	19.8	614.4	837.0
11001743	5 G 16	6	22.1	768.0	1040.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001744	4 G 25	4	25.1	960.0	1317.0
11001745	5 G 25	4	28.2	1200.0	1647.0
11001746	4 G 35	2	28.5	1344.0	1849.0
11001747	5 G 35	2	31.9	1680.0	2253.0

HELUCHAIN® MULTISPEED® PWR 521-C-PUR UL/CSA

for increased mechanical stress, oil resistant

TECHNICAL DATA

PUR drag chain cable acc. to UL-Std. 758 (AWM) Style 21223, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-51 / DIN EN 50525-2-51

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
Nominal voltage	AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Test voltage core/screen	3000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 7.5x Outer-Ø fixed 5x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- G = with protective conductor GN-YE
- cores stranded into one layer with an optimally matched short lay length
- Ripcord
- Inner sheath: TPE, extruded filler
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: PUR
- Sheath colour: black (RAL 9005)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone
- low adhesion
- longer service life due to low frictional resistance of the PP-insulated cores
- for outdoor use
- suitable for use in drag chains
- Drag chain parameters
  Acceleration (max.): 50 m/s²
  Velocity (max.), gliding: 5 m/s
  Traverse path (max.): 450 m
- highly restistant to alternate bending strength
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

This UL/CSA approved cable is used when high demands are placed on the cable. Designed for export-oriented mechanical engineers, specifically in the USA and Canada. Gearing to the needs of the industry, materials and stranding techniques permit continuous use as highly flexible drag chain cables with long travelling distance capabilities at high or low speeds. For installation in dry and damp rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, these highly flexible PUR drag chain cables are suitable for frequent lifting and bending stress in machine and tool construction. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001814	4 G 10	8	19.7	453.9	672.0
11001815	5 G 10	8	22.0	587.9	844.0
11001816	4 G 16	6	23.2	721.9	998.0
11001817	5 G 16	6	25.9	893.5	1231.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001818	4 G 25	4	29.1	1099.7	1538.0
11001819	5 G 25	4	32.4	1357.2	1890.0
11001820	4 G 35	2	32.7	1504.1	2064.0
11001821	5 G 35	2	36.5	1904.0	2571.0

HELUCHAIN® MULTISPEED® PWR 522-TPE UL/CSA

for extreme mechanical stress, oil resistant

TECHNICAL DATA

TPE drag chain cable acc. to UL-Std. 758 (AWM) Style 21387, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-51 / DIN EN 50525-2-51

Temperature range	flexible -40°C to +90°C fixed -40°C to +90°C
Nominal voltage	AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Minimum bending radius	flexible 7.5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- G = with protective conductor GN-YE
- cores stranded into one layer with an optimally matched short lay length
- Ripcord
- Outer sheath: TPE, extruded filler
- Sheath colour: black (RAL 9004)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone
- low adhesion
- longer service life due to low frictional resistance of the PP-insulated cores
- for outdoor use
- suitable for use in drag chains
- Drag chain parameters
  Acceleration (max.): 50 m/s²
  Velocity (max.), gliding: 5 m/s
  Traverse path (max.): 450 m
- highly restistant to alternate bending strength
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL-VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

This UL/CSA approved cable is used when extreme demands are placed on the cable. Designed for export-oriented mechanical engineers, specifically in the USA and Canada. Gearing to the needs of the industry, materials and stranding techniques permit continuous use as highly flexible drag chain cables with long travelling distance capabilities at high or low speeds. For installation in dry and damp rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, these highly flexible TPE drag chain cables are suitable for frequent lifting and bending stress in machine and tool construction.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001888	4 G 10	8	16.7	384.0	538.0
11001889	5 G 10	8	18.6	480.0	666.0
11001890	4 G 16	6	19.8	614.4	811.0
11001891	5 G 16	6	22.1	768.0	1008.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001892	4 G 25	4	25.1	960.0	1277.0
11001893	5 G 25	4	28.2	1200.0	1596.0
11001894	4 G 35	2	28.5	1344.0	1792.0
11001895	5 G 35	2	31.9	1680.0	2184.0

HELUCHAIN® MULTISPEED® PWR 522-C-TPE UL/CSA

for extreme mechanical stress, oil resistant, EMC-preferred type

TECHNICAL DATA

TPE drag chain cable acc. to UL-Std. 758 (AWM) Style 21387, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-51 / DIN EN 50525-2-51

Temperature range	flexible -40°C to +90°C fixed -40°C to +90°C
Nominal voltage	AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage core/core	3000 V
Test voltage core/screen	3000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 7.5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- G = with protective conductor GN-YE
- cores stranded into one layer with an optimally matched short lay length
- Ripcord
- Inner sheath: TPE, extruded filler
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: TPE
- Sheath colour: black (RAL 9004)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone
- low adhesion
- longer service life due to low frictional resistance of the PP-insulated cores
- for outdoor use
- suitable for use in drag chains
- Drag chain parameters
  Acceleration (max.): 50 m/s²
  Velocity (max.), gliding: 5 m/s
  Traverse path (max.): 450 m
- highly restistant to alternate bending strength
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL-VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

This UL/CSA approved cable is used when extreme demands are placed on the cable. Designed for export-oriented mechanical engineers, specifically in the USA and Canada. Gearing to the needs of the industry, materials and stranding techniques permit continuous use as highly flexible drag chain cables with long travelling distance capabilities at high or low speeds. For installation in dry and damp rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, these highly flexible TPE drag chain cables are suitable for frequent lifting and bending stress in machine and tool construction. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001962	4 G 10	8	19.7	453.9	689.0
11001963	5 G 10	8	22.0	587.9	864.0
11001964	4 G 16	6	23.2	721.9	1023.0
11001965	5 G 16	6	25.9	893.5	1261.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11001966	4 G 25	4	29.1	1099.7	1576.0
11001967	5 G 25	4	32.4	1357.2	1936.0
11001968	4 G 35	2	32.7	1504.1	2115.0
11001969	5 G 35	2	36.5	1904.0	2634.0

Sheathed single-core cables are conductors that are given an additional sheath for added protection. They are typically used in tight spaces where four-core motor cables with very large conductor nominal cross-sections cannot be moved. They are available screened and unscreened, and with green/yellow or black core insulation.

Sheathed Single-Core Cables

HELUCHAIN® SINGLE 602-HF-J PVC UL/CSA / HELUCHAIN® SINGLE 602-HF-O PVC UL/CSA

TECHNICAL DATA

PVC sheathed single core cable acc. to UL-Std. 758 (AWM) Style 10107, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-31 / DIN EN 50525-2-31

Temperature range	flexible -5°C to +90°C fixed -40°C to +90°C
Permissible operating temperature of the conductor	+90°C
Nominal voltage	VDE AC U_0/U 600/1000 V UL (AWM) AC 600 V
Test voltage	4000 V
Breakdown voltage	8000 V
Minimum bending radius	flexible 7.5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: Special-PVC acc. to UL-Std. 1581
- Core identification: see table
- G = with protective conductor GN-YE, x = without protective conductor
- Outer sheath: PVC acc. to DIN VDE 0207-5 (compound type YM5), UL-Std. 1581
- Sheath colour: black (RAL 9005)
- Length marking: in metres

PROPERTIES

- resistant to: UV radiation, weathering effects
- largely resistant to: oil
- for outdoor use
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2
- certifications and approvals: EAC

APPLICATION

Highly flexible drag chain single core cable for use in dry and damp rooms as well as outdoors; for applications involving free movement, no tensile stress and no forced movement guidance. Suitable for frequent lifting and bending stresses in machine and tool construction and on permanently moving machine parts.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Core identification: green-yellow

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
69601	1 G 10	8	9.4	96.0	180.0
69603	1 G 16	6	10.5	154.0	250.0
69605	1 G 25	4	11.6	240.0	370.0
69607	1 G 35	2	14.0	336.0	490.0
69609	1 G 50	1	16.6	480.0	665.0
69611	1 G 70	2/0	18.4	672.0	910.0
69613	1 G 95	3/0	19.6	912.0	1195.0
69615	1 G 120	4/0	23.0	1152.0	1545.0
69617	1 G 150	250 kcmil	25.2	1440.0	1750.0
69619	1 G 185	350 kcmil	29.0	1776.0	2320.0
69621	1 G 240	450 kcmil	32.5	2304.0	2960.0
69623	1 G 300	550 kcmil	36.4	2880.0	3550.0

Core identification: black

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
69602	1 x 10	8	9.4	96.0	180.0
69604	1 x 16	6	10.5	154.0	250.0
69606	1 x 25	4	11.6	240.0	370.0
69608	1 x 35	2	14.0	336.0	490.0
69610	1 x 50	1	16.6	480.0	665.0
69612	1 x 70	2/0	18.4	672.0	910.0
69614	1 x 95	3/0	19.6	912.0	1195.0
69616	1 x 120	4/0	23.0	1152.0	1545.0
69618	1 x 150	250 kcmil	25.2	1440.0	1750.0
69620	1 x 185	350 kcmil	29.0	1776.0	2320.0
69622	1 x 240	450 kcmil	32.5	2304.0	2960.0
69624	1 x 300	550 kcmil	36.4	2880.0	3550.0

HELUCHAIN® SINGLE 602-HF-CY-J PVC UL/CSA / HELUCHAIN® SINGLE 602-HF-CY-O PVC UL/CSA

TECHNICAL DATA

PVC sheathed single core cable acc. to UL-Std. 758 (AWM) Style 10107, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-31 / DIN EN 50525-2-31

Temperature range	flexible -5°C to +90°C fixed -40°C to +90°C
Permissible operating temperature of the conductor	+90°C
Nominal voltage	VDE AC U_0/U 600/1000 V UL (AWM) AC 600 V
Test voltage	4000 V
Breakdown voltage	8000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 7.5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: Special-PVC acc. to UL-Std. 1581
- Core identification: see table
- G = with protective conductor GN-YE, x = without protective conductor
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: PVC acc. to DIN VDE 0207-5 (compound type YM5), UL-Std. 1581
- Sheath colour: orange (RAL 2003), acc. to. DESINA
- Length marking: in metres

PROPERTIES

- resistant to: UV radiation, weathering effects
- largely resistant to: oil
- for outdoor use
- suitable for use in drag chains
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2
- certifications and approvals:
  EAC

APPLICATION

Highly flexible drag chain single core cable for use in dry and damp rooms as well as outdoors; for applications involving free movement, no tensile stress and no forced movement guidance. Suitable for frequent lifting and bending stresses in machine and tool construction and on permanently moving machine parts. EMC = Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Core identification: green-yellow

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
69631	1 G 10	8	9.7	125.0	230.0
69633	1 G 16	6	10.8	187.0	300.0
69635	1 G 25	4	12.1	277.0	420.0
69637	1 G 35	2	14.8	387.0	615.0
69639	1 G 50	1	16.3	536.0	825.0
69641	1 G 70	2/0	18.3	739.0	1090.0
69643	1 G 95	3/0	20.4	1004.0	1395.0
69645	1 G 120	4/0	23.8	1259.0	1770.0
69647	1 G 150	250 kcmil	26.2	1597.0	1930.0
69649	1 G 185	350 kcmil	29.0	1945.0	2635.0
69651	1 G 240	450 kcmil	32.0	2496.0	3380.0
69653	1 G 300	550 kcmil	37.5	3106.0	4120.0

Core identification: black

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
69632	1 x 10	8	9.7	125.0	230.0
69634	1 x 16	6	10.8	187.0	300.0
69636	1 x 25	4	12.1	277.0	420.0
69638	1 x 35	2	14.8	387.0	615.0
69640	1 x 50	1	16.3	536.0	825.0
69642	1 x 70	2/0	18.3	739.0	1090.0
69644	1 x 95	3/0	20.4	1004.0	1395.0
69646	1 x 120	4/0	23.8	1259.0	1770.0
69648	1 x 150	250 kcmil	26.2	1597.0	1930.0
69650	1 x 185	350 kcmil	29.0	1945.0	2635.0
69652	1 x 240	450 kcmil	32.0	2496.0	3380.0
69654	1 x 300	550 kcmil	37.5	3106.0	4120.0

TOPFLEX® 304

TECHNICAL DATA

PVC sheathed single core cable acc. to UL-Std. 758 (AWM) Style 1032, CSA-Std. C22.2 No. 210 - AWM I A/B

Temperature range	flexible -5°C to +90°C fixed -40°C to +90°C
Nominal voltage	AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage	3000 V
Minimum bending radius	flexible 7.5x Outer-Ø

CABLE STRUCTURE

- Copper conductor bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PVC
- Core identification: green-yellow
- Outer sheath: PVC
- Sheath colour: grey

PROPERTIES

- suitable for use in drag chains
- flame-retardant

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, CSA FT1, UL VW-1

APPLICATION

Thanks to their outstanding alternating bending stress characteristics, these cables are ideally suited for use in drag chains, and also for use in handlingdevices, robots, and nearly any area requiring flexible used and free motion.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
79639	1 G 2.5	14	4.5	24.0	42.0
79640	1 G 4	12	5.6	38.4	58.0
79641	1 G 6	10	6.1	57.6	85.0
71544	1 G 10	8	8.0	96.0	130.0
79642	1 G 16	6	9.8	154.0	190.0
79643	1 G 25	4	11.8	240.0	280.0
79644	1 G 35	2	12.9	336.0	400.0
79645	1 G 50	1	16.9	480.0	520.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
79646	1 G 70	2/0	19.1	672.0	720.0
79647	1 G 95	3/0	21.7	912.0	1050.0
79648	1 G 120	4/0	24.0	1152.0	1220.0
79649	1 G 150	250 kcmil	27.0	1440.0	1500.0
79650	1 G 185	350 kcmil	28.6	1776.0	1940.0
79651	1 G 240	450 kcmil	33.5	2304.0	2675.0
79652	1 G 300	550 kcmil	38.0	2880.0	3300.0

MULTISPEED®-600-PUR-J / MULTISPEED®-600-PUR-O

for extreme mechanical stress

TECHNICAL DATA

PUR sheathed single core cable acc. to UL-Std. 758 (AWM) Style 10553, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-31 / DIN EN 50525-2-31

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
Nominal voltage	VDE AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage	3000 V
Minimum bending radius	flexible 5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification: see table
- G = with protective conductor GN-YE,
  x = without protective conductor
- Outer sheath: Special grade of full polyurethane in alignment with DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TMPU)
- Sheath colour: black (RAL 9005)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater
- highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- for outdoor use
- suitable for use in drag chains
- halogen-free
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- halogen-free acc. to DIN VDE 0482-754-1 / DIN EN 60754-1 / IEC 60754-1
- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2

APPLICATION

This special drag chain cable permits extended use with extreme requirements, with free movement, without tensile stresses or forced movements. Suitable for installation in long traverse paths and with high speeds in dry, moist and wet environments as well as for outdoor use.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Core identification: green-yellow

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11007722	1 G 2.5	14	5.4	24.0	53.0
11007724	1 G 4	12	6.0	38.4	73.0
25888	1 G 6	10	6.8	58.0	80.0
25889	1 G 10	8	8.2	96.0	130.0
25890	1 G 16	6	9.3	154.0	181.0
25891	1 G 25	4	11.0	240.0	274.0
25892	1 G 35	2	12.2	336.0	398.0
25893	1 G 50	1	14.5	480.0	529.0
25894	1 G 70	2/0	16.5	672.0	717.0
25895	1 G 95	3/0	18.6	912.0	1050.0
25896	1 G 120	4/0	20.6	1152.0	1240.0
25897	1 G 150	250 kcmil	23.4	1440.0	1524.0
25898	1 G 185	300 kcmil	25.6	1776.0	1932.0
25899	1 G 240	450 kcmil	28.8	2304.0	2467.0
25900	1 G 300	550 kcmil	33.9	2880.0	3140.0

Core identification: black

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11007723	1 x 2.5	14	5.4	24.0	53.0
11007725	1 x 4	12	6.0	38.4	73.0
25269	1 x 6	10	6.8	58.0	80.0
25270	1 x 10	8	8.2	96.0	130.0
25271	1 x 16	6	9.3	154.0	181.0
25272	1 x 25	4	11.0	240.0	274.0
25273	1 x 35	2	12.2	336.0	398.0
25274	1 x 50	1	14.5	480.0	529.0
25275	1 x 70	2/0	16.5	672.0	717.0
25276	1 x 95	3/0	18.6	912.0	1050.0
25277	1 x 120	4/0	20.6	1152.0	1240.0
25278	1 x 150	250 kcmil	23.4	1440.0	1524.0
25279	1 x 185	300 kcmil	25.6	1776.0	1932.0
25280	1 x 240	450 kcmil	28.8	2304.0	2467.0
25281	1 x 300	550 kcmil	33.9	2880.0	3140.0

MULTISPEED®-600-C-PUR-J / MULTISPEED®-600-C-PUR-O

for extreme mechanical stress, EMC-preferred type

TECHNICAL DATA

PUR sheathed single core cable acc. to UL-Std. 758 (AWM) Style 10553, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-31 / DIN EN 50525-2-31

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
Nominal voltage	VDE AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage	3000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification: see table
- G = with protective conductor GN-YE, x = without protective conductor
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Fleece wrapping
- Outer sheath: Special grade of full polyurethane in alignment with DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TMPU)
- Sheath colour: black (RAL 9005)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater
- highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- for outdoor use
- suitable for use in drag chains
- halogen-free
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- halogen-free acc. to DIN VDE 0482-754-1 / DIN EN 60754-1 / IEC 60754-1
- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2

APPLICATION

This special drag chain cable permits extended use with extreme requirements, with free movement, without tensile stresses or forced movements. Suitable for installation in long traverse paths and with high speeds in dry, moist and wet environments as well as for outdoor use. EMC= Electromagnetic compatibility; to optimize the EMC features we recommend a large round contact of the copper braiding on both ends.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Aderkennzeichnung: grün-gelb

Art.-Nr.	Aderzahl x Nennquerschnitt mm²	ca. AWG	Außen-Ø ca. mm	Cu-Zahl per km	Gewicht ca. kg/km
11007726	1 G 2,5	14	6,0	39,0	65,0
11007728	1 G 4	12	6,6	58,0	88,0
25901	1 G 6	10	7,4	71,0	101,0
25902	1 G 10	8	8,8	122,0	168,0
25903	1 G 16	6	10,0	180,0	217,0
25904	1 G 25	4	11,7	282,0	342,0
25905	1 G 35	2	12,9	386,0	468,0
25906	1 G 50	1	15,4	584,0	728,0
25907	1 G 70	2/0	17,4	750,0	822,0
25908	1 G 95	3/0	19,5	1004,0	1190,0
25909	1 G 120	4/0	21,7	1260,0	1400,0
25910	1 G 150	250 kcmil	24,5	1570,0	1710,0
25911	1 G 185	300 kcmil	26,7	1911,0	2021,0

Aderkennzeichnung: schwarz

Art.-Nr.	Aderzahl x Nennquerschnitt mm²	ca. AWG	Außen-Ø ca. mm	Cu-Zahl per km	Gewicht ca. kg/km
11007727	1 x 2,5	14	6,0	39,0	65,0
11007729	1 x 4	12	6,6	58,0	88,0
25282	1 x 6	10	7,4	71,0	101,0
25283	1 x 10	8	8,8	122,0	168,0
25284	1 x 16	6	10,0	180,0	217,0
25285	1 x 25	4	11,7	282,0	342,0
25286	1 x 35	2	12,9	386,0	468,0
25287	1 x 50	1	15,4	584,0	728,0
25288	1 x 70	2/0	17,4	750,0	822,0
25289	1 x 95	3/0	19,5	1004,0	1190,0
25290	1 x 120	4/0	21,7	1260,0	1400,0
25291	1 x 150	250 kcmil	24,5	1570,0	1710,0
25292	1 x 185	300 kcmil	26,7	1911,0	2021,0

MULTISPEED®-600-C-PUR-J / MULTISPEED®-600-C-PUR-O

for extreme mechanical stress, EMC-preferred type

Core identification: green-yellow

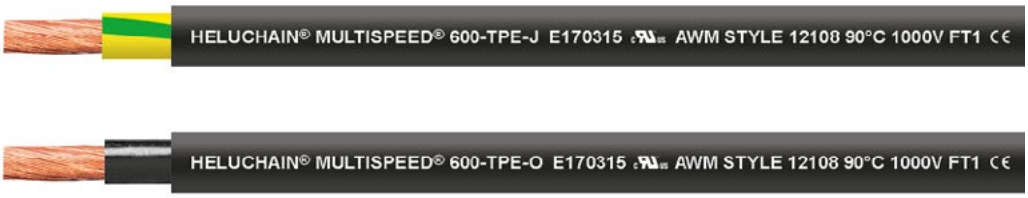
Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
25912	1 G 240	450 kcmil	30.3	2451.0	2601.0
25913	1 G 300	550 kcmil	35.0	2997.0	3257.0

Core identification: black

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
25293	1 x 240	450 kcmil	30.3	2451.0	2601.0
25294	1 x 300	550 kcmil	35.0	2997.0	3257.0

HELUCHAIN® MULTISPEED® 600-TPE-J / HELUCHAIN® MULTISPEED® 600-TPE-O

for extreme mechanical stress, oil resistant



TECHNICAL DATA

TPE sheathed single core cable acc. to UL-Std. 758 (AWM) Style 12108, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-31 / DIN EN 50525-2-31

Temperature range	flexible -40°C to +90°C fixed -40°C to +90°C
Nominal voltage	VDE AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage	3000 V
Minimum bending radius	flexible 5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification: see table
- G = with protective conductor GN-YE, x = without protective conductor
- Outer sheath: TPE
- Sheath colour: black (RAL 9004)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone
- low adhesion
- for outdoor use
- suitable for use in drag chains
- highly restistant to alternate bending strength
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

This UL/CSA approved cable is used when extreme demands are placed on the cable. Designed for export-oriented machine manufacturers, specifically in the USA and Canada. Gearing to the needs of the industry, materials and stranding techniques permit continuous use as highly flexible drag chain cable with long travelling distance capabilities at high and low speed. For installation in dry and damp rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, this highly flexible TPE drag chain cable is suitable for frequent lifting and bending stresses in machine and tool construction.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Core identification: green-yellow

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11026287	1 G 6	10	6.8	57.6	88.0
11026288	1 G 10	8	8.2	96.0	140.0
11026289	1 G 16	6	9.3	153.6	200.0
11026290	1 G 25	4	11.0	240.0	297.0
11026291	1 G 35	2	12.2	336.0	404.0
11026292	1 G 50	1	14.5	480.0	588.0
11026293	1 G 70	2/0	16.5	672.0	779.0
11026294	1 G 95	3/0	18.6	912.0	1030.0
11026295	1 G 120	4/0	20.6	1152.0	1278.0
11026296	1 G 150	250 kcmil	23.4	1440.0	1548.0
11026297	1 G 185	300 kcmil	25.6	1776.0	1886.0

Core identification: black

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11026299	1 x 6	10	6.8	57.6	88.0
11026300	1 x 10	8	8.2	96.0	140.0
11026301	1 x 16	6	9.3	153.6	200.0
11026302	1 x 25	4	11.0	240.0	297.0
11026303	1 x 35	2	12.2	336.0	404.0
11026304	1 x 50	1	14.5	480.0	588.0
11026305	1 x 70	2/0	16.5	672.0	779.0
11026306	1 x 95	3/0	18.6	912.0	1030.0
11026307	1 x 120	4/0	20.6	1152.0	1278.0
11026308	1 x 150	250 kcmil	23.4	1440.0	1548.0
11026309	1 x 185	300 kcmil	25.6	1776.0	1886.0

HELUCHAIN® MULTISPEED® 600-C-TPE-J / HELUCHAIN® MULTISPEED® 600-C-TPE-O

for extreme mechanical stress, oil resistant, EMC-preferred type

TECHNICAL DATA

TPE sheathed single core cable acc. to UL-Std. 758 (AWM) Style 12108, CSA-Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-31 / DIN EN 50525-2-31

Temperature range	flexible -40°C to +90°C fixed -40°C to +90°C
Nominal voltage	VDE AC U_0/U 600/1000 V UL (AWM) AC 1000 V
Test voltage	3000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 5x Outer-Ø fixed 3x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification: see table
- G = with protective conductor GN-YE,
  x = without protective conductor
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: TPE
- Sheath colour: black (RAL 9004)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone
- low adhesion
- longer service life due to low frictional resistance of the PP-insulated cores
- for outdoor use
- suitable for use in drag chains
- highly restistant to alternate bending strength
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404

APPLICATION

This UL/CSA approved cable is used when extreme demands are placed on the cable. Designed for export-oriented machine manufacturers, specifically in the USA and Canada. Gearing to the needs of the industry, materials and stranding techniques permit continuous use as highly flexible drag chain cable with long travelling distance capabilities at high and low speed. For installation in dry and damp rooms, as well as outdoors. With free movement, without tensile stress and without forced motion control capabilities, this highly flexible TPE drag chain cable is suitable for frequent lifting and bending stresses in machine and tool construction. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in energy supply systems:
  1) the assembly instructions must be observed
  2) for further application parameters, please refer to the selection tables
  3) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Core identification: green-yellow

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11026311	1 G 6	10	7.4	75.0	109.0
11026312	1 G 10	8	8.8	118.7	163.0
11026313	1 G 16	6	10.0	185.4	239.0
11026314	1 G 25	4	11.7	280.0	341.0
11026315	1 G 35	2	12.9	381.0	455.0
11026316	1 G 50	1	15.4	552.0	664.0
11026317	1 G 70	2/0	17.4	756.0	854.0
11026318	1 G 95	3/0	19.5	1005.0	1112.0
11026319	1 G 120	4/0	21.7	1297.0	1423.0
11026320	1 G 150	250 kcmil	24.5	1590.0	1749.0
11026321	1 G 185	300 kcmil	26.7	1946.0	2088.0

Core identification: black

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
11026323	1 x 6	10	7.4	75.0	109.0
11026324	1 x 10	8	8.8	118.7	163.0
11026325	1 x 16	6	10.0	185.4	239.0
11026326	1 x 25	4	11.7	280.0	341.0
11026327	1 x 35	2	12.9	381.0	455.0
11026328	1 x 50	1	15.4	552.0	664.0
11026329	1 x 70	2/0	17.4	756.0	854.0
11026330	1 x 95	3/0	19.5	1005.0	1112.0
11026331	1 x 120	4/0	21.7	1297.0	1423.0
11026332	1 x 150	250 kcmil	24.5	1590.0	1749.0
11026333	1 x 185	300 kcmil	26.7	1946.0	2088.0

Servo cables are used in drive technology to connect and supply power to servo motors. Hybrid cables combine power supply and data feedback into a single cable. This construction has the advantage of taking up less space by reducing the number of cables and plugs on the drive. The construction of the cables differs significantly based on the manufacturer of the drive unit.

Servo Cables / Hybrid Cables

HELUCHAIN® TOPSERV® 201-PVC UL/CSA

compatible with servo cables from well known manufacturers

TECHNICAL DATA

PUVCMotor and servo cable acc. to UL Std. 758 (AWM) Style 21179

Temperature range	flexible 0°C to +90°C fixed -20°C to +90°C
Nominal voltage	VDE AC U0/U 600/1000 V UL (AWM) AC 1000 V
AC Test voltage	3000 V
Minimum bending radius	flexible 7.5 x outer Ø fixed 4 x outer Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification:
  Power supply cores
  Core 1: black with imprint U/L1/C/L+
  Core 2: black with imprint V/L2
  Core 3: black with imprint W/L3/D/L-
  Control cores
  Pair 1: black-br1, white-br2
- G = with protective conductor GN-YE,
  x = without protective conductor
- Screened cores: control cores in pairs, with tinned copper wires, approx. Coverage 95%
- Power supply cores laid up with optimal lay length and stabilising filler
- Ripcord
- Inner sheath: TPE, extruded filler
- Screen: braided screen of tinned copper wires, approx. Coverage 85%
- Polyester fleece wrapped
- Outer sheath: PVC
- Sheath colour: see table
- Length marking: in metres

PROPERTIES

- resistant to: oil
- low capacity
- suitable for drag chain application
- Drag chain parameters
  Acceleration (max.): 10 m/s²
  Velocity (max.), gliding: 5 m/s
  Traverse path (max.): 100 m
- These cables are produced to high quality specifications are conform to the DESINA® standard
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- certifications and approvals:
- ECOLAB®

APPLICATION

This PVC-drag chain cable is suitable for use in machinery, plant engineering, robotics, as well as automation, drive, control, and production technology. A key advantage lies in the TPE inner sheath, which is specially designed for long travel distances and high accelerations. In addition, a ripcord is integrated into the inner sheath, enabling faster and easier processing. Furthermore, the cable stands out due to its high abrasion resistance and oil resistance, ensuring reliable performance even under intensive mechanical stress. Thanks to the robust PVC sheath, it offers a long service life, reduces downtime, and helps increase system availability.

NOTES

- Brackets ( ) mean screen
- DESINA is a registered trademark and stands for decentralized and standardized installation technology for machine tools and production systems.
- for use in energy supply systems:
- 1) the assembly instructions must be observed
- 2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	for system	Sheath colour	Outer-Ø approx. mm	Cu factor per km	Weight kg/km, approx
11029600	(4G1,5 + (2x1,5)D)C	Divers	orange	13.3	146.7	258.0
11028110	(4G2,5 + (2x1,5)D)C	Divers	orange	14.2	191.5	313.0
11028123	(4G4 + (2x1,5)D)C	Divers	orange	15.8	254.7	403.0
11028126	(4G6 + (2x1,5)D)C	Divers	orange	17.4	337.2	510.0

TOPSERV® 109 PUR

TECHNICAL DATA

PUR Motor and servo cable acc. to UL Std. 758 (AWM) Style 21209

Temperature range	flexible -30°C to +80°C fixed -40°C to +90°C
Nominal voltage	VDE AC U0/U 600/1000 V UL (AWM) AC 1000 V
AC Test voltage	50 Hz 4000 V
Minimum bending radius	flexible 7.5 x outer Ø fixed 4 x outer Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6
- Core insulation: PP
- Core identification:
  Power supply cores
  Core 1: black with imprint U/L1/C/L+
  Core 2: black with imprint V/L2
  Core 3: black with imprint W/L3/D/L-
- G = with protective conductor GN-YE
- wrapping: fleece-coated polyester foil
- Power supply cores laid up with optimal lay length and stabilising filler
- Screen: braided screen of tinned copper wires, approx. Coverage 85%
- wrapping: polyester fleece
- Outer sheath: PUR
- Sheath colour: see table
- Length marking: in metres

PROPERTIES

- resistant to: UV radiation, oil, grease, coolants, hydraulic fluids, microbes, numerous alkalis and solvents, as well as chemical cleaning supplies and disinfectants
- low adhesion
- low capacitance
- suitable for use in drag chains
- halogen-free
- These cables are manufactured in accordance with high quality guidelines and complies with the DESINA® standard
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, CSA FT1, UL VW-1
- certifications and approvals:
- ECOLAB®

APPLICATION

The HELUKABEL TOPSERV® 109 PUR is specifically designed for power transmission in servo applications – without integrated control cores for brake function or thermal protection. The production is in accordance with the specifications of well known servo drive and control manufacturers. They are used, for example, in machine, plant and robot construction as well as in automation, drive, control and production technology. Interesting for export-oriented machine and plant construction. . EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- Brackets () mean screen
- SIEMENS® Article designations are registered trademarks of Siemens AG. The references in the table are for guidance only.
- This cable is manufactured in accordance with high quality guidelines and complies with the DESINA® standard
- for use in energy supply systems:
- 1) the assembly instructions must be observed
- 2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	for system	Part no. OEM	Sheath colour	Outer-Ø approx. mm	Cu factor per km	Weight kg/km, approx
75943	(4G1,5)C	SIEMENS®	6FX8008-1BB11	orange	9.2	90.0	142.9
75944	(4G2,5)C	SIEMENS®	6FX8008-1BB21	orange	10.7	132.0	206.5
75945	(4G4)C	SIEMENS®	6FX8008-1BB31	orange	12.1	195.0	290.4
75946	(4G6)C	SIEMENS®	6FX8008-1BB41	orange	14.5	296.0	423.6
75947	(4G10)C	SIEMENS®	6FX8008-1BB51	orange	17.7	488.0	675.4
75948	(4G16)C	SIEMENS®	6FX8008-1BB61	orange	21.6	769.0	1034.0
75949	(4G25)C	SIEMENS®	6FX8008-1BB25	orange	25.2	1100.0	1329.0
75950	(4G35)C	SIEMENS®	6FX8008-1BB35	orange	28.6	1510.0	1936.0
75951	(4G50)C	SIEMENS®	6FX8008-1BB50	orange	33.4	2133.0	2790.0
700437	(4G70)C	SIEMENS®	6FX8008-1BB70	orange	39.9	3029.0	3801.0
700897	(4G95)C	SIEMENS®	6FX8008-1BB95	orange	47.6	4606.0	5145.0

TOPSERV® 113 PUR

TECHNICAL DATA

PUR Motor and servo cable acc. to UL Std. 758 (AWM) Style 21209

Temperature range	flexible -30°C to +80°C fixed -40°C to +90°C
Nominal voltage	VDE AC U0/U 600/1000 V UL (AWM) AC 1000 V
AC Test voltage	50 Hz 4000 V
Minimum bending radius	flexible 7.5 x outer Ø fixed 4 x outer Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6
- Core insulation: PP
- Core identification:
  Power supply cores
  Core 1: black with imprint U/L1/C/L+
  Core 2: black with imprint V/L2
  Core 3: black with imprint W/L3/D/L-
  Control cores (Bosch, Divers)
  Core 1: black with imprint BR1
  Core 2: white with imprint BR2
  19 drähtige verzinnte Beilauflitze im Steuerpaar
  Control cores (Siemens)
  Core 1: black with imprint BR1
  Core 2: white with imprint BR2
  Control cores (Lenze)
  Core 1: brown with imprint BR1
  Core 2: white with imprint BR2
- G = with protective conductor GN-YE,
  x = without protective conductor
- Screened cores: control cores in pairs, with tinned copper wires, approx. Coverage 85%
- Power supply cores laid up with optimal lay length and stabilising filler
- Sliding movement supporting fleece wrapping
- Screen: braided screen of tinned copper wires, approx. Coverage 85%
- Outer sheath: PUR
- Sheath colour: see table
- Length marking: in metres

PROPERTIES

- resistant to: UV radiation, oil, grease, coolants, hydraulic fluids, microbes, numerous alkalis and solvents, as well as cleaning agents and disinfectants according to ECOLAB®
- low adhesion
- low capacity
- suitable for drag chain application
- These cables are manufactured in accordance with high quality guidelines and complies with the DESINA® standard
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- certifications and approvals:
- ECOLAB®

APPLICATION

With HELUKABEL TOPSERV® 113 PUR, the power cores are ideally combined with the control cores for the brake function and thermal protection. The production is in accordance with the specifications of well known servo drive and control manufacturers. They are used, for example, in machine, plant and robot construction as well as in automation, drive, control and production technology. Interesting for export-oriented machine and plant construction.EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

- Brackets ( ) mean screen
- BOSCH Rexroth® Article designations INK are registered trademarks of Bosch Rexroth AG. Schneider Electric® is a registered trademark of Schneider Electric GmbH. SIEMENS® Article designations are registered trademarks of SIEMENS AG. Lenze® is a registered trademark of Lenze GmbH. The references in the table are for guidance only.
- DESINA is a registered trademark and stands for decentralized and standardized installation technology for machine tools and production systems.
- for use in energy supply systems:
- 1) the assembly instructions must be observed
- 2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	for system	Part no. OEM	Sheath colour	Outer-Ø approx. mm	Cu factor per km	Weight kg/km, approx
78948	(4G1,5 + (2x1,5)C)C	Siemens®	6FX8008-1BA11	orange	11.7	148.0	233.1
78949	(4G2,5 + (2x1,5)C)C	Siemens®	6FX8008-1BA21	orange	13.4	187.0	315.8
78950	(4G4 + (2x1,5)C)C	Siemens®	6FX8008-1BA31	orange	14.8	268.0	400.9

TOPSERV® 113 PUR

Part no.	No. cores x cross-sec. mm²	for system	Part no. OEM	Sheath colour	Outer-Ø approx. mm	Cu factor per km	Weight kg/km, approx
78951	(4G6 + (2x1,5)C)C	Siemens®	6FX8008-1BA41	orange	16.8	358.0	555.3
78952	(4G10 + (2x1,5)C)C	Siemens®	6FX8008-1BA51	orange	19.4	584.0	772.7
75956	(4G16 + (2x1,5)C)C	Siemens®	6FX8008-1BA61	orange	23.1	825.0	1203.0
75957	(4G25 + (2x1,5)C)C	Siemens®	6FX8008-1BA25	orange	26.6	1283.0	1642.0
75958	(4G35 + (2x1,5)C)C	Siemens®	6FX8008-1BA35	orange	30.9	1850.0	2119.0
75959	(4G50 + (2x1,5)C)C	Siemens®	6FX8008-1BA50	orange	34.0	2540.0	2601.0
707228	(4G1,0 + (2x0,5)C)C	Lenze®		orange	10.5	88.0	167.7
707229	(4G1,5 + (2x0,5)C)C	Lenze®		orange	11.5	106.0	205.7
707230	(4G2,5 + (2x0,5)C)C	Lenze®		orange	13.2	152.0	270.6
707231	(4G4 + (2x1,0)C)C	Lenze®		orange	14.6	250.0	386.6
707232	(4G6 + (2x1,0)C)C	Lenze®		orange	17.6	344.5	524.0
707746	(4G10 + (2x1,0)C)C	Lenze®		orange	20.1	508.0	766.2
707747	(4G16 + (2x1,0)C)C	Lenze®		orange	23.8	751.0	1174.0
706003	(4G0,75 + (2x0,5)C)C	Bosch Rexroth®	INK0670	orange	9.2	77.0	137.4
77376	(4G1,0 + (2x0,75)C)C	Divers		orange	10.0	134.0	162.1
74506	(4G1,5 + (2x1,0)C)C	Divers		orange	11.1	138.0	207.8
74507	(4G2,5 + (2x1,0)C)C	Divers		orange	12.5	177.0	269.2
74508	(4G4 + (2x1,0)C)C	Divers		orange	14.3	258.0	372.3
74514	(4G6 + (2x1,0)C)C	Divers		orange	16.2	348.0	492.6
710176	(4G10 + (2x0,5)C)C	Divers		orange	18.6	542.0	714.0
74509	(4G10 + (2x1,0)C)C	Divers		orange	19.0	510.0	726.2
710177	(4G16 + (2x0,5)C)C	Divers		orange	22.5	752.4	1055.0
74510	(4G16 + (2x1,0)C)C	Divers		orange	22.2	798.0	1070.0
710178	(4G25 + (2x0,5)C)C	Divers		orange	26.2	1129.8	1537.0
74511	(4G25 + (2x1,0)C)C	Divers		orange	26.0	1273.0	1576.0
710179	(4G35 + (2x0,5)C)C	Divers		orange	30.3	1615.2	2052.0
74512	(4G35 + (2x1,0)C)C	Divers		orange	29.8	1490.0	2052.0
710180	(4G50 + (2x0,5)C)C	Divers		orange	33.7	2130.8	2834.0
74513	(4G50 + (2x1,0)C)C	Divers		orange	33.7	2110.0	2818.0

TOPSERV® 121 PUR

TECHNICAL DATA

PUR Motor and servo cable acc. to UL Std. 758 (AWM) Style 21209

Temperature range	flexible -30°C to +80°C fixed -40°C to +90°C
Nominal voltage	VDE AC U0/U 600/1000 V UL (AWM) AC 1000 V
AC Test voltage	50 Hz 4000 V
Minimum bending radius	flexible 7.5 x outer Ø fixed 4 x outer Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6
- Core insulation: PP
- Core identification:
  Power supply cores
  Core 1: black with imprint U/L1/C/L+
  Core 2: black with imprint V/L2
  Core 3: black with imprint W/L3/D/L-
  Control cores
  Pair 1: black with imprint no. 5+6
  Pair 2: black with imprint no. 7+8
- G = with protective conductor GN-YE,
  x = without protective conductor
- Drain wire in the control pair
- Screened cores: control cores in pairs, with tinned copper wires, approx. Coverage 85%
- Power supply cores laid up with optimal lay length and stabilising filler
- Sliding movement supporting fleece wrapping
- Screen: braided screen of tinned copper wires, approx. Coverage 85%
- Outer sheath: PUR
- Sheath colour: see table
- Length marking: in metres

PROPERTIES

- resistant to: UV radiation, oil, grease, coolants, hydraulic fluids, microbes, numerous alkalis and solvents, as well as cleaning agents and disinfectants
- low adhesion
- low capacity
- limited torsional strength
- halogen-free
- These cables are manufactured in accordance with high quality guidelines. All orange cables comply with the DESINA® standard
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- certifications and approvals:
- ECOLAB®

APPLICATION

With HELUKABEL TOPSERV® 121 PUR, the power cores are ideally combined with the control cores for the brake function and thermal protection. The production is in accordance with the specifications of well known servo drive and control manufacturers. They are used, for example, in machine, plant and robot construction as well as in automation, drive, control and production technology. Interesting for export-oriented machine and plant construction. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

NOTES

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- DESINA is a registered trademark and stands for decentralized and standardized installation technology for machine tools and production systems.
- for use in energy supply systems:
- 1) the assembly instructions must be observed
- 2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	for system	Part no. OEM	Sheath colour	Outer-Ø approx. mm	Cu factor per km	Weight kg/km, approx
73774	(4G1,0 + 2x(2x0,75)C)C	Bosch Rexroth®	REL0105 (INK0653)	orange	11.5	148.0	217.9
700561	(4G1,5 + 2x(2x0,75)C)C	Bosch Rexroth®	REL0106 (INK0650)	orange	12.2	170.0	250.5
73580	(4G2,5 + 2x(2x1,0)C)C	Bosch Rexroth®	REL0107 (INK0602)	orange	14.0	229.0	349.7
700562	(4G4 + (2x1,0)C + (2x1,5)C)C	Bosch Rexroth®	REL0108 (INK0603)	orange	15.8	318.0	463.0
700563	(4G6 + (2x1,0)C + (2x1,5)C)C	Bosch Rexroth®	REL0109 (INK0604)	orange	17.6	398.0	611.6
700564	(4G10 + (2x1,0)C + (2x1,5)C)C	Bosch Rexroth®	REL0110 (INK0605)	orange	20.3	610.0	857.5

TOPSERV® 121 PUR

Part no.	No. cores x cross-sec. mm²	for system	Part no. OEM	Sheath colour	Outer-Ø approx. mm	Cu factor per km	Weight kg/km, approx
75978	(4G16 + 2x(2x1,5)C)C	Bosch Rexroth®	REL0111 (INK0606)	orange	23.6	904.0	1240.0
75979	(4G25 + 2x(2x1,5)C)C	Bosch Rexroth®	REL0112 (INK0607)	orange	27.0	1323.0	1653.0
75980	(4G35 + 2x(2x1,5)C)C	Bosch Rexroth®	REL0113 (INK0667)	orange	30.5	1621.0	2117.0
700565	(4G50 + 2x(2x2,5)C)C	Bosch Rexroth®	INK0668	orange	35.5	2600.0	3058.0
708499	(4G0,75 + 2x(2x0,34)C)C	Divers		orange	10.4	102.8	180.8
76103	(4G1,5 + 2x(2x0,5)C)C	Divers		orange	11.6	145.0	230.6
73579	(4G1,5 + 2x(2x1,0)C)C	Divers		orange	12.4	182.0	274.8
78955	(4G2,5 + 2x(2x1,5)C)C	Divers		orange	15.0	241.0	403.0
74094	(4G4 + 2x(2x1,0)C)C	Divers		orange	15.5	312.0	445.0
78956	(4G4 + 2x(2x1,5)C)C	Divers		orange	16.2	324.0	477.9
74095	(4G6 + 2x(2x1,0)C)C	Divers		orange	17.3	376.0	589.7
78957	(4G6 + 2x(2x1,5)C)C	Divers		orange	18.0	412.0	626.8
74096	(4G10 + 2x(2x1,0)C)C	Divers		orange	19.9	609.0	800.0
78958	(4G10 + 2x(2x1,5)C)C	Divers		orange	20.9	625.0	872.9
73826	(4x16 + 2x(2x1,0)C)C	Divers		orange	23.0	894.0	1208.0
74097	(4x25 + 2x(2x1,0)C)C	Divers		orange	28.0	1313.0	1607.0
707775	(4G1,5 + 2x(2x0,75)C)C	Schneider Electric®		green	12.1	144.0	240.0
703103	(4G2,5 + 2x(2x1,0)C)C	Schneider Electric®		green	14.6	229.0	366.8

HELUCHAIN® TOPSERV® 211-PUR UL/CSA

compatible with servo cables from well known manufacturers

TECHNICAL DATA

PUR Motor and servo cable acc. to UL Std. 758 (AWM) Style 21209

Temperature range	flexible -30°C to +90°C fixed -50°C to +90°C
Nominal voltage	VDE AC U0/U 600/1000 V UL (AWM) AC 1000 V
AC Test voltage	3000 V
Minimum bending radius	flexible 7.5 x outer Ø fixed 4 x outer Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: PP
- Core identification:
  Power supply cores
  Core 1: black with imprint U/L1/C/L+
  Core 2: black with imprint V/L2
  Core 3: black with imprint W/L3/D/L-
  Control cores
  Pair 1: black-BR1, white-BR2
- G = with protective conductor GN-YE,
  x = without protective conductor
- Screened cores: control cores in pairs, helically screen with tinned copper wires, approx. Coverage 95%
- Power supply cores laid up with optimal lay length and stabilising filler
- Ripcord
- Inner sheath: TPE, extruded filler
- Screen: braided screen of tinned copper wires, approx. Coverage 85%
- Polyester fleece wrapped
- Outer sheath: PUR
- Sheath colour: see table
- Length marking: in metres

PROPERTIES

- resistant to: oil, grease, coolants, hydraulic fluids, microbes, numerous alkalis and solvents, as well as cleaning agents and disinfectants
- low adhesion
- low capacity
- halogen free
- suitable for drag chain application
- Drag chain parameters
  Acceleration (max.): 50 m/s²
  Velocity (max.), gliding: 5 m/s
  Traverse path (max.): 100 m
- These cables are produced to high quality specifications are conform to the DESINA® standard
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- certifications and approvals:
- ECOLAB®

APPLICATION

This PUR-drag chain cable is particularly suitable for use in machinery, plant engineering, robotics, as well as automation, drive, control, and production technology. A key advantage lies in the TPE inner sheath, which is specially designed for long travel distances and high accelerations. In addition, a ripcord is integrated into the inner sheath, enabling faster and easier processing. Furthermore, the cable stands out due to its increased abrasion resistance and oil resistance, ensuring reliable performance even under intensive mechanical stress. Thanks to the robust PUR sheath, it offers a long service life, reduces downtime, and helps increase system availability.

NOTES

- Brackets ( ) mean screen
- DESINA® is a registered trademark and stands for decentralized and standardized installation technology for machine tools and production systems.
- for use in energy supply systems:
- 1) the assembly instructions must be observed
- 2) for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	for system	Sheath colour	Outer-Ø approx. mm	Cu factor per km	Weight kg/km, approx
11029601	(4G1,5 + (2x1,5)D)C	Divers	orange	13.3	146.7	253.0
11028111	(4G2,5 + (2x1,5)D)C	Divers	orange	14.2	191.5	319.0
11028124	(4G4 + (2x1,5)D)C	Divers	orange	15.8	254.7	397.0
11028127	(4G6 + (2x1,5)D)C	Divers	orange	17.4	337.2	503.0

TOPSERV® Hybrid

Hybrid cable for SICK Hiperface DSL® motorfeedbacksystems

Technical data

- **TOPSERV® PUR**
- Special PUR drag chain cable acc. to UL AWM Style 21223 CSA AWM
- **Temperature range**
  flexing -30°C to +80°C
  fixed installation -40°C to +90°C
- **Nominal voltage**
  VDE
  power supply cores U_0/U 600/1000 V
  control cores U_0/U 300/500 V
  UL/CSA 1000 V
- **A.c. test voltage**, 50 Hz
  power supply cores 4000 V
  control cores 1000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Coupling resistance**
  max. 250 Ohm/km
- **Minimum bending radius**
  flexing 7,5x cable Ø
  fixed installation 4x cable Ø
  min. 5 mio. cycles

Cable structure

- Bare copper conductor, to DIN VDE 0295 cl.6, extra fine wire, IEC 60228 cl.6
- Core insulation halogen-free PP
- Core identification
  power supply cores
  core 1: black with imprint U/L1/C/L+
  core 2: black with imprint V/L2
  core 3: black with imprint W/L3/D/L-
  control cores
  pair 1: black with number no. 5+6
  pair 2: white and blue
- GN-YE conductor
- Screening of the control cores in pairs wrapped with tinned copper braid
- Power supply cores laid up with optimal lay length and stabilising filler
- Overall screening from tinned copper braid, optimal coverage approx. 85%
- Outer sheath of PVC or PUR
- Sheath colour: orange (RAL 2003) acc. to DESINA®

Properties

- Low capacitance
- PUR outer sheath: low adhesion, extremely abrasion resistant, halogen-free, resistant to UV-, oil-, hydrolysis and microbial attack
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- These cables are produced to high quality specifications and conform to the DESINA® standard.
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

Tests

- PUR outer sheath
  self-extinguishing and flame retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2

Note

- The technical data for **TOPSERV® Hybrid PVC** cables are available on request.

Application

The supply conductors for these cables are ideally combined with the control conductors for the brake function and the transmission of the Sick Hiperface DSL protocols. Applications include machine, plant and robot construction. Please observe applicable installation regulations for use in energy supply chains.
EMC = Electromagnetic compatibility
To optimize the EMC features we recommend a large round contact of the copper braiding on both ends.
CE = Product conforms with Low-Voltage Directive 2014/35/EU.

TOPSERV® Hybrid PVC for fixed or not constantly movements

Part no.	No.cores x cross-sec. mm²	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
709930	(4G0,5 + (2x0,34) + (2x26 AWG))	Orange RAL 2003	9,3	72,0	123,0	26
709931	(4G0,75 + (2x0,34) + (2x26 AWG))	Orange RAL 2003	9,9	88,0	153,0	26
709932	(4G1 + (2x0,75) + (2x22 AWG))	Orange RAL 2003	11,6	130,0	208,0	22
709933	(4G1,5 + (2x0,75) + (2x22 AWG))	Orange RAL 2003	12,2	152,0	248,0	22
709934	(4G2,5 + (2x1) + (2x22 AWG))	Orange RAL 2003	13,8	207,0	326,0	22
709935	(4G4 + (2x1) + (2x22 AWG))	Orange RAL 2003	15,3	273,0	415,0	22
709936	(4G6 + (2x1) + (2x22 AWG))	Orange RAL 2003	17,2	357,0	538,0	22
709937	(4G10 + (2x1,5) + (2x22 AWG))	Orange RAL 2003	20,3	530,0	752,0	22
709938	(4G16 + (2x1,5) + (2x22 AWG))	Orange RAL 2003	22,6	768,0	1005,0	22

TOPSERV® Hybrid PUR, high flexible for drag chain

Part no.	No.cores x cross-sec. mm²	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
709703	(4G0,5 + (2x0,34) + (2x26 AWG))	Orange RAL 2003	9,3	76,0	127,0	26
709704	(4G0,75 + (2x0,34) + (2x26 AWG))	Orange RAL 2003	9,9	88,0	153,0	26
708543	(4G1 + (2x0,75) + (2x22 AWG))	Orange RAL 2003	11,6	133,0	212,0	22
710081	(4G1,5 + (2x0,75) + (2x24 AWG))	Orange RAL 2003	11,7	146,0	229,0	24
708544	(4G1,5 + (2x0,75) + (2x22 AWG))	Orange RAL 2003	12,7	155,0	269,0	22
708545	(4G2,5 + (2x1) + (2x22 AWG))	Orange RAL 2003	13,9	205,0	310,0	22
708546	(4G4 + (2x1) + (2x22 AWG))	Orange RAL 2003	15,7	280,0	420,0	22
708547	(4G6 + (2x1) + (2x22 AWG))	Orange RAL 2003	18,0	363,0	540,0	22
708548	(4G10 + (2x1,5) + (2x22 AWG))	Orange RAL 2003	21,0	538,0	760,0	22
709705	(4G16 + (2x1,5) + (2x22 AWG))	Orange RAL 2003	23,4	775,0	1020,0	22

Dimensions and specifications may be changed without prior notice.

Feedback cables are also referred to as measurement system, resolver, or tachometer cables, but all have the same function. They transmit the resulting movement signal back to the frequency converter. This allows the motor to be optimally controlled. These cables are constructed according to manufacturer specifications. This applies equally to screening, data characteristics, and the colour-coding of the cores.

Feedback Cables

TOPGEBER 512 PUR high flexible Feedback cable for drag chain according to Siemens, Bosch Rexroth, Lenze and other Standards

Technical data

- Special PUR drag chain feedback cable acc. to UL AWM style 20233 and 20236 and CSA
- **Temperature range**
  flexing -30°C to +80°C
  fixed installation -40°C to +80°C
- **Nominal voltage**
  acc. to Siemens 30 V
  acc. to Bosch Rexroth and Lenze 300 V
  further details on request
- **A.c. test voltage**, 50 Hz
  core/core 2000 V
  core/screen 1000 V
- **Mutual capacitance** at 800 Hz
  core/core approx. 70 nF/km
  core/screen approx. 110 nF/km
- **Insulation resistance**
  min. 20 MOhm x km
- **Coupling resistance**
  max. 250 Ohm
- **Minimum bending radius**
  flexing 10x cable Ø
  fixed installation 6x cable Ø

Cable structure

- tinned copper, to DIN VDE 0295 cl.6, extra fine-wire, BS 6360 cl.6, IEC 60228 cl.6
- Core insulation of special polypropylene
- Core colours on demand
- Fleece wrapping facilitates sliding
- Overall screening of tinned copper wire braid with tinned drain wire, coverage approx. 85%
- Polyester foil
- Outer sheath of PUR
- Sheath colour green (RAL 6018) acc. to DESINA® or orange

Properties

- PUR outer sheath, low adhesion, extremely abrasion resistant, halogen-free, resistant to UV-, oil-, hydrolysis and microbial attack
- Special feature: These cables are produced to high quality specifications and conform to the DESINA®-standard
- Due to the high grade special core insulation, the PUR sheath and the highly flexible conductor, these cables are ideally suitable for use in drag chains and provide high functional reliability
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- Particularly attractive for export-oriented markets due to UL/CSA approval
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- Resistant to cleaning and disinfecting agents acc. to ECOLAB®

Note

- For a corresponding motor- and servocables please check chapter **TOPSERV® PUR**
- Encoder cables for static application please check chapter **TOPGEBER 511 PVC**
- Brackets ( ) indicate screen.
- SIEMENS product designations 6FX 8008-... are registered trademarks of Siemens AG and are to be used only for purposes of comparison.
- Bosch Rexroth product designations INK- are registered trademarks of Bosch-Rexroth AG and are to be used only for purposes of comparison.
- DESINA®: Explanation: see introduction.

Application

These low-capacitance incremental encoder cables or position feedback cables transmit the control pulses for positioning and operating characteristics of servomotors. These cables are used as connecting cables for tachos, brakes and pulse generators in applications subjected to heavy mechanical stresses in industrial equipment, machine tools, control and automation equipment. Please observe applicable installation regulations for use in energy supply chains.

EMC = Electromagnetic compatibillity

To optimize the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Continuation ▸

TOPGEBER 512 PUR high flexible Feedback cable for drag chain according to Siemens, Bosch Rexroth, Lenze and other Standards

Part no.	No.cores x cross-sec. mm²	for system	OEM Part no.	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
700655	(8 x 2 x 0,18)	Siemens	6FX 8008-1BD11	Green	7,8	54,0	79,0	24
78081	(4 x 2 x 0,34 + 4 x 0,5)	Siemens	6FX 8008-1BD21	Green	9,8	83,0	135,0	21
707400	(3 x (2 x 0,14) + 2 x 0,5)	Siemens	6FX 8008-1BD31	Green	9,0	74,0	119,0	21
700657	(3 x (2 x 0,14) + 4 x 0,14 + 2 x 0,5)	Siemens	6FX 8008-1BD41	Green	8,9	66,0	120,0	26
700540	(3 x (2 x 0,14) + 4 x 0,14 + 4 x 0,25 + 2 x 0,5)	Siemens	6FX 8008-1BD51	Green	9,6	75,0	138,0	-
700654	(4 x 2 x 0,18)	Siemens	6FX 8008-1BD61	Green	6,4	35,0	57,0	-
700653	(2 x 2 x 0,18)	Siemens	6FX 8008-1BD71	Green	5,0	24,0	42,0	-
78079	(12 x 0,22)	Siemens	6FX 8008-1BD81	Green	7,5	65,0	74,0	24
804767	(2 x 2 x 0,2 + 2 x 0,38)	Siemens	6FX 8008-2DC00	Green	7,0	40,0	74,0	-
706333	(5 x 2 x 0,25 + 2 x 0,5)	Berger Lahr	-	Green	8,8	69,0	127,0	24
705413	(3 x 2 x 0,25 + 2 x 0,5)	Elau	-	Green	7,4	43,0	82,0	24
707403	(3 x 2 x 0,25)	B+R	-	Green	6,5	31,0	60,0	24
707404	(5 x 2 x 0,14 + 2 x 0,5)	B+R	-	Green	8,7	48,0	98,0	24
707405	3 x (2 x 0,14) + (2 x 0,5)	Lenze	-	Green	9,8	42,0	98,0	24
707406	4 x (2 x 0,14) + (2 x 1,0)	Lenze	-	Green	11,3	66,0	144,0	24
707407	3 x (2 x 0,14) + (3 x 0,14)	Lenze	-	Green	10,3	41,0	127,0	24
702050	(4 x 2 x 0,25 + 2 x 1,0)	Bosch Rexroth	INK-0209 grün	Green	8,8	64,0	99,0	24
78080	(4 x 2 x 0,25 + 2 x 0,5)	Bosch Rexroth	INK-0448 grün	Green	8,5	51,0	106,0	24
77741	(9 x 0,5)	Bosch Rexroth	INK-0208 grün	Green	8,8	69,0	124,0	20
707738	(4 x 2 x 0,25 + 2 x 1,0)	Bosch Rexroth	INK-0209	Orange	8,8	64,0	99,0	20
707739	(4 x 2 x 0,25 + 2 x 0,5)	Bosch Rexroth	INK-0448	Orange	8,5	51,0	106,0	20
707740	(9 x 0,5)	Bosch Rexroth	INK-0208	Orange	8,8	69,0	124,0	20
707408	(4 x 2 x 0,14 + 4 x 1,0 + (4 x 0,14))	Bosch Rexroth	INK-0532	Orange	9,7	81,0	142,0	20
707418	(3 x (2 x 0,25) + 3 x 0,25 + 2 x 1,0)	Bosch Rexroth	INK-0280	Orange	9,0	84,0	134,7	20
707409	(2 x 2 x 0,25 + 2 x 0,5)	Bosch Rexroth	INK-0750	Orange	7,2	38,0	79,0	20
77743	(3 x (2 x 0,14) + 2 x (1 x 0,5))	Heidenhain	-	Green	8,4	81,0	109,0	-
79513	(4 x 2 x 0,14 + 4 x 0,5)	Heidenhain	-	Green	8,5	52,0	100,0	26
707410	(3 x 2 x 0,14 + 2 x 1,0)	Heidenhain	-	Green	9,1	72,0	132,0	26
700560	(4 x 2 x 0,14 + (4 x 0,14) + 4 x 0,5)	Heidenhain	-	Green	8,3	67,0	104,0	-
77753	(10 x 0,14 + 2 x 0,5)	Heidenhain	-	Green	7,2	43,0	83,0	26
78963	(5 x 2 x 0,14 + 2 x 0,5)	Baumüller	-	Green	9,0	72,0	98,0	26
78828	(3 x 2 x 0,25)	-	-	Green	7,2	55,0	83,0	24
79613	(5 x 2 x 0,38 + 2 x 0,5)	-	-	Green	8,6	69,0	130,0	21
77744	(3 x (2 x 0,14) + 2 x 1,0)	-	-	Green	8,2	71,0	107,0	26
78372	(3 x 2 x 0,14 + 2 x 0,5)	-	-	Green	7,2	35,0	67,0	26
77750	(4 x (2 x 0,25) + 2 x 1,0)	-	-	Green	10,5	93,0	175,0	24
705221	(4 x 2 x 0,25)	-	-	Green	7,5	39,0	88,0	24

Dimensions and specifications may be changed without prior notice. (RN07)

Fibre-optic cables do not use electricity to transmit data; they instead transmit light signals. This means that instead of copper, the cores are made of glass or plastic elements that conduct impulses of light. These conducting elements have cladding that causes light to refract towards the inside of the cable. For technical reasons, this type of cable uses different materials than electrical cables.

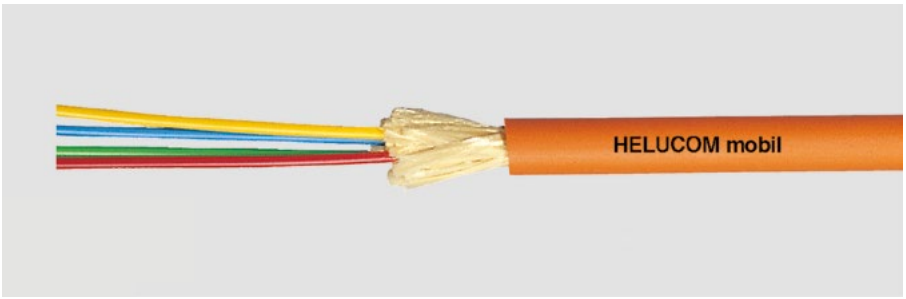
Fibre-optic cables

Fibre Optic Cable flexible

WK - mobile

HELUCOM®

A-V(ZN)11Y



Cable structure

Core type: Tight buffer
Strain relief elements: Aramide
Outer sheath colour: Orange

Temperature range

Laying, min.: +5°C
Laying, max.: +50°C
Operating, min.: -30°C
Operating, max.: +70°C

Other data

Max. tensile force: 650 N
Max. transverse pressure: 40 N / cm
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant
Resistant to hammer impact acc. to IEC 60794-1-2-E4
Bending cycles acc. to IEC 60794-1-2-E6: 500.000
Oil-resistant

Designation	Number of fibres	Fibre type	Fibre category	Outer Ø app. mm	Outer sheath material	Min. stat. bending radius mm	Flame proof	halogen-free	UL	Weight kg / km	**Part no.**
Fibre-optic cable	2	Multimode G50/125	OM2	5,0	PUR	75	yes	yes	no	20	**80382**
Fibre-optic cable	2	Multimode G62.5/125	OM1	5,0	PUR	75	yes	yes	no	20	**80363**
Fibre-optic cable	4	Multimode G50/125	OM2	5,8	PUR	90	yes	yes	no	31	**80534**
Fibre-optic cable	4	Multimode G62.5/125	OM1	5,8	PUR	90	yes	yes	no	31	**81036**
Fibre-optic cable	4	Single-mode E9/125	ITU-T G.652	5,8	PUR	90	yes	yes	no	31	**801727**
Fibre-optic cable	8	Multimode G50/125	OM2	7,0	PUR	105	yes	yes	no	47	**81037**
Fibre-optic cable	8	Multimode G62.5/125	OM1	7,0	PUR	105	yes	yes	no	47	**81038**

Dimensions and specifications may be changed without prior notice.

Application

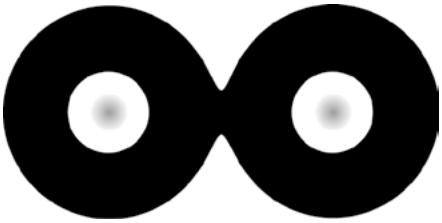
These HELUCOM® cables were designed as mobile field cables. They are easily wound up on a drum and are very tension-proof. As the outer sheath is tightly anchored on the aramid braiding, it is especially suitable for mobile use. The advantage of these cables is evident especially where mobile fibre-optic lines are to be installed, such as for drag chains, TV transmission, supervision of protected areas, etc.

Plastic Fibre cable industry

POF/PE

HELUCOM®

I-V2Y, I-V2Y(ZN)11Y



Cable structure

Fibre type: POF 980/1000
Fibre cladding: PE

Optical characteristic

Refractive index core: 1,492
Refractive index cladding: 1,419
Numerical aperture: 0,5
Attenuation see table

Temperature range

Laying, min.: -20°C
Laying, max.: +80°C
Operating, min.: -20°C
Operating, max.: +80°C

Designation	Outer sheath material	Sheath colour	Outer Ø app. mm	Max. tensile force N	Min. stat. bending radius mm	Fibre attenuation	Oil-resistant	Acc. to DESINA®	Weight kg / km	**Part no.**
I-V2Y(ZN)11Y 1P 980/1000, high flexible	PUR	Violet	5,8	400	30,0	230A1	yes	yes	30,0	**81611**
I-V2Y(ZN)11Y 2P 980/1000, high flexible	PUR	Violet	6,0	400	31,0	230A1	yes	yes	36,0	**80629**
I-V2Y(ZN)11Y 4P 980/1000, high flexible	PUR	Violet	7,1	400	45,0	230A1	yes	yes	65,0	**80630**

Dimensions and specifications may be changed without prior notice.

Application

HELUCOM® plastic-fibre cables are used in mechanical engineering, both in mobile and fixed applications. With different constructions, such as PUR outer sheaths, special strain relief components, hybrid construction with copper cores for power supply or only raw fibre cables, any possible fields of application are covered. Due to their solidity and their simple adjustability on site, the plastic-fibres (PMMA) are particularly suitable for applications where trouble-free data transmission in necessary under heavy-duty conditions.

Technical Data Overview

Max. travel distances in m (max. 10 m for 25-core cables)						Min. bending radius (D = outer-Ø)						Max. speed m/s				Max. acceleration m/s²			Max. cycles per min in mil.				
5	10	15	30	100	450	5xD	6.8xD	7.5xD	10xD	12.5xD	15xD	2	3	4	5	3	10	50	3	5	9	10	11
x						x						x					x				x		
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	x										x			x		x			x				
	x								x				x			x			x				

Checklist for Drag Chain Systems

Contact Information

Company: _____ Contact person: _____

Address: _____ Department: _____

_____ Email: _____

_____ Tel: _____

Project name: _____

1. Arrangement

☐ Unsupported

☐ Gliding

☐ Lateral

☐ Unsupported vertical

☐ Vertical standing

☐ Circular

☐ Unsupported overhanging

☐ Vertical hanging

☐ Other arrangement
(see included diagram or description)

2. Construction

Chain material

☐ Plastic

☐ Steel

☐ Stainless steel

Construction

☐ open

☐ Closed

3. Operating conditions

The drag chain will be used:

☐ Indoors

☐ Outdoors

☐ Both

4. Operating Parameters

	mm	Max. travel distance L
	m	Offset of fixed point X Fixed point not centred, Provide direction of offset
	kg/m	Dynamic addtl. load q_z Refer to cable and hose configuration for guideline values
	m/s	Dynamic addtl. load q_z
	m/s^2	Acceleration a
	m/s^2	Lateral acceleration a_q

Temperature range

	Max. °C
	Min. °C

Environmental conditions

Acids, alkalis, oil, dust, high humidity explosion protection, clean room, etc.

5. Installation space

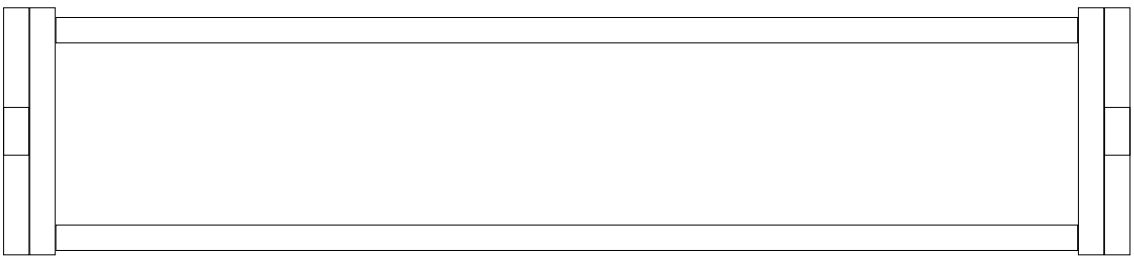
	mm	With of the complete drag chain system
	mm	Height of the complete drag chain system

6. Filling

Cable type	Overhang [mm]		Diameter Ø [mm]	Bending radius [mm]	Weight [kg/m]
	Mount	Fixed			

Hose	Medium	Operating pressure [bar]	Diameter Ø [mm]	Bending radius [mm]	Weight [kg/m]

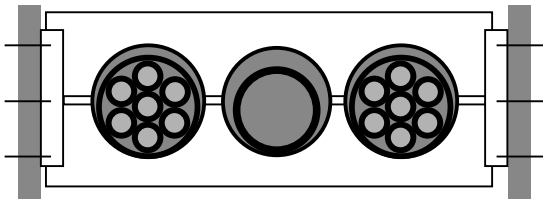
Sketch of inner separations:



Installation Instructions

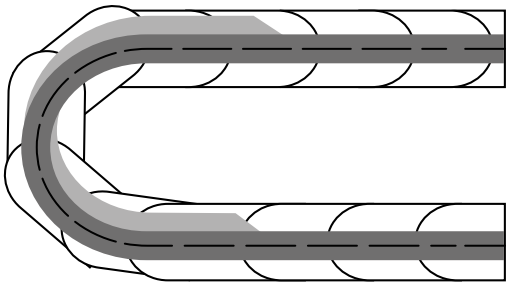
DRAG CHAIN CABLE INSTALLATION

Since control cables in drag chains perform an important role in control and energy technology, they must be perfectly coordinated. The installation of cables and protective hosing in drag chains must be done with great care. Please observe the following:



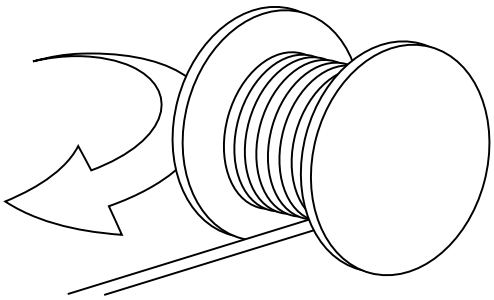
1. Cables (flat/round) should, if possible, be installed loosely next to one another. Separation bars should be installed between neighbouring cables. We do not recommend installing multiple cables on top of one another or installing cables with significant differences in diameter directly next to one another. If the installation of cables on top of one another cannot be avoided, separators should be installed.

2. The cables must be able to move freely within the crossbars of the chain. There should be clearance equal to 10% of the cable's diameter.

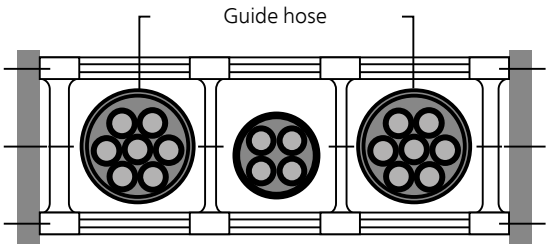


3. Always ensure that the cables are able to follow the bending radius without any mechanical stress.

4. In the case of multi-layered internal routing, the cables must be installed in the drag chain so that they have retain an appropriate clearance from one another.

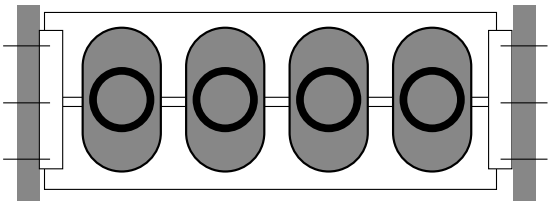


5. The cables should be installed in the drag chain without any torsion. Cables from rings or drums must be unwound tangentially, and cables in coils must not be lifted overhead. Before installation, the cable must be laid out on a flat surface with a slack allowance equal to 10% of the total cable length. This is to ensure that it can be installed in the drag chain without torsion. Tips for vertical installation:
Ensure approx. 20% clearance in the height of the crossbar as, due to the combined weight of the cable and drag chain, the cables tend to lengthen downward. This drawdown must be monitored regularly and readjusted if necessary.

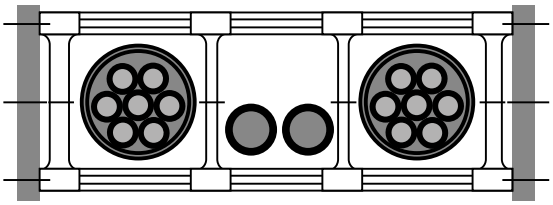


6. If it is not possible to install the cables as described in paragraph 1, we recommend the use of a guiding hose, within which many highly flexible, multi-core cables with a diameter less than 10 mm should be installed loosely. The cross-section of the hose should be significantly larger than the sum of the individual cable cross-sections.

7. If pressure or hydraulic hoses are to be installed, they must be able to move freely within the crossbars as they may lengthen or shorten with cyclic pressure loading. Contact our Accessories department for more information.



8. The distribution of weight within the crossbars should be as symmetrical as possible. Heavier cables should be installed on the outside, with lighter cables on the inside. The cables should optimally be secured with strain relief on both ends, but on the moving end of the drag chain at a minimum. It should be noted that compression occurs primarily in the outer sheath. Fastening must be done in a manner that prevents singular cores within cables from being crushed, however the movement of the cables within the chain should not be possible. This is the only way to ensure the correct compensation for length. As a guideline, keep a distance of 20–30 x the cable diameter between the end of the bending zone and the fastening point. As a general rule, avoid using cables with large core counts (> 25). Instead, divide the required core count across multiple cables.



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