

THE WORLD OF LAPP

Solutions for railway technology



LAPP GROUP

Legend for icons

PRODUCT CHARACTERISTICS



Suitable for outdoor use



Good chemical resistance



Flame-retardant



Wide clamping range



Halogen-free



Heat-resistant



Cold-resistant



Corrosion-resistant



Mechanical resistance



Assembly time



Low weight



Oil-resistant



Space requirement



Robust



Acid-resistant



Reliability



Voltage



Interference signals



Temperature-resistant



UV-resistant



Waterproof



Variety of approval certifications

Please note: the purpose of the icons is to provide you with a quick overview and a rough indication of the product features to which the corresponding information relates. You can find details of product characteristics in the “technical data” sections on the product pages.

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Success through values

Rock solid, high performance. Regional roots, global aspirations. Fast, reliable, high quality – and development that is always one step ahead. For products for the railway industry as well. This is Lapp.

The southwest region of Germany is considered one of the most innovative and powerful industrial sectors in the world, and for good reason. Lapp is a part of this region, helping to guide it and its success worldwide.

As a completely family run company, we know: Everything that we have achieved since our founding in 1957 is based on

the daily commitment of our skilled staff and partnerships with our customers based on trust. Each of them has made a decisive contribution to our mutual success. Today, Lapp is one of the world's leading manufacturers of cables, leads, cable accessories and systems of the highest level of quality. We have approximately 3,300 employees worldwide. With 17 production sites on four continents, more than 39 sales companies and hundreds of dedicated consulting experts, we are always close by. And not just physically: customer proximity cannot be meas-

ured in mere kilometres. It is based on listening, making your challenges our own and developing solutions that help to further your business model. Candid closeness and a trusting, partnership-based cooperation are more than just words for Lapp, they are values upon which we have built our family company.

The result? Intelligent and reliable connectivity solutions precisely tailored to the needs of our globally active customers. For you as well.

Customer-oriented
Successful
Family based
Innovative. **Lapp.**

- Founded in 1957
- A leading manufacturer of cables, leads, accessories and complete system solutions for connection technology
- Approximately 3,300 employees worldwide
- 17 production facilities
- More than 39 sales companies
- Hundreds of dedicated consulting experts worldwide
- Years of experience in the rail industry



Andreas Lapp,
Matthias Lapp,
Ursula Ida Lapp,
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Reliably connecting the world

We want to help you become even more productive and successful. This is why we work tirelessly on optimising our processes. We do everything to make sure we always find the best solution for you and also provide you with quick, efficient and effective support.

No matter where you are – we are always by your side. Our plants, sales companies,

partners and, above all, our competent teams of advisers ensure we offer you a comprehensive service on every continent. We do not simply distribute cable technology, we also manufacture our products ourselves – which represents another advantage for you. As a manufacturer with 18 of our own production facilities, you will benefit from our expertise in the development, design and manufacture of cables, system

products and cable accessories. Thanks to this expertise, we can guarantee that Lapp will provide you with the quality that you require and that you demand.

You can always rely on quality from Lapp – wherever you are in the world. This is also embodied by our strong brands.

8
strong
brands

100
sales partners

1
innovation
after
another

Employees from
152
countries

More than
40,000
standard products

39
proprietary sales
companies

3,300
employees

Our global corporate network



Find other sales partners in your location:
www.lappgroup.com

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Yemen

see United Arab Emirates
LAPP CABLES MIDDLE EAST FZE

Railway cables – quality makes the difference

The railway industry opens up to great opportunities: Numerous emerging markets around the world are developing with increasing momentum. And their demand for transport systems grows – in Asia and in the Middle East, Eastern Europe, Latin America and more recently in Africa as well. Even in Germany, with its dense transportation infrastructure, the market is growing at a disproportionate rate, in particular in the short-distance sector.

The modernisation of old system alone is a task of Herculean proportions – both for public budgets and for manufacturers and operators.

This is due to the fact that a significant innovation backlog has built up. At the same time, the demand for urban transport and fast short-distance systems grows. For larger distances, high-speed projects are gaining in importance, cities are growing and freight traffic is steadily increasing.

This is coupled with increasingly stringent safety regulations and quality standards that must be met. Fire protection standards are particularly demanding. Based on decades of experience as a

full-service provider for electrical cables, cable connections and accessories, Lapp has rounded out its portfolio with products for the railway industry and can offer its customers high-quality solutions in this sector as well.

Lapp now supplies a large number of customers in this market. One of our refer-

ence customers is the Korean manufacturer Hyundai-Rotem. They have placed their trust in use for a number of years and have equipped their high-speed trains for the new line of the Korea Train eXpress (KTX) from Seoul to Mokpo and Pusan with Lapp cables. Here, our quality and delivery service were the decisive factors to gain the edge over our competitors.

At the
forefront of
development.
Also for
the railway
industry.

Lapp.

- Almost 60 years of experience in the development and production of electrical cables, cable connections and accessories
- In-house production expertise
- Current reference project: High-speed trains for the Korea Train eXpress (KTX)
- IRIS certified



Your interests in mind – and passengers'



We are prepared and have systematically built up our know-how and expertise in the railway technology sector in order to provide convincing arguments to the railway industry regarding our global capabilities.

Because we have a great deal to offer. This starts with the ability to speak your language. Our employees come from 152 countries. With our sales companies and competent consulting teams, we are represented locally around the world, providing you with comprehensive services. An effective customer focus is part of Lapp, as is our keen sense for trends, sectors and markets. Using this as a basis, we develop the components and solutions of tomorrow for your ideas and projects.

Even for complex requirements, we provide you with the perfect solution, from proven standard products to sophisticated custom solutions. We back up these promises with our actions. To make the procurement process as simple as possible, we can connect your inventory management system to our system. And in our e-shop, you can order any of our 40,000+ standard articles, including railway products, with a simple click – including individual price enquiries, availability and delivery time details, as well as shipment tracking.

Our full service, fast worldwide availability and small minimum order quantities reduce the overall cost to our customers. In short: We are your partner, and we always keep your interests in mind, ensure

uncomplicated cooperation and provide you with the highest quality from a single source paired with a clear added value for your business.

Clear added value for your company. Optimised total cost for rail equipment providers.

Lapp.

- A local presence, worldwide
- More than 40,000 standard items, for order with the click of a mouse
- Excellent full service
- Fast worldwide availability
- Small minimum order quantities
- Total cost optimisation
- Highest quality
- Complete solutions for the railway industry from a single source = one-stop shop
- e-Service solutions

Technological lead, step-by-step

Our manufacturing facility for the ÖLFLEX® TRAIN is certified in accordance with the IRIS (International Rail Industry Standard), thus operating within the framework of the required processes of the railway industry.

We are a technology group in our sector. We live up to this expectation every day. This is a key success factor for us, something that is more important today in the railway business than ever. Lapp solutions set standards for safety, quality and functionality. And at a great value for money too.

ÖLFLEX® has long become synonymous in the market for power and control cables. Our flexible, oil-resistant cables satisfy the highest demands and can withstand even the very toughest conditions. We have now developed our ÖLFLEX® TRAIN product line, thus providing the railway industry with connectivity solutions of the highest quality that satisfy a wide range of national and international standards.

ÖLFLEX® TRAIN manufacturing technology:

Cable insulation products are usually made of thermoplastic materials, mainly consisting of macromolecules.

When warmed, the mobility of the molecule chains increases, making the plastic soft and malleable and eventually melting – an exclusion criterion for the use of such materials in railway equipment with its demanding safety and environmental conditions and high temperature requirements.

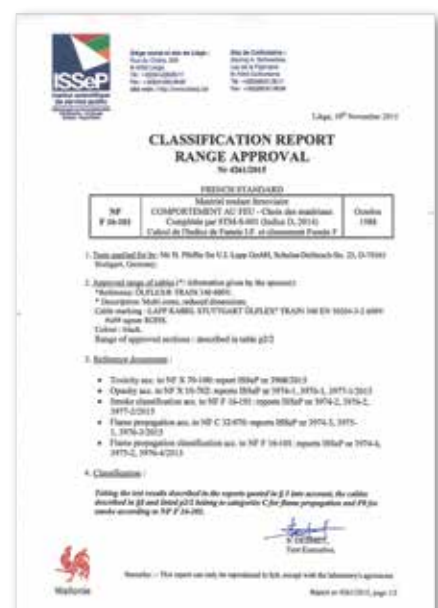
To counteract these factors, ÖLFLEX® TRAIN cables are physically cross-linked in our electron beam system using high-energy beams. This gives them significantly improved mechanical and chemical resistance, even at elevated temperatures.

However, durability and resistance is important not only at high temperatures. In some climatic zones, cables running along

the outside of the railways vehicles must be able to withstand temperatures down to -40°C. No problem for cross-linked products from Lapp.

This also applies to our other established brands:

- ÖLFLEX® CONNECT assembled cable solutions
- ETHERLINE® data communication systems for Ethernet technology
- UNITRONIC® data communication systems
- SKINTOP® cable glands
- EPIC® industrial connectors
- SILVYN® cable protection and guiding systems
- FLEXIMARK® marking systems
- HITRONIC® optical data communication systems



Absolute safety on the tracks

The topic is well known: Railway lines must fulfil demanding national and international standards. In addition to these provisions, EU standards has achieved great importance. These include design standards such as EN 50264 and EN 50306. They define the required panel thickness and design and stipulate the mechanical, thermal, fire safety and chemical tests.

These testing standards are part of DIN EN 45545-2: Railway applications – Fire protection on railway vehicles – Part 2: Requirements for fire behaviour of materials and components. It defines the requirements for the fire behaviour.

Lapp has fulfilled the technological requirements for satisfying this standard for railway cables. The result: Cables and

wires from Lapp fulfil the key requirements for railway equipment with flying colours. Reliable and safe – up to the highest level defined in EN 45545-2, Hazard Level 3 (HL3).

Testing standards that define the requirements for behaviour in case of fire are of particular importance. These include:

Flame propagation for a single cable
DIN EN 60332-1-2

Smoke density
DIN EN 61034-2

Content of halogens
DIN EN 60754-1

Acidity/Corrosiveness
DIN EN 60754-2

Flame spread of bunched cables
DIN EN 60332-3-24/25

Fluorine content
DIN EN 60684-2

Toxicity
EN 50305

- The highest level of technology
- Top priority: Safety and fire protection
- Test in accordance with EN 45545-2 at accredited and approved test laboratories passed successfully
- Important railway transport standards are satisfied and observed by Lapp



Arrival in
the global
railway
market.
A sure thing.
Lapp.

Only the toughest tests guarantee the highest quality

Test centre at Lapp headquarters in Stuttgart

Our trial and test centre, with its extremely high standards for material testing and quality assurance, is a further guarantee of the decisive quality advancements of Lapp products. It is here that every Lapp Group design is subjected to tough performance and endurance tests. For example, our high-flexibility cables undergo millions of bending cycles at different speeds and extreme bending radii. Only products that survive the “folding chamber” are good enough to be included in our product range.

Comprehensive quality tests for cables

- Tensile and shearing strength test
- Resistance test
- Electrical test
- Torsion test
- Torsion-bending test
- Drag chain test
- Roll bending test
- Fire tests

Quality checks for cable glands

- Protection class testing - water (IP X3 to X8)
- Protection class testing - dust (IP 5X, IP 6X)
- Oil spray test according to UL 514 B
- Pulling protection testing

Strict materials testing

- Infra-red spectroscopy for material identification
- Thermogravimetry to determine material proportions
- Thermal analysis to test the thermal properties of materials
- Climate cabinets to test ageing and storability

Our test centre is also open for our customers

A customer-focused mentality and perfect service form part of the Lapp Group company values. We therefore offer our customers the chance to profit from our trial and test centre beyond the scope of qual-

ity assurance of our products.

We will test your products and carry out material tests in accordance with your wishes. For instance, you might bring us a length of cable whose material composition you wish to find out. We will test it for you using infrared spectroscopy and tell you what materials it contains. Using thermoanalysis we can give you information about the material properties. And we can test materials for aging and shelf-life.

In short: The entire know-how of our specialists is available to you for your analysis and quality assurance.

- ÖLFLEX® TRAIN solutions for the railway industry
- Perfect material properties thanks to electron beam cross-linking in our in-house production facility
- IRIS certified
- In-house test centre at our headquarters

With expertise
in the railway
sector. **Lapp.**



Railway equipment – available soon worldwide

You can forget about long delivery times and high minimum order quantities. We keep railway products in stock for you and deliver quickly. Regardless of where in the world you need them. Even in smaller quantities.

To make this possible, we have built up a close-knit network of logistics centres and professionally trained consulting experts. Our fast, smooth delivery service is based on sophisticated, completely digitised and reliable logistics processes.

Our logistics and service centre in Ludwigsburg is setting the benchmark in many ways: 30,000 m² total floor, fully automated high-rack facility, 120 logistics employees, 30 truck loading ramps, over 90,000 articles and nearly 500,000 km

cables delivered every year represent the most important facts.

With our Track & Trace web service, you can always view the current status of your deliveries. Or you can give us your e-mail address and request our evening delivery update. It includes all the details on your current shipment, including the package or shipment number.

Incidentally, When the Lapp logistics centre was constructed, great importance was placed on sustainability and energy saving. The photovoltaic system on the roof, for instance, generates approximately 1,000 MWh of energy per year, thus reducing annual CO₂ emissions by around 650 tonnes.

- Delivery within a short time worldwide from the warehouse
- Track & Trace web service
- Daily delivery update with mail-push service
- Fully automatic high-rack facilities
- Sustainability and environmental awareness

Fast and reliable.
All over
the world. **Lapp.**

65,000 m²

of storage space in Germany alone enables us to keep 40,000 km of ÖLFLEX® constantly in stock.

This is longer than the length of the equator



Products for the railway industry at a glance

- 1** Brake
- 2** Driver's Desk
- 3** Traction Converter
- 4** Control Cabinets
- 5** Coupler
- 6** Train Control System
- 7** Traction Motor
- 8** Brake
- 9** Blower
- 10** Battery
- 11** Auxiliary Power Converter
- 12** Passenger Information System
- 13** Lavatory
- 14** Lighting
- 15** Air Condition
- 16** Doors



ÖLFLEX® Power and control cables

ÖLFLEX® TRAIN 301

1 2 4 6 8 11 12 13
14 16

ÖLFLEX® TRAIN 310/315 C

1 4 6 8 11 12 13 15

ÖLFLEX® TRAIN 317 C

1 2 3 4 6 8 11 12
13 15 16

ÖLFLEX® TRAIN 320/325 C

1 3 8 11 16

ÖLFLEX® TRAIN 327 C

1 3 5 6 8 11 15

ÖLFLEX® TRAIN 331 600V

1 2 3 4 5 6 8 9 10
11 13 14 15 16

ÖLFLEX® TRAIN 340 600V

1 3 4 5 8 9 11 13 15

ÖLFLEX® TRAIN 345 C 600V

1 3 4 5 8 11 13 15

ÖLFLEX® TRAIN 350 300V/355 C 300V

4 5 6 13

ÖLFLEX® TRAIN 361 1,8kV

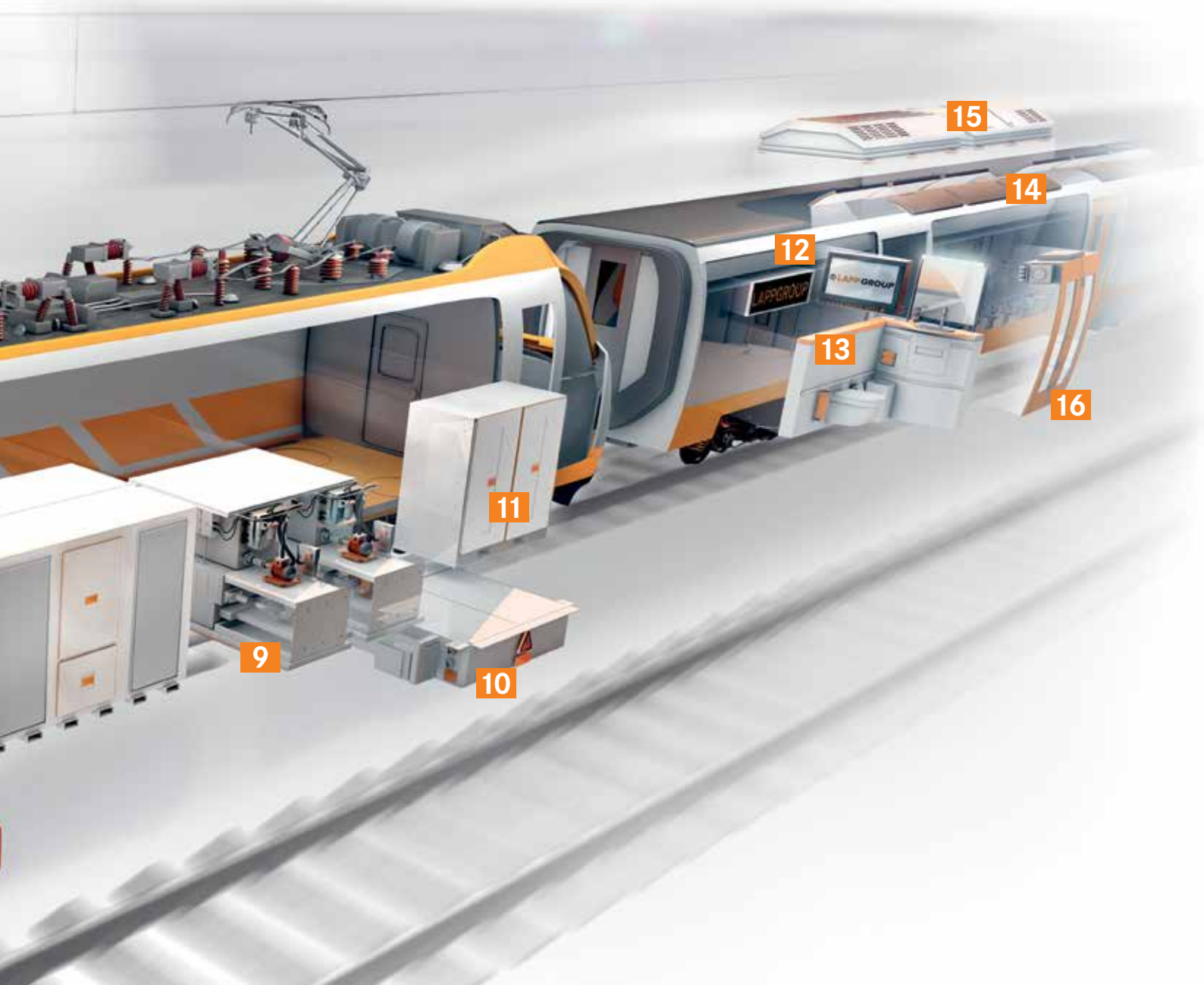
3 4 7 9 10 11 15

ÖLFLEX® TRAIN 371 1,8kV

3 4 5 7 9 10 11

ÖLFLEX® TRAIN 381 3,6kV

7



UNITRONIC® Data communication systems

UNITRONIC® TRAIN

1 2 3 4 5 6 8 10 11 13 14 15 16

ETHERLINE® Data communication systems for ETHERNET technology

ETHERLINE® TRAIN

1 2 3 4 5 6 8 11 12 13 15 16

EPIC® Industrial connectors

1 2 3 4 5 6 8 9 10 11 12 15

SKINTOP® Cable glands

1 3 4 5 6 7 8 9 10 11 12 13 15

SILVYN® Cable protection and guiding systems

1 2 3 4 5 6 7 8 9 10 11 12 13
14 15 16

FLEXIMARK® Marking systems

1 2 3 4 5 6 7 8 9 10 11 12 13
14 15 16

Overview ÖLFLEX® TRAIN

Single cores according to EN 50306 (Thin Wall)

LAPP KABEL STUTTGART ÖLFLEX® TRAIN 301 TW 300V EN 50306-2 M

	ÖLFLEX® TRAIN 301 TW 300 V
Type standard	EN 50306-2
May substitute previous type	GKW R
With screen	
Type acc. to EN standard	M
Conductor cross-section (mm²)	Article number
0,5	15301000
0,75	15301001
1	15301002
1,5	15301003
2,5	15301004

Multi core cables with twisted pairs according to EN 50306 (Thin Wall)



	TRAIN 317 C TW-P 300 V	ÖLFLEX® TRAIN 327 C TW-E 300 V
Type standard	EN 50306-4 / 5P	EN 50306-4 / 5E
May substitute previous type		
With screen	●	●
Type acc. to EN standard	MM S	MM S
Number of pairs and mm² per conductor	Article number	Article number
2 X(2 X 0,5)	15317000	15327000
3 X(2 X 0,5)	15317001	15327001
4 X(2 X 0,5)	15317002	15327002
7 X(2 X 0,5)	15317003	15327003
2 X(2 X 0,75)	15317004	15327004
3 X(2 X 0,75)	15317005	15327005
4 X(2 X 0,75)	15317006	15327006
7 X(2 X 0,75)	15317007	15327007
2 X(2 X 1)	15317008	15327008
3 X(2 X 1)	15317009	15327009
4 X(2 X 1)	15317010	15327010
7 X(2 X 1)	15317011	15327011
2 X(2 X 1,5)	15317012	15327012
3 X(2 X 1,5)	15317013	15327013
4 X(2 X 1,5)	15317014	15327014
7 X(2 X 1,5)	15317015	15327015

Overview ÖLFLEX® TRAIN

Multi core cables according to EN 50306 (Thin Wall)

LAPP KABEL STUTTGART ÖLFLEX® TRAIN 310 TW-P 300V EN 50306-4 1P MM



	ÖLFLEX® TRAIN 310 TW-P 300 V	ÖLFLEX® TRAIN 315 C TW-P 300 V	ÖLFLEX® TRAIN 320 TW-E 300 V	ÖLFLEX® TRAIN 325 C TW-E 300 V
Type standard	EN 50306-4 / 1P	EN 50306-4 / 3P	EN 50306-4 / 1E	EN 50306-4 / 3E
May substitute previous type	GKW flex R	GKW C-flex R	GKW flex R	GKW C-flex R
With screen		●		●
Type acc. to EN standard	MM	MM S	MM	MM S
Number of cores and mm ² per conductor	Article number	Article number	Article number	Article number
2 X 0,5		15315000		15325000
3 X 0,5		15315001		15325001
4 X 0,5	15310000	15315002	15320000	15325002
6 X 0,5		15315003		15325003
7 X 0,5	15310001		15320001	
8 X 0,5		15315004		15325004
13 X 0,5	15310002		15320002	
19 X 0,5	15310003		15320003	
37 X 0,5	15310004		15320004	
2 X 0,75		15315005		15325005
3 X 0,75		15315006		15325006
4 X 0,75	15310005	15315007	15320005	15325007
6 X 0,75		15315008		15325008
7 X 0,75	15310006		15320006	
8 X 0,75		15315009		15325009
13 X 0,75	15310007		15320007	
19 X 0,75	15310008		15320008	
37 X 0,75	15310009		15320009	
48 X 0,75	15310010		15320010	
2 X 1		15315010		15325010
3 X 1		15315011		15325011
4 X 1	15310011	15315012	15320011	15325012
6 X 1		15315013		15325013
7 X 1	15310012		15320012	
8 X 1		15315014		15325014
13 X 1	15310013		15320013	
19 X 1	15310014		15320014	
37 X 1	15310015		15320015	
2 X 1,5		15315015		15325015
3 X 1,5		15315016		15325016
4 X 1,5	15310016	15315017	15320016	15325017
6 X 1,5		15315018		15325018
7 X 1,5	15310017		15320017	
8 X 1,5		15315019		15325019
13 X 1,5	15310018		15320018	
19 X 1,5	15310019		15320019	
37 X 1,5	15310020		15320020	
2 X 2,5	15310021	15315020	15320021	15325020
3 X 2,5	15310022	15315021	15320022	15325021
4 X 2,5	15310023	15315022	15320023	15325022

Overview ÖLFLEX® TRAIN

Single core cables according to EN 50264



	ÖLFLEX® TRAIN 331 600 V		ÖLFLEX® TRAIN 361 1.8 kV	ÖLFLEX® TRAIN 371 1.8 kV	ÖLFLEX® TRAIN 381 3.6 kV
Type standard	EN 50264-3-1		EN 50264-3-1	EN 50264-3-1	EN 50264-3-1
May substitute previous type	3GKW	3GKW		4GKW AXplus	9GKW-AXplus
With outer sheath				●	●
Type according to EN standard	M		M	MM	MM
Colour of insulation/outer sheath	BK	GN/YE	BK	BK	BK
Conductor cross-section/mm²	Article number	Article number	Article number	Article number	Article number
1	15331000	15331017			
1.5	15331001	15331018	15361000	15371000	
2.5	15331002	15331019	15361001	15371001	15381000
4	15331003	15331020	15361002	15371002	15381001
6	15331004	15331021	15361003	15371003	15381002
10	15331005	15331022	15361004	15371004	15381003
16	15331006	15331023	15361005	15371005	15381004
25	15331007	15331024	15361006	15371006	15381005
35	15331008	15331025	15361007	15371007	15381006
50	15331009	15331026	15361008	15371008	15381007
70	15331010	15331027	15361009	15371009	15381008
95	15331011	15331028	15361010	15371010	15381009
120	15331012		15361011	15371011	15381010
150	15331013		15361012	15371012	15381011
185	15331014		15361013	15371013	15381012
240	15331015		15361014	15371014	15381013
300	15331016		15361015	15371015	15381014

Overview ÖLFLEX® TRAIN

Multi core cables according to EN 50264

LAPP KABEL STUTTGART ÖLFLEX® TRAIN 345 C 600V EN 50264-3-2 MM



	ÖLFLEX® TRAIN 340 600 V	ÖLFLEX® TRAIN 345 C 600 V	ÖLFLEX® TRAIN 350 300 V	ÖLFLEX® TRAIN 355 C 300V
Type standard	EN 50264-3-2	EN 50264-3-2	EN 50264-3-2	EN 50264-3-2
May substitute previous type	3GKW-flex	3GKW C-flex		
With screen		●		●
Type according to EN standard	MM	MM S	MM	MM S
Number of cores and mm² per conductor	Article number	Article number	Article number	Article number
2 X 1			15350000	15355000
4 X 1			15350001	15355001
7 X 1			15350002	15355002
9 X 1			15350003	15355003
12 X 1			15350004	15355004
19 X 1			15350005	15355005
24 X 1			15350006	15355006
32 X 1			15350007	15355007
37 X 1			15350008	15355008
40 X 1			15350009	15355009
2 X 1.5	15340000	15345000		
3 X 1.5	15340001	15345001		
3 G 1.5	15340025	15345025		
4 X 1.5	15340002	15345002	15350010	15355010
4 G 1.5	15340026	15345026		
7 X 1.5			15350011	15355011
9 X 1.5			15350012	15355012
12 X 1.5			15350013	15355013
19 X 1.5			15350014	15355014
24 X 1.5			15350015	15355015
32 X 1.5			15350016	15355016
37 X 1.5			15350017	15355017
2 X 2.5	15340003	15345003		
3 X 2.5	15340004	15345004		
3 G 2.5	15340027	15345027		
4 X 2.5	15340005	15345005	15350018	15355018
4 G 2.5	15340028	15345028		
7 X 2.5			15350019	15355019
9 X 2.5			15350020	15355020
12 X 2.5			15350021	15355021
19 X 2.5			15350022	15355022
24 X 2.5			15350023	15355023
2 X 4	15340006	15345006		
3 X 4	15340007	15345007		
4 X 4	15340008	15345008		
2 X 6	15340009	15345009		
3 X 6	15340010	15345010		
4 X 6	15340011	15345011		
2 X 10	15340012	15345012		
3 X 10	15340013	15345013		
4 X 10	15340014	15345014		
2 X 16	15340015	15345015		
3 X 16	15340016	15345016		
4 X 16	15340017	15345017		
2 X 25	15340018	15345018		
3 X 25	15340019	15345019		
4 X 25	15340020	15345020		
2 X 35	15340021	15345021		
3 X 35	15340022	15345022		
2 X 50	15340023	15345023		
3 X 50	15340024	15345024		

EPIC® Industrial connectors

At a glance

Properties	Connection type					Connection cross section	Rated voltage according to standards			Rated current for largest connection cross section according to standards			Approvals
	Screw	Crimp	Spring	Push-In	Solder	in mm² depending on connection type	IEC	UL/USR	CSA/CNR	IEC	UL/USR	CSA/CNR	International
													
Rectangular – inserts fixed													
EPIC® H-A 3, 4	●					0.5 – 2.5	400 V	600 V	600 V	23 A	10 A	10 A	VDE, UR, CSA
EPIC® H-A 10, 16, 32, 48	●					0.5 – 2.5	250 V	600 V	600 V	16 A	14 A	16 A	VDE, UR, CSA
EPIC® STA 6, 14, 20	●				●	0.5 – 1.5/ max. 1.5	24 VAC/60 VDC	48 V	48 V	10 A	10 A	10 A	UR, CSA
EPIC® H-Q 5		●				0.14 – 4.0	230 V/400 V	600 V	600 V	16 A	16 A	16 A	UR, CSA
EPIC® H-D 7, 8		●				0.14 – 2.5	H*	250 V	–	10 A	10 A	–	UR
EPIC® H-D 15, 25, 40, 64		●				0.14 – 2.5	250 V	250 V	–	10 A	10 A	–	UR
EPIC® H-DD 24, 42, 72, 108		●				0.14 – 2.5	250 V	600 V	600 V	10 A	8.5 A	10 A	UR, CSA
EPIC® H-BE 6, 10, 16, 24, 32, 48	●	●	●	●		0.5 – 2.5/ 0.14 – 4.0	500 V	600 V	600 V	16 A	16 A	16 A	VDE, cURus
EPIC® H-EE 10, 18, 32, 46		●				0.14 – 4.0	500 V	600 V	600 V	16 A	16 A	16 A	UR, CSA
EPIC® H-BS 6, 12	●					0.5 – 6.0	500 V	600 V	600 V	35 A	35 A	35 A	UR, CSA
EPIC® H-BVE 3, 6, 10	●					0.5 – 2.5	630 V	600 V	600 V	16 A	16 A	16 A	VDE, cURus
POWER H-S 4	●					2.5 – 10.0	1000 V	–	–	65 A	–	–	–
EPIC® POWER K 4/0, 4/2	●					1.5 – 16.0	830 V	–	–	80 A	–	–	–
EPIC® TB-H-BE 16, 24	●					0.5 – 4.0	500 V	600 V	600 V	16 A	16 A	16 A	UR, CSA
Rectangular – inserts modular													
High voltage 1+PE, 2	●					10.0 – 25.0	1000 V	600 V	–	82 A	82 A	–	VDE, cURus
EPIC® POWER HC2		●				16	1000 V	–	–	65 A	–	–	–
POWER HHC2		●				16.0 – 35.0	1000 V	–	–	150 A	–	–	–
POWER HHC1		●				50.0 – 95.0	1000 V	–	–	220 A	–	–	–
High voltage 3-pin		●				1.5 – 10.0	1000 V	–	–	50 A	–	–	–
High voltage 4+PE		●				0.5 – 2.5	1000 V	–	–	16 A	–	–	–
3-pin		●				1.5 – 10.0	630 V	600 V	600 V	40 A	40 A	35 A	UR, CSA
HE 4-pin		●				0.5 – 4.0	630 V	–	–	25 A	–	–	–
Cage clamp 4-pin			●			0.5 – 2.5	400 V	–	–	14 A	–	–	–
5-pin		●				0.5 – 4.0	400 V	400 V	400 V	20 A	20 A	16 A	UR, CSA
10-pin		●				0.14 – 2.5	250 V	250 V	240 V	10 A	10 A	10 A	UR, CSA
10-pin stamped		●				0.14 – 2.5	250 V	–	–	10 A	–	–	–
20-pin		●				0.08 – 0.56	100 V	100 V	100 V	4 A	4 A	4 A	UR, CSA
Blind						–	–	–	–	–	–	–	–
Coaxial		●				Coaxial	250 V	–	–	–	–	–	–
PROFIBUS® DP	●					0.08 – 1.5	30 V	–	–	1 A	–	–	–
Universal bus	●					0.08 – 1.5	30 V	–	–	1 A	–	–	–
RJ45		●				0.14 – 2.5/ 0.12 – 0.2	600 V/ 125 V	–	–	P*: 10 A S*: 1.5 A	–	–	–
Pneumatic 1, 2-pin				●		∅ 2.5/4.0 mm ∅ 2.5/4.0 mm	–	–	–	–	–	–	–
Round													
EPIC® POWER M12 3+PE	●					0.75 – 1.5	630 V	600 V	–	12 A	12 A	12 A	cURus
EPIC® SIGNAL M17 8, 17		●				0.06 – 0.56/ 0.06 – 1.0	60 V	–	–	3.6 A	–	–	–
EPIC® POWER M17 3+PE		●				0.5 – 2.5	630 V	–	–	20 A	–	–	–
EPIC® POWER M17 5+PE, 6+PE, 7+PE		●				0.06 – 1.0	630 V	–	–	14 A	–	–	–
EPIC® POWER M17 3+PE+5		●				0.06 – 1.0/ 0.06 – 0.56	630 V/ 60 V	–	–	P*: 14 A S*: 3.6 A	–	–	–
EPIC® SIGNAL M23 6, 7		●			●	0.06 – 2.5	150 V	150 V	150 V	18 A	15 A	15 A	VDE, cURus
EPIC® SIGNAL M23 8+1		●			●	0.06 – 1.0/ 0.06 – 2.5	150 V	150 V	150 V	P*: 20 A S*: 7 A	P*: 20 A S*: 7 A	P*: 20 A S*: 7 A	VDE, cURus
EPIC® SIGNAL M23 9		●			●	0.06 – 1.0	150 V	150 V	150 V	7 A	7 A	6 A	VDE, cURus
EPIC® SIGNAL M23 12, 16		●			●	0.06 – 1.0	100 V	100 V	100 V	7 A	7 A	6 A	VDE, cURus
EPIC® SIGNAL M23 17		●			●	0.06 – 1.0	50 V	50 V	50 V	7 A	7 A	7 A	VDE, cURus
EPIC® SIGNAL R3.0					●	0.06 – 1.0	24 VAC/60 VDC	–	–	7.5 A	–	–	–
EPIC® POWER LS1 5+PE		●				0.5 – 4.0	630 V	600 V	600 V	25 A	22 A	17 A	VDE, cURus
EPIC® POWER LS1 3+PE+4		●				0.5 – 4.0/ 0.4 – 1.0	630 V/250 V	600 V/ 250 V	600 V/ 250 V	P*: 26 A S*: 7 A	P*: 22 A S*: 7 A	P*: 17 A S*: 7 A	VDE, cURus
EPIC® POWER LS1.5 3+PE+2, 3+PE+4		●				0.75 – 10.0/ 0.14 – 4.0	630 V/250 V	–	–	P*: 70 A S*: 30 A	–	–	–
EPIC® POWER LS3 3+PE+2, 3+PE+4		●				10.0 – 50.0/ 0.75 – 1.5	630 V/250 V	–	–	P*: 150 A S*: 12 A	–	–	–
EPIC® POWERLOCK S	●					50.0 – 120.0	1000 V	–	–	400 A	–	–	VDE
EPIC® POWERLOCK C		●				35.0 – 240.0	1000 V	–	–	660 A	–	–	VDE
SOLAR													
EPIC® SOLAR 4		●				2.5 – 6.0	1000 V	–	–	30 A	–	–	TÜV

P*: Power S*: Signal H*: In metal housing: 24 VAC/60 VDC; in plastic housing: 250 V

EPIC® rectangular connectors

Flexible, robust connectors for mechanical engineering



The connector system for mechanical and plant engineering and wherever a robust connection system is required. EPIC® Rectangular connectors are available as components. The right connector for any application can be made individually from housings, inserts and contacts. www.lappgroup.com/connectorfinder

For the housing, there are two performance classes to choose from

- EPIC® Standard is robust and there is a flexible choice of cable entries www.lappgroup.com/connector-housing
- EPIC® ULTRA has a high corrosion protection, EMC protection as well as a stainless steel interlocking device

EPIC® inserts are available in a fixed pin design and as a modular system

- EPIC® fixed pin inserts are easy to handle and come in a wide variety of designs
- EPIC® modular inserts offer flexibility with modules for data, signals, power, fibre-optics and pneumatics. This means every insert is individually tailor-made for the relevant modul configuration

EPIC® circular connectors

Compact connectors for motion control and energy transfer



Circular connections come in two designs, a signal design with gold-plated contacts for transmitting delicate signals and as high-reserve power connectors.

EPIC® SIGNAL connectors are available as M17, M23 and R3.0 (M27)

- The metal housing with an integrated EMC screen contact reliably prevents electromagnetic interferences
- Gold-plated signal contacts reliably transmit with the lowest of currents and voltages

EPIC® POWER connectors are available as M12, M17, LS1 (M23), LS1.5 (M40) and LS3 (M58)

- The integrated EMC cable glands offer strain relief and are perfectly sealed
- High-quality sealing materials for good chemical protection

EPIC® POWERLOCK

- Perfect for transmitting very high currents
- Colour coded and geometrically coded in order to prevent incorrect connections



ÖLFLEX® TRAIN 301 TW 300V

Single-core cable according to EN 50306-2 type M for high requirements in railway applications

LAPP KABEL STUTTGART ÖLFLEX® TRAIN 301 TW 300V EN 50306-2 M



Info

- Meets EN 50306-2 type M and EN 45545-2
- High temperature resistance: -45°C up to +125°C
- Highly oil- and fuel-resistant

Benefits

- Reduced insulation wall thickness, thus space-saving installation
- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Application range

- For use in railway vehicles and buses, for fixed and protected installation and applications where limited movement may occur
- Suitable for switchboards and control panels of trains and locomotives
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 50305
- Fire behaviour according to NF: on request / see data sheet
- Chemical properties:
 - Oil resistant acc. to EN 50306
 - Fuel resistant acc. to EN 50306
 - Acid resistant acc. to EN 50306
 - Alkali resistant acc. to EN 50306
 - Ozone resistant acc. to EN 50306

Norm references / Approvals

- EN 50306-2, type M
- EN 45545-2
- NF F 16-101: on request / see data sheet

Product Make-up

- Tinned-copper strand, 19 or 37 wires, SRC (Special Round Conductor)
- Insulation: Electron beam cross-linked Polymer compound acc. to EN 50306
- Colour of core insulation: white

Technical data



Classification

ETIM 5.0 Class-ID: EC000993
ETIM 5.0 Class-Description:
Single core cable



Conductor stranding

SRC (special round conductor)
19 or 37 wires acc. to EN 50306-1



Minimum bending radius

Fixed installation:
4 x OD
3 x OD for careful bending, once at connecting terminal
Occasional flexing:
5 x OD
(OD = outer diameter)



Nominal voltage

U_0/U AC 300/500 V
 U_m AC 550 V
 V_0 DC 410 V
Fixed installation:
 U_0/U AC 0,6/1 kV
 U_m AC 1,2 kV
 V_0 DC 0,9 kV



Test voltage

3,5 kV AC; 8,4 kV DC



Temperature range

Fixed installation:
-45°C to +125°C (20.000 h)
Occasional flexing:
-35°C to +105°C
Short circuit: +160°C (5s)

Article number	Conductor cross-section (mm ²)	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 301 TW 300V				
15301000	0.5	1.3	4.8	6
15301001	0.75	1.5	7.2	8
15301002	1.0	1.6	9.6	11
15301003	1.5	2.1	14.4	17
15301004	2.5	2.7	24.4	28

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.

Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum

Please specify the preferred

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® TRAIN 331 600V refer to page 29

**ÖLFLEX® TRAIN 310 TW-P 300V**

Multi-core cable according to EN 50306-4 1P type MM for high requirements in railway applications

**Info**

- Meets EN 50306-4 class P, type MM and EN 45545-2
- High temperature resistance: -45°C up to +125°C
- Highly oil- and fuel-resistant

Benefits

- Reduced insulation wall thickness, thus space-saving installation
- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Application range

- For use in railway vehicles and buses, for fixed and protected installation and applications where limited movement may occur
- Suitable for control and monitoring circuits as well as locking circuits and internal wiring of equipment in trains and locomotives
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-24 / EN 60332-3-25 / EN 50305
- Fire behaviour according to NF: on request / see data sheet

Chemical properties:

- Oil resistant acc. to EN 50306
- Fuel resistant acc. to EN 50306
- Acid resistant acc. to EN 50306
- Alkali resistant acc. to EN 50306
- Ozone resistant acc. to EN 50306

Norm references / Approvals

- EN 50306-4 class P, type MM
- EN 45545-2
- NF F 16-101: on request / see data sheet

Product Make-up

- Tinned-copper strand, 19 or 37 wires, SRC (Special Round Conductor)
- Insulation: Electron beam cross-linked Polymer compound acc. to EN 50306
- Colour of insulation: White with black numbers
- Outer sheath: electron beam cross-linked polymer-compound S2 acc. to EN 50306
- Outer sheath colour: Black

Technical data**Classification**

ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description:
Control cable

**Core identification code**

White with black numbers

**Conductor stranding**

SRC (special round conductor)
19 or 37 wires acc. to EN 50306-1

**Minimum bending radius**

Fixed installation:

≤ 12 mm: 4 x OD / 3 x OD*

> 12 mm: 5 x OD / 4 x OD*

* for careful bending, once at connecting terminal

Occasional flexing:

≤ 12 mm: 5 x OD

> 12 mm: 6 x OD

(OD = outer diameter)

**Nominal voltage**

U₀/U AC 300/500 V

U_m AC 550 V

V_m DC 410 V

Fixed installation:

U₀/U AC 0,6/1 kV

U_m AC 1,2 kV

V_m DC 0,9 kV

**Test voltage**

3,5 kV AC; 8,4 kV DC

**Protective conductor**

G = with GN-YE protective conductor

X = without protective conductor

**Temperature range**

Fixed installation:

-45°C to +125°C (20.000 h)

Occasional flexing:

-35°C to +105°C

Short circuit: +160°C (5s)

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 310 TW-P 300V				
15310000	4 X 0.5	4.6	19.2	42
15310001	7 X 0.5	5.4	33.6	64
15310002	13 X 0.5	7.8	62.4	120
15310003	19 X 0.5	8.6	91.2	157
15310004	37 X 0.5	11.4	177.6	285
15310005	4 X 0.75	5.1	28.8	55
15310006	7 X 0.75	6.0	50.4	84
15310007	13 X 0.75	8.7	93.6	162
15310008	19 X 0.75	9.6	136.8	214
15310009	37 X 0.75	12.8	266.4	392
15310011	4 X 1.0	5.4	38.4	68

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
15310012	7 X 1.0	6.5	67.2	106
15310013	13 X 1.0	9.3	124.8	200
15310014	19 X 1.0	10.4	182.4	267
15310015	37 X 1.0	13.9	355.2	498
15310016	4 X 1.5	6.5	57.6	98
15310017	7 X 1.5	8.2	108.0	170
15310018	13 X 1.5	11.3	187.2	295
15310019	19 X 1.5	12.6	273.6	396
15310020	37 X 1.5	17.0	532.8	728
15310021	2 X 2.5	7.2	49.2	106
15310022	3 X 2.5	7.6	73.8	131
15310023	4 X 2.5	8.4	98.4	165

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.

Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum

Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® TRAIN 320 TW-E 300V refer to page 26
- ÖLFLEX® TRAIN 350 300V refer to page 32

Accessories

- SKINTOP® ST-HF-M refer to page 45
- SKINTOP® MS-HF-M refer to page 47



ÖLFLEX® TRAIN 315 C TW-P 300V

Screened multi-core cable according to EN 50306-4 3P type MM S for high requirements in railway applications

LAPP KABEL STUTTGART ÖLFLEX® TRAIN 315 C TW-P 300V EN 50306-4 3P MM S



Info

- Meets EN 50306-4 class P, type MM S and EN 45545-2
- High temperature resistance: -45°C up to +125°C
- Highly oil- and fuel-resistant

Benefits

- Reduced insulation wall thickness, thus space-saving installation
- Copper screening complies with EMC requirements and protects against electromagnetic interference
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Application range

- In EMC-sensitive environments
- For use in railway vehicles and buses, for fixed and protected installation and applications where limited movement may occur
- Suitable for control and monitoring circuits as well as locking circuits and internal wiring of equipment in trains and locomotives
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-24 / EN 60332-3-25 / EN 50305
- Fire behaviour according to NF: on request / see data sheet
- Chemical properties:
 - Oil resistant acc. to EN 50306
 - Fuel resistant acc. to EN 50306
 - Acid resistant acc. to EN 50306
 - Alkali resistant acc. to EN 50306
 - Ozone resistant acc. to EN 50306

Norm references / Approvals

- EN 50306-4 class P, type MM S
- EN 45545-2
- NF F 16-101: on request / see data sheet

Product Make-up

- Tinned-copper strand, 19 or 37 wires, SRC (Special Round Conductor)
- Insulation: Electron beam cross-linked Polymer compound acc. to EN 50306
- Colour of insulation: White with black numbers
- Wrapping: Halogen-free plastic foil
- Screen: Tinned-copper braiding
- Outer sheath: electron beam cross-linked polymer-compound S2 acc. to EN 50306
- Outer sheath colour: Black

Technical data



Classification

ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description: Control cable



Core identification code

White with black numbers



Conductor stranding

SRC (special round conductor)
19 or 37 wires acc. to EN 50306-1



Minimum bending radius

Fixed installation:
10 x outer diameter
Occasional flexing: 10 x outer diameter



Nominal voltage

U₀/U AC 300/500 V
U_m AC 550 V
V₀ DC 410 V
Fixed installation:
U₀/U AC 0,6/1 kV
U_m AC 1,2 kV
V₀ DC 0,9 kV



Test voltage

Core/core: 3,5 kV AC; 8,4 kV DC
Core/screen: 3,5 kV AC; 8,4 kV DC



Protective conductor

G = with GN-YE protective conductor
X = without protective conductor



Temperature range

Fixed installation:
-45°C to +125°C (20.000 h)
Occasional flexing:
-35°C to +105°C
Short circuit: +160°C (5s)

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 315 C TW-P 300V				
15315000	2 X 0.5	4.6	19.37	38
15315001	3 X 0.5	4.8	24.88	45
15315002	4 X 0.5	5.2	30.87	54
15315003	6 X 0.5	6.0	42.95	72
15315004	8 X 0.5	6.5	61.26	94
15315005	2 X 0.75	5.0	25.67	46
15315006	3 X 0.75	5.2	33.71	56
15315007	4 X 0.75	5.7	42.18	69
15315008	6 X 0.75	6.6	65.35	96
15315009	8 X 0.75	7.1	83.99	123
15315010	2 X 1.0	5.2	31.41	54

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
15315011	3 X 1.0	5.5	41.97	66
15315012	4 X 1.0	6.0	52.89	81
15315013	6 X 1.0	7.1	81.74	117
15315014	8 X 1.0	8.2	105.40	157
15315015	2 X 1.5	6.2	44.09	74
15315016	3 X 1.5	6.5	65.52	95
15315017	4 X 1.5	7.1	82.13	118
15315018	6 X 1.5	8.8	117.21	172
15315019	8 X 1.5	9.5	151.94	222
15315020	2 X 2.5	7.8	75.42	120
15315021	3 X 2.5	8.2	102.07	150
15315022	4 X 2.5	9.0	129.75	191

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.

Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum

Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® TRAIN 325 C TW-E 300V refer to page 27
- ÖLFLEX® TRAIN 355 C 300V refer to page 33

Accessories

- SKINTOP® MS-HF-M SC refer to page 48
- SKINTOP® MS-HF-M BRUSH refer to page 49

**ÖLFLEX® TRAIN 317 C TW-P 300V**

Screened multi-core cable according to EN 50306-4 5P type MM S for high requirements in railway applications

Info

- Meets EN 50306-4 class P, type MM S and EN 45545-2
- High temperature resistance: -45°C up to +125°C
- Highly oil- and fuel-resistant

Benefits

- Reduced insulation wall thickness, thus space-saving installation
- Copper screening complies with EMC requirements and protects against electromagnetic interference
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Application range

- In EMC-sensitive environments
- For use in railway vehicles and buses, for fixed and protected installation and applications where limited movement may occur
- Suitable for control and monitoring circuits as well as locking circuits and internal wiring of equipment in trains and locomotives
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-24 / EN 60332-3-25 / EN 50305

- Fire behaviour according to NF: on request / see data sheet
- Chemical properties:
 - Oil resistant acc. to EN 50306
 - Fuel resistant acc. to EN 50306
 - Acid resistant acc. to EN 50306
 - Alkali resistant acc. to EN 50306
 - Ozone resistant acc. to EN 50306

Norm references / Approvals

- EN 50306-4 class P, type MM S
- EN 45545-2
- NF F 16-101: on request / see data sheet

Product Make-up

- Tinned-copper strand, 19 or 37 wires, SRC (Special Round Conductor)
- Insulation: Electron beam cross-linked Polymer compound acc. to EN 50306
- Colour of insulation: White with black numbers
- Screen: Tinned-copper braiding over each pair
- Jacket over screen: electron beam cross-linked polymer-compound S2 acc. to EN 50306
- Outer sheath: electron beam cross-linked polymer-compound S2 acc. to EN 50306
- Outer sheath colour: Black

Technical data

- Classification**
 ETIM 5.0 Class-ID: EC000104
 ETIM 5.0 Class-Description: Control cable
- Core identification code**
 White with black numbers
- Conductor stranding**
 SRC (special round conductor) 19 or 37 wires acc. to EN 50306-1
- Minimum bending radius**
 Fixed installation: 10 x outer diameter
 Occasional flexing: 10 x outer diameter
- Nominal voltage**
 U_0/U AC 300/500 V
 U_m AC 550 V
 V_m DC 410 V
 Fixed installation:
 U_0/U AC 0,6/1 kV
 U_m AC 1,2 kV
 V_m DC 0,9 kV
- Test voltage**
 Core/core: 3,5 kV AC; 8,4 kV DC
 Core/screen: 3,5 kV AC; 8,4 kV DC
- Temperature range**
 Fixed installation: -45°C to +125°C (20.000 h)
 Occasional flexing: -35°C to +105°C
 Short circuit: +160°C (5s)

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 317 C TW-P 300V				
15317000	2x (2X0,5)	9.6	38.86	150
15317001	3x (2X0,5)	10.2	58.30	178
15317002	4x (2X0,5)	11.3	77.73	217
15317003	7x (2X0,5)	13.6	330.78	331
15317004	2x (2X0,75)	10.4	51.49	179
15317005	3x (2X0,75)	11.1	77.24	219
15317006	4x (2X0,75)	12.2	102.99	267
15317007	7x (2X0,75)	14.8	180.64	399
15317008	2x (2X1)	10.9	63.00	208
15317009	3x (2X1)	11.5	94.50	250
15317010	4x (2X1)	12.7	126.00	304
15317011	7x (2X1)	15.4	220.93	458
15317012	2x (2X1,5)	12.8	88.75	283
15317013	3x (2X1,5)	13.7	133.56	346
15317014	4x (2X1,5)	15.1	181.00	443
15317015	7x (2X1,5)	18.4	313.19	638

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
 Copper price basis: EUR 150 / 100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
 Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
 Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
 Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® TRAIN 327 C TW-E 300V refer to page 28

Accessories

- SKINTOP® MS-HF-M SC refer to page 48
- SKINTOP® MS-HF-M BRUSH refer to page 49



ÖLFLEX® TRAIN 320 TW-E 300V

Multi-core cable according to EN 50306-4 1E type MM for high requirements in railway applications

LAPP KABEL STUTTGART ÖLFLEX® TRAIN 320 TW-E 300V EN 50306-4 1E MM



Info

- Meets EN 50306-4 class E, type MM and EN 45545-2
- High temperature resistance: -45°C up to +125°C
- Highly oil- and fuel-resistant

Benefits

- Reduced insulation wall thickness, thus space-saving installation
- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Chemical properties:

- Oil resistant acc. to EN 50306
- Fuel resistant acc. to EN 50306
- Acid resistant acc. to EN 50306
- Alkali resistant acc. to EN 50306
- Ozone resistant acc. to EN 50306

Norm references / Approvals

- EN 50306-4 class E, type MM
- EN 45545-2
- NF F 16-101: on request / see data sheet

Application range

- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Suitable for control and monitoring circuits as well as locking circuits and internal wiring of equipment in trains and locomotives
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-24 / EN 60332-3-25 / EN 50305
- Fire behaviour according to NF: on request / see data sheet

Product Make-up

- Tinned-copper strand, 19 or 37 wires, SRC (Special Round Conductor)
- Insulation: Electron beam cross-linked Polymer compound acc. to EN 50306
- Colour of insulation: White with black numbers
- Outer sheath: electron beam cross-linked polymer-compound S2 acc. to EN 50306
- Outer sheath colour: Black

Technical data



Classification

ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description:
Control cable



Core identification code

White with black numbers



Conductor stranding

SRC (special round conductor)
19 or 37 wires acc. to EN 50306-1



Minimum bending radius

Fixed installation:
≤ 12 mm: 4 x OD / 3 x OD*
> 12 mm: 5 x OD / 4 x OD*
* for careful bending, once at connecting terminal
Occasional flexing:
≤ 12 mm: 5 x OD
> 12 mm: 6 x OD
(OD = outer diameter)



Nominal voltage

U₀/U AC 300/500 V
U_m AC 550 V
V₀ DC 410 V
Fixed installation:
U₀/U AC 0,6/1 kV
U_m AC 1,2 kV
V₀ DC 0,9 kV



Test voltage

3,5 kV AC; 8,4 kV DC



Protective conductor

G = with GN-YE protective conductor
X = without protective conductor



Temperature range

Fixed installation:
-45°C to +125°C (20.000 h)
Occasional flexing:
-35°C to +105°C
Short circuit: +160°C (5s)

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 320 TW-E 300V				
15320000	4 X 0.5	6.0	19.2	61
15320001	7 X 0.5	6.8	33.6	84
15320002	13 X 0.5	8.8	62.4	142
15320003	19 X 0.5	9.6	91.2	181
15320004	37 X 0.5	12.9	177.6	333
15320005	4 X 0.75	6.5	28.8	76
15320006	7 X 0.75	7.4	50.4	108
15320007	13 X 0.75	9.7	93.6	186
15320008	19 X 0.75	10.6	136.8	240
15320009	37 X 0.75	13.8	266.4	427
15320011	4 X 1.0	6.8	38.4	90

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
15320012	7 X 1.0	7.8	67.2	130
15320013	13 X 1.0	10.3	124.8	226
15320014	19 X 1.0	11.3	182.4	296
15320015	37 X 1.0	14.8	355.2	532
15320016	4 X 1.5	7.9	57.6	125
15320017	7 X 1.5	9.3	108.0	189
15320018	13 X 1.5	12.3	187.2	325
15320019	19 X 1.5	13.6	273.6	433
15320020	37 X 1.5	18.0	532.8	782
15320023	4 X 2.5	9.4	98.4	189
15320021	2 X 2.5	8.2	49.2	126
15320022	3 X 2.5	8.6	73.8	152

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.

Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum

Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® TRAIN 350 300V refer to page 32

Accessories

- SKINTOP® ST-HF-M refer to page 45
- SKINTOP® MS-HF-M refer to page 47

**ÖLFLEX® TRAIN 325 C TW-E 300V**

Screened multi-core cable according to EN 50306-4 3E type MM S for high requirements in railway applications

Info

- Meets EN 50306-4 class E, type MM S and EN 45545-2
- High temperature resistance: -45°C up to +125°C
- Highly oil- and fuel-resistant

Benefits

- Reduced insulation wall thickness, thus space-saving installation
- Copper screening complies with EMC requirements and protects against electromagnetic interference
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Application range

- In EMC-sensitive environments
- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Suitable for control and monitoring circuits as well as locking circuits and internal wiring of equipment in trains and locomotives
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-24 / EN 60332-3-25 / EN 50305

- Fire behaviour according to NF: on request / see data sheet
- Chemical properties:
 - Oil resistant acc. to EN 50306
 - Fuel resistant acc. to EN 50306
 - Acid resistant acc. to EN 50306
 - Alkali resistant acc. to EN 50306
 - Ozone resistant acc. to EN 50306

Norm references / Approvals

- EN 50306-4 class E, type MM S
- EN 45545-2
- NF F 16-101: on request / see data sheet

Product Make-up

- Outer sheath colour: Black
- Tinned-copper strand, 19 or 37 wires, SRC (Special Round Conductor)
- Insulation: Electron beam cross-linked Polymer compound acc. to EN 50306
- Colour of insulation: White with black numbers
- Wrapping: Halogen-free plastic foil (optional)
- Screen: Tinned-copper braiding
- Outer sheath: electron beam cross-linked polymer-compound S2 acc. to EN 50306

Technical data

- Classification**
 ETIM 5.0 Class-ID: EC000104
 ETIM 5.0 Class-Description: Control cable
- Core identification code**
 White with black numbers
- Conductor stranding**
 SRC (special round conductor)
 19 or 37 wires acc. to EN 50306-1
- Minimum bending radius**
 Fixed installation: 10 x outer diameter
 Occasional flexing: 10 x outer diameter
- Nominal voltage**
 U_0/U AC 300/500 V
 U_0 AC 550 V
 V_m DC 410 V
 Fixed installation:
 U_0/U AC 0,6/1 kV
 U_0 AC 1,2 kV
 V_m DC 0,9 kV
- Test voltage**
 Core/core: 3,5 kV AC; 8,4 kV DC
 Core/screen: 3,5 kV AC; 8,4 kV DC
- Protective conductor**
 G = with GN-YE protective conductor
 X = without protective conductor
- Temperature range**
 Fixed installation: -45°C to +125°C (20.000 h)
 Occasional flexing: -35°C to +105°C
 Short circuit: +160°C (5s)

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 325 C TW-E 300V				
15325000	2 X 0.5	6.0	19.36	57
15325001	3 X 0.5	6.2	24.88	65
15325002	4 X 0.5	6.6	30.87	75
15325003	6 X 0.5	7.4	42.95	95
15325004	8 X 0.5	8.0	61.26	122
15325005	2 X 0.75	6.4	25.67	66
15325006	3 X 0.75	6.7	33.71	78
15325007	4 X 0.75	7.0	42.18	89
15325008	6 X 0.75	8.0	65.35	121
15325009	8 X 0.75	8.7	83.99	153
15325010	2 X 1.0	6.7	31.41	76

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
15325011	3 X 1.0	7.0	41.97	89
15325012	4 X 1.0	7.4	52.89	106
15325013	6 X 1.0	8.5	81.74	144
15325014	8 X 1.0	9.2	105.40	180
15325015	2 X 1.5	7.6	44.09	99
15325016	3 X 1.5	7.9	65.52	121
15325017	4 X 1.5	8.5	82.13	145
15325018	6 X 1.5	9.8	117.21	196
15325019	8 X 1.5	10.8	151.94	250
15325020	2 X 2.5	8.8	75.42	142
15325021	3 X 2.5	9.2	102.07	173
15325022	4 X 2.5	10.0	129.75	211

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.

Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum

Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® TRAIN 355 C 300V refer to page 33

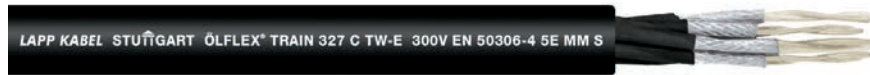
Accessories

- SKINTOP® MS-HF-M SC refer to page 48
- SKINTOP® MS-HF-M BRUSH refer to page 49



ÖLFLEX® TRAIN 327 C TW-E 300V

Screened multi-core cable according to EN 50306-4 5E type MM S for high requirements in railway applications



Info

- Meets EN 50306-4 class E, type MM S and EN 45545-2
- High temperature resistance: -45°C up to +125°C
- Highly oil- and fuel-resistant

Benefits

- Reduced insulation wall thickness, thus space-saving installation
- Copper screening complies with EMC requirements and protects against electromagnetic interference
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

- Fire behaviour according to NF: on request / see data sheet
- Chemical properties:
 - Oil resistant acc. to EN 50306
 - Fuel resistant acc. to EN 50306
 - Acid resistant acc. to EN 50306
 - Alkali resistant acc. to EN 50306
 - Ozone resistant acc. to EN 50306

Norm references / Approvals

- EN 50306-4 class E, type MM S
- EN 45545-2
- NF F 16-101: on request / see data sheet

Application range

- In EMC-sensitive environments
- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Suitable for control and monitoring circuits as well as locking circuits and internal wiring of equipment in trains and locomotives
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-24 / EN 60332-3-25 / EN 50305

Product Make-up

- Tinned-copper strand, 19 or 37 wires, SRC (Special Round Conductor)
- Insulation: Electron beam cross-linked Polymer compound acc. to EN 50306
- Colour of insulation: White with black numbers
- Screen: Tinned-copper braiding over each pair
- Jacket over screen: electron beam cross-linked polymer-compound S2 acc. to EN 50306
- Outer sheath: electron beam cross-linked polymer-compound S2 acc. to EN 50306
- Outer sheath colour: Black

Technical data



Classification

ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description:
Control cable



Core identification code

White with black numbers



Conductor stranding

SRC (special round conductor)
19 or 37 wires acc. to EN 50306-1



Minimum bending radius

Fixed installation:
10 x outer diameter
Occasional flexing: 10 x outer diameter



Nominal voltage

U₀/U AC 300/500 V
U_m AC 550 V
V₀ DC 410 V
Fixed installation:
U₀/U AC 0,6/1 kV
U_m AC 1,2 kV
V₀ DC 0,9 kV



Test voltage

Core/core: 3,5 kV AC; 8,4 kV DC
Core/screen: 3,5 kV AC; 8,4 kV DC



Temperature range

Fixed installation:
-45°C to +125°C (20.000 h)
Occasional flexing:
-35°C to +105°C
Short circuit: +160°C (5s)

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 327 C TW-E 300V				
15327000	2x (2X0,5)	10.7	38.86	179
15327001	3x (2X0,5)	11.4	58.30	212
15327002	4x (2X0,5)	12.4	77.73	254
15327003	7x (2X0,5)	14.7	136.38	375
15327004	2x (2X0,75)	11.5	51.49	213
15327005	3x (2X0,75)	12.2	77.24	250
15327006	4x (2X0,75)	13.4	102.99	307
15327007	7x (2X0,75)	15.9	180.64	447
15327008	2x (2X1)	11.9	63.00	235
15327009	3x (2X1)	12.6	94.50	282
15327010	4x (2X1)	13.8	126.00	342
15327011	7x (2X1)	16.5	220.93	499
15327012	2x (2X1,5)	13.9	88.75	317
15327013	3x (2X1,5)	14.8	133.56	383
15327014	4x (2X1,5)	16.3	181.00	492
15327015	7x (2X1,5)	19.5	313.19	697

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.

Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum

Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).

Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINTOP® MS-HF-M SC refer to page 48
- SKINTOP® MS-HF-M BRUSH refer to page 49

**ÖLFLEX® TRAIN 331 600V**

Single-core cable according to EN 50264-3-1 type M for high requirements in railway applications

**Info**

- Meets EN 50264-3-1 type M and EN 45545-2
- High temperature resistance: -45°C up to 120°C
- Highly oil- and fuel-resistant

Benefits

- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Application range

- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Suitable for connecting lamps, heating equipment, switchgear, terminal boxes and power supply
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-24 / EN 60332-3-25 / EN 50305

- Fire behaviour according to NF:
 - Toxicity of gases acc. to NF X 70-100
 - Low smoke density acc. to NF X 10-702
 - No flame propagation acc. to NF C 32-070, Cat. C1 and C2
- Chemical properties:
 - Oil resistant acc. to EN 50264-3-1
 - Fuel resistant acc. to EN 50264-3-1
 - Acid resistant acc. to EN 50264-3-1
 - Alkali resistant acc. to EN 50264-3-1
 - Ozone resistant acc. to EN 50264-3-1 / EN 50305

Norm references / Approvals

- EN 50264-3-1 type M
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 - Classification: C / F0 (flame propagation / smoke)

Product Make-up

- Tinned-copper strand, fine-wire
- Insulation: Electron beam cross-linked Polymer compound EI 109
- Colour: Black or green-yellow

LAPP KABEL STUTTGART ÖLFLEX® TRAIN 331 600 V EN 50264-3-1 M

Technical data**Classification**

ETIM 5.0 Class-ID: EC000993
ETIM 5.0 Class-Description:
Single core cable

**Conductor stranding**

Fine-wired/ Finely stranded according to IEC 60228, conductor class 5

**Minimum bending radius**

Fixed installation:
≤ 12 mm: 3 x OD
> 12 mm: 4 x OD
Occasional flexing:
≤ 12 mm: 4 x OD
> 12 mm ≤ 20 mm: 5 x OD
> 20 mm: 6 x OD
(OD = outer diameter)

**Nominal voltage**

U₀/U AC 0.6/1 kV
U_m AC 1.2 kV
V₀ DC 0.9 kV

**Test voltage**

3,5 kV AC; 8,4 kV DC

**Temperature range**

Fixed installation:
-45°C to +120°C (20.000 h)
Occasional flexing:
-35°C to +90°C
Short circuit: +200°C (5s)

Article number	Conductor cross-section (mm²)	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 331 600V - BK				
15331000	1	2.5	9.6	15
15331001	1.5	3.0	14.4	22
15331002	2.5	3.4	24.0	33
15331003	4	4.1	38.4	49
15331004	6	4.6	57.6	70
15331005	10	5.6	96.0	112
15331006	16	6.6	153.6	174
15331007	25	8.3	240.0	273
15331008	35	9.5	336.0	374
15331009	50	11.7	480.0	531
15331010	70	13.6	672.0	739
15331011	95	15.6	912.0	988
15331012	120	17.4	1152.0	1243
15331013	150	19.8	1440.0	1558
15331014	185	21.7	1776.0	1927

Article number	Conductor cross-section (mm²)	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
15331015	240	25.4	2304.0	2487
15331016	300	26.8	2880.0	3085
ÖLFLEX® TRAIN 331 600V - GN/YE				
15331017	1	2.5	9.6	15
15331018	1.5	3.0	14.4	22
15331019	2.5	3.4	24.0	33
15331020	4	4.1	38.4	49
15331021	6	4.6	57.6	70
15331022	10	5.6	96.0	112
15331023	16	6.6	153.6	174
15331024	25	8.3	240.0	273
15331025	35	9.5	336.0	374
15331026	50	11.7	480.0	531
15331027	70	13.6	672.0	739
15331028	95	15.6	912.0	988

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.

Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum

Please specify the preferred

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® TRAIN 361 1,8kV refer to page 34

Accessories

- SKINTOP® ST-HF-M refer to page 45
- SKINTOP® MS-HF-M refer to page 47

Power and control cables

Special applications • Rolling stock



ÖLFLEX® TRAIN 340 600V

Multi-core cable according to EN 50264-3-2 type MM for high requirements in railway applications



Info

- Meets EN 50264-3-2 type MM and EN 45545-2
- High temperature resistance: -45°C up to 90°C
- Highly oil- and fuel-resistant

Benefits

- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Application range

- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Suitable for connecting lamps, heating equipment, switchgear, terminal boxes and power supply
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-24 / EN 60332-3-25 / EN 50305

- Fire behaviour according to NF:
 - Toxicity of gases acc. to NF X 70-100
 - Low smoke density acc. to NF X 10-702
 - No flame propagation acc. to NF C 32-070, Cat. C1 and C2
- Chemical properties:
 - Oil resistant acc. to EN 50264-3-2
 - Fuel resistant acc. to EN 50264-3-2
 - Acid resistant acc. to EN 50264-3-2
 - Alkali resistant acc. to EN 50264-3-2
 - Ozone resistant acc. to EN 50264-3-2 / EN 50305)

Norm references / Approvals

- EN 50264-3-2 type MM
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 - Classification: C / F0 (flame propagation / smoke)

Product Make-up

- Tinned-copper strand, fine-wire
- Insulation: Electron beam cross-linked Polymer compound EI 109
- Colour of insulation: Black with white numbers
- Outer sheath: electron beam cross-linked polymer-compound EM 104
- Outer sheath colour: Black

Technical data



Classification

ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description:
Control cable



Core identification code

Black with white numbers



Conductor stranding

Fine-wired/ Finely stranded according to IEC 60228, conductor class 5



Minimum bending radius

Fixed installation:
≤ 12 mm: 3 x OD
> 12 mm: 4 x OD
Occasional flexing:
≤ 12 mm: 4 x OD
> 12 mm ≤ 20 mm: 5 x OD
> 20 mm: 6 x OD
(OD = outer diameter)



Nominal voltage

U₀/U AC 0.6/1 kV
U AC 1.2 kV
V_m DC 0.9 kV



Test voltage

3,5 kV AC; 8,4 kV DC



Protective conductor

G = with GN-YE protective conductor
X = without protective conductor



Temperature range

Fixed installation:
-45°C to +90°C
Occasional flexing:
-35°C to +90°C
Short circuit: +200°C (5s)

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 340 600V				
15340000	2 X 1.5	7.4	28.8	94
15340001	3 X 1.5	7.9	43.2	114
15340025	3 G 1.5	7.9	43.2	114
15340002	4 X 1.5	8.6	57.6	140
15340026	4 G 1.5	8.6	57.6	140
15340003	2 X 2.5	8.2	48.0	127
15340004	3 X 2.5	8.7	72.0	157
15340027	3 G 2.5	8.7	72.0	157
15340005	4 X 2.5	9.6	96.0	195
15340028	4 G 2.5	9.6	96.0	195
15340006	2 X 4.0	9.6	76.8	179
15340007	3 X 4.0	10.2	115.2	223
15340008	4 X 4.0	11.4	153.6	285
15340009	2 X 6.0	10.8	115.2	244

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
15340010	3 X 6.0	11.5	172.8	308
15340011	4 X 6.0	13.0	230.4	393
15340012	2 X 10.0	13.2	192.0	377
15340013	3 X 10.0	14.0	288.0	480
15340014	4 X 10.0	15.4	384.0	604
15340015	2 X 16.0	15.2	307.2	552
15340016	3 X 16.0	16.2	460.8	708
15340017	4 X 16.0	18.2	614.4	916
15340018	2 X 25.0	19.0	480.0	857
15340019	3 X 25.0	20.2	720.0	1102
15340020	4 X 25.0	22.7	960.0	1421
15340021	2 X 35.0	21.4	672.0	1141
15340022	3 X 35.0	23.0	1008.0	1489
15340023	2 X 50.0	26.2	960.0	1627
15340024	3 X 50.0	28.0	1440.0	2101

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.

Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum

Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® TRAIN 345 C 600V refer to page 31

Accessories

- SKINTOP® ST-HF-M refer to page 45
- SKINTOP® MS-HF-M refer to page 47

**ÖLFLEX® TRAIN 345 C 600V**

Screened multi-core cable according to EN 50264-3-2 type MM S for high requirements in railway applications

Info

- Meets EN 50264-3-2 type MM S and EN 45545-2
- High temperature resistance: -45°C up to 90°C
- Highly oil- and fuel-resistant

LAPP KABEL STUTTGART ÖLFLEX® TRAIN 345 C 600V EN 50264-3-2 MM S

Benefits

- Copper screening complies with EMC requirements and protects against electromagnetic interference
- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Application range

- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Suitable for connecting lamps, heating equipment, switchgear, terminal boxes and power supply
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-24 / EN 60332-3-25 / EN 50305

- Fire behaviour according to NF:
 - Toxicity of gases acc. to NF X 70-100
 - Low smoke density acc. to NF X 10-702
 - No flame propagation acc. to NF C 32-070, Cat. C1 and C2
- Chemical properties:
 - Oil resistant acc. to EN 50264-3-2
 - Fuel resistant acc. to EN 50264-3-2
 - Acid resistant acc. to EN 50264-3-2
 - Alkali resistant acc. to EN 50264-3-2
 - Ozone resistant acc. to EN 50264-3-2 / EN 50305

Norm references / Approvals

- EN 50264-3-2 type MM S
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 - Classification: C / F0 (flame propagation / smoke)

Product Make-up

- Conductor: Fine-wire strands of tinned copper
- Insulation: Electron beam cross-linked Polymer compound EI 109
- Colour of insulation: Black with white numbers
- Wrapping: Halogen-free plastic foil
- Screen: Tinned-copper braiding
- Outer sheath: electron beam cross-linked polymer-compound EM 104
- Outer sheath colour: Black

Technical data

- Classification**
 ETIM 5.0 Class-ID: EC000104
 ETIM 5.0 Class-Description: Control cable
- Core identification code**
 Black with white numbers
- Conductor stranding**
 Fine-wired/ Finely stranded according to IEC 60228, conductor class 5
- Minimum bending radius**
 Fixed installation:
 ≤ 12 mm: 3 x OD
 > 12 mm: 4 x OD
 Occasional flexing:
 ≤ 12 mm: 4 x OD
 > 12 mm ≤ 20 mm: 5 x OD
 > 20 mm: 6 x OD
 (OD = outer diameter)
- Nominal voltage**
 U_0/U AC 0.6/1 kV
 U_m AC 1.2 kV
 V_0 DC 0.9 kV
- Test voltage**
 Core/core: 3,5 kV AC; 8,4 kV DC
 Core/screen: 3,5 kV AC; 8,4 kV DC
- Protective conductor**
 G = with GN-YE protective conductor
 X = without protective conductor
- Temperature range**
 Fixed installation:
 -45°C to +90°C
 Occasional flexing:
 -35°C to +90°C
 Short circuit: +200°C (5s)

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 345 C 600V				
15345000	2 X 1.5	8.2	57.35	125
15345001	3 X 1.5	8.7	73.27	149
15345025	3 G 1.5	8.7	73.27	149
15345002	4 X 1.5	9.4	90.92	180
15345026	4 G 1.5	9.4	90.92	180
15345003	2 X 2.5	9.0	80.38	160
15345004	3 X 2.5	9.5	107.46	196
15345027	3 G 2.5	9.5	107.46	196
15345005	4 X 2.5	10.8	147.08	259
15345028	4 G 2.5	10.8	147.08	259
15345006	2 X 4.0	10.8	126.68	237
15345007	3 X 4.0	11.4	167.66	290
15345008	4 X 4.0	12.4	210.89	354
15345009	2 X 6.0	11.8	171.91	294

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
15345010	3 X 6.0	12.5	233.52	368
15345011	4 X 6.0	14.0	297.39	470
15345012	2 X 10.0	14.2	258.83	428
15345013	3 X 10.0	15.2	378.94	572
15345014	4 X 10.0	16.6	485.83	711
15345015	2 X 16.0	16.4	411.94	637
15345016	3 X 16.0	17.8	574.29	836
15345017	4 X 16.0	19.4	741.03	1040
15345018	2 X 25.0	20.2	608.98	940
15345019	3 X 25.0	21.4	861.67	1219
15345020	4 X 25.0	24.1	1147.27	1601
15345021	2 X 35.0	23.2	852.85	1287
15345022	3 X 35.0	24.6	1203.78	1668
15345023	2 X 50.0	27.6	1175.17	1733
15345024	3 X 50.0	29.8	1710.69	2336

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
 Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
 Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
 Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
 Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINTOP® MS-HF-M SC refer to page 48
- SKINTOP® MS-HF-M BRUSH refer to page 49



ÖLFLEX® TRAIN 350 300V

Multi-core cable according to EN 50264-3-2 type MM for high requirements in railway applications

LAPP KABEL STUTTGART ÖLFLEX® TRAIN 350 300 V EN 50264-3-2 MM



Info

- Meets EN 50264-3-2 type MM and EN 45545-2
- High temperature resistance: -45°C up to 90°C
- Highly oil- and fuel-resistant

Benefits

- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Application range

- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Suitable for connecting lamps, heating equipment, switchgear, terminal boxes and power supply
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-24 / EN 60332-3-25 / EN 50305

- Fire behaviour according to NF:
 - Toxicity of gases acc. to NF X 70-100
 - Low smoke density acc. to NF X 10-702
 - No flame propagation acc. to NF C 32-070, Cat. C1 and C2
- Chemical properties:
 - Oil resistant acc. to EN 50264-3-2
 - Fuel resistant acc. to EN 50264-3-2
 - Acid resistant acc. to EN 50264-3-2
 - Alkali resistant acc. to EN 50264-3-2
 - Ozone resistant acc. to EN 50264-3-2 / EN 50305)

Norm references / Approvals

- EN 50264-3-2 type MM
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 - Classification: C / F0 (flame propagation / smoke)

Product Make-up

- Tinned-copper strand, fine-wire
- Insulation: Electron beam cross-linked Polymer compound EI 109
- Colour of insulation: Black with white numbers
- Outer sheath: electron beam cross-linked polymer-compound EM 104
- Outer sheath colour: Black

Technical data



Classification

ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description:
Control cable



Core identification code

Black with white numbers



Conductor stranding

Fine-wired/ Finely stranded according to IEC 60228, conductor class 5



Minimum bending radius

Fixed installation:
≤ 12 mm: 3 x OD
> 12 mm: 4 x OD
Occasional flexing:
≤ 12 mm: 4 x OD
> 12 mm ≤ 20 mm: 5 x OD
> 20 mm: 6 x OD
(OD = outer diameter)



Nominal voltage

U₀/U: 300/500 V
U_{AC} 600 V
V_m DC 450 V



Test voltage

2,0 kV AC; 4,8 kV DC



Protective conductor

G = with GN-YE protective conductor
X = without protective conductor



Temperature range

Fixed installation:
-45°C to +90°C
Occasional flexing:
-35°C to +90°C
Short circuit: +200°C (5s)

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 350 300V				
15350000	2 X 1.0	5.4	19.2	54
15350001	4 X 1.0	6.2	38.4	81
15350002	7 X 1.0	7.7	67.2	128
15350003	9 X 1.0	9.6	86.4	179
15350004	12 X 1.0	10.1	115.2	204
15350005	19 X 1.0	12.1	182.4	309
15350006	24 X 1.0	14.4	230.4	396
15350007	32 X 1.0	15.9	307.2	520
15350008	37 X 1.0	16.7	355.2	580
15350009	40 X 1.0	17.8	384.0	644
15350010	4 X 1.5	7.6	57.6	116
15350011	7 X 1.5	9.2	100.8	184

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
15350012	9 X 1.5	11.7	129.6	273
15350013	12 X 1.5	12.4	172.8	302
15350014	19 X 1.5	15.0	273.6	473
15350015	24 X 1.5	17.3	345.6	577
15350016	32 X 1.5	19.6	460.8	778
15350017	37 X 1.5	20.6	532.8	879
15350018	4 X 2.5	8.6	96.0	169
15350019	7 X 2.5	10.6	168.0	270
15350020	9 X 2.5	13.7	216.0	402
15350021	12 X 2.5	14.5	288.0	461
15350022	19 X 2.5	17.0	456.0	680
15350023	24 X 2.5	20.1	576.0	879

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum

Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® TRAIN 340 600V refer to page 30
- ÖLFLEX® TRAIN 355 C 300V refer to page 33

Accessories

- SKINTOP® ST-HF-M refer to page 45
- SKINTOP® MS-HF-M refer to page 47

**ÖLFLEX® TRAIN 355 C 300V**

Screened multi-core cable according to EN 50264-3-2 type MM S for high requirements in railway applications

**Info**

- Meets EN 50264-3-2 type MM S and EN 45545-2
- High temperature resistance: -45°C up to 90°C
- Highly oil- and fuel-resistant

LAPP KABEL STUTTGART ÖLFLEX® TRAIN 355 C 300 V EN 50264-3-2 MM S

**Benefits**

- Copper screening complies with EMC requirements and protects against electromagnetic interference
- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Application range

- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Suitable for connecting lamps, heating equipment, switchgear, terminal boxes and power supply
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-24 / EN 60332-3-25 / EN 50305

- Fire behaviour according to NF:
 - Toxicity of gases acc. to NF X 70-100
 - Low smoke density acc. to NF X 10-702
 - No flame propagation acc. to NF C 32-070, Cat. C1 and C2
- Chemical properties:
 - Oil resistant acc. to EN 50264-3-2
 - Fuel resistant acc. to EN 50264-3-2
 - Acid resistant acc. to EN 50264-3-2
 - Alkali resistant acc. to EN 50264-3-2
 - Ozone resistant acc. to EN 50264-3-2 / EN 50305

Norm references / Approvals

- EN 50264-3-2 type MM S
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 - Classification: C / F0 (flame propagation / smoke)

Product Make-up

- Conductor: Fine-wire strands of tinned copper
- Insulation: Electron beam cross-linked Polymer compound EI 109
- Colour of insulation: Black with white numbers
- Wrapping: Halogen-free plastic foil
- Screen: Tinned-copper braiding
- Outer sheath: electron beam cross-linked polymer-compound EM 104
- Outer sheath colour: Black

Technical data**Classification**

ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description:
Control cable

**Core identification code**

Black with white numbers

**Conductor stranding**

Fine-wired / Finely stranded according to IEC 60228, conductor class 5

**Minimum bending radius**

Fixed installation:

≤ 12 mm: 3 x OD

> 12 mm: 4 x OD

Occasional flexing:

≤ 12 mm: 4 x OD

> 12 mm ≤ 20 mm: 5 x OD

> 20 mm: 6 x OD

(OD = outer diameter)

**Nominal voltage**

U₀/U: 300/500 V

U_m AC 600 V

V₀ DC 450 V

**Test voltage**

Core/core: 2 kV AC; 4,8 kV DC

Core/screen: 2 kV AC; 4,8 kV DC

**Protective conductor**

G = with GN-YE protective conductor

X = without protective conductor

**Temperature range**

Fixed installation:

-45°C to +90°C

Occasional flexing:

-35°C to +90°C

Short circuit: +200°C (5s)

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 355 C 300V				
15355000	2 X 1.0	6.2	39.27	71
15355001	4 X 1.0	7.2	64.06	109
15355002	7 X 1.0	8.5	97.15	152
15355003	9 X 1.0	10.8	137.41	234
15355004	12 X 1.0	11.3	170.09	258
15355005	19 X 1.0	13.7	261.77	395
15355006	24 X 1.0	15.6	324.51	482
15355007	32 X 1.0	17.1	411.92	606
15355008	37 X 1.0	17.9	471.56	686
15355009	40 X 1.0	19.4	510.27	777
15355010	4 X 1.5	8.4	86.80	145

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
15355011	7 X 1.5	10.2	150.51	224
15355012	9 X 1.5	13.1	191.37	336
15355013	12 X 1.5	13.8	240.00	371
15355014	19 X 1.5	16.2	369.00	548
15355015	24 X 1.5	18.9	463.04	698
15355016	32 X 1.5	20.8	591.57	892
15355017	37 X 1.5	21.8	664.73	994
15355018	4 X 2.5	9.6	153.75	220
15355019	7 X 2.5	11.6	224.75	311
15355020	9 X 2.5	14.9	309.28	478
15355021	12 X 2.5	15.7	382.12	530
15355022	19 X 2.5	18.6	573.02	795
15355023	24 X 2.5	21.3	718.82	999

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum

Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® TRAIN 345 C 600V refer to page 31

Accessories

- SKINTOP® MS-HF-M SC refer to page 48
- SKINTOP® MS-HF-M BRUSH refer to page 49



ÖLFLEX® TRAIN 361 1,8kV

Single-core cable according to EN 50264-3-1 type M for high requirements in railway applications

LAPP KABEL STUTTGART ÖLFLEX® TRAIN 361 1,8 kV EN 50264-3-1 M



Info

- Meets EN 50264-3-1 type M and EN 45545-2
- High temperature resistance: -45°C up to 120°C
- Highly oil- and fuel-resistant

Benefits

- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Application range

- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Suitable for connecting lamps, heating equipment, switchgear, terminal boxes and power supply
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-24 / EN 60332-3-25 / EN 50305

- Fire behaviour according to NF:
 - Toxicity of gases acc. to NF X 70-100
 - Low smoke density acc. to NF X 10-702
 - No flame propagation acc. to NF C 32-070, Cat. C1 and C2
- Chemical properties:
 - Oil resistant acc. to EN 50264-3-1
 - Fuel resistant acc. to EN 50264-3-1
 - Acid resistant acc. to EN 50264-3-1
 - Alkali resistant acc. to EN 50264-3-1
 - Ozone resistant acc. to EN 50264-3-1 / EN 50305)

Norm references / Approvals

- EN 50264-3-1 type M
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 - Classification: C / F1 (flame propagation / smoke)

Product Make-up

- Tinned-copper strand, fine-wire
- Insulation: Electron beam cross-linked Polymer compound EI 109
- Colour: Black

Technical data



Classification

ETIM 5.0 Class-ID: EC000993
ETIM 5.0 Class-Description:
Single core cable



Conductor stranding

Fine-wired/ Finely stranded according to IEC 60228, conductor class 5



Minimum bending radius

Fixed installation:
≤ 12 mm: 3 x OD
> 12 mm: 4 x OD
Occasional flexing:
≤ 12 mm: 4 x OD
> 12 mm ≤ 20 mm: 5 x OD
> 20 mm: 6 x OD
(OD = outer diameter)



Nominal voltage

U₀/U AC 1.8/3 kV
U₀ AC 3,6 kV
V₀ DC 2,7 kV



Test voltage

6,5 kV AC; 15 kV DC



Temperature range

Fixed installation:
-45°C to +120°C (20.000 h)
Occasional flexing:
-35°C to +90°C
Short circuit: +200°C (5s)

Article number	Conductor cross-section (mm²)	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 361 1,8kV				
15361000	1.5	5.6	14.4	48
15361001	2.5	6.0	24.0	61
15361002	4	6.7	38.4	80
15361003	6	7.2	57.6	105
15361004	10	8.2	96.0	153
15361005	16	9.2	153.6	224
15361006	25	10.5	240.0	323
15361007	35	11.7	336.0	431
15361008	50	13.7	480.0	592
15361009	70	15.4	672.0	801
15361010	95	17.8	912.0	1076
15361011	120	19.4	1152.0	1329
15361012	150	21.4	1440.0	1634
15361013	185	23.3	1776.0	2011
15361014	240	26.8	2304.0	2571
15361015	300	28.0	2880.0	3176

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum

Please specify the preferred

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® TRAIN 371 1,8kV refer to page 35

Accessories

- SKINTOP® ST-HF-M refer to page 45
- SKINTOP® MS-HF-M refer to page 47



ÖLFLEX® TRAIN 371 1,8kV

Single-core cable according to EN 50264-3-1 type MM for high requirements in railway applications



Info

- Meets EN 50264-3-1 type MM and EN 45545-2
- High temperature resistance: -45°C up to 90°C
- Highly oil- and fuel-resistant

LAPP KABEL STUTTGART ÖLFLEX® TRAIN 371 1,8 kV EN 50264-3-1 MM

Benefits

- High electrical strength and mechanical durability due to dual-layer cable construction
- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Application range

- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Suitable for wiring of control cabinets, distributors, converters, motors and batteries
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-24 / EN 60332-3-25 / EN 50305

- Fire behaviour according to NF:
 - Toxicity of gases acc. to NF X 70-100
 - Low smoke density acc. to NF X 10-702
 - No flame propagation acc. to NF C 32-070, Cat. C1 and C2
- Chemical properties:
 - Oil resistant acc. to EN 50264-3-1
 - Fuel resistant acc. to EN 50264-3-1
 - Acid resistant acc. to EN 50264-3-1
 - Alkali resistant acc. to EN 50264-3-1
 - Ozone resistant acc. to EN 50264-3-1 / EN 50305

Norm references / Approvals

- EN 50264-3-1 type MM
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 - Classification: C / F1 (flame propagation / smoke)

Product Make-up

- Tinned-copper strand, fine-wire
- Insulation: Electron beam cross-linked Polymer compound EI 109
- Outer sheath: electron beam cross-linked polymer-compound EM 104
- Outer sheath colour: Black

Technical data



Classification

ETIM 5.0 Class-ID: EC000057
ETIM 5.0 Class-Description:
Low voltage power cable



Conductor stranding

Fine-wired/ Finely stranded according to IEC 60228, conductor class 5



Minimum bending radius

Fixed installation:
≤ 12 mm: 3 x OD
> 12 mm: 4 x OD
Occasional flexing:
≤ 12 mm: 4 x OD
> 12 mm ≤ 20 mm: 5 x OD
> 20 mm: 6 x OD
(OD = outer diameter)



Nominal voltage

U₀/U AC 1.8/3 kV
U_m AC 3,6 kV
V₀ DC 2,7 kV



Test voltage

6,5 kV AC; 15 kV DC



Temperature range

Fixed installation:
-45°C to +90°C
Occasional flexing:
-35°C to +90°C
Short circuit: +200°C (5s)

Article number	Conductor cross-section (mm²)	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 371 1,8kV				
15371000	1.5	5.8	14.4	57
15371001	2.5	6.2	24.0	67
15371002	4	6.9	38.4	90
15371003	6	7.4	57.6	116
15371004	10	8.8	96.0	173
15371005	16	9.8	153.6	244
15371006	25	12.1	240.0	374
15371007	35	13.3	336.0	488
15371008	50	15.3	480.0	659
15371009	70	17.0	672.0	875
15371010	95	19.8	912.0	1180
15371011	120	21.4	1152.0	1441
15371012	150	23.8	1440.0	1788
15371013	185	25.7	1776.0	2166
15371014	240	29.2	2304.0	2775
15371015	300	30.4	2880.0	3367

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.

Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum

Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® TRAIN 381 3,6kV refer to page 36

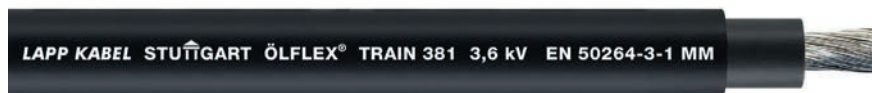
Accessories

- SKINTOP® ST-HF-M refer to page 45
- SKINTOP® MS-HF-M refer to page 47



ÖLFLEX® TRAIN 381 3,6kV

Single-core cable according to EN 50264-3-1 type MM for high requirements in railway applications



Info

- Meets EN 50264-3-1 type MM and EN 45545-2
- High temperature resistance: -45°C up to 90°C
- Highly oil- and fuel-resistant

Benefits

- High electrical strength and mechanical durability due to dual-layer cable construction
- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Application range

- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Suitable for wiring of control cabinets, distributors, converters, motors and batteries
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-24 / EN 60332-3-25 / EN 50305

- Fire behaviour according to NF:
 - Toxicity of gases acc. to NF X 70-100
 - Low smoke density acc. to NF X 10-702
 - No flame propagation acc. to NF C 32-070, Cat. C1 and C2
- Chemical properties:
 - Oil resistant acc. to EN 50264-3-1
 - Fuel resistant acc. to EN 50264-3-1
 - Acid resistant acc. to EN 50264-3-1
 - Alkali resistant acc. to EN 50264-3-1
 - Ozone resistant acc. to EN 50264-3-1 / EN 50305

Norm references / Approvals

- EN 50264-3-1 type MM
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 - Classification: C / F1 (flame propagation / smoke)

Product Make-up

- Tinned-copper strand, fine-wire
- Insulation: Electron beam cross-linked Polymer compound EI 109
- Outer sheath: electron beam cross-linked polymer-compound EM 104
- Outer sheath colour: Black

Technical data



Classification

ETIM 5.0 Class-ID: EC000057
ETIM 5.0 Class-Description:
Low voltage power cable



Conductor stranding

Fine-wired/ Finely stranded according to IEC 60228, conductor class 5



Minimum bending radius

Fixed installation:
≤ 12 mm: 3 x OD
> 12 mm: 4 x OD
Occasional flexing:
≤ 12 mm: 4 x OD
> 12 mm ≤ 20 mm: 5 x OD
> 20 mm: 6 x OD
(OD = outer diameter)



Nominal voltage

U₀/U AC 3,6/6 kV
U_m AC 7,2 kV
V_m DC 5,4 kV



Test voltage

11 kV AC; 26 kV DC



Temperature range

Fixed installation:
-45°C to +90°C
Occasional flexing:
-35°C to +90°C
Short circuit: +200°C (5s)

Article number	Conductor cross-section (mm ²)	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 381 3,6kV				
15381000	2.5	9.0	24.0	118
15381001	4	9.7	38.4	146
15381002	6	10.2	57.6	176
15381003	10	11.2	96.0	232
15381004	16	12.2	153.6	303
15381005	25	14.5	240.0	445
15381006	35	15.7	336.0	566
15381007	50	17.7	480.0	747
15381008	70	19.4	672.0	972
15381009	95	21.4	912.0	1250
15381010	120	23.4	1152.0	1557
15381011	150	25.4	1440.0	1895
15381012	185	27.5	1776.0	2281
15381013	240	31.8	2304.0	2982
15381014	300	33.0	2880.0	3554

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum

Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).

Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINTOP® ST-HF-M refer to page 45
- SKINTOP® MS-HF-M refer to page 47



UNITRONIC® TRAIN



Info

- Small outer diameters for maximum saving of space and weight
- Extremely low attenuation ≤ 5 MHz

Benefits

- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire
- EMC-optimised design

Application range

- The communication systems WTB (wire train bus) and MVB (multifunction vehicle bus) make up the so-called TCN (train communication network)
- UNITRONIC® TRAIN bus cables are designed for use in TCN acc. IEC 61375 MVB according IEC 61375-3-1 WTB according IEC 61375-2-1
- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-25
- Fire behaviour according to NF:
 - Toxicity of gases acc. to NF X 70-100
 - Low smoke density acc. to NF X 10-702
 - No flame propagation acc. to NF C 32-070, Cat. C1 and C2
- Chemical properties:
 - Oil resistant acc. to EN 50264-1
 - Fuel resistant acc. to EN 50264-1
 - Acid resistant acc. to EN 50264-1
 - Alkali resistant acc. to EN 50264-1
 - Ozone resistant acc. to EN 50264-3-2

Norm references / Approvals

- EN 45545-2 HL1, HL2, HL3
- EN 50264-1

Product Make-up

- Stranded tinned 19-wire conductor
- Core insulation: Based on Polyolefin
- Outer sheath: electron beam cross-linked polymer-compound EM 104
- Outer sheath colour: Black

Technical data

	Classification ETIM 5.0 Class-ID: EC000830 ETIM 5.0 Class-Description: Data cable
	Peak operating voltage (not for power applications) 125 V
	Minimum bending radius Flexing: 10 x outer diameter Fixed installation: 6 x outer diameter
	Test voltage Core/core: 1000 V Core/screen: 1000 V
	Characteristic impedance 120 ohm ($\pm 10\%$)
	Temperature range Fixed installation: -45°C to +90°C Occasional flexing: -35°C up to +90°C

Article number	Article designation	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)
Cables for MVB				
2173000	UNITRONIC® TRAIN MVB 1x2x0,5	1x2x0,5	7.4	29
2173001	UNITRONIC® TRAIN MVB 1x2x0,5+1x0,5	1x2x0,5+1x0,5	7.4	34
2173002	UNITRONIC® TRAIN MVB 2x2x0,5	2x2x0,5	8.1	40
2173003	UNITRONIC® TRAIN MVB 2x2x0,5+4x0,25	2x2x0,5+4x0,25	8.1	50
Cables for WTB				
2173004	UNITRONIC® TRAIN WTB 1x2x0,75	1x2x0,75	8.4	33

Photographs are not to scale and do not represent detailed images of the respective products.



ETHERLINE® TRAIN

Ethernet cables according to EN 50264-3-1 Type XM for high requirements in railway applications



Info

- Meets EN 50264-3-2 type XM and EN 45545-2
- Cat.5e Performance up to 100 / 1000 MBit/s
- Cat.6_A & Cat.7 qualified for 10 GBit/s

Benefits

- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increase the protection against damage to persons and property in the event of a fire

Application range

- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Suitable for connecting to of e.g. camera systems, enter-/infotainment for passengers, ticketing systems
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
 - Halogen-free acc. to EN 60754-1
 - No corrosive gases acc. to EN 60754-2
 - No fluorine acc. to EN 60684-2
 - No toxic gases acc. to EN 50305
 - Low smoke density acc. to EN 61034-2
 - Flame-retardant acc. to EN 60332-1-2
 - No flame propagation acc. to EN 60332-3-25

- Fire behaviour according to NF:
 - Toxicity of gases acc. to NF X 70-100
 - Low smoke density acc. to NF X 10-702
 - No flame propagation acc. to NF C 32-070, Cat. C1 and C2
- Chemical properties:
 - Oil resistant acc. to EN 50264-1
 - Fuel resistant acc. to EN 50264-1
 - Acid resistant acc. to EN 50264-1
 - Alkali resistant acc. to EN 50264-1
 - Ozone resistant acc. to EN 50264-3-2

Norm references / Approvals

- Electrical requirements acc. to IEC 61156-6
- EN 50264-1
- EN 45545-2 HL1, HL2, HL3

Product Make-up

- Stranded tinned 7-wire conductor
- Core insulation: Based on Polyolefin
- Cat.5e: SF/UTP - copper braid and foil screening as overall screening
- Cat.6_A/Cat.7: S/FTP - copper braid as overall screening and pair screening with aluminium compound foil
- Outer sheath: electron beam cross-linked polymer-compound EM 104
- Outer sheath colour: Black

Technical data



Classification

ETIM 5.0 Class-ID: EC000830
ETIM 5.0 Class-Description: Data cable



Peak operating voltage

(not for power applications) 125 V



Minimum bending radius

Flexing: 10 x outer diameter
Fixed installation: 8 x outer diameter



Test voltage

Core/core: 1000 V
Core/screen: 1000 V



Characteristic impedance

nom. 100 Ohm acc. to IEC 61156-6



Temperature range

Fixed installation:
-45°C to +90°C
Occasional flexing: -35°C up to +90°C

Article number	Article designation	Number of pairs and AWG per conductor	Max. outer diameter (mm)	Copper index (kg/km)
Cat.5e, 2-pair version				
2170906	ETHERLINE TRAIN FLEX Cat.5e 1x4x22/7 PE	1x4xAWG22/7	6.5	30.4
2170910	ETHERLINE TRAIN FLEX Cat.5e 1x4x0,5 PE	1x4x0,5/7	7.6	41
Cat.5e, 4-pair version				
2170907	ETHERLINE TRAIN Cat.5e 4x2x24/7 PE	4x2xAWG24/7	7.7	38
Cat.6_A				
2170908	ETHERLINE TRAIN FLEX Cat.6 _A 4x2x24/7 PE	4x2xAWG24/7	8.4	38
Cat.7				
2170909	ETHERLINE TRAIN FLEX Cat.7 4x2x24/7 PE	4x2xAWG24/7	8.4	38

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths

PROFINET® is a registered trademark of the PNO (PROFIBUS user organisation)

Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.

Photographs are not to scale and do not represent detailed images of the respective products.



Info

- Proven screw for easy installation
- Railway applications



Info

- Push-In version - fast and easy tool free connection technology
- Railway applications

Suitable housing

- EPIC® ULTRA H-B 6
- EPIC® H-B 6 Housings
- EPIC® QUICK & EASY Mounting system
- Refer to Selection Table A10 to select the required inserts and housings

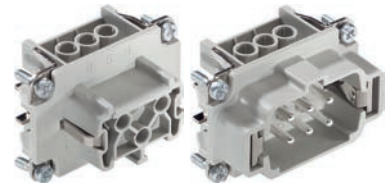
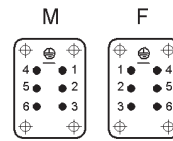
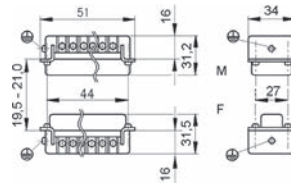
Benefits

EPIC® H-BE 6 Screw termination

- Standard inserts with screw, crimp cage clamp and Push-In termination
- The EPIC® H-BE series is suitable for applications that require a reliable connection when working with high voltages and currents
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL4

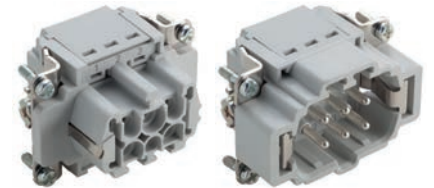
EPIC® H-BE 6 Push-In termination

- Insertion of cores with end sleeves in Push-In inserts gives mounting safety and time saving without any tools
- Easy dismantling and insertion of wires by pushing the orange button
- Test socket for standard 2mm test tip for easy testing of Push-In inserts
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL4
- The EPIC® H-BE series is suitable for applications that require a reliable connection when working with high voltages and currents



EPIC® H-BE 6 Push-In termination

The proven standard inserts for easy assembly



Technical data

	Classification ETIM 5.0 Class-ID: EC000438 ETIM 5.0 Class-Description: Contact insert for industrial connectors
	Rated voltage (V) IEC: 500 VUL: 600 VCSA: 600 V
	Rated impulse voltage 6 kV
	Rated current (A) EPIC® H-BE 6 Screw termination IEC: 16 A UL: 16 A CSA: 16 A EPIC® H-BE 6 Push-In termination IEC: 16 A UL: 13 A CSA: 13 A
	Degree of soiling 3
	Contact resistance < 2 mOhm
	Contacts Copper alloy, hard silver-plated

	Number of contacts 6 + PE
	Termination methods EPIC® H-BE 6 Screw termination Screw termination: 0.5 - 2.5 mm² EPIC® H-BE 6 Push-In termination Push-In termination: 0.14 - 2.5mm²
	Stripping length (mm) EPIC® H-BE 6 Screw termination 8 EPIC® H-BE 6 Push-In termination 10
	Cycle of mechanical operation 100
	Certifications EPIC® H-BE 6 Screw termination Certified production control: VDE-REG. no.: B437 UL-tested: UL File Number: E75770 EPIC® H-BE 6 Push-In termination UL-tested: UL File Number: E75770
	Temperature range -40°C to +100°C, short-term up to +125°C

Application range

EPIC® H-BE 6 Screw termination

- Mechanical engineering
- Plastics industry
- Light & sound technology
- Railway applications / vehicle construction

EPIC® H-BE 6 Push-In termination

- Mechanical engineering
- Plastics industry
- Light & sound technology
- Railway applications / vehicle construction

Suitable tools

EPIC® H-BE 6 Screw termination

- PEW 8.186 crimping pliers refer to main catalogue
- Kraftform® adjustable torque screwdriver/ Kraftform Kompakt® Set refer to main catalogue
- Recommended crimping tool when conductor end-sleeves are used: PEW 8.186

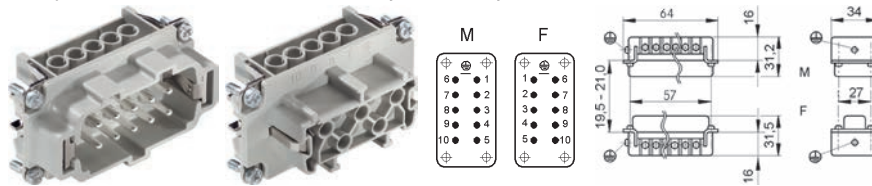
Article number	Article description	Contact type	Wire protection	Number of operating contacts	Pieces / PU
H-BE 6 screw termination					
10190000	EPIC® H-BE 6 SS	male	yes	1 - 6	10
10191000	EPIC® H-BE 6 BS	female	yes	1 - 6	10
10190100	EPIC® H-BE 6 SS	male		1 - 6	10
10191100	EPIC® H-BE 6 BS	female		1 - 6	10
H-BE 6 Push-In termination					
44423200	EPIC® H-BE 6 SP	male	yes	1 - 6	10
44423201	EPIC® H-BE 6 BP	female	yes	1 - 6	10

Photographs are not to scale and do not represent detailed images of the respective products.



EPIC® H-BE 10 Screw termination

The proven standard inserts for easy assembly



Info

- Proven screw for easy installation
- Railway applications

EPIC® H-BE 10 Push-In termination

The proven standard inserts for easy assembly



Info

- Push-In version - fast and easy tool free connection technology
- Railway applications

Suitable housing

- EPIC® ULTRA H-B 10
- EPIC® H-B 10 Housings
- EPIC® QUICK & EASY Mounting system
- Refer to Selection Table A10 to select the required inserts and housings

Benefits

EPIC® H-BE 10 Screw termination

- Standard inserts with screw, crimp cage clamp and Push-In termination
- The EPIC® H-BE series is suitable for applications that require a reliable connection when working with high voltages and currents
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL4

EPIC® H-BE 10 Push-In termination

- Insertion of cores with end sleeves in Push-In inserts gives mounting safety and time saving without any tools
- Easy dismantling and insertion of wires by pushing the orange button
- Test socket for standard 2mm test tip for easy testing of Push-In inserts
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL4
- The EPIC® H-BE series is suitable for applications that require a reliable connection when working with high voltages and currents

Technical data



Classification

ETIM 5.0 Class-ID: EC000438
ETIM 5.0 Class-Description: Contact insert for industrial connectors



Rated voltage (V)

IEC: 500 VUL: 600 VCSA: 600 V

Rated impulse voltage

6 kV



Rated current (A)

EPIC® H-BE 10 Screw termination
IEC: 16 A
UL: 16 A
CSA: 16 A
EPIC® H-BE 10 Push-In termination
IEC: 16 A
UL: 13 A
CSA: 13 A



Degree of soiling

3

Contact resistance

< 2 mOhm



Contacts

Copper alloy, hard silver-plated



Number of contacts

10 + PE



Termination methods

EPIC® H-BE 10 Screw termination
Screw termination: 0.5 - 2.5 mm²
EPIC® H-BE 10 Push-In termination
Push-In termination: 0.14 - 2.5mm²

Stripping length (mm)

EPIC® H-BE 10 Screw termination
8
EPIC® H-BE 10 Push-In termination
10



Cycle of mechanical operation

100



Certifications

EPIC® H-BE 10 Screw termination
Certified production control:
VDE-REG. no.: B437
UL-tested:
UL File Number: E75770
EPIC® H-BE 10 Push-In termination
UL-tested:
UL File Number: E75770



Temperature range

-40°C to +100°C,
short-term up to +125°C

Application range

EPIC® H-BE 10 Screw termination

- Mechanical engineering
- Plastics industry
- Light & sound technology
- Railway applications / vehicle construction

EPIC® H-BE 10 Push-In termination

- Mechanical engineering
- Plastics industry
- Light & sound technology
- Railway applications / vehicle construction

Suitable tools

EPIC® H-BE 10 Screw termination

- PEW 8.186 crimping pliers refer to main catalogue
- Kraftform® adjustable torque screwdriver/ Kraftform Kompakt® Set refer to main catalogue
- Recommended crimping tool when conductor end-sleeves are used: PEW 8.186

Article number	Article description	Contact type	Wire protection	Number of operating contacts	Pieces / PU
H-BE 10 screw termination					
10192000	EPIC® H-BE 10 SS	male	yes	1 - 10	10
10193000	EPIC® H-BE 10 BS	female	yes	1 - 10	10
10192100	EPIC® H-BE 10 SS	male		1 - 10	10
10193100	EPIC® H-BE 10 BS	female		1 - 10	10
H-BE 10 Push-In termination					
44423202	EPIC® H-BE 10 SP	male	yes	1 - 10	10
44423203	EPIC® H-BE 10 BP	female	yes	1 - 10	10

Photographs are not to scale and do not represent detailed images of the respective products.



Info

- Proven screw for easy installation
- Also as EPIC® H-BE 32 available
- Railway applications

Info

- Push-In version - fast and easy tool free connection technology
- Also as EPIC® H-BE 32 available
- Railway applications

Suitable housing

- EPIC® ULTRA H-B 16
- EPIC® H-B 16 Housings
- EPIC® QUICK & EASY Mounting system
- Refer to Selection Table A10 to select the required inserts and housings

Similar products

EPIC® H-BE 16 Schraubanschluss

- Further products with higher numbering in the internet. (H-BE 32, H-BE 48)

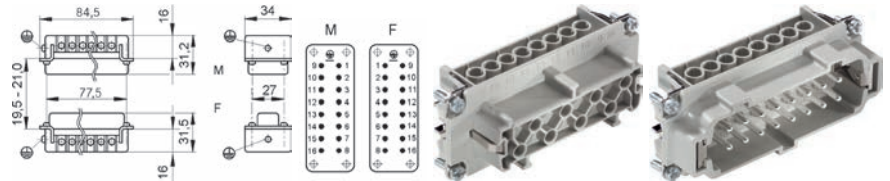
Benefits

EPIC® H-BE 16 Screw termination

- Standard inserts with screw, crimp cage clamp and Push-In termination
- The EPIC® H-BE series is suitable for applications that require a reliable connection when working with high voltages and currents
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL4

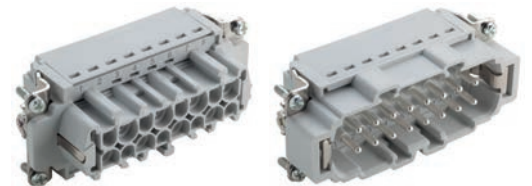
EPIC® H-BE 16 Push-In termination

- Insertion of cores with end sleeves in Push-In inserts gives mounting safety and time saving without any tools
- Easy dismantling and insertion of wires by pushing the orange button
- Test socket for standard 2mm test tip for easy testing of Push-In inserts
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL4
- The EPIC® H-BE series is suitable for applications that require a reliable connection when working with high voltages and currents



EPIC® H-BE 16 Push-In termination

The proven standard inserts for easy assembly



Technical data

	Classification ETIM 5.0 Class-ID: EC000438 ETIM 5.0 Class-Description: Contact insert for industrial connectors		Number of contacts 16 + PE
	Rated voltage (V) IEC: 500 VUL: 600 VCSA: 600 V		Termination methods EPIC® H-BE 16 Screw termination Screw termination: 0.5 - 2.5 mm ² EPIC® H-BE 16 Push-In termination Push-In termination: 0.14 - 2.5mm ²
	Rated current (A) EPIC® H-BE 16 Screw termination IEC: 16 A UL: 16 A CSA: 16 A EPIC® H-BE 16 Push-In termination IEC: 16 A UL: 13 A CSA: 13 A		Stripping length (mm) EPIC® H-BE 16 Screw termination 8 EPIC® H-BE 16 Push-In termination 10
	Degree of soiling 3		Cycle of mechanical operation 100
	Contact resistance < 2 mOhm		Certifications EPIC® H-BE 16 Screw termination Certified production control: VDE-REG. no.: B437 UL-tested: UL File Number: E75770 EPIC® H-BE 16 Push-In termination UL-tested: UL File Number: E75770
	Contacts Copper alloy, hard silver-plated		Temperature range -40°C to +100°C, short-term up to +125°C

Application range

EPIC® H-BE 16 Screw termination

- Mechanical engineering
- Plastics industry
- Light & sound technology
- Railway applications / vehicle construction

EPIC® H-BE 16 Push-In termination

- Mechanical engineering
- Plastics industry
- Light & sound technology
- Railway applications / vehicle construction

Similar products

EPIC® H-BE 16 Screw termination

- Further products with higher numbering in the internet. (H-BE 32, H-BE 48)

Suitable tools

EPIC® H-BE 16 Screw termination

- PEW 8.186 crimping pliers refer to main catalogue
- Kraftform® adjustable torque screwdriver/ Kraftform Kompakt® Set refer to main catalogue
- Recommended crimping tool when conductor end-sleeves are used: PEW 8.186

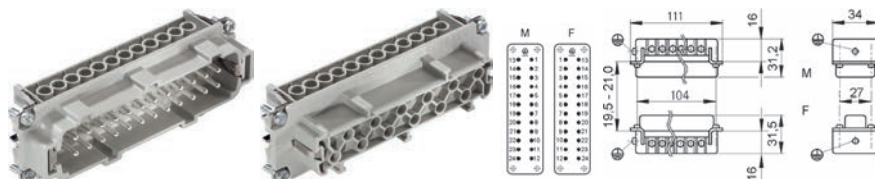
Article number	Article description	Contact type	Wire protection	Number of operating contacts	Pieces / PU
H-BE 16 screw termination					
10194000	EPIC® H-BE 16 SS	male	yes	1 - 16	5
10195000	EPIC® H-BE 16 BS	female	yes	1 - 16	5
10194100	EPIC® H-BE 16 SS	male		1 - 16	5
10195100	EPIC® H-BE 16 BS	female		1 - 16	5
H-BE 16 Push-In termination					
44423204	EPIC® H-BE 16 SP	male	yes	1 - 16	5
44423205	EPIC® H-BE 16 BP	female	yes	1 - 16	5

Photographs are not to scale and do not represent detailed images of the respective products.



EPIC® H-BE 24 Screw termination

The proven standard inserts for easy assembly

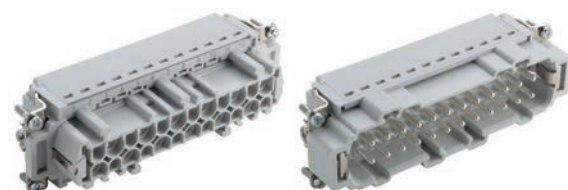


Info

- Proven screw for easy installation
- Also as EPIC® H-BE 48 available
- Railway applications

EPIC® H-BE 24 Push-In termination

The proven standard inserts for easy assembly



Info

- Push-In version - fast and easy tool free connection technology
- Also as EPIC® H-BE 48 available
- Railway applications

Suitable housing

- EPIC® ULTRA H-B 24
- EPIC® H-B 24 Housings
- EPIC® QUICK & EASY Mounting system
- Refer to Selection Table A10 to select the required inserts and housings

Similar products

EPIC® H-BE 24 Schraubanschluss

- Further products with higher numbering in the internet. (H-BE 32, H-BE 48)

Benefits

EPIC® H-BE 24 Screw termination

- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL4
- Standard inserts with screw, crimp cage clamp and Push-In termination
- The EPIC® H-BE series is suitable for applications that require a reliable connection when working with high voltages and currents

EPIC® H-BE 24 Push-In termination

- Insertion of cores with end sleeves in Push-In inserts gives mounting safety and time saving without any tools
- Easy dismantling and insertion of wires by pushing the orange button
- Test socket for standard 2mm test tip for easy testing of Push-In inserts
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL4
- The EPIC® H-BE series is suitable for applications that require a reliable connection when working with high voltages and currents

Technical data

	Classification ETIM 5.0 Class-ID: EC000438 ETIM 5.0 Class-Description: Contact insert for industrial connectors
	Rated voltage (V) IEC: 500 VUL: 600 VCSA: 600 V
	Rated impulse voltage 6 kV
	Rated current (A) EPIC® H-BE 24 Screw termination IEC: 16 A UL: 16 A CSA: 16 A EPIC® H-BE 24 Push-In termination IEC: 16 A UL: 13 A CSA: 13 A
	Degree of soiling 3
	Contact resistance < 2 mOhm
	Contacts Copper alloy, hard silver-plated
	Number of contacts 24 + PE

	Termination methods EPIC® H-BE 24 Screw termination Screw termination: 0.5 - 2.5 mm ² EPIC® H-BE 24 Push-In termination Push-In termination: 0.14 - 2.5mm ²
	Stripping length (mm) EPIC® H-BE 24 Screw termination 8 EPIC® H-BE 24 Push-In termination 10
	Cycle of mechanical operation 100
	Certifications EPIC® H-BE 24 Screw termination Certified production control: VDE-REG. no.: B437 UL-tested: UL File Number: E75770 EPIC® H-BE 24 Push-In termination UL-tested: UL File Number: E75770
	Temperature range -40°C to +100°C, short-term up to +125°C

Application range

EPIC® H-BE 24 Screw termination

- Mechanical engineering
- Plastics industry
- Light & sound technology
- Railway applications / vehicle construction

EPIC® H-BE 24 Push-In termination

- Mechanical engineering
- Plastics industry
- Light & sound technology
- Railway applications / vehicle construction

Similar products

EPIC® H-BE 24 Screw termination

- Further products with higher numbering in the internet. (H-BE 32, H-BE 48)

Suitable tools

EPIC® H-BE 24 Screw termination

- PEW 8.186 crimping pliers refer to main catalogue
- Kraftform® adjustable torque screwdriver / Kraftform Kompakt® Set refer to main catalogue
- Recommended crimping tool when conductor end-sleeves are used: PEW 8.186

Article number	Article description	Contact type	Wire protection	Number of operating contacts	Pieces / PU
H-BE 24 screw termination					
10196000	EPIC® H-BE 24 SS	male	yes	1 - 24	5
10197000	EPIC® H-BE 24 BS	female	yes	1 - 24	5
10196100	EPIC® H-BE 24 SS	male		1 - 24	5
10197100	EPIC® H-BE 24 BS	female		1 - 24	5
H-BE 24 Push-In termination					
44423206	EPIC® H-BE 24 SP	male	yes	1 - 24	5
44423207	EPIC® H-BE 24 BP	female	yes	1 - 24	5

Photographs are not to scale and do not represent detailed images of the respective products.



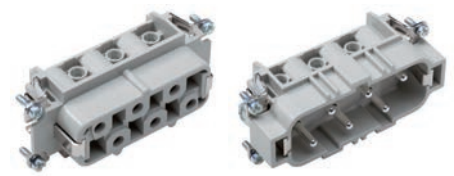
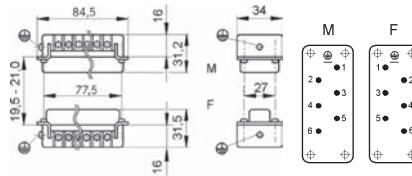
Info

- Standard insert for currents up to 35A
- Railway applications



Info

- Standard insert for currents up to 35A
- Railway applications

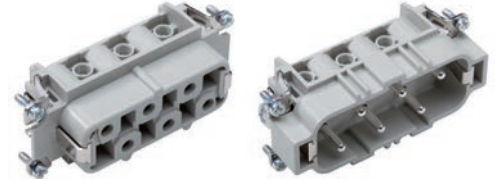
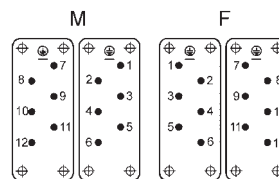


EPIC® H-BS 6

Inserts for high currents.

EPIC® H-BS 12

Inserts for high currents.



Suitable housing

EPIC® H-BS 6

- EPIC® ULTRA H-B 16
- EPIC® H-B 16 Housings
- EPIC® QUICK & EASY Mounting system

EPIC® H-BS 12

- EPIC® ULTRA H-B 16
- Refer to Selection Table A10 to select the required inserts and housings

Benefits

EPIC® H-BS 6

- High rating for currents up to 35 A
- Screw termination up to a conductor cross section of 6 mm²
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL4

EPIC® H-BS 12

- High rating for currents up to 35 A
- Screw termination up to a conductor cross section of 6 mm²
- Two H-BS 6 inserts with different contact-numbering for one housing.

Technical data

	Classification ETIM 5.0 Class-ID: EC000438 ETIM 5.0 Class-Description: Contact insert for industrial connectors
	Rated voltage (V) IEC: 500 VUL: 600 VCSA: 600 V Conductor - conductor: 690 V
	Rated impulse voltage 6 kV
	Rated current (A) IEC: 35 A UL: 35 A CSA: 35 A
	Degree of soiling 3
	Contact resistance < 2 mOhm
	Contacts Copper alloy, hard silver-plated

	Number of contacts EPIC® H-BS 6 6 + PE EPIC® H-BS 12 12 + PE
	Termination methods Screw termination: 0.5 - 6 mm ²
	Stripping length (mm) 8
	Cycle of mechanical operation 100
	VDE-tested Certified production control: VDE-REG. no.: B437 UL-tested: UL File Number: E75770
	Temperature range -40°C to +100°C, short-term up to +125°C

Application range

EPIC® H-BS 6

- Railway applications / vehicle construction
- Plant engineering
- Mechanical engineering
- Drive systems

EPIC® H-BS 12

- Plant engineering
- Mechanical engineering
- Drive systems

Suitable tools

EPIC® H-BS 6

- PEW 8.186 crimping pliers refer to main catalogue
- Kraftform® adjustable torque screwdriver / Kraftform Kompakt® Set refer to main catalogue

EPIC® H-BS 12

- PEW 8.186 crimping pliers refer to main catalogue

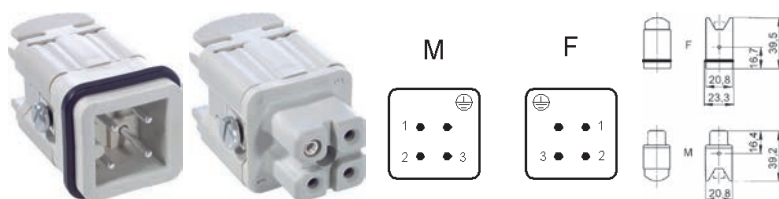
Article number	Article description	Contact type	Wire protection	Number of operating contacts	Pieces / PU
H-BS 6 screw termination					
10170000	H-BS 6 SS	male	yes	1 - 6	5
10171000	H-BS 6 BS	female	yes	1 - 6	5
H-BS 12 screw termination					
10170600	H-BS 6 SS	male	yes	7 - 12	5
10171600	H-BS 6 BS	female	yes	7 - 12	5

Photographs are not to scale and do not represent detailed images of the respective products.



EPIC® H-A 3

H-A inserts with screw termination up to 2.5 mm² wire cross section

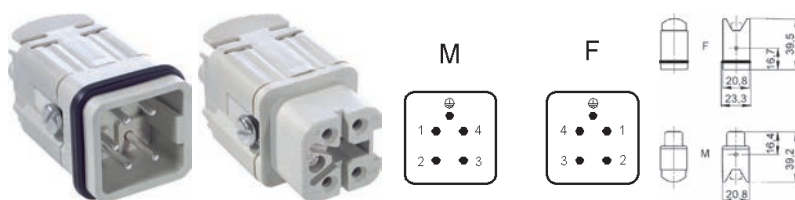


Info

- Small power connector for single- or three-phase current
- Easy to assemble due to straight entry of conductors
- Railway applications

EPIC® H-A 4

H-A inserts with screw termination up to 2.5 mm² wire cross section



Info

- Insert for three-phase current application with neutral conductor
- Easy to assemble due to straight entry of conductors
- Railway applications

Suitable housing

- EPIC® H-A 3 Housings
- Refer to Selection Table A10 to select the required inserts and housings

Benefits

- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL4
- The small H-A 3 / H-A 4 are used whenever there is minimal space.
- Easy to service screw connection
- Easy cable connection with strait cable entry in the contacts

Application range

- Railway applications / vehicle construction
- Machine and equipment manufacturing
- Control engineering
- Apparatus construction

Suitable tools

- PEW 8.186 crimping pliers refer to main catalogue
- MULTICRIMP 6 crimping pliers refer to main catalogue
- Kraftform® adjustable torque screwdriver/ Kraftform Kompakt® Set refer to main catalogue

Technical data

Classification
ETIM 5.0 Class-ID: EC000438
ETIM 5.0 Class-Description: Contact insert for industrial connectors

Rated voltage (V)
IEC: 400 V
UL: 600 V
CSA: 600 V

Rated impulse voltage
4 kV

Rated current (A)
IEC: 23 A
UL: 10 A
CSA: 10 A

Degree of soiling
3

Contact resistance
1.5 - 4 mohm

Contacts
Copper alloy, hard silver-plated

Number of contacts
EPIC® H-A 3
3 + PE
EPIC® H-A 4
4 + PE

Termination methods
Screw termination: 0.5 - 2.5 mm² (2.5 mm² with conductor end sleeves depending on the crimping profile)

Stripping length (mm)
6

Cycle of mechanical operation
100

VDE-tested
Certified production control:
VDE-REG. no.: B437
UL-tested:
UL File Number: E75770

Temperature range
-40 °C to +100 °C,
short-term up to +125 °C

Article number	Article description	Contact type	Number of operating contacts	Pieces / PU
H-A 3 screw termination				
10420000	H-A 3 SS	male	1 - 3	10
10421000	H-A 3 BS	female	1 - 3	10
H-A 4 screw termination				
10431000	H-A 4 SS	male	1 - 4	10
10432000	H-A 4 BS	female	1 - 4	10

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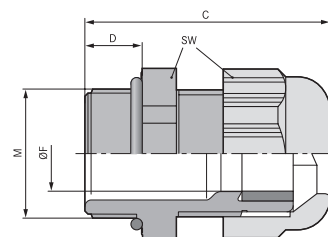
SKINTOP® ST-HF-M

SKINTOP® Halogen-free



Info

- Cable gland for railway applications



Benefits

- Maximum reliability
- Extremely flame-retardant according to UL 94 V0
- Completely halogen-free (including sealing material)
- Self-extinguishing, no dripping
- Permanent vibration protection

Application range

- Underground railways and trains
- When the protection of people and property is a priority.
- Public buildings
- Ventilation systems
- Tunnel construction

Norm references / Approvals

- DIN EN 45545-2: 2013
- Filament testing according to EN 60695-2-1/1 +960°C

Product Make-up

- Metric connection thread acc. to DIN EN 60423
- Basis for technical information DIN IEC 62444

Technical data



Classification

ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description:
Cable screw gland



Caution

Refer to Appendix T21 for the installation dimensions and torques



Colour delivered

Light grey (RAL 7035)



Material

Body: Polyamide UL 94V-0 - halogen-free
Sealing ring: halogen-free polymer compound
O-ring: halogen-free polymer compound



Protection rating

IP 68 - 5 bar



Temperature range

-20°C to +100°C

Article number	Article designation / size	Clamping range ØF (mm)	SW wrench size mm	Overall length, C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® ST-HF-M						
53111407	M 12 x 1,5	4-5,5	15	30.0	8	100
53111417	M 16 x 1,5	5-9	19	34.0	8	100
53111427	M 20 x 1,5	7-13	25	37.0	9	100
53111437	M 25 x 1,5	9-17	30	40.0	10	50
53111447	M 32 x 1,5	11-21	36	47.0	10	25
53111457	M 40 x 1,5	19-28	46	52.0	10	10
53111467	M 50 x 1,5	27-35	55	62.0	12	5
53111477	M 63 x 1,5	34-45	66	71.0	12	5

Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINTOP® GMP-HF-M refer to page 46



SKINTOP® GMP-HF-M



Benefits

- Halogen-free
- Extremely flame-retardant according to UL 94 V0
- Self-extinguishing, no dripping

Application range

- For locking SKINTOP® cable glands in boreholes without thread.
- Airports
- Tunnel construction
- Underground railways
- Public buildings

Product Make-up

- Metric connection thread acc. to DIN EN 60423
- Basis for technical information DIN IEC 62444

Note

- Designed for use with SKINTOP® ST-HF-M



Info

- Cable gland for railway applications

Technical data



Classification

ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description:
Cable screw gland



Colour delivered

Light grey (RAL 7035)



Material

Polyamide UL 94V-0 - halogen-free



Temperature range

-20°C to +100°C

Article number	Article designation / size	SW wrench size mm	PU
SKINTOP® GMP-HF-M			
53119200	M 12 x 1,5	17	100
53119210	M 16 x 1,5	22	100
53119220	M 20 x 1,5	27	100
53119230	M 25 x 1,5	34	100
53119240	M 32 x 1,5	41	100
53119250	M 40 x 1,5	50	25
53119260	M 50 x 1,5	60	25
53119270	M 63 x 1,5	75	25

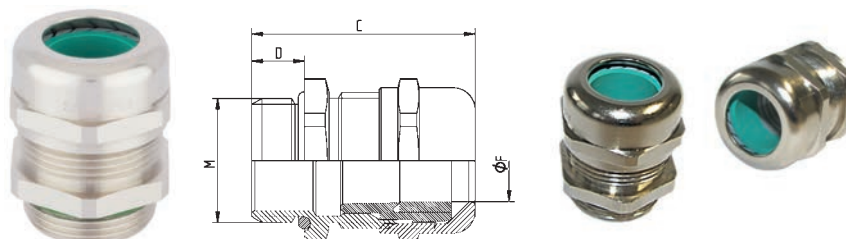
Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINTOP® ST-HF-M refer to page 45

**Info**

- Cable gland for railway applications
- Hazard Level: HL 3

**SKINTOP® MS-HF-M****Benefits**

- Halogen-free and flame-retardant
- Optimum strain relief
- Wide, variable clamping ranges
- Maximum reliability

Application range

- Underground railways and trains
- In areas where mechanical and chemical stability are critical
- When the protection of people and property is a priority.

Norm references / Approvals

- DIN EN 45545-2
- DIN EN 45545-3: 2013-08
- DIN EN 1363-1: 2012-10
- DIN EN 13501-2: Classification E30

Product Make-up

- Metric connection thread acc. to DIN EN 60423
- Basis for technical information DIN IEC 62444

Note

- Refer to SKINTOP® metric accessories for suitable accessories

Technical data**Classification**

ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description:
Cable screw gland

**Caution**

Refer to Appendix T21 for the installation dimensions and torques

**Material**

Body: nickel-plated brass
Cap nut: nickel-plated brass
Insert: polyamide, halogenfree acc. to UL 94 V 0
Sealing ring: Special elastomere
O-ring: Special elastomere

**Protection rating**

IP 68 - 5 bar

**Temperature range**

dynamic -25°C up to + 100°C
Fixed: -40°C to +100°C

Article number	Article designation / size	Clamping range ØF (mm)	SW wrench size mm	Overall length, C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® MS-HF-M						
53112570	M 12 x 1,5	3,5-7	16	26,5	6,5	100
53112571	M 16 x 1,5	4,5-10	20	33,0	7	100
53112572	M 20 x 1,5	7-13	24	37,0	8	50
53112573	M 25 x 1,5	9-17	29	38,5	8	25
53112574	M 32 x 1,5	11-21	36	45,5	9	25
53112575	M 40 x 1,5	19-28	45	48,0	9	10
53112576	M 50 x 1,5	27-35	54	55,5	10	5
53112577	M 63 x 1,5	34-45	67	67,0	15	5

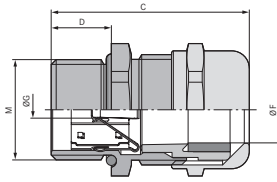
Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINDICHT® SM-M refer to main catalogue
- SKINMATIC® MH Set refer to main catalogue



SKINTOP® MS-HF-M SC



Info

- Cable gland for railway applications
- Hazard Level: HL 3

Benefits

- Halogen-free and flame-retardant
- Suitable for cables with and without inner sheath
- Low-resistance screen contact, optimum EMC protection
- Highly conductive, flexible EMC contact for clamping various screen diameters
- Few operation steps, easy to assemble

Application range

- Underground railways and trains
- For EMC-compliant earthing of the copper braiding, or for cables with copper shaft sheath
- Industrial machinery and plant engineering
- Measurement and control technology
- Automation technology

Norm references / Approvals

- DIN EN 45545-2
- DIN EN 45545-3: 2013-08
- DIN EN 1363-1: 2012-10
- DIN EN 13501-2: Classification E30

Product Make-up

- Metric connection thread acc. to DIN EN 60423
- Basis for technical information DIN IEC 62444

Note

- SKINDICHT® SM-PE-M counter nut should be used to ensure optimum contact with painted, anodised or powder-coated housings
- Refer to SKINTOP® metric accessories for suitable accessories

Technical data



Classification

ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description:
Cable screw gland



Caution

Refer to Appendix T21 for the installation dimensions and torques



Material

Body: nickel plated brass
Cap nut: nickel plated brass
Insert: halogen-free polyamid acc. to UL 94 V0
Sealing ring: special elastomer
O-ring: special elastomer



Protection rating

IP 68 - 5 bar



Temperature range

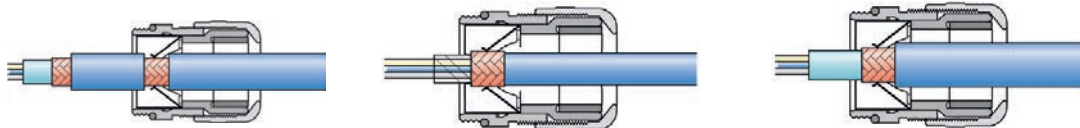
dynamic -25°C up to + 100°C
static -40°C up to +100°C

Article number	Article designation / size	Clamping range ØF (mm)	Minimum Ø above braiding (mm)	SW wrench size mm	Overall length, C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® MS-HF-M SC							
53112530	M 12 x 1,5	3,5-7	1	16	26.5	6.5	50
53112531	M 16 x 1,5	4,5-10	4	20	33.0	7	50
53112532	M 20 x 1,5	7-13	5	24	37.0	8.5	25
53112533	M 25 x 1,5	9-17	7.5	29	38.5	8	25
53112534	M 32 x 1,5	11-21	9	36	45.5	9	25
53112535	M 40 x 1,5	19-28	15	45	48.0	9	10
53112536	M 50 x 1,5	27-35	21	50	55.5	10	5

Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINDICHT® SM-PE-M refer to main catalogue





SKINTOP® MS-HF-M BRUSH



Info

- Cable gland for railway applications
- Hazard Level: HL 3



Benefits

- Halogen-free and flame-retardant
- Optimum, low-resistance 360° screen contact
- Faster than any other comparable system
- Maximum reliability
- Maximum assembly freedom during adjustment

Application range

- Underground railways and trains
- Automation systems
- High-power drives
- Frequency converters
- Conveyor and transport systems

Norm references / Approvals

- DIN EN 45545-2
- DIN EN 45545-3: 2013-08
- DIN EN 1363-1: 2012-10
- DIN EN 13501-2: Classification E30

Product Make-up

- Metric connection thread acc. to DIN EN 60423
- Basis for technical information DIN IEC 62444

Note

- SKINDICHT® SM-PE-M counter nut should be used to ensure optimum contact with painted, anodised or powder-coated housings
- Refer to SKINTOP® metric accessories for suitable accessories

Technical data



Classification

ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description:
Cable screw gland



Caution

Refer to Appendix T21 for the installation dimensions and torques



Material

Body: nickel-plated brass
Cap nut: nickel-plated brass
Insert: polyamide, halogen-free acc. to UL 94 V0
EMC brush: brass wire
Sealing ring: special elastomer
O-ring: special elastomer



Protection rating

IP 68 - 5 bar



Temperature range

dynamic -25°C up to + 100°C
Fixed: -40°C to +100°C

Article number	Article designation / size	Clamping range ØF (mm)	Minimum Ø above braiding (mm)	SW wrench size mm	Overall length, C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® MS-HF-M BRUSH							
53112543	M 25 x 1,5	9-17	6	29	36.0	8	10
53112544	M 32 x 1,5	11-21	8	36	42.2	9	5
53112545	M 40 x 1,5	19-28	10	45	49.5	9	5
53112546	M 50 x 1,5	27-35	14	54	52.0	10	5
53112547	M 63 x 1,5	34-45	20	67	61.3	15	1

Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINDICHT® SM-PE-M refer to main catalogue

SKINTOP® metric nickel-plated brass cable glands • SKINTOP® Halogen-free



SKINTOP® MS-HF-M GRIP



Benefits

- Halogen-free and flame-retardant
- Reliable bending and anti-kink protection
- High strain relief
- For high mechanical stress

Application range

- Saddle clamp strain relief gland for harsh application conditions.
- Portable equipment
- Machines and systems on building sites
- Crane and conveying machinery
- Plant engineering

Norm references / Approvals

- DIN EN 45545-2
- DIN EN 45545-3: 2013-08
- DIN EN 1363-1: 2012-10
- DIN EN 13501-2: Classification E30

Product Make-up

- Metric connection thread acc. to DIN EN 60423
- Basis for technical information DIN IEC 62444

Note

- Refer to SKINTOP® metric accessories for suitable accessories



Info

- Cable gland for railway applications
- Brass cable gland with with centred strain relief and kink protection
- Hazard Level: HL 3

Technical data



Classification

ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description:
Cable screw gland



Caution

Refer to the instruction leaflet for the installation dimensions and torques



Material

Body: nickel plated brass
Cap nut: nickel plated brass
Insert: halogen-free polyamid acc. to UL 94 V0
Sealing ring: special elastomer
O-ring: special elastomer



Protection rating

IP 68 - 5 bar



Temperature range

dynamic -25°C up to + 100°C
static -40°C up to +100°C

Article number	Article designation / size	Clamping range ØF (mm)	SW wrench size mm	Overall length, C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® MS-HF-M GRIP						
53112551	M 16 x 1,5	4,5-10	20	41.0	7	25
53112552	M 20 x 1,5	7-13	24	46.0	8.5	25
53112553	M 25 x 1,5	9-17	29	48.5	8	25
53112554	M 32 x 1,5	11-21	36	56.6	9	25

Photographs are not to scale and do not represent detailed images of the respective products.



**FIPLOCK® PA6**

Flexible, corrugated cable conduit system in closed and divisible version

**Info**

- Hazard Level: HL 3

**Benefits**

- The flexible conduit design enables small bending radii and is ideally suited for space-saving installations where space is limited in dry and damp interiors, as well as for outdoor applications
- Robust against mechanical impacts
- Flexible
- Dimensionally stable

Application range

- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Railway technology
- Public transport equipment

Product features

- Low smoke density
- Self-extinguishing, no dripping
- Halogen-free
- High resistance to oil, petrol, acids and other chemicals
- Good weather and UV-resistance

Technical data**Classification**

ETIM 5.0 Class-ID: EC001175
ETIM 5.0 Class-Description:
Corrugated plastic hose

**Certifications**

IEC EN 61386-23
EN 45545-2 HL1 / HL2 / HL3

**Colour delivered**

Grey (RAL 7011)
Black (RAL 9005), UV-resistant

**Material**

PA 6 MOD V0
Silicone-free
Halogen-free
Fire behaviour according to UL 94V-0

**Temperature range**

-45°C to +120°C

Article number	Nominal size	ID x OD mm	Bending radius (mm)	Suitable for FIPLOCK® ONE M	Colour	PU ring (m)
FPAF - Standard weight version (closed)						
61803908	7	6.2 x 10.0	15	12 x 1.5	black	50
61803909	10	9.6 x 12.8	20	12 x 1.5 / 16 x 1.5 / 20 x 1.5	black	50
61803910	12	12.0 x 15.7	30	16 x 1.5 / 20 x 1.5	black	50
61803911	17	16.1 x 21.1	35	20 x 1.5 / 25 x 1.5	black	50
61803912	23	22.0 x 28.4	40	25 x 1.5 / 32 x 1.5	black	50
61803913	29	28.3 x 34.5	50	32 x 1.5 / 40 x 1.5	black	50
61803914	36	35.8 x 42.2	55	40 x 1.5 / 50 x 1.5	black	25
61803915	48	46.7 x 53.8	65	50 x 1.5 / 63 x 1.5	black	25
61803916	56	56.3 x 67.2	100	-	black	25
61803917	70	67.2 x 79.6	130	-	black	25
61803918	95	91.3 x 106.0	170	-	black	10
61803919	125	126.5 x 146.5	380	-	black	10
61803920	7	6.2 x 10.0	15	12 x 1.5	grey	50
61803921	10	9.6 x 12.8	20	12 x 1.5 / 16 x 1.5 / 20 x 1.5	grey	50
61803922	12	12.0 x 15.7	30	16 x 1.5 / 20 x 1.5	grey	50
61803923	17	16.1 x 21.1	35	20 x 1.5 / 25 x 1.5	grey	50
61803924	23	22.0 x 28.4	40	25 x 1.5 / 32 x 1.5	grey	50
61803925	29	28.3 x 34.5	50	32 x 1.5 / 40 x 1.5	grey	50
61803926	36	35.8 x 42.2	55	40 x 1.5 / 50 x 1.5	grey	25
61803927	48	46.7 x 53.8	65	50 x 1.5 / 63 x 1.5	grey	25
61803928	56	56.3 x 67.2	100	-	grey	25
61803929	70	67.2 x 79.6	130	-	grey	25
61803930	95	91.3 x 106.0	170	-	grey	10
61803931	125	126.5 x 146.5	380	-	grey	10
HPAF - Heavy duty version (closed)						
61803932	17	16.1 x 21.1	35	20 x 1.5 / 25 x 1.5	black	50
61803933	23	22.0 x 28.5	45	25 x 1.5 / 32 x 1.5	black	50
61803934	29	28.3 x 34.7	55	32 x 1.5 / 40 x 1.5	black	50
61803935	36	35.8 x 42.3	60	40 x 1.5 / 50 x 1.5	black	25
61803936	48	46.7 x 54.2	70	50 x 1.5 / 63 x 1.5	black	25
61803937	17	16.1 x 21.1	35	20 x 1.5 / 25 x 1.5	grey	50
61803938	23	22.0 x 28.5	45	25 x 1.5 / 32 x 1.5	grey	50
61803939	29	28.3 x 34.7	55	32 x 1.5 / 40 x 1.5	grey	50
61803940	36	35.8 x 42.3	60	40 x 1.5 / 50 x 1.5	grey	25
61803941	48	46.7 x 54.2	70	50 x 1.5 / 63 x 1.5	grey	25
2PAF - Divisible version						
61803942	7	6.3 x 10.0	25	-	black	50
61803943	10	8.8 x 13.5	30	-	black	50
61803944	11	11.0 x 16.1	30	-	black	50
61803945	14	13.2 x 18.7	35	-	black	50
61803946	16	16.0 x 21.5	40	-	black	50
61803947	20	20.2 x 25.7	50	-	black	50
61803948	23	23.9 x 31.3	60	-	black	50
61803949	29	27.3 x 35.5	110	-	black	25
61803950	37	32.5 x 43.2	135	-	black	25
61803951	45	43.1 x 54.2	140	-	black	25

Photographs are not to scale and do not represent detailed images of the respective products.
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Similar products

- FIPLOCK® PA12 refer to page 52

Accessories

- FIPLOCK® ONE M refer to page 53



FIPLOCK® PA12

Flexible, corrugated cable conduit system in closed and divisible version



Info

- Hazard Level: HL 3

Benefits

- The flexible conduit design enables small bending radii and is ideally suited for space-saving installations where space is limited in dry and damp interiors, as well as for outdoor applications
- Robust against mechanical impacts
- Highly flexible and high fatigue life
- Dimensionally stable

Application range

- For use in railway vehicles and buses, for fixed installations and applications where continuous movement may occur
- Railway technology
- Public transport equipment
- For indoor and outdoor use
- Carriage roof, Jumper connections, Couplings

Product features

- Low smoke density
- Self-extinguishing, no dripping
- Halogen-free
- High resistance to oil, petrol, acids and other chemicals
- Excellent weather and UV-resistance

Technical data



Classification

ETIM 5.0 Class-ID: EC001175
ETIM 5.0 Class-Description:
Corrugated plastic hose



Certifications

IEC EN 61386-23
EN 45545-2 HL1 / HL2 / HL3



Colour delivered

Black (RAL 9005), UV-resistant



Material

PA 12 MOD V0
Silicone-free
Halogen-free
Fire behaviour according to UL 94V-0



Temperature range

-45°C to +105°C

Article number	Nominal size	ID x OD mm	Bending radius (mm)	Suitable for FIPLOCK® ONE M	Colour	PU ring (m)
FPDF - Standard weight version (closed)						
61803952	7	6.2 x 10.0	15	12 x 1.5	black	50
61803953	10	9.6 x 12.8	20	12 x 1.5/16 x 1.5/20 x 1.5	black	50
61803954	12	12.0 x 15.7	25	16 x 1.5/20 x 1.5	black	50
61803955	17	16.1 x 21.1	30	20 x 1.5/25 x 1.5	black	50
61803956	23	22.0 x 28.5	40	25 x 1.5/32 x 1.5	black	50
61803957	29	28.3 x 34.7	50	32 x 1.5/40 x 1.5	black	50
61803958	36	36.6 x 42.3	55	40 x 1.5/50 x 1.5	black	25
61803959	48	47.0 x 54.4	65	50 x 1.5/63 x 1.5	black	25
61803960	56	56.3 x 67.2	100	-	black	25
61803961	70	67.2 x 79.6	135	-	black	25
61803962	95	91.3 x 106.0	150	-	black	10
61803963	125	126.5 x 146.5	320	-	black	10
61803964	170	172.0 x 193.0	440	-	black	10
HPDF - Heavy duty version (closed)						
61803965	7	6.0 x 10.0	15	12 x 1.5	black	50
61803966	10	9.2 x 12.8	20	12 x 1.5/16 x 1.5/20 x 1.5	black	50
61803967	12	11.8 x 15.7	25	16 x 1.5/20 x 1.5	black	50
61803968	17	16.1 x 21.1	35	20 x 1.5/25 x 1.5	black	50
61803969	23	22.0 x 28.5	40	25 x 1.5/32 x 1.5	black	50
61803970	29	28.3 x 34.7	50	32 x 1.5/40 x 1.5	black	50
61803971	36	35.8 x 42.3	60	40 x 1.5/50 x 1.5	black	25
61803972	48	46.7 x 54.2	70	50 x 1.5/63 x 1.5	black	25
2PDF - Divisible version						
61803973	7	6.3 x 10.0	20	-	black	50
61803974	10	8.8 x 13.5	25	-	black	50
61803975	11	11.0 x 16.1	25	-	black	50
61803976	14	13.2 x 18.7	30	-	black	50
61803977	16	16.0 x 21.5	35	-	black	50
61803978	20	20.2 x 25.7	45	-	black	50
61803979	23	23.9 x 31.3	55	-	black	50
61803980	29	27.3 x 35.5	105	-	black	25
61803981	37	32.5 x 43.2	130	-	black	25
61803982	45	43.1 x 54.2	135	-	black	25
61803983	70	67.0 x 79.8	175	-	black	10
61803984	100	87.5 x 102.5	195	-	black	10

Photographs are not to scale and do not represent detailed images of the respective products.
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Accessories

- FIPLOCK® ONE M refer to page 53



FIPLOCK® ONE M

Conduit fitting system for highest requirements, suitable for FIPLOCK® PA6 / PA12



Info

- New conduit fitting system with innovative locking system



Benefits

- Very high tensile strength due to all around tooth system
- Ensures mounting safety due to integrated coding system
- Excellent IP rating
- Cost-saving due to quick and easy installation

Application range

- Suitable for FIPLOCK® PA6 / PA12
- Demand of increased liquid tightness
- For indoor and outdoor use

Product features

- All around locking mechanism due to 360° tooth system
- Locking mechanism with integrated coding system
- Extended sealing range across multiple corrugated conduit waves

Note

- Fitting is not suitable for use with divisible version of FIPLOCK® conduit

Technical data

	Classification ETIM 5.0 Class-ID: EC001176 ETIM 5.0 Class-Description: Screw connection for corrugated plastic hose
	Certifications IEC EN 61386-23
	On request PG or NPT connection thread With 90° elbow
	Colour delivered Grey (RAL 7005) Black (RAL 9005), UV-resistant
	Material PA 6 Halogen-free Fire behaviour according to UL 94V-0
	Protection rating IP66/IP67/IP68/IP69
	Temperature range -45°C to +120°C

Article number	Metric size	SW wrench size mm	Clear opening (mm)	Suitable for FIPLOCK® PA6 / PA12	Colour	Pieces / PU
FIPLOCK® ONE M black						
61804211	12 x 1.5	17	7.2	7	black	10
61804212	12 x 1.5	20	10	10	black	10
61804213	16 x 1.5	20	10	10	black	10
61804214	16 x 1.5	22	9	12	black	10
61804215	20 x 1.5	20	10	10	black	10
61804216	20 x 1.5	22	13	12	black	10
61804217	20 x 1.5	27	13	17	black	10
61804218	25 x 1.5	27	17.2	17	black	10
61804219	25 x 1.5	36	18	23	black	10
61804220	32 x 1.5	36	23	23	black	10
61804221	32 x 1.5	41	25	29	black	10
61804222	40 x 1.5	41	29	29	black	10
61804223	40 x 1.5	52	31.9	36	black	10
61804224	50 x 1.5	52	36	36	black	10
61804225	50 x 1.5	65	41.9	48	black	10
61804226	63 x 1.5	65	50.5	48	black	10
FIPLOCK® ONE M grey						
61804227	12 x 1.5	17	7.2	7	grey	10
61804228	12 x 1.5	20	10	10	grey	10
61804229	16 x 1.5	20	10	10	grey	10
61804230	16 x 1.5	22	9	12	grey	10
61804231	20 x 1.5	20	10	10	grey	10
61804232	20 x 1.5	22	13	12	grey	10
61804233	20 x 1.5	27	13	17	grey	10
61804234	25 x 1.5	27	17.2	17	grey	10
61804235	25 x 1.5	36	18	23	grey	10
61804236	32 x 1.5	36	23	23	grey	10
61804237	32 x 1.5	41	25	29	grey	10
61804238	40 x 1.5	41	29	29	grey	10
61804239	40 x 1.5	52	31.9	36	grey	10
61804240	50 x 1.5	52	36	36	grey	10
61804241	50 x 1.5	65	41.9	48	grey	10
61804242	63 x 1.5	65	50.5	48	grey	10

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SILVYN® HFX-V0 / SILVYN® FCE-V0

Interlocked metal conduit with thick-walled Polyurethane jacket



SILVYN® HFX-V0

SILVYN® FCE-V0



Info

- Hazard Level: HL 2

Benefits

- The flexible conduit design enables small bending radii and is ideally suited for space-saving installations where space is limited in dry and damp interiors, as well as for outdoor applications
- High resistance to oil, petrol, acids and greases
- Liquiditytight

Application range

- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- UV-resistant
- Halogen-free and flame-retardant
- High mechanical and chemical resistance

Product Make-up

- Helically-wound metal protective conduit with interlocked profile
- PUR outer sheath

Technical data



Classification

ETIM 5.0 Class-ID: EC001179
ETIM 5.0 Class-Description:
Protective metallic hose



Certifications

IEC EN 61386-23
EN 45545-2 HL1 / HL2



Colour delivered

Black (RAL 9005), UV-resistant



Material

Metal with PUR sheath
Fire behaviour according to UL 94V-0



Temperature range

-50 °C to +105 °C
Short-term up to +125 °C

Article number	Nominal size	ID x OD mm	Bending radius (mm)	Suitable for SILVYN® COMPACT M	Suitable for SILVYN® FCE-M	PU ring (m)
SILVYN® HFX-V0						
64400248	5/16"	10.1 x 14.4	65	16 x 1.5/20 x 1.5		30
64400241	3/8"	12.6 x 17.8	85	16 x 1.5/20 x 1.5		30
64400253	1/2"	16.0 x 21.1	110	20 x 1.5		30
64400242	3/4"	21.0 x 26.4	140	25 x 1.5		30
64400243	1"	26.5 x 33.1	170	32 x 1.5		30
64400244	1 1/4"	35.1 x 41.8	215	40 x 1.5		15
64400245	1 1/2"	40.3 x 47.8	250	50 x 1.5		15
64400246	2"	51.6 x 59.9	300	63 x 1.5		15
SILVYN® FCE-V0						
61814708	12	10.0 x 14.0	50		12 x 1.5	25
61814709	16	13.0 x 17.0	60		16 x 1.5/20 x 1.5	25
61814710	20	17.0 x 21.5	80		20 x 1.5	25
61814711	25	21.2 x 26.0	100		25 x 1.5	25
61814712	32	28.1 x 34.0	125		32 x 1.5	25
61814713	40	37.7 x 44.5	160		40 x 1.5	10
61814714	50	48.4 x 55.5	190		50 x 1.5	10

* Trade product, no Lapp product

Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

SILVYN® HFX-V0

- SILVYN® COMPACT M refer to page 56

SILVYN® FCE-V0

- SILVYN® COMPACT M refer to page 56



SILVYN® ZHLS / SILVYN® FCE-LFH

Interlocked metal conduit with thick-walled Polyolefin jacket



Info

- Hazard Level: HL 3



SILVYN® ZHLS

SILVYN® FCE-LFH

Benefits

- The flexible conduit design enables small bending radii and is ideally suited for space-saving installations where space is limited in dry and damp interiors, as well as for outdoor applications
- Liquidtight

Application range

- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur

Product features

- UV-resistant
- Halogen-free and flame-retardant
- High mechanical and chemical resistance

Product Make-up

- Helically-wound metal protective conduit with interlocked profile
- Outer sheath: halogen-free, thermoplastic polyolefin compound

Technical data



Classification

ETIM 5.0 Class-ID: EC001179
ETIM 5.0 Class-Description:
Protective metallic hose



Certifications

IEC EN 61386-23
EN 45545-2 HL1 / HL2 / HL3



Colour delivered

Black (RAL 9005), UV-resistant



Material

Metal with Polyolefin jacket



Temperature range

-25°C to +80°C
Short-term: up to +100°C

Article number	Nominal size	ID x OD mm	Bending radius (mm)	Suitable for SILVYN® COMPACT M	Suitable for SILVYN® FCE-M	PU ring (m)
SILVYN® ZHLS						
64400254	1/4"	6.4 x 11.5	40	-		30
64400255	5/16"	10.1 x 14.4	50	16 x 1.5/20 x 1.5		30
64400256	3/8"	12.6 x 17.8	60	16 x 1.5/20 x 1.5		30
64400257	1/2"	16.0 x 21.1	75	20 x 1.5		30
64400258	3/4"	21.0 x 26.4	90	25 x 1.5		30
64400259	1"	26.5 x 33.1	120	32 x 1.5		30
64400260	1 1/4"	35.1 x 41.8	135	40 x 1.5		15
64400261	1 1/2"	40.3 x 47.8	165	50 x 1.5		15
64400266	2"	51.6 x 59.9	210	63 x 1.5		15
SILVYN® FCE-LFH						
61814717	12	10.0 x 14.0	50		12 x 1.5	25
61814718	16	13.0 x 17.0	60		16 x 1.5/20 x 1.5	25
61814719	20	17.0 x 21.5	80		20 x 1.5	25
61814720	25	21.2 x 26.0	100		25 x 1.5	25
61814721	32	28.1 x 34.0	125		32 x 1.5	25
61814722	40	37.7 x 45.0	160		40 x 1.5	10
61814723	50	48.4 x 56.0	190		50 x 1.5	10

* Trade product, no Lapp product

Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

SILVYN® ZHLS

- SILVYN® COMPACT M refer to page 56

SILVYN® FCE-LFH

- SILVYN® COMPACT M refer to page 56



SILVYN® COMPACT M

Nickel-plated brass fitting with space-saving dimensions in various designs



Info

- Space-saving due to compact dimensions

Benefits

- Space-saving application
- For high mechanical stress
- High tensile strength
- Corrosion-resistant

Application range

- In combination with protective conduit:
- Suitable for SILVYN® HFX-V0 / ZHLS

Product Make-up

- Metric connection thread
- Hexagonal collar
- Threaded sleeve
- Cap nut

Technical data



Classification

ETIM 5.0 Class-ID: EC001180

ETIM 5.0 Class-Description: Screw connection for protective metallic hose



On request

Available in stainless steel
PG or NPT connection thread



Material

Body: nickel-plated brass
Sealing: polyamide
O-ring: NBR



Protection rating

IP 66
IP 67
NEMA 4X



Temperature range

-45°C to +105°C

Article number	Metric size	Clear opening (mm)	Suitable for SILVYN® HFX-V0 / ZHLS	Pieces / PU
SILVYN® COMPACT M				
61803846	16 x 1.5	8.3	5/16"	10
61803800	16 x 1.5	11.0	3/8"	10
61803847	20 x 1.5	8.3	5/16"	10
61803801	20 x 1.5	11.0	3/8"	10
61803802	20 x 1.5	14.5	1/2"	10
61803803	25 x 1.5	19.4	3/4"	5
61803804	32 x 1.5	24.7	1"	5
61803805	40 x 1.5	33.3	1 1/4"	5
61803806	50 x 1.5	38.0	1 1/2"	2
61803807	63 x 1.5	49.0	2"	2
SILVYN® COMPACT 45° M				
61803848	16 x 1.5	8.3	5/16"	10
61803850	16 x 1.5	11.0	3/8"	10
61803849	20 x 1.5	8.3	5/16"	10
61803851	20 x 1.5	11.0	3/8"	10
61803852	20 x 1.5	14.5	1/2"	10
61803853	25 x 1.5	19.4	3/4"	5
61803854	32 x 1.5	24.7	1"	5
SILVYN® COMPACT 90° M				
61803808	16 x 1.5	11.0	3/8"	10
61803809	20 x 1.5	11.0	3/8"	10
61803810	20 x 1.5	14.5	1/2"	10
61803811	25 x 1.5	19.4	3/4"	5
61803812	32 x 1.5	24.7	1"	5
61803813	40 x 1.5	33.3	1 1/4"	5
61803814	50 x 1.5	38.0	1 1/2"	2
61803815	63 x 1.5	49.0	2"	2

Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINDICHT® SM-M refer to main catalogue

**SILVYN® FCE-M**

Nickel-plated brass fitting with space-saving dimensions in various designs

**Info**

- Space-saving due to compact dimensions

**Benefits**

- High mechanical stability
- High tensile strength
- Space-saving application
- Corrosion-resistant

Application range

- In combination with protective conduit:
- SILVYN® FCE-V0
- SILVYN® FCE-LFH

Product Make-up

- Metric connection thread
- Hexagonal collar
- Threaded sleeve
- Cap nut

Technical data**Classification**

ETIM 5.0 Class-ID: EC001180
ETIM 5.0 Class-Description: Screw connection for protective metallic hose

**Material****SILVYN® FCE COMPACT**

Metal parts: nickel-plated brass
Sealings: NBR

SILVYN® FCE-F, FCE-S

Nickel-plated brass

**Protection rating**

SILVYN® FCE COMPACT: IP 68
SILVYN® FCE-F, FCE-S: IP 54

**Temperature range**

SILVYN® FCE COMPACT:
-45°C to +105°C
SILVYN® FCE-F, FCE-S:
-55°C to +260°C

Article number	Metric size	Clear opening (mm)	Suitable for SILVYN® FCE	Pieces / PU
SILVYN® FCE COMPACT M				
55503624	12 x 1.5	8.5	12	10
55503625	16 x 1.5	11.2	16	10
55503626	20 x 1.5	11.2	16	10
55503627	20 x 1.5	15.2	20	10
55503628	25 x 1.5	19.2	25	5
61803855	32 x 1.5	25.9	32	5
61803856	40 x 1.5	34.5	40	2
SILVYN® FCE COMPACT 90° M				
61803860	16 x 1.5	11.2	16	10
61803861	20 x 1.5	11.2	16	10
61803862	20 x 1.5	15.2	20	10
61803863	25 x 1.5	19.2	25	5
61803864	32 x 1.5	25.9	32	5
SILVYN® FCE-F M				
55503602	12 x 1.5	8.5	12	10
55503603	16 x 1.5	8.5	12	10
55503604	16 x 1.5	11.2	16	10
55503605	20 x 1.5	11.2	16	10
55503606	20 x 1.5	15.2	20	10
55503607	25 x 1.5	19.2	25	5
55503608	32 x 1.5	25.9	32	5
55503609	40 x 1.5	34.8	40	2
55503610	50 x 1.5	44.8	50	2
55503611	63 x 1.5	44.8	50	2
SILVYN® FCE-S M				
55503614	12 x 1.5	8.5	12	10
55503615	16 x 1.5	8.5	12	10
55503616	16 x 1.5	11.2	16	10
55503617	20 x 1.5	11.2	16	10
55503618	20 x 1.5	15.2	20	10
55503619	25 x 1.5	19.2	25	5
55503620	32 x 1.5	25.9	32	5
55503621	40 x 1.5	34.8	40	2
55503622	50 x 1.5	44.8	50	2
55503623	63 x 1.5	44.8	50	2

Photographs are not to scale and do not represent detailed images of the respective products.



SILVYN® HIPROJACKET / SILVYN® HIPROSILTAPE

Fireproof cable protection conduit to protect the inner from flames and liquid metal with a temperature up to +1640 °C



SILVYN® HIPROJACKET



SILVYN® HIPROSILTAPE



Info

- Outstanding protection for extreme impact of heat
- Hazard Level: HL 3

Benefits

- Heat-resistant
- Flexible
- Temporarily reduces the temperature in the conduit by up to 30 %
- The protection rating increases to IP67 if SILVYN® HIPROSILTAPE is also used

Application range

- Railway applications / vehicle construction
- Used in areas where cables and wires are exposed to extreme heat

Product Make-up

SILVYN® HIPROJACKET

- Woven glass fibre conduit
- Iron oxide silicone coat

Technical data



Classification

SILVYN® HIPROJACKET
ETIM 5.0 Class-ID: EC002254
ETIM 5.0 Class-Description:
Cable insulation hose
SILVYN® HIPROSILTAPE
ETIM 5.0 Class-ID: EC000128
ETIM 5.0 Class-Description: Adhesive tape



Certifications

SILVYN® HIPROJACKET
EN 45545-2 HL1 / HL2 / HL3
NF F 16-101 I2/F1
NF EN ISO 11925-2
DIN 5510-2 S4/SR2/ST2
SAE AS 1072 Type 2



On request

SILVYN® HIPROJACKET
Other sizes, lengths and colours are available upon request



Colour delivered

Red



Material

SILVYN® HIPROJACKET
Glass fibre with iron oxide silicone coat LOI 39,2
SILVYN® HIPROSILTAPE
Silicone-rubber compound, self-vulcanising, halogen-free



Protection rating

SILVYN® HIPROJACKET
IP 54 in combination with SILVYN® HIPROJACKET AMG fitting
IP 67 if SILVYN® HIPROSILTAPE is also used



Temperature range

SILVYN® HIPROJACKET
-55°C to +260 °C permanent temp.
+800°C for approx. 20 min (flame treatment)
+800°C for approx. 20 min (radiation heat)
+1640°C for approx. 15-30 sec (liquid-metal contact)
SILVYN® HIPROSILTAPE
-55°C to +260 °C permanent temp.

Article number	Nominal size	ID x OD mm	Suitable gland size	PU ring (m)
SILVYN® HIPROJACKET				
52021385	6	6.0 x 15.0		15
61713003	10	10.0 x 15.0	M16/2 + PG 9/2. 11/2. 13.5	15
61713005	13	13.0 x 18.0	M16/2. M20 PG 9/2. 11/2. 13.5. 16	15
61713007	16	16.0 x 22.0	M20 + PG 16	15
61713010	19	19.0 x 25.0	M25 + PG 21	15
61713011	22	22.0 x 28.0	M25 + PG 21	15
61713000	25	25.0 x 31.0	M32 + PG 29	15
61713014	29	29.0 x 35.0		15
61713015	32	32.0 x 38.0	M40 + PG 36	15
61713016	35	35.0 x 41.0	M40 + PG 36	15
61713017	38	38.0 x 44.0	M50 + PG 42	15
61713018	41	41.0 x 47.0		15
61713021	44	44.0 x 50.0		15
61713019	51	51.0 x 57.0	M63 + PG 48	15
61713022	57	57.0 x 63.0		15
61713025	64	64.0 x 70.0		15
61713027	70	70.0 x 76.0		15
61713028	76	76.0 x 82.0		15
61713029	83	83.0 x 89.0		15
61713037	89	89.0 x 95.0		15
61713038	95	95.0 x 101.0		15
61713039	102	102.0 x 108.0		15
SILVYN® HIPROSILTAPE				
61713040	25	25.0 x 0.5		11

* Trade product, no Lapp product

Photographs are not to scale and do not represent detailed images of the respective products.



SILVYN® HIPROJACKET AMG



Info

- Suitable fitting for use with SILVYN® HIPROJACKET

Benefits

- High tensile strength
- For high mechanical stress
- 45° and 90° elbow enables optimal assembly

Application range

- In combination with protective conduit:
- SILVYN® HIPROJACKET

Product Make-up

- Connection thread metric/PG
- Hexagonal collar, straight/45° elbow/90° elbow
- Threaded sleeve
- Cap nut

Note

- It is possible to extend the temperature range by removing the plastic components

Technical data



Classification

ETIM 5.0 Class-ID: EC001180
ETIM 5.0 Class-Description: Screw connection for protective metallic hose



On request

NPT connection thread



Material

Body: nickel-plated brass
Clamping ring: nickel-plated brass
O-ring: NBR



Protection rating

IP 54
IP 67 if SILVYN® HIPROSILTAPE is also used



Temperature range

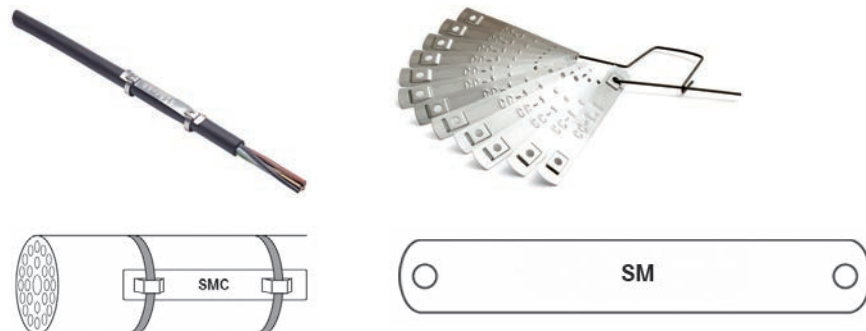
-45°C to +105°C

Article number	Metric size	PG size	Pieces / PU
SILVYN® HIPROJACKET AMG M			
55503516	16 x 1.5		50
55503517	20 x 1.5		50
55503518	25 x 1.5		25
55503519	32 x 1.5		10
55503520	40 x 1.5		5
55503521	50 x 1.5		5
55503522	63 x 1.5		4
SILVYN® HIPROJACKET AMG 45° M			
55503523	16 x 1.5		50
55503524	20 x 1.5		50
55503525	25 x 1.5		25
55503526	32 x 1.5		10
55503527	40 x 1.5		5
55503528	50 x 1.5		5
55503529	63 x 1.5		4
SILVYN® HIPROJACKET AMG 90° M			
55503530	16 x 1.5		50
55503531	20 x 1.5		50
55503532	25 x 1.5		25
55503533	32 x 1.5		10
55503534	40 x 1.5		5
55503535	50 x 1.5		5
55503536	63 x 1.5		4
SILVYN® HIPROJACKET AMG PG			
55503537		9	50
55503538		11	50
55503539		13.5	50
55503540		16	50
55503541		21	25
55503542		29	10
55503543		36	5
55503544		42	5
55503499		48	4
SILVYN® HIPROJACKET AMG 45° PG			
55503500		11	50
55503501		13.5	50
55503502		16	50
55503503		21	25
55503504		29	10
55503505		36	5
55503506		42	5
55503507		48	4
SILVYN® HIPROJACKET AMG 90° PG			
55503508		11	50
55503509		13.5	50
55503510		16	50
55503511		21	25
55503512		29	10
55503513		36	5
55503514		42	5
55503515		48	4

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FLEXIMARK® Stainless steel marking FCC



Info

- Contained in FLEXIMARK® sample bag (article number M32511)

Benefits

- Markers are sorted prior to delivery
- No time-consuming preparation and installation
- Acid-resistant
- Diverse criteria as ageing resistance and chemical resistance are tested by the independent SP Technical Research Institute of Sweden according to SP 2171 Test Method (see selection table A15)
- Customised stainless steel cable and component marking

Application range

- Markers will be delivered with the desired text (printing service is included in the price)
- Markers could be used in any industry with a demanding environment (e.g. oil & gas, railways)
- Cable and component marking system

Product features

- Included cable ties in article no. 83251406, 83251456, 83251426, 83251468: Stainless steel cable ties LS 4,6-200 (article no. 61812950)
- For fastening with cable ties (LS) up to a width of 7.9 mm

Norm references / Approvals

- Achilles JQS certified

Note

- Length of the markers is depending on the number of characters
- All characters are printed in capital letters
- The column "number of characters" refers to the quantity in one line (the maximum amount of characters for a two-line embossing is 30-max.15 per line)
- Ordering process: Customised data will be emailed as an Excel file to the responsible Lapp employee when the order is made- Column A: Text for the first row- Column B: Text for the second row- Column C: Amount of each text

Included

- 1 PU= 1 marker, there is no minimum purchase quantity

Suitable tools

- STEEL GUN HT-338 cable tie pliers

Technical data



Classification

ETIM 5.0 Class-ID: EC001288
ETIM 5.0 Class-Description:
Labelling material



Dimensions

Character size (height): 4.5 mm
Diameter borehole: 3,2 mm



On request

Blank version available upon request



Note

Gap between characters: approximately 1 mm



Info

Available characters: A-Ö, 0-9, +, -, /, =, -, X
Earthing sign



Material

Acid resistant stainless steel
EN 1.4404 (SS2348, AISI 316L)

Article number	Article designation	Height (mm)	Product Make-up	Number of characters	Number of markers per PU
83251406	FLEXIMARK® stainless steel SMC FCC LS200 0-15	9.9	with cable tie	0-15	1
83251456	FLEXIMARK® stainless steel SMC FCC LS 16-25	9.9	with cable tie	16-25	1
83251402	FLEXIMARK® stainless steel SMC FCC 0-15	9.9	without cable tie	0-15	1
83251454	FLEXIMARK® stainless steel SMC FCC 16-25	9.9	without cable tie	16-25	1
83251450	FLEXIMARK® stainless steel SMC FCC 16-25	9.9	with screw hole	0-15	1
83251478	FLEXIMARK® stainless steel SM FCC 16-25	9.9	with screw hole	16-25	1
83251426	FLEXIMARK® stainless steel SMC2R FCC LS 0-15	13.9	with cable tie	0-15	1
83251468	FLEXIMARK® stainless steel SMC2R FCC LS 16-25	13.9	with cable tie	16-25	1
83251422	FLEXIMARK® stainless steel SMC2R FCC 0-15	13.9	without cable tie	0-15	1
83251466	FLEXIMARK® stainless steel SMC2R FCC 16-25	13.9	without cable tie	16-25	1
83251451	FLEXIMARK® stainless steel SM2R FCC 0-15	13.9	with screw hole	0-15	1
83251479	FLEXIMARK® stainless steel SM2R FCC 16-25	13.9	with screw hole	16-25	1

Photographs are not to scale and do not represent detailed images of the respective products.
Blank markers could be found on the product page "SP Metalprint" (article no. 83251575 und 83251576).

Similar products

- FLEXIMARK® Stainless steel kit refer to main catalogue
- SP Metal print refer to main catalogue

Accessories

- STEEL GUN HT-338 cable tie pliers refer to main catalogue
- LS steel cable ties refer to main catalogue



FLEXIMARK® Organized shrink tube



Benefits

- UV-resistant, resistant against fluids (SAE-AMS-DTL-23053 tested)
- Reduced working time
- Already cut to the exact length
- Covers a wide range of cable diameters, even applicable for single core marking

Application range

- Railway applications
- Printing with FLEXIMARK® Software (Download: <http://www.lappkabel.com/service/downloadcenter/markingsystem/markingsystem.html>)
- Can be printed with the FLEXIMARK® thermal transfer printer as CAB A4+M and EOS4

Product features

- Recommended ribbon: FLEXIMARK® FTI-Y 60-360 BK (article no. 83260201)

Norm references / Approvals

- UL 224 approved- E file number: E 228117

Product Make-up

- Delivered as a roll of labels

Technical data



Classification

ETIM 5.0 Class-ID: EC001288
ETIM 5.0 Class-Description:
Labelling material



On request

Also available as halogen-free und diesel-resistant (with SNCF-NF F00-608 approval) version



Colour delivered

YellowWhite and other colours available on request
Also available in white



Material

Polyolefin
Shrinking ratio: 3:1

Article number	Colour	Shrinkage range (mm)	Length (mm)	Number of markers per PU	PU
83260026	yellow	0.8 - 2.4	50	1000	1
83260027	yellow	1.0 - 3.2	50	1000	1
83260028	yellow	1.6 - 4.8	50	1000	1
83260029	yellow	2.0 - 6.4	50	1000	1
83260030	yellow	3.0 - 9.5	50	500	1
83260031	yellow	4.0 - 12.7	50	500	1
83260032	yellow	6.0 - 19.0	50	500	1
83260033	yellow	8.0 - 25.4	50	300	1
83260034	yellow	12.7 - 38.1	75	100	1
83260035	yellow	0.8 - 2.4	38	1000	1
83260036	yellow	1.0 - 3.2	38	1000	1
83260037	yellow	1.6 - 4.8	38	1000	1
83260038	yellow	2.0 - 6.4	38	1000	1
83260039	yellow	3.0 - 9.5	38	500	1
83260040	yellow	4.0 - 12.7	38	500	1
83260041	yellow	6.0 - 9.0	38	500	1
83260042	yellow	8.0 - 25.4	38	300	1
83260043	yellow	12.7 - 38.1	38	100	1
83260044	yellow	0.8 - 2.4	25	2000	1
83260045	yellow	1.0 - 3.2	25	2000	1
83260046	yellow	1.6 - 4.8	25	2000	1
83260047	yellow	2.0 - 6.4	25	2000	1
83260048	yellow	3.0 - 9.5	25	1000	1
83260049	yellow	4.0 - 12.7	25	1000	1
83260050	yellow	6.0 - 19.0	25	1000	1
83260051	yellow	8.0 - 25.4	25	600	1

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FLEXIMARK® products are sold in packaging units. As example if you like to order 640 labels of LCK 32 you just need to order 1 PU instead of 640 single labels.

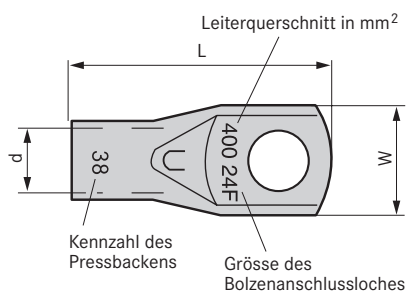
Similar products

- FLEXIMARK® Organized shrink tube FCC refer to main catalogue

Accessories

- HG 2320 hot-air pistol refer to main catalogue

Tube cable lugs KRFN



Benefits

- Can be installed via cable glands, allowing pre-assembly
- High-quality electrolytic copper ensures a good crimping quality
- With inspection hole

Application range

- Narrow tube cable lugs for stranded and flexible CU-conductors 50-240 mm², suitable for class 2 and class 5
- Adapted for narrow spaces

Norm references / Approvals

- In combination with recommended crimp tool fulfill requirements of SS-EN 61238-1, BS 4579:1, VDE 0220:1, EN-IEC 61238:1

Suitable tools

- V 1311-A pressing pliers, hydraulic

Technical data



Classification

ETIM 5.0 Class-ID: EC001051

ETIM 5.0 Class-Description:

Tube cable lug for copper conductors



Material

Tinned electrolyte copper



Temperature range

Temperature range up to +90°C

Working temperature: 110°C, max. +140°C

Article number	Article designation	Screw hole Ø (mm)	UL certification	Length (mm)	Pressing dies	d mm	W mm	Pieces / PU
Tube cable lugs KRFN								
61797400	KRFN 50/6	6	no	51	B 14.5	11	18	100
61797401	KRFN 50/8	8	no	51	B 14.5	11	18	100
61797402	KRFN 50/10	10	no	51	B 14.5	11	18	100
61797403	KRFN 70/6	6	no	56	B 14.5	13	20	50
61797404	KRFN 70/8	8	no	56	B 17	13	20	50
61797405	KRFN 70/10	10	no	56	B 17	13	20	50
61797406	KRFN 95/8	8	no	61	B 20	15	24	50
61797407	KRFN 95/10	10	no	62	B 20	15	24	50
61797408	KRFN 95/12	12	no	64	B 20	15	24	50
61797409	KRFN 120/8	8	no	65	B 22	17	26	50
61797410	KRFN 120/10	10	no	66	B 22	17	26	50
61797411	KRFN 120/12	12	no	68	B 22	17	26	50
61797412	KRFN 150/10	10	no	73	B 25/13 B 25	19	30	50
61797413	KRFN 150/12	12	no	75	B 25/13 B 25	19	30	50
61797414	KRFN 185/10	10	no	80	13 B 27	21	32	25
61797415	KRFN 185/12	12	no	82	13 B 27	21	32	25
61797416	KRFN 185/16	16	no	86	13 B 27	21	32	25
61797417	KRFN 240/10	10	no	84	13 B 30	22.5	38	50
61797418	KRFN 240/12	12	no	84	13 B 30	22.5	38	50

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- Tube cable lugs KR/ KRT/ KRF refer to main catalogue
- Solderless cable lugs KB refer to main catalogue

Accessories

- T 2288 pressing pliers refer to main catalogue
- V 1311-A pressing pliers, hydraulic refer to main catalogue
- DKB 0325 + DKB 0360 crimping pliers refer to main catalogue
- PVL 1300 pressing pliers battery-operated refer to main catalogue





TY-RAP® Railway



Info

- Cable tie for railway applications
- Hazard Level: HL 3



Benefits

- The special design of the cable ties guarantees maximum resistance and safety even in the most extreme applications.
- Steel nose ensures secure and durable binding
- Lock is also resistant to shocks and vibrations
- Fire behaviour according to UL 94V-0

Application range

- Underground railways and trains
- In areas where mechanical and chemical stability are critical
- When the protection of people and property is a priority.
- Public utilities

Product features

- The steel blade is fixed to the tie head and is made from corrosion-resistant, anti-magnetic steel (type 316)

Norm references / Approvals

- DIN EN 45545-2
- NFF 16-101: I3F1

Technical data

	Classification ETIM 5.0 Class-Description: Cable tie
	Colour delivered Natural colour
	Material Polyamide 6.6 Halogen-free and silicone-free
	Temperature range -40°C to +85°C

Article number	Article description	UL certification	Length x width (mm)	Bundling Ø (mm)	Tensile strength (N)	PU
TY-RAP® Railway						
61723330	TY 23 MFR RW	no	92.0 x 2.4	2.0 - 16.0	80.0	1000
61723331	TY 232 MFR RW	no	203.0 x 2.4	2.0 - 50.0	80.0	1000
61723332	TY 24 MFR RW	no	140.0 x 3.6	2.0 - 29.0	180.0	1000
61723333	TY 25 MFR RW	no	186.0 x 4.8	3.5 - 45.0	220.0	1000
61723334	TY 28 MFR RW	no	360.0 x 4.8	3.5 - 102.0	220.0	500
61723335	TY 27 MFR RW	no	340.0 x 7.0	6.0 - 90.0	540.0	100

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Notes

Reach us around the world

...or closer to home. To contact your local Lapp Group representative:

please visit

www.lappgroup.com/worldwide

Enter the world
of Lapp:



Our apps are available from
the following stores:



The following applies for the use of our products

The conformity of our products to the relevant European directives and compliance with the provisions contained therein shall be indicated by the CE marking.

The safety of our products is closely associated with how they are used. A knowledge of and adherence to the respective international/national standards of use (e.g. DIN VDE 0100; 0298) are

mandatory. There are particular risks if installed improperly. This applies to all our products/items:

Processing is only to be done by an authorised electrician! Otherwise, there is the risk of an electric shock or a fire ignited by electric current!

Safety

Without exception, our products are tested for application safety in accordance with defined standards and our own regulations, which complement the standards. Relevant legal requirements and safety regulations are also observed. Provided due care and attention is paid, the possibility of product-specific danger to the user may thus reasonably be excluded. Where products are used carelessly or incorrectly, however, considerable danger to persons and the

environment may arise. For this reason, our cables must only be processed and/or used responsibly by trained electricians or specialists. This catalogue contains general information for the application of each product. Independent of such information, the application standards DIN VDE 0298 and DIN VDE 0891 for cables will apply. Excerpts from these standards, as well as complementary selection and application tables, design and installation

guidelines, are contained in the tables in the appendix to this catalogue. Our machines and installation tools are - where necessary - designed in accordance with the machine guidelines and display the CE identification mark. It must be noted, however, that our machines and installation tools must only be used by trained specialist personnel and for the purpose for which they were designed.

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