

THE WORLD OF LAPP

Solutions for railway technology

2018 | 2019



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.

content

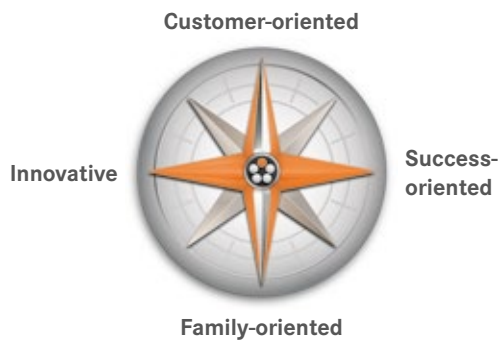
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Andreas Lapp,
Matthias Lapp,
Ursula Ida Lapp,
Alexander Lapp,
Siegbert Lapp.

family

On course for success



Family business and global player

LAPP is both. The history of our company has been one of success and expansion ever since it was founded in 1959 by Ursula Ida and Oskar Lapp. It remains resolutely family owned to this day. We safeguard our success by staying close to our customers and markets, maintaining our innovative strength and brand quality, and being a reliable partner. We provide continuity, always guided in our thoughts and actions by our values.

Success built on family values

At LAPP, we maintain values that promote cooperation and enable relationships with employees, suppliers and customers based on partnership and trust. Good relations and mutual respect are key elements of our company culture and a central plank of company policy. We know that our successful business development of the last decades is down in particular to our 3,770 skilled and dedicated staff around the world, as well as the reliable partnership with our customers.

With 17 production facilities, over 40 sales companies and hundreds of dedicated consultants, we are always close to the individual needs and challenges of our customers all over the globe. We are constantly developing our products and system solutions, setting standards in safety, quality and functionality. This is why we are one of the world's leading manufacturers of integrated solutions and branded products in cable and connection technology. As our success story enters its third generation, we are aware of our duty to the future.



www.lappkabel.com/company



LAPP worldwide

Algeria

EURL Chemin Solution Installation

Villa N°A 149 Les Castors
Bordj El Kifan, ALGER
Tel.: +213 21 214604
Fax: +213 21 214604
www.eurclsi.com

Argentina

NAKASE SRL

Calle 49 No. 5764
B1653AOX
Villa Ballester
1870 BUENOS AIRES
Tel.: +54 11 4768 4242
Fax: +54 11 4768 4242
ventas@nakase.com.ar
www.nakase.com.ar

Australia

Lapp Australia Pty Ltd

12 Grevillea Street
EASTERN CREEK, NSW 2766
Tel.: 1800 931 559
sales@lappaustralia.com.au
www.lappaustralia.com.au

Austria

Lapp Austria GmbH

Bremenstraße 8
4030 LINZ
Tel.: +43 732 781272-444
Fax: +43 732 781272-34
sales@lappaustria.at
www.lappaustria.at

Belarus

PNS - Professional Network

Systems

Temirjazeva str. 64b, office 308
220035 MINSK
Tel.: +375 17 2908372
Fax: +375 17 2547828
info@pns.by
www.pns.by

Belgium – Luxembourg

Lapp Benelux B.V.

Van Dijklaan 16, 5581 WG WAALRE
Postbus 74, 5580 AB WAALRE
The Netherlands
Tel.: +32 78 353060
Fax: +32 78 353065
sales.lappbenelux@lappgroup.com
www.lappbenelux.com

Brazil

Cabos Lapp Brasil Ltda.

Av. Dr. Mauro Lindenberg
Monteiro, 628
Galpao 18, Osasco
CEP 06278-010 SAO PAULO
Tel.: +55 11 21664166
Fax: +55 11 21664165
vendas@lappgroup.com.br
www.lappgroup.com.br

Bulgaria

V&V Isomatic Ltd.

40a, Pirin Str.
1680 SOFIA
Tel.: +359 29 583111
Fax: +359 29 582270
office@viv-isomatic.com
www.viv-isomatic.com

Canada

Lapp Canada Inc.

3505 Laird Road, Unit 10
L5L 5Y7 MISSISSAUGA, Ontario
Tel.: +905 8 205492
Fax: +905 8 206516
sales@lappcanada.com
www.lappcanada.com

Chile

Desimat Chile

Av. Puerto Vespucio 9670
Parque Industrial Puerto Santiago
Pudahuel, SANTIAGO
Tel.: +56 2 25851200
Fax: +56 2 27470153
ventaschile@desimat.cl
www.desimat.cl

China

Lapp Kabel Shanghai Co., Ltd.

23A Zhaofeng Universe Building
1800 Zhongshan Road West
SHANGHAI 200235
Tel.: +86 21 64400833
Fax: +86 21 64400834
info@lappgroup.com.cn
www.lappgroup.com.cn

Lapp Cable Works Shanghai Co., Ltd.

No. 6 Standard Workshop Lingang
Industrial Area
1555 Cenglin Road, Pudong District
SHANGHAI 201306
Tel.: +86 21 20955833
Fax: +86 21 20955834

Colombia

Transmisiones Ltda.

Carrera 69B N. 21A – 24
Bodega UE 28 – 1
BOGOTÁ
Tel.: +57 1 4126898
www.transmisiones.de

Republic of the Congo Global Automation Solution & Services (GASS)

BP 517, Avenue Tchingobo n°150
Zone Industrielle
POINTE NOIRE
Tel.: 00 242 064277711
Fax: 00 242 064277711
gass-congo@hotmail.com

Costa Rica

Elvatron, SA

De Repifreno en la Uruca
400 metros Nte.
SAN JOSÉ, Costa Rica
P.O. Box 8-3770 (1000)
Tel.: +506 2242-9955
Fax: +506 2520-0697
elvatron@elvatron.com
www.elvatron.com

Croatia

TIM KABEL

Savska cesta 103
10360 ZAGREB – Sesvete
Tel.: +385 1 5555900
Fax: +385 1 5555901
zagreb@tim-kabel.hr
www.tim-kabel.hr

Cyprus

3 BRO Ltd.

3 Limnou Str.
Office 301
3820 LIMASSOL
Tel.: +357 25255353
info@threebro.com
www.threebro.com

Czech Republic

LAPP KABEL s.r.o.

Bartosova 315, Kvítkovice
765 02 OTROKOVICE
Tel.: +420 573 501011
Fax: +420 573 394650
info@lappgroup.cz
www.lappgroup.cz

Denmark

Lapp Danmark

Korskildeeng 6
2670 GREVE
Tel.: +45 43 950000
Fax: +45 43 950009
ordre@lappgroup.dk
www.lappgroup.dk

Dominican Republic

ING. Rudy Moreno & Asociados, S.R.L.

Prolongación 27 de Febrero Esq.
Cuidad Agraria, Edif. Yarudith
SANTO DOMINGO OESTE
Tel.: +809 334 4394
Fax: +809 334 4454
www.ingrudymorenoyasoc.com

Ecuador

Elsystec S.A.

Electricidad Sistemas y Tecnología
Vasco de Contreras N35-251 y
Mañosca
CÓDIGO POSTAL 170521
Tel.: +593 2 2456510
Fax: +593 2 2455698
elsystec@elsystec.com.ec
elsystec@uiio.satnet.net
www.elsystec.com.ec

Egypt

see United Arab Emirates

LAPP CABLES MIDDLE EAST FZE

El Salvador

Intek El Salvador S.A. de C.V.

Calle Gabriela Mistral No. 373
Entre Blvd. Los Héroes y 33 Av. Nte.
SAN SALVADOR, El Salvador CA.
Tel.: +503 2260-8888
Fax: +503 2260-8855
inteksv@intek-ca.com
www.intek-ca-com

Estonia

Lapp Miltronic SIA Eesti Filiaal

Kastani pst 10
44307 RAKVERE
Tel.: +372 6 518970
Fax: +372 6 518971
orders@lappmiltronic.lv
www.lappmiltronic.ee

Finland

SKS Automaatio Oy

Martinkyläntie 50
P.O. Box 122
01721 VANTAA
Tel.: +358 2 076461
Fax: +358 2 07646820
automaatio@sksf.fi
www.sks.fi

France

Lapp France s.a.r.l.

Technopôle Forbach-Sud BP 50084
57602 FORBACH CEDEX
Tel.: +33 387 841929
Fax: +33 387 841794
lappfrance@lappgroup.com
www.lappfrance.fr

LAPP MULLER SAS

Z.A. du Grand Pont
83310 GRIMAUD
Tel.: +33 494 566500
Fax: +33 494 43487
info@mullercables.com
www.mullercables.com

Câbleries Lapp Sarl

Technopôle Forbach Sud
Rue Avogadro
57600 Oeting
Tel.: +33 387 844343
Fax: +33 387 871641
accueil@lappgroup.com

Georgia

Insta LLC

Sergo Zakariadze str. 8
0177 TBILISI
Tel.: +995 32 2202020
Fax: +995 32 2202022
sales@insta.ge
www.insta.ge

Germany

U.I. Lapp GmbH

Schulze-Delitzsch-Straße 25
70565 STUTTGART
Tel.: +49 711 783801
Fax: +49 711 78382640
info@lappkabel.de
www.lappkabel.de

Lapp Systems GmbH

Oskar-Lapp-Str. 5
70565 STUTTGART
Tel.: +49 711 783804
Fax: +49 711 78383520
info@lappkabel.de
www.lappkabel.de

Ghana

PROCESS AND PLANT AUTOMATION Ltd.

No. 3 Becca Villa, behind Cal Bank
Baatsona, Spintex Road.
P.O. Box Sr 95
ACCRA
Tel.: +233 3 02812680
ekua@automationghana.com
www.automationghana.com

Great Britain

Lapp Limited

Unit 3 Perivale Park
Horsenden Lane South
GREENFORD, Middlesex, UB6 7RL
Tel.: +44 20 87587800
Fax: +44 20 87587880
sales@lapplimited.com
www.lappgroup.co.uk

Greece

Dimoulas Special Cables S.A.

100-102 Lenorman Str.
10444 ATHENS
Tel.: +30 21 05157610
Fax: +30 21 05157611
info@dimoulas.gr
www.dimoulas.gr

Guatemala

Intek Guatemala S.A.

4a. Ave. 10 – 31 Zona 9
GUATEMALA
Tel.: +502 2507-0500
Fax: +502 2507-0501
intekgt@intek-ca.com
www.intek-ca.com

Honduras

intek Honduras

Ofi-Bodegas Premier
100 mts. antes del Peaje a La Lima
Edificio PWC-14B
SAN PEDRO SULA
Tel.: +504 2559-4748, -50
Fax: +504 2559-4740
intekhn@intek-ca.com
www.intek-ca.com

Hungary

Lapp Hungária Kft.

Neumann János u.1
2040 BUDAÖRS
Tel.: +36 23 501-250
Fax: +36 23 501-259
sales@lapphungaria.hu
www.lapphungaria.hu

India

Lapp India Pvt. Ltd.

Plot No.98, J & K
Jigani Industrial Area, II Phase
BANGALORE SOUTH – 560 105
Tel.: +91 80 47405222
Fax: +91 80 47405101
info@lappindia.com
www.lappindia.com

Indonesia

PT. JJ-Lapp Cable SMI

Graha INTI FAUZI, 7th Floor
Jl. Buncit Raya No. 22
JAKARTA 12510
Tel.: +62 21 27537051
Fax: +62 21 27537052
sales_jjli@jjsea.com
www.jj-lappcable.com

Iran

see United Arab Emirates

LAPP CABLES MIDDLE EAST FZE

Island

Johan Rønning Ltd.

Klettagardar 25
104 REYKJAVIK
Tel.: +354 5 200800
Fax: +354 5 200888
ronning@ronning.is
www.ronning.is

Israel

Arrow Control Cables Ltd.

7, Zavitán street
49950 NEHALIM
Tel.: +972 3 9074887
Fax: +972 3 9074889
info@arrowcables.com
www.arrowcables.com

Italy

LAPP ITALIA S.R.L.

Via Laboratori Autobianchi 1
Building 20
20832 DESIO (MB)
Tel.: +39 0362 4871
Fax: +39 0362 487330-340
lappitalia@lappitalia.it
www.lappitalia.it

Camuna Cavi s.r.l.

Via Generale Treboldi, 128
25048 EDOLO (BS)
Tel.: +39 0364 773411
Fax: +39 0364 770120
info@camunacavi.it
www.camunacavi.it
Sales Office
Via Laboratori Autobianchi 1
Building 20
20832 DESIO (MB)

Japan

Lapp Japan k.k.

5F New Sankei Bldg.
3-18-1 Asakusabashi, Taito-ku
TOKYO, 111-0053
Tel.: +81 3-4520-6245
Fax: +81 3-4520-6246
sales@lappgroup.jp
www.lappgroup.jp

Jordan

see United Arab Emirates

LAPP CABLES MIDDLE EAST FZE

Kazakhstan

Lapp Kazakhstan LLP

Abaya ave. 13, office 703
010000 ASTANA
Tel.: +7 7172 787365
sales@lappgroup.kz
www.lappgroup.kz

Korea

Lapp Korea LLC.

42, Jangangongdan 8-gil
Jangan-myeon, Hwaseong-si
Gyeonggi-do, Republic of Korea
Tel.: +82 1688 1099
Fax: +82 31 697 4099
dowoomi@lappgroup.com
www.lappkorea.com
www.lapp4u.com

Kuwait

see United Arab Emirates

LAPP CABLES MIDDLE EAST FZE

Latvia

LAPP MILTRONIC SIA
Ulbrokas 44a
RIGA, 1021
Tel.: +371 67 501900
Fax: +371 67 501909
pasutijumi@lappmiltronic.lv
www.lappmiltronic.lv

Lebanon

see United Arab Emirates
LAPP CABLES MIDDLE EAST FZE

Libya

Al Jouda Co.
Al Fath – Street
Al Buraq – Building 3rd floor
BENGHAZI
Tel.: +218 91 7433363
ilsharee@yahoo.co.uk

Lithuania

LAPP MILTRONIC filialas
Aukštaitių g. 6
11341 VILNIUS
Tel.: +370 5 2780390
info@lappmiltronic.lt
www.lappmiltronic.lt

Macedonia

Siskon Doel
Taskenska 4A
1000 SKOPJE
Tel.: +389 2 3062423
Fax: +389 2 3061250
siskon@mt.net.mk
www.siskon.com.mk

Malaysia

JJ-LAPP Cable (M) sdn. Bhd.
16, Jalan 51A/225,
46100 PETALING JAYA SELANGOR
Tel.: +603 78 616288
Fax: +603 78 616299
sales_jjlm@jjsea.com
www.jj-lappcable.com

Malta

G & E Electronics Ltd.
Genics Bldgs.
Giov. Papaffy Str.
B'KARA BKR 4021
Tel.: +356 21 486816
Fax: +356 21 497103
info@gemalta.com
www.gemalta.com

Mexico

Lapp Mexico S de RL de CV
Avenida del bosque 1190 Int. 1
Parque Industrial del Bosque II
45619, TLAQUEPAQUE, Jalisco
Tel.: +52 33 36660250
Fax: +52 33 36660075
ventas@lappmexico.com
www.lappmexico.com

Republic of Moldova

Lapp Kabel Romania SRL
A1 Business Park
(Autostrada Bucuresti – Pitesti, Km 13.5)
Aleea Camilla nr. 11, Unitatea G2
Comuna Dragomiresti Vale
Sat Dragomiresti Deal
Judet ILFOV, 077096
Tel.: +40 213 1009-61
Fax: +40 213 1009-59
office@lappkabel.ro
www.lappkabel.ro

Mongolia

TECHSOURCE Co., Ltd.
4th floor, Gandirs tower
Baruun Selbe 5/26
Chingeltei District-1
ULAANBAATAR 15160
Tel.: +976 70 117171, 94 010920
info@techsource.mn
www.techsource.mn

Morocco

Fiabel
16 Allée des Dahlias (Beausite)
Bd la Grande Ceinture
20250 Ain Sebâa, CASABLANCA
Tel.: +212 522 4033-01, -02
Tel.: +212 522 4046-16, -17, -18
Fax: +212 522 403303
www.fiabel.ma

Netherlands

Lapp Benelux B.V.
Van Dijklaan 16,
5581 WG WAALRE
Postbus 74, 5580 AB WAALRE
Tel.: +31 40 2285000
Fax: +31 40 2285010
sales.lappbenelux@lappgroup.com
www.lappbenelux.com

New Zealand

Engineering Computer Services Ltd.
Cnr Te-Rapa & Ruffell Rd
P.O. Box 20204
HAMILTON, 3288
Tel.: +64 7 8492211
Fax: +64 7 8492220
garry@lappgroup.co.nz
www.lappgroup.co.nz

Nicaragua

Electronica Tecnica SA.
De la Óptica Nicaraguense
3C al este, 1/2C al Sur
Casa #38 Residencial Bolonia
MANAGUA
Tel.: +505 2254-4913
info@ni.elvatron.com
nicaragua.elvatron.com

Norway

Miltronik AS
Eikveien 11
3036 DRAMMEN
Tel.: +47 32 261300
Fax: +47 32 261398
info@miltronik.no
www.miltronik.no

Oman

see United Arab Emirates
LAPP CABLES MIDDLE EAST FZE

Pakistan

see United Arab Emirates
LAPP CABLES MIDDLE EAST FZE

Panama

Lapp Panama S.A.
Building 9075, Unit 9
PanAmerica Corporate Center
Panamá Pacifico, Arraiján.
Tel.: +507 320 5090
sales.panama@lappgroup.com
laplatinamerica.lappgroup.com

Peru

DIPROSOL PERU SAC
Av. Velasco Astete 2371
Surco LIMA 33
Tel.: +51 1 2752765
Fax: +51 1 2752776
ventas@diprosol.com.pe
www.diprosol.com.pe

Philippines

JJ-LAPP Cable (P) Inc
Unit 704, Philplans Corporate Center
1012 Triangle Drive
Bonifacio Global City
1634 TAGUIG CITY, MANILA
Tel.: +632 786 7566
Fax: +632 786 7544
sales_jjlp@jjsea.com
www.jj-lappcable.com

Poland

Lapp Kabel Sp. z o.o.
Ulica: Profesjonalna 1
Biskupice Podgórne
55-040 KOBIERZYCE
Tel.: +48 71 3306300
Fax: +48 71 3306306
info@lapppolska.pl
www.lapppolska.pl

Portugal

Policabos S.A.
Av. Pedro Álvares Cabral
Lugar da Capa Rota
2710-144 SINTRA
Tel.: +351 21 9178640
Fax: +351 21 9178649
policabos@policabos.pt
www.policabos.pt

Qatar

see United Arab Emirates
LAPP CABLES MIDDLE EAST FZE

Romania

Lapp Kabel Romania SRL
A1 Business Park
(Autostrada Bucuresti – Pitesti, Km 13.5)
Aleea Camilla nr. 11, Unitatea G2
Comuna Dragomiresti Vale
Sat Dragomiresti Deal
Judet ILFOV, 077096
Tel.: +40 213 1009-61
Fax: +40 213 1009-59
office@lappkabel.ro
www.lappkabel.ro

Russia

Lapp Russia OOO
Mira st., 7, Krutye Kluchi
443028 SAMARA
Tel.: +7 846 2315155
info@lappgroup.ru
www.lappgroup.ru

Saudi Arabia

see United Arab Emirates
LAPP CABLES MIDDLE EAST FZE

Senegal

Sénégal Automation Technology Assistance (SATA Sarl)
Avenue Birago Diop x rue G Point E
BP 5344, DAKAR
Tel.: +221 338601030
Fax: +221 338207093

Serbia

VESIMPEX d.o.o.
Patrijarha Dimitrija 24 (DMB)
11090 BEOGRAD-RAKOVICA
Tel.: +381 11 4049-070, -071, -072, -073
Magacin/warehouse: +381 11 4049-075
Fax: +381 11 4049-077
Mob: +381 63 693-373
info@vesimpex.rs
www.vesimpex.rs

Singapore

Lapp Asia Pacific Pte. Ltd.
No.9 Tuas South St. 3
SINGAPORE 638017
Tel.: +65 6558-7176
Fax: +65 6558-7081
lappapac.lappgroup.com

JJ-LAPP Cable (S) Pte. Ltd.

No.9 Tuas South St 3
SINGAPORE 638017
Tel.: +65 6508-6200
Fax: +65 6863-1271
sales_jjls@jjsea.com
www.jj-lappcable.com

Slovakia

LAPP SLOVENSKO, s.r.o.
Piaristicka 2
949 24 NITRA
Tel.: +421 376 578095
Fax: +421 376 578096
info@lappgroup.sk
www.lappgroup.sk

Slovenia

Lapp, d. o. o.
Limbuška cesta 2
2341 LIMBUŠ
Tel.: +386 2 4213550
Fax: +386 2 4213571
info@lappslovenia.com
www.lappslovenia.com

South Africa

Lapp Group Southern Africa
51 Brunton Circle
Founders View South
Modderfontein
1645 GAUTENG
Tel.: +27 11 2013200
Fax: +27 11 6095850
info@lappkabel.co.za
www.lappcable.co.za

Spain

Lapp Group España
Avda. de les Garrigues, 34 – 36
Parque Empresarial Mas Blau II
08820 EL PRAT DE LLOBREGAT
(Barcelona)
Tel.: +34 902 108 669
Fax: +34 934 796 272
info@lappgroup.es
www.lappgroup.es

Sweden

Miltronik AB
Kungshagsvägen 7
Box 1022
611 29 NYKÖPING
Tel.: +46 155 77780
info@miltronik.se
www.miltronik.se

Sales office Denmark

Korskildeeng 6
2670 GREVE
Tel.: +45 43 950000
Fax: +45 43 950009
info@miltronik.dk
www.miltronik.dk

Switzerland

Volland AG
Ifangstrasse 103
8153 RÜMLANG
Tel.: +41 44 8179797
Fax: +41 44 8179700
info@volland.ch
www.volland.ch

EPIC®

Bachofen AG
Ackerstraße 42
8610 USTER
Tel.: +41 44 9441111
Fax: +41 44 9441233
info@bachofen.ch
www.bachofen.ch

Syria

see United Arab Emirates
LAPP CABLES MIDDLE EAST FZE

Taiwan

DKSH Taiwan Ltd.
10th Floor, No. 22, Lane 407
Tiding Blvd., Sec. 2
Neihu Technology Park
TAIPEI CITY 114-93
Tel.: +886 2 87527654
Fax: +886 2 87518688
wilson.wang@dksh.com

Thailand

JJ-LAPP Cable (T) Ltd.
23/110-117 Sorachai Building
25-29th FL
Soi Sukhumvit 63 (Ekamai),
Sukhumvit Road, Klongton Nua,
Wattana, BANGKOK 10110
Tel.: +66 27 878288
Fax: +66 27 878299
sales_jjlt@jjsea.com
www.jj-lappcable.com

Tunisia

ELECSA TN, Groupe TTI
Zone industrielle
8030 GROMBALIA
Tel.: +216 72 255954
Fax: +216 72 255980
commercial@elecsa-tn.com
www.elecsa-tn.com

Turkey

LAPP KABLO San. ve Tic. Ltd. Şti.
Atatürk Mah. Şeref Sok. No: 55/1
34758 ATAŞEHİR-İSTANBUL
Tel.: +90 216 4565699
Fax: +90 216 4565687-89
info@lapp.com.tr
www.lapp.com.tr

Ukraine

Lapp Ukraine LLC
201 – 203, Kharkivske shose
02121 KIEV
Tel.: +38 044 495-6000
Fax: +38 044 490-7630
sales@lappukraine.com
www.lappukraine.com

United Arab Emirates

LAPP CABLES MIDDLE EAST FZE
Wing A-502, P.O. Box 341223
Dubai Silicon Oasis
DUBAI
Tel.: +971 4 3712905
Fax: +971 4 3712918
lappme@lappgroup.com
www.lappgroup.com

Uruguay

Reprinter LTDA.
Avda. Italia 6481
MONTEVIDEO
Tel.: +598 2600-7343
Fax: +598 2600-8658
lapp@reprinter.com.uy
www.reprinter.com.uy

USA

Lapp USA, Inc.
29 Hanover Road
FLORHAM PARK, NJ 07932
Tel.: +1 973 6609700
Fax: +1 973 6609330
sales@lappusa.com
www.lappusa.com

Lapp Tannehill, Inc.

8675 Eagle Creek Parkway Suite 900
SAVAGE, MN 55378
Tel.: +1 952 8816700
Fax: +1 952 8810743
sales@lapptannehill.com
www.lapptannehill.com

Venezuela

Somerinca, C.A
Qta Corazón de Jesus
4ta Transversal de Montecristo c/
calle el Carmen, de los Dos Caminos
1070 CARACAS
Tel.: +212 235 1081/
1696/2748, 237 3003
Fax: +212 239 9341
klocmoeller@cantv.net
www.somerinca.com

Vietnam

JJ-Lapp Cable Vietnam Co., Ltd
12th floor, Unit 1206, Sailing Tower
111A Pasteur Street, District 1
HO CHI MINH CITY
Tel.: +84 8 62887668
Fax: +84 8 38236776
sales_jjlv@jjsea.com
www.jj-lappcable.com

Yemen

see United Arab Emirates
LAPP CABLES MIDDLE EAST FZE

about

us

Headquarters 4.0

Goodbye isolated individual offices! LAPP's new European headquarters in Stuttgart-Vaihingen features an open-space design, modern architecture and short distances that enable all-new forms of cooperation. Individual departments are no longer physically separated. Everything is bright and open. Plants are used to separate space,

absorb noise and improve air quality. Height-adjustable desks allow staff to concentrate better and work more healthily. The open office design aims to improve communication, teamwork, knowledge exchange, creativity and mobile working. This workplace concept is being rolled out worldwide.



Open office, open cooperation

Our new headquarters presents an entirely new concept of office life. Digital, connected and flexible, it improves communication and cooperation, benefiting both our employees and customers. Our new spatial design allows us to react even more quickly and directly to our customers' needs. This

is because departments that cooperate often are placed closer to each other. Sales and all sales-related departments have now, for example, been brought together under one roof.

Despite this, there is still plenty of room for individuality and quiet places where staff

can go for greater concentration. As such, the building features team zones, think tanks, lounges and project zones. Staff can also work in the espresso bar on the ground floor or on the roof terrace if they so wish. Here they can use bistro tables and even sun loungers.



The road to the future

Transport is changing. From electric cars to modern rail vehicles, high-performance connection technology is a vital part of future mobility. Based on 60 years of experience in the development and production of electric cables, connectors and accessories, we have steadily developed and expanded our range of products for railway technology. With LAPP brands we provide reliable solutions that make no compromises when it comes to safety, quality and function. Our products meet tough national and international norms and standards like EN 45545-2, and are used in the high-speed trains of Korea Train eXpress (KTX), for example. Our production facility for ÖLFLEX® TRAIN is certified in line with ISO/TS 22163.



www.lappkabel.com/rollingstock



mobility

485

545

Our range of railway technology products covers over 545 cable types and 485 connectors, along with cable glands, protective conduits and accessories. We have over a million metres of cable in storage for the rolling stock industry.

1,000,000



logistics

Reliably connecting the world

24

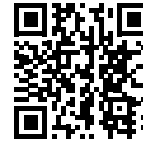
We manage the majority of our railway technology products from stock and make quick deliveries, e.g. within 24 hours in Germany. We have more than 40 sales companies and around an additional 100 sales partners to ensure global availability and excellent service. We do not impose minimum order volumes. We will deliver your goods to anywhere in the world when you order €100 or more of our products.

40

100



www.lappkabel.com/service/logistics



Absolute safety on the tracks

The topic is well known: Railway wires and cables must fulfil demanding national and international standards. In addition to EN 45545-2 these include design standards such as EN 50264 and EN 50306. They define the required sheath and insulation thickness and design and stipulate the mechanical, thermal, fire safety and chemical tests.

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

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).



safety

quality

Technological lead, step-by-step

Our manufacturing facility for the ÖLFLEX® TRAIN is certified in accordance with the ISO/TS 22163, thus operating within the framework of the required processes of the railway industry.

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

- 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

Test centre at LAPP headquarters in Stuttgart and at the production site in South Korea

Only the toughest tests guarantee the highest quality. Our trial and test centres, with their extremely high standards for material testing and quality assurance, are 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.

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

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



Our test centre is also open for our customers

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

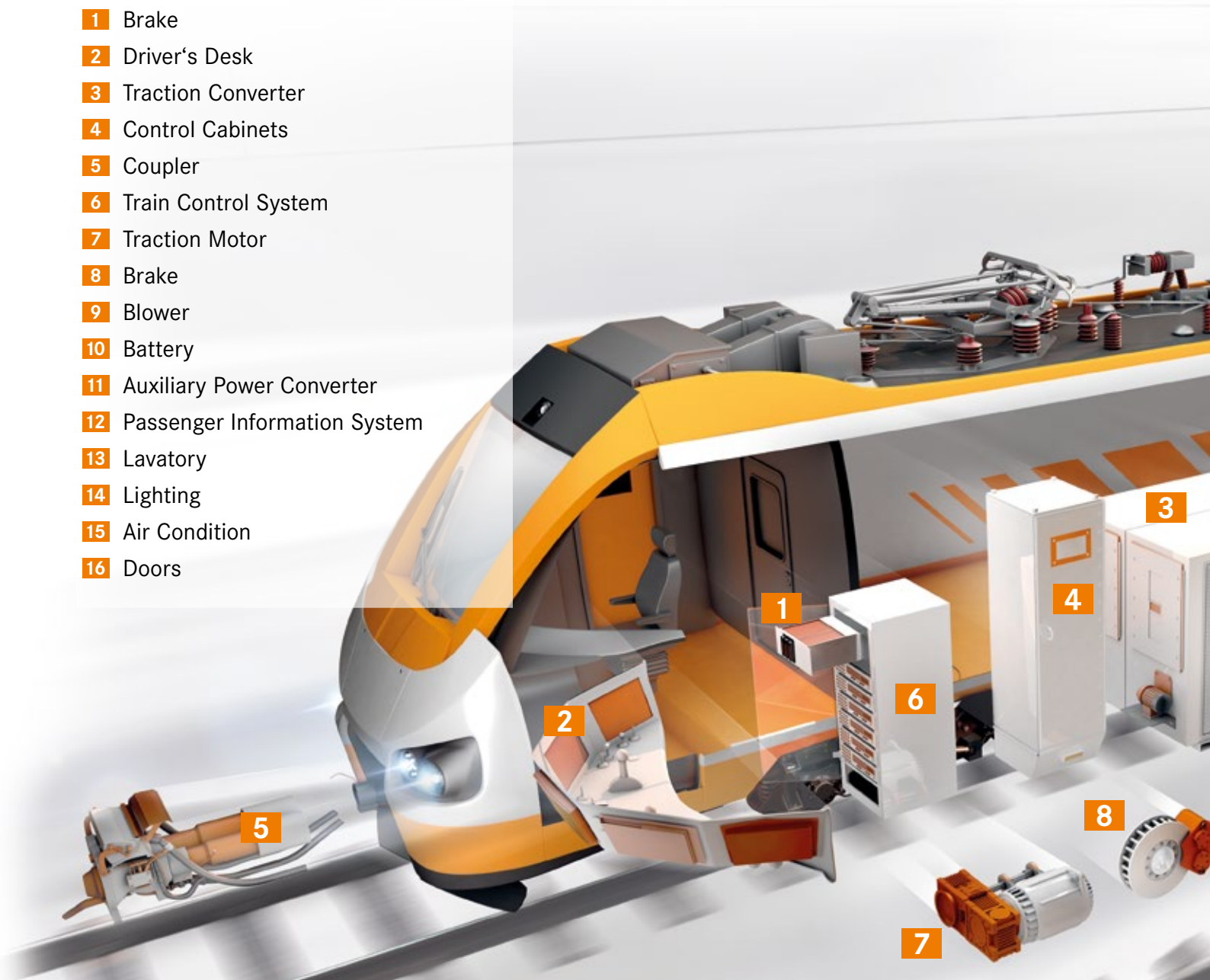
We will test your products and carry out material tests in accordance with your wishes. For instance, you might bring us a length of cable whose material composition you wish to find out. We will test it for you using infrared spectroscopy and tell you what materials it contains. Using thermo-

analysis 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.

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 TW 300V

1 2 4 6 8 11 12 13
14 16

ÖLFLEX® TRAIN 310/315 C TW-P 300V

1 4 6 8 11 12 13 15

ÖLFLEX® TRAIN 317 C TW-P 300V

1 2 3 4 6 8 11 12
13 15 16

ÖLFLEX® TRAIN 320/325 C TW-E 300V

1 3 8 11 16

ÖLFLEX® TRAIN 327 C TW-E 300V

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

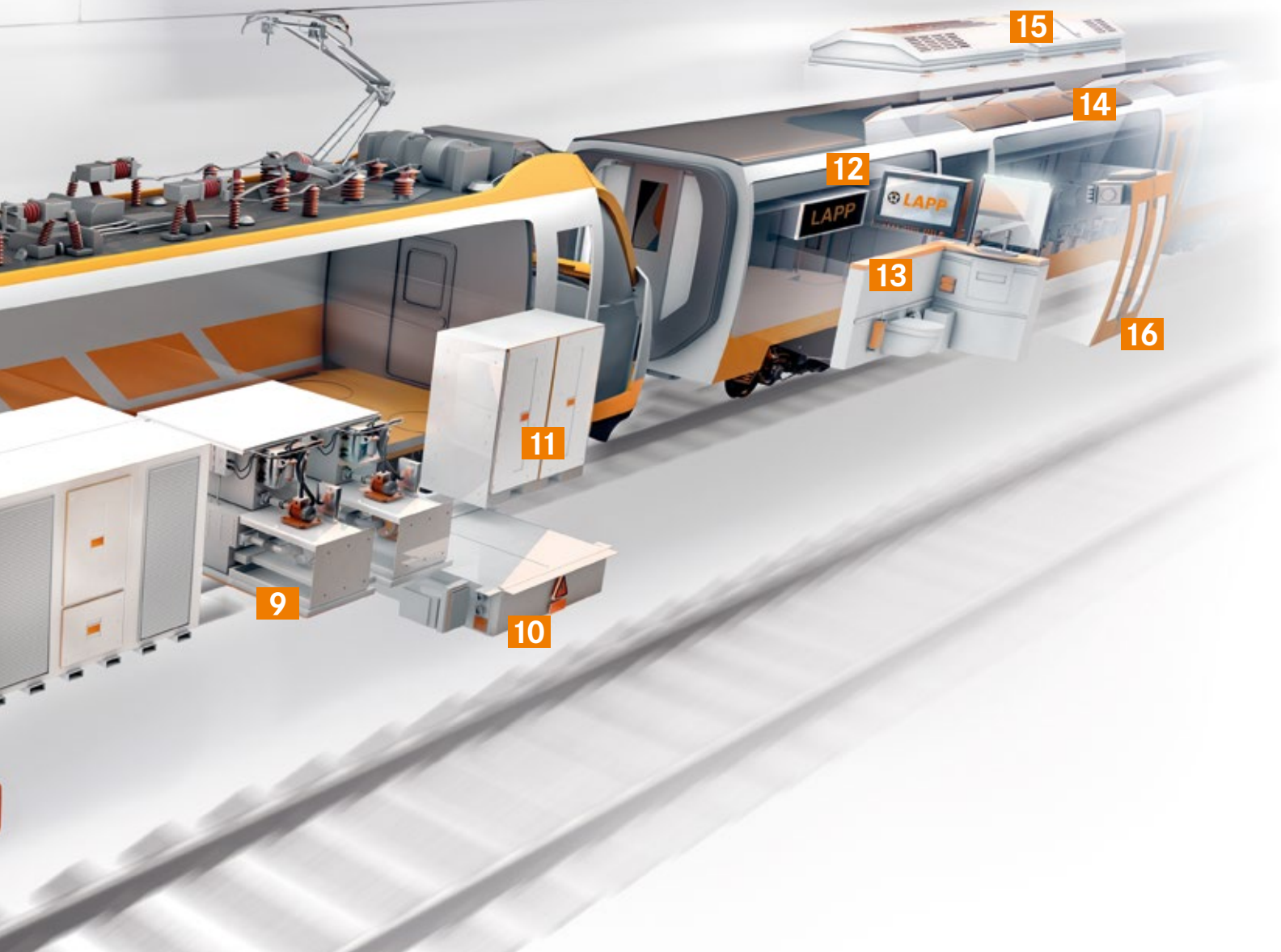
3 4 5 7 9 10 11

ÖLFLEX® TRAIN 381 3,6kV

7

ÖLFLEX® TRAIN HT 150 F/FF

3 4 5 7 9 11



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	m/ring	m/spool	m/box
0.5	15301000	100		
	15301000S		500	
	15301000K			3000
0.75	15301001	100		
	15301001S		500	
	15301001K			3000
1	15301002	100		
	15301002S		500	
	15301002K			2500
1.5	15301003	100		
	15301003S		250	
	15301003K			2500
2.5	15301004	100		
	15301004S		250	
	15301004K			2000

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

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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

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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	4GKW AXplus	9GKW-AXplus
With outer sheath				●	●
Type according to EN standard	M		M	MM	MM
Colour of insulation	BK	GN/YE	BK	BK	BK
Colour of outer sheath				BK	BK
Conductor cross-section/mm ²	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

Multi core cables according to EN 50264



	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 mm ² per conductor	Article number	Article number	Article number	Article number
2 X 0.5	15340040	15345040		
4 X 0.5	15340041	15345041		
7 X 0.5	15340042	15345042		
9 X 0.5	15340043	15345043		
12 X 0.5	15340044	15345044		
19 X 0.5	15340045	15345045		
24 X 0.5	15340046	15345046		
32 X 0.5	15340047	15345047		
37 X 0.5	15340048	15345048		
40 X 0.5	15340049	15345049		
2 X 0.75	15340050	15345050		
4 X 0.75	15340051	15345051		
7 X 0.75	15340052	15345052		
9 X 0.75	15340053	15345053		
12 X 0.75	15340054	15345054		
19 X 0.75	15340055	15345055		

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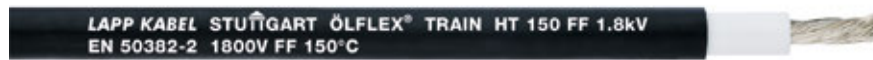
Overview ÖLFLEX® TRAIN

	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
24 X 0.75	15340056	15345056		
32 X 0.75	15340057	15345057		
37 X 0.75	15340058	15345058		
40 X 0.75	15340059	15345059		
2 X 1	15340060	15345060	15350000	15355000
4 X 1	15340061	15345061	15350001	15355001
7 X 1	15340062	15345062	15350002	15355002
9 X 1	15340063	15345063	15350003	15355003
12 X 1	15340064	15345064	15350004	15355004
19 X 1	15340065	15345065	15350005	15355005
24 X 1	15340066	15345066	15350006	15355006
32 X 1	15340067	15345067	15350007	15355007
37 X 1	15340068	15345068	15350008	15355008
40 X 1	15340069	15345069	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	15340070	15345070	15350011	15355011
9 X 1.5	15340071	15345071	15350012	15355012
12 X 1.5	15340072	15345072	15350013	15355013
19 X 1.5	15340073	15345073	15350014	15355014
24 X 1.5	15340074	15345074	15350015	15355015
32 X 1.5	15340075	15345075	15350016	15355016
37 X 1.5	15340076	15345076	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	15340077	15345077	15350019	15355019
9 X 2.5	15340078	15345078	15350020	15355020
12 X 2.5	15340079	15345079	15350021	15355021
19 X 2.5	15340080	15345080	15350022	15355022
24 X 2.5	15340081	15345081	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		

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Overview ÖLFLEX® TRAIN

Single core cables according to EN 50382 (Silicone high temperature cables)



	ÖLFLEX® TRAIN HT 150 F 1,8kV	ÖLFLEX® TRAIN HT 150 F 3,6kV	ÖLFLEX® TRAIN HT 150 FF 1,8kV	ÖLFLEX® TRAIN HT 150 FF 3,6kV	ÖLFLEX® TRAIN HT 150 FX 3,6kV
Type standard	EN 50382-2	EN 50382-2	EN 50382-2	EN 50382-2	EN 50382-2
With outer sheath			•	•	
Type according to EN standard	F	F	FF	FF	FX
Colour of insulation	BK	BK	WH	WH	BK
Colour of outer sheath			BK	BK	
Conductor cross-section/mm²	Article number	Article number	Article number	Article number	Article number
1.5	15382000		15382040		
2.5	15382001	15382020	15382041	15382060	
4	15382002	15382021	15382042	15382061	
6	15382003	15382022	15382043	15382062	
10	15382004	15382023	15382044	15382063	
16	15382005	15382024	15382045	15382064	
25	15382006	15382025	15382046	15382065	
35	15382007	15382026	15382047	15382066	
50	15382008	15382027	15382048	15382067	15382080
70	15382009	15382028	15382049	15382068	15382081
95	15382010	15382029	15382050	15382069	15382082
120	15382011	15382030	15382051	15382070	15382083
150	15382012	15382031	15382052	15382071	15382084
185	15382013	15382032	15382053	15382072	15382085
240	15382014	15382033	15382054	15382073	
300	15382015	15382034	15382055	15382074	
400	15382016	15382035	15382056	15382075	

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Overview ÖLFLEX® TRAIN

Multi-core control cables, EN 45545-2 certified



	ÖLFLEX® CLASSIC 110 H SF	ÖLFLEX® CLASSIC 115 CH SF	ÖLFLEX® CLASSIC 115 CH SF (TP)
Fire behaviour	EN 45545-2	EN 45545-2	EN 45545-2
Type standard			
With screen		•	•
Core identification code	numbered	numbered	colour-coded
Number of cores and mm² per conductor	Article number	Article number	Article number
5 G 0.5	1002140	1002164	
36 X 0.5		1002165	
3 G 0.75		1002166	
5 G 0.75		1002167	
7 G 0.75		1002168	
25 G 0.75		1002169	
3 G 1	1002141		
5 G 1	1002142		
7 G 1	1002143	1002170	
13 G 1	1002144	1002171	
25 G 1	1002145	1002172	
43 G 1	1002146		
73 G 1	1002147		
2 X 1.5		1002173	
3 G 1.5	1002148	1002174	
5 G 1.5	1002149	1002175	
7 G 1.5	1002150		
13 G 1.5	1002151		
25 G 1.5	1002152		
43 G 1.5	1002153		
61 G 1.5	1002154		
3 G 2.5	1002155		
4 G 2.5		1002176	
5 G 2.5	1002156		
7 G 2.5	1002157		
4 G 4		1002177	
3 G 6	1002158		
4 G 6		1002178	
5 G 6	1002159		
7 G 6	1002160		
4 G 10		1002179	
5 G 10	1002161		
5 G 16	1002162		
5 G 35	1002163		
3 x 2 x 0.75			1002180
4 x 2 x 0.75			1002181
6 x 2 x 0.75			1002182
12 x 2 x 0.75			1002183
2 x 2 x 1			1002184
4 x 2 x 1			1002185
12 x 2 x 1			1002186
3 x 2 x 1.5			1002187

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



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: -50°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, 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:
 - 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 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
- Current rating acc. to EN 50355, appendix A

Norm references / Approvals

- EN 50306-2, type M
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 – Classification: C / F0 (flame propagation / smoke)

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



Conductor stranding

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



Minimum bending radius

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



Nominal voltage

U₀: 600 V AC
U₀/U: 300/500 V AC
acc. to EN 50306
U_m: 550 V AC



Test voltage

3,5 kV AC; 8,4 kV DC



Temperature range

Fixed installation:
-45°C to +125°C (20.000 h)
-50°C acc. to GOST 20.57.406-81
Occasional flexing:
-35°C to +105°C
Short circuit:
+160°C (5s)

Article number	Conductor cross-section (mm ²)	m/Ring	m/Spule	m/Karton	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 301 TW 300V							
15301000	0.5	100	—	—	1.3	4.8	6
15301000S	0.5	—	500	—	1.3	4.8	6
15301000K	0.5	—	—	3000	1.3	4.8	6
15301001	0.75	100	—	—	1.5	7.2	8
15301001S	0.75	—	500	—	1.5	7.2	8
15301001K	0.75	—	—	3000	1.5	7.2	8
15301002	1	100	—	—	1.6	9.6	11
15301002S	1	—	500	—	1.6	9.6	11
15301002K	1	—	—	2500	1.6	9.6	11
15301003	1.5	100	—	—	2.1	14.4	17
15301003S	1.5	—	250	—	2.1	14.4	17
15301003K	1.5	—	—	2500	2.1	14.4	17
15301004	2.5	100	—	—	2.7	24.4	28
15301004S	2.5	—	250	—	2.7	24.4	28
15301004K	2.5	—	—	2000	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 and graphics are not to scale and do not represent detailed images of the respective products.

**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: -50°C up to +125°C
- Highly oil- and fuel-resistant

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

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, 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:
 - 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 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
- Current rating acc. to EN 50355, appendix A

Norm references / Approvals

- EN 50306-4 class P, type MM
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 - Classification: C / F0 (flame propagation / smoke)
- Compliant with NFPA 130

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

- 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 × OD / 3 × OD*
> 12 mm: 5 × OD / 4 × OD*
* for careful bending, once at connecting terminal
Occasional flexing:
≤ 12 mm: 5 × OD
> 12 mm: 6 × OD
(OD = outer diameter)
- Nominal voltage**
U₀: 600 V AC
U₀/U: 300/500 V AC
acc. to EN 50306
U_m: 550 V AC
- 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)
-50°C acc. to GOST 20.57.406-81
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 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	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	5.4	38.4	68

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
15310012	7 X 1	6.5	67.2	106
15310013	13 X 1	9.3	124.8	200
15310014	19 X 1	10.4	182.4	267
15310015	37 X 1	13.9	355.2	498
15310016	4 X 1.5	6.5	57.6	98
15310017	7 X 1.5	8.2	108	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	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 and graphics are not to scale and do not represent detailed images of the respective products.



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: -50°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, 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:
 - 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 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
- Current rating acc. to EN 50355, appendix A

Norm references / Approvals

- EN 50306-4 class P, type MM S
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 – Classification: C / F0 (flame propagation / smoke)

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



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:
5 × outer diameter
Occasional flexing:
10 × outer diameter



Nominal voltage

U₀: 600 V AC
U₀/U: 300/500 V AC
acc. to EN 50306
U_m: 550 V AC



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)
-50°C acc. to GOST 20.57.406-81
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	42.95	72
15315004	8 X 0.5	6.5	61.26	94
15315005	2 X 0.75	5	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	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	5.5	41.97	66
15315012	4 X 1	6	52.89	81
15315013	6 X 1	7.1	81.74	117
15315014	8 X 1	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	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 and graphics are not to scale and do not represent detailed images of the respective products.



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: -50°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, 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:
 - 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 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
- Current rating acc. to EN 50355, appendix A

Norm references / Approvals

- EN 50306-4 class P, type MM S
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 – Classification: C / F1 (flame propagation / smoke)

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

- 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:
 5 × outer diameter
 Occasional flexing:
 10 × outer diameter
- Nominal voltage**
 U₀: 600 V AC
 U₀/U: 300/500 V AC
 acc. to EN 50306
 U_m: 550 V AC
- Test voltage**
 3.5 kV AC; 8.4 kV DC
- Temperature range**
 Fixed installation:
 -45°C to +125°C (20,000 h)
 -50°C acc. to GOST 20.57.4.06-81
 Occasional flexing:
 -35°C to +105°C
 Short circuit:
 +160°C (5s)

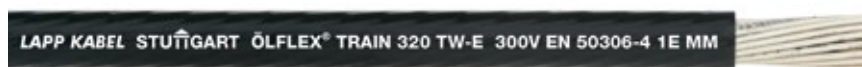
Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 317 C TW-P 300V				
15317000	2 X (2 x 0.5)	9.6	38.86	150
15317001	3 X (2 x 0.5)	10.2	58.30	178
15317002	4 X (2 x 0.5)	11.3	77.73	217
15317003	7 X (2 x 0.5)	13.6	136.38	331
15317004	2 X (2 x 0.75)	10.4	51.49	179
15317005	3 X (2 x 0.75)	11.1	77.24	219
15317006	4 X (2 x 0.75)	12.2	102.99	267
15317007	7 X (2 x 0.75)	14.8	180.64	399
15317008	2 X (2 x 1)	10.9	63	208
15317009	3 X (2 x 1)	11.5	94.50	250
15317010	4 X (2 x 1)	12.7	126	304
15317011	7 X (2 x 1)	15.4	220.93	458
15317012	2 X (2 x 1.5)	12.8	90	283
15317013	3 X (2 x 1.5)	13.7	136	346
15317014	4 X (2 x 1.5)	15.1	181	443
15317015	7 X (2 x 1.5)	18.4	320	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 and graphics are not to scale and do not represent detailed images of the respective products.



ÖLFLEX® TRAIN 320 TW-E 300V

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



Info

- Meets EN 50306-4 class E, type MM and EN 45545-2
- High temperature resistance: -50°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, 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:
 - 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 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
- Current rating acc. to EN 50355, appendix A

Norm references / Approvals

- EN 50306-4 class E, type MM
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 - Classification: C / FO (flame propagation / smoke)

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



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:
 $\leq 12 \text{ mm: } 4 \times \text{OD} / 3 \times \text{OD}^*$
 $> 12 \text{ mm: } 5 \times \text{OD} / 4 \times \text{OD}^*$
 * for careful bending, once at connecting terminal
 Occasional flexing:
 $\leq 12 \text{ mm: } 5 \times \text{OD}$
 $> 12 \text{ mm: } 6 \times \text{OD}$
 (OD = outer diameter)



Nominal voltage

U_0 : 600 V AC
 U_0/U : 300/500 V AC
 acc. to EN 50306
 U_m : 550 V AC



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 $+125^\circ\text{C}$ (20,000 h)
 -50°C acc. to GOST 20.57.406-81
 Occasional flexing:
 -35°C to $+105^\circ\text{C}$
 Short circuit:
 $+160^\circ\text{C}$ (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	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	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	7.8	67.2	130
15320013	13 X 1	10.3	124.8	226
15320014	19 X 1	11.3	182.4	296
15320015	37 X 1	14.8	355.2	532
15320016	4 X 1.5	7.9	57.6	125
15320017	7 X 1.5	9.3	100.8	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	532.8	782
15320021	2 X 2.5	8.2	49.2	126
15320022	3 X 2.5	8.6	73.8	152
15320023	4 X 2.5	9.4	98.4	189

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 $\leq 30 \text{ kg}$ or $\leq 250 \text{ m}$, otherwise drum

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

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



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: -50°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, 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:
 - 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 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
- Current rating acc. to EN 50355, appendix A

Norm references / Approvals

- EN 50306-4 class E, type MM S
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 - Classification: C / F0 (flame propagation / smoke)

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 (optional)
- Screen: Tinned-copper braiding
- Outer sheath: electron beam cross-linked polymer-compound S2 acc. to EN 50306
- Outer sheath colour: Black

Technical data

- 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:
 5 × outer diameter
 Occasional flexing:
 10 × outer diameter
- Nominal voltage**
 U₀: 600 V AC
 U₀/U: 300/500 V AC
 acc. to EN 50306
 U_m: 550 V AC
- 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)
 -50°C acc. to GOST 20.57.406-81
 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	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	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	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	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	7	41.97	89
15325012	4 X 1	7.4	52.89	106
15325013	6 X 1	8.5	81.74	144
15325014	8 X 1	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	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 and graphics are not to scale and do not represent detailed images of the respective products.



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: -50°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, 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:
 - 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 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
- Current rating acc. to EN 50355, appendix A

Norm references / Approvals

- EN 50306-4 class E, type MM S
- EN 45545-2 HL1, HL2, HL3
- NF F 16-101 - Classification: C / F1 (flame propagation / smoke)

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



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:
5 × outer diameter
Occasional flexing:
10 × outer diameter



Nominal voltage

U₀: 600 V AC
U₀/U: 300/500 V AC
acc. to EN 50306
U_m: 550 V AC



Test voltage

3.5 kV AC; 8.4 kV DC



Temperature range

Fixed installation:
-45°C to +125°C (20.000 h)
-50°C acc. to GOST 20.57.406-81
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	2 X (2 × 0.5)	10.7	38.86	179
15327001	3 X (2 × 0.5)	11.4	58.30	212
15327002	4 X (2 × 0.5)	12.4	77.73	254
15327003	7 X (2 × 0.5)	14.7	136.38	375
15327004	2 X (2 × 0.75)	11.5	51.49	213
15327005	3 X (2 × 0.75)	12.2	77.24	250
15327006	4 X (2 × 0.75)	13.4	102.99	307
15327007	7 X (2 × 0.75)	15.9	180.64	447
15327008	2 X (2 × 1)	11.9	63	235
15327009	3 X (2 × 1)	12.6	94.50	282
15327010	4 X (2 × 1)	13.8	126	342
15327011	7 X (2 × 1)	16.5	220.93	499
15327012	2 X (2 × 1.5)	13.9	90.10	317
15327013	3 X (2 × 1.5)	14.8	136	383
15327014	4 X (2 × 1.5)	16.3	181	492
15327015	7 X (2 × 1.5)	19.5	320	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 and graphics are not to scale and do not represent detailed images of the respective products.



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: -50°C up to 120°C
- Also available in red and blue colour

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, 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)
- Current rating acc. to EN 50355, appendix A

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)
- Compliant with NFPA 130

Product Make-up

- Tinned-copper strand, fine-wire
- Insulation: Electron beam cross-linked Polymer compound EI 109
- Colour: Black or green-yellow
- Also available in red and blue colour

Technical data

- Conductor stranding**
 Fine-wired/Finely stranded acc. to IEC 60228, conductor class 5
- Minimum bending radius**
 Fixed installation:
 ≤ 12 mm: 3 × OD
 > 12 mm: 4 × OD
 Occasional flexing:
 ≤ 12 mm: 4 × OD
 > 12 mm ≤ 20 mm: 5 × OD
 > 20 mm: 6 × 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)
 -50°C acc. to GOST 20.57.406-81
 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	14.4	22
15331002	2.5	3.4	24	33
15331003	4	4.1	38.4	49
15331004	6	4.6	57.6	70
15331005	10	5.6	96	112
15331006	16	6.6	153.6	174
15331007	25	8.3	240	273
15331008	35	9.5	336	374
15331009	50	11.7	480	531
15331010	70	13.6	672	739
15331011	95	15.6	912	988
15331012	120	17.4	1152	1243
15331013	150	19.8	1440	1558
15331014	185	21.7	1776	1927

Article number	Conductor cross-section (mm²)	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
15331015	240	25.4	2304	2487
15331016	300	26.8	2880	3085
ÖLFLEX® TRAIN 331 600V – GN/YE				
15331017	1	2.5	9.6	15
15331018	1.5	3	14.4	22
15331019	2.5	3.4	24	33
15331020	4	4.1	38.4	49
15331021	6	4.6	57.6	70
15331022	10	5.6	96	112
15331023	16	6.6	153.6	174
15331024	25	8.3	240	273
15331025	35	9.5	336	374
15331026	50	11.7	480	531
15331027	70	13.6	672	739
15331028	95	15.6	912	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 and graphics are not to scale and do not represent detailed images of the respective products.



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: -50°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, 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 (please refer to data sheet):
 - 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)
- Current rating acc. to EN 50355, appendix A

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) please refer to data sheet

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



Core identification code
Black with white numbers



Conductor stranding
Fine-wired/Finely stranded acc. to IEC 60228, conductor class 5



Minimum bending radius
Fixed installation:
≤ 12 mm: 3 × OD
> 12 mm: 4 × OD
Occasional flexing:
≤ 12 mm: 4 × OD
> 12 mm ≤ 20 mm: 5 × OD
> 20 mm: 6 × 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



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



Temperature range
Fixed installation:
-45°C to +120°C (20.000 h)
-50°C acc. to GOST 20.57.406-81
Occasional flexing:
-35°C to +90°C
Short circuit:
+200°C (5s)



ÖLFLEX® TRAIN 340 600V

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

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 340 600V				
15340040	2 X 0.5	5.7	9.6	49
15340041	4 X 0.5	6.6	19.2	70
15340042	7 X 0.5	7.9	33.6	103
15340043	9 X 0.5	9.8	43.2	152
15340044	12 X 0.5	10.5	57.6	165
15340045	19 X 0.5	12.4	91.2	242
15340046	24 X 0.5	14.7	115.2	312
15340047	32 X 0.5	16.2	153.6	399
15340048	37 X 0.5	17.5	177.6	470
15340049	40 X 0.5	18.5	192	521
15340050	2 X 0.75	6.1	14.4	59
15340051	4 X 0.75	7	28.8	84
15340052	7 X 0.75	8.5	50.4	128
15340053	9 X 0.75	10.8	64.8	194
15340054	12 X 0.75	11.4	86.4	208
15340055	19 X 0.75	13.8	136.8	320
15340056	24 X 0.75	15.9	172.8	393
15340057	32 X 0.75	17.9	230.4	522
15340058	37 X 0.75	18.9	266.4	592
15340059	40 X 0.75	20	288	656
15340060	2 X 1	6.4	19.2	68
15340061	4 X 1	7.4	38.4	99
15340062	7 X 1	8.9	67.2	150
15340063	9 X 1	11.4	86.4	227
15340064	12 X 1	12	115.2	245
15340065	19 X 1	14.5	182.4	377
15340066	24 X 1	16.8	230.4	468
15340067	32 X 1	18.9	307.2	623
15340068	37 X 1	19.9	355.2	702
15340069	40 X 1	21.2	384	785
15340000	2 X 1.5	7.4	28.8	94.1
15340001	3 X 1.5	7.9	43.2	113.5
15340025	3 G 1.5	7.9	43.2	113.5
15340002	4 X 1.5	8.6	57.6	139.6
15340026	4 G 1.5	8.6	57.6	139.6

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
15340070	7 X 1.5	10.6	100.8	217
15340071	9 X 1.5	13.7	129.6	332
15340072	12 X 1.5	14.5	172.8	364
15340073	19 X 1.5	17.4	273.6	554
15340074	24 X 1.5	20.1	345.6	684
15340075	32 X 1.5	22.6	460.8	908
15340076	37 X 1.5	23.8	532.8	1027
15340003	2 X 2.5	8.2	48	127.4
15340004	3 X 2.5	8.7	72	156.9
15340027	3 G 2.5	8.7	72	156.9
15340005	4 X 2.5	9.6	96	195
15340028	4 G 2.5	9.6	96	195
15340077	7 X 2.5	11.8	168	302
15340078	9 X 2.5	15.3	216	465
15340079	12 X 2.5	16.1	288	504
15340080	19 X 2.5	19.4	456	776
15340081	24 X 2.5	22.9	576	1000
15340006	2 X 4	9.6	76.8	178.5
15340007	3 X 4	10.2	115.2	222.9
15340008	4 X 4	11.4	153.6	284.5
15340009	2 X 6	10.8	115.2	244.2
15340010	3 X 6	11.5	172.8	308
15340011	4 X 6	13	230.4	393.4
15340012	2 X 10	13.2	192	377.3
15340013	3 X 10	14	288	479.6
15340014	4 X 10	15.4	384	604
15340015	2 X 16	15.2	307.2	551.9
15340016	3 X 16	16.2	460.8	708
15340017	4 X 16	18.2	614.4	916.2
15340018	2 X 25	19	480	857
15340019	3 X 25	20.2	720	1101.5
15340020	4 X 25	22.7	960	1420.9
15340021	2 X 35	21.4	672	1140.9
15340022	3 X 35	23	1008	1488.8
15340023	2 X 50	26.2	960	1626.5
15340024	3 X 50	28.0	1440	2101.1

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



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: -50°C up to 120°C
- Highly oil- and fuel-resistant

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, 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 (please refer to data sheet):
 - 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)
- Current rating acc. to EN 50355, appendix A

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) please refer to data sheet

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



Core identification code

Black with white numbers



Conductor stranding

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



Minimum bending radius

Fixed installation:
 ≤ 12 mm: 3 × OD
 > 12 mm: 4 × OD
 Occasional flexing:
 ≤ 12 mm: 4 × OD
 > 12 mm ≤ 20 mm: 5 × OD
 > 20 mm: 6 × 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



Protective conductor

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



Temperature range

Fixed installation:
 -45°C to +120°C (20.000 h)
 -50°C acc. to GOST 20.57.406-81
 Occasional flexing:
 -35°C to +90°C
 Short circuit:
 +200°C (5s)



ÖLFLEX® TRAIN 345 C 600V

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

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN 345 C 600V				
15345040	2 X 0.5	6.5	31.96	68
15345041	4 X 0.5	7.4	47.63	96
15345042	7 X 0.5	8.7	62.03	125
15345043	9 X 0.5	11	94.35	222
15345044	12 X 0.5	11.5	116.88	239
15345045	19 X 0.5	13.8	158.34	342
15345046	24 X 0.5	15.9	218.11	445
15345047	32 X 0.5	17.8	267.57	565
15345048	37 X 0.5	18.7	292.32	621
15345049	40 X 0.5	19.7	321.25	688
15345050	2 X 0.75	6.9	37.07	77
15345051	4 X 0.75	7.8	57.58	109
15345052	7 X 0.75	9.3	83.98	153
15345053	9 X 0.75	11.8	124.5	267
15345054	12 X 0.75	12.4	146.36	283
15345055	19 X 0.75	15	226.45	436
15345056	24 X 0.75	17.5	288.27	558
15345057	32 X 0.75	19.1	357.11	685
15345058	37 X 0.75	20.1	393.95	756
15345059	40 X 0.75	21.2	428.32	837
15345060	2 X 1	7.2	44.81	87
15345061	4 X 1	8.2	67.46	124
15345062	7 X 1	9.7	105.44	178
15345063	9 X 1	12.4	146.91	300
15345064	12 X 1	13.4	182.93	341
15345065	19 X 1	15.7	284.97	506
15345066	24 X 1	18.4	349.83	640
15345067	32 X 1	20.1	437.27	791
15345068	37 X 1	21.1	486.38	870
15345069	40 X 1	23	567.56	1047
15345000	2 X 1.5	8.2	57.35	125.3
15345001	3 X 1.5	8.7	73.27	149.1
15345025	3 G 1.5	8.7	73.27	149.1
15345002	4 X 1.5	9.4	90.92	180.3
15345026	4 G 1.5	9.4	90.92	180.3

Article number	Number of cores and mm² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
15345070	7 X 1.5	11.6	160.19	261
15345071	9 X 1.5	14.7	205.47	391
15345072	12 X 1.5	15.7	273.53	448
15345073	19 X 1.5	18.6	388.32	649
15345074	24 X 1.5	21.3	485.98	801
15345075	32 X 1.5	24	644.59	1067
15345076	37 X 1.5	25.2	732.73	1203
15345003	2 X 2.5	9	80.38	160
15345004	3 X 2.5	9.5	107.46	196.2
15345027	3 G 2.5	9.5	107.46	196.2
15345005	4 X 2.5	10.8	147.08	258.5
15345028	4 G 2.5	10.8	147.08	258.5
15345077	7 X 2.5	13.2	235.62	362
15345078	9 X 2.5	16.5	319.89	538
15345079	12 X 2.5	17.7	403.78	615
15345080	19 X 2.5	20.6	582.85	875
15345081	24 X 2.5	24.3	762.28	1160
15345006	2 X 4	10.8	126.68	237.2
15345007	3 X 4	11.4	167.66	289.6
15345008	4 X 4	12.4	210.89	353.9
15345009	2 X 6	11.8	171.91	294.3
15345010	3 X 6	12.5	233.52	368.3
15345011	4 X 6	14	297.39	470.2
15345012	2 X 10	14.2	258.83	427.9
15345013	3 X 10	15.2	378.94	571.9
15345014	4 X 10	16.6	485.83	711.2
15345015	2 X 16	16.4	411.94	637.3
15345016	3 X 16	17.8	574.29	836.3
15345017	4 X 16	19.4	741.03	1040.4
15345018	2 X 25	20.2	608.98	939.8
15345019	3 X 25	21.4	861.67	1219.1
15345020	4 X 25	24.1	1147.27	1601.3
15345021	2 X 35	23.2	852.85	1286.7
15345022	3 X 35	24.6	1203.78	1668.2
15345023	2 X 50	27.6	1175.17	1732.8
15345024	3 X 50	29.8	1710.69	2336.3

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

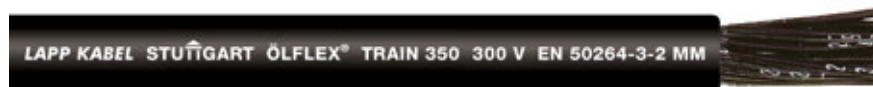
Power and control cables

Special applications • Rolling stock



ÖLFLEX® TRAIN 350 300V

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: -50°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
- For use in railway vehicles, for fixed installations and applications where limited movement may occur

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
- Current rating acc. to EN 50355, appendix A

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



Core identification code
Black with white numbers



Conductor stranding
Fine-wired/Finely stranded acc. to IEC 60228, conductor class 5



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



Nominal voltage
U₀/U: 300/500 V
U_m AC 600 V
V₀ 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 +120°C (20.000 h)
-50°C acc. to GOST 20.57.406-81
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 350 300V				
15350000	2 X 1	5.4	19.2	54
15350001	4 X 1	6.2	38.4	81
15350002	7 X 1	7.7	67.2	128
15350003	9 X 1	9.6	86.4	179
15350004	12 X 1	10.1	115.2	204
15350005	19 X 1	12.1	182.4	309
15350006	24 X 1	14.4	230.4	396
15350007	32 X 1	15.9	307.2	520
15350008	37 X 1	16.7	355.2	580
15350009	40 X 1	17.8	384	644
15350010	4 X 1.5	7.6	57.6	116

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
15350011	7 X 1.5	9.2	100.8	184
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	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	169
15350019	7 X 2.5	10.6	168	270
15350020	9 X 2.5	13.7	216	402
15350021	12 X 2.5	14.5	288	461
15350022	19 X 2.5	17	456	680
15350023	24 X 2.5	20.1	576	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 and graphics are not to scale and do not represent detailed images of the respective products.



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: -50°C up to 120°C
- Highly oil- and fuel-resistant

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, 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
- Current rating acc. to EN 50355, appendix A

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

- Core identification code**
 Black with white numbers
- Conductor stranding**
 Fine-wired/Finely stranded acc. to IEC 60228, conductor class 5
- Minimum bending radius**
 Fixed installation:
 ≤ 12 mm: 3 × OD
 > 12 mm: 4 × OD
 Occasional flexing:
 ≤ 12 mm: 4 × OD
 > 12 mm ≤ 20 mm: 5 × OD
 > 20 mm: 6 × OD
 (OD = outer diameter)
- Nominal voltage**
 U₀/U: 300/500 V
 U_m AC 600 V
 V₀ DC 450 V
- Test voltage**
 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 +120°C (20.000 h)
 -50°C acc. to GOST 20.57.406-81
 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	6.2	39.27	71
15355001	4 X 1	7.2	64.06	109
15355002	7 X 1	8.5	97.15	152
15355003	9 X 1	10.8	137.41	234
15355004	12 X 1	11.3	170.09	258
15355005	19 X 1	13.7	261.77	395
15355006	24 X 1	15.6	324.51	482
15355007	32 X 1	17.1	411.92	606
15355008	37 X 1	17.9	471.56	686
15355009	40 X 1	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	240.0	371
15355014	19 X 1.5	16.2	369.0	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 and graphics are not to scale and do not represent detailed images of the respective products.



ÖLFLEX® TRAIN 361 1.8 kV

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: -50°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, 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 NFC 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)
- Current rating acc. to EN 50355, appendix A

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



Conductor stranding

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



Minimum bending radius

Fixed installation:
 ≤ 12 mm: 3 × OD
 > 12 mm: 4 × OD
 Occasional flexing:
 ≤ 12 mm: 4 × OD
 > 12 mm ≤ 20 mm: 5 × OD
 > 20 mm: 6 × 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 +120°C (20.000 h)
 -50°C acc. to GOST 20.57.406-81
 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 361 1,8kV				
15361000	1.5	5.6	14.4	48
15361001	2.5	6	24	61
15361002	4	6.7	38.4	80
15361003	6	7.2	57.6	105
15361004	10	8.2	96	153
15361005	16	9.2	153.6	224
15361006	25	10.5	240	323
15361007	35	11.7	336	431
15361008	50	13.7	480	592
15361009	70	15.4	672	801
15361010	95	17.8	912	1076
15361011	120	19.4	1152	1329
15361012	150	21.4	1440	1634
15361013	185	23.3	1776	2011
15361014	240	26.8	2304	2571
15361015	300	28	2880	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 and graphics are not to scale and do not represent detailed images of the respective products.



ÖLFLEX® TRAIN 371 1.8 kV

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: -50°C up to 120°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, 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)
- Current rating acc. to EN 50355, appendix A

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

- Conductor stranding**
 Fine-wired/Finely stranded acc. to IEC 60228, conductor class 5
- Minimum bending radius**
 Fixed installation:
 ≤ 12 mm: 3 × OD
 > 12 mm: 4 × OD
 Occasional flexing:
 ≤ 12 mm: 4 × OD
 > 12 mm ≤ 20 mm: 5 × OD
 > 20 mm: 6 × 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 +120°C (20.000 h)
 -50°C acc. to GOST 20.57.406-81
 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	67
15371002	4	6.9	38.4	90
15371003	6	7.4	57.6	116
15371004	10	8.8	96	173
15371005	16	9.8	153.6	244
15371006	25	12.1	240	374
15371007	35	13.3	336	488
15371008	50	15.3	480	659
15371009	70	17	672	875
15371010	95	19.8	912	1180
15371011	120	21.4	1152	1441
15371012	150	23.8	1440	1788
15371013	185	25.7	1776	2166
15371014	240	29.2	2304	2775
15371015	300	30.4	2880	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

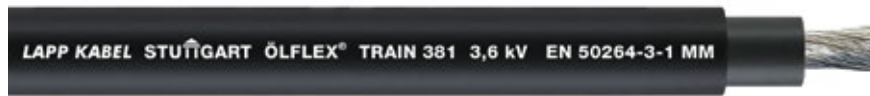
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).

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



ÖLFLEX® TRAIN 381 3.6 kV

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: -50°C up to 120°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, 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 NFC 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
- Current rating acc. to EN 50355, appendix A

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



Conductor stranding

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



Minimum bending radius

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



Nominal voltage

U₀/U AC 3.6/6 kV
 U_m AC 7.2 kV
 V₀ DC 5.4 kV



Test voltage

11 kV AC; 26 kV DC



Temperature range

Fixed installation:
 -45°C to +120°C (20.000 h)
 -50°C acc. to GOST 20.57.406-81
 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	24	118
15381001	4	9.7	38.4	146
15381002	6	10.2	57.6	176
15381003	10	11.2	96	232
15381004	16	12.2	153.6	303
15381005	25	14.5	240	445
15381006	35	15.7	336	566
15381007	50	17.7	480	747
15381008	70	19.4	672	972
15381009	95	21.4	912	1250
15381010	120	23.4	1152	1557
15381011	150	25.4	1440	1895
15381012	185	27.5	1776	2281
15381013	240	31.8	2304	2982
15381014	300	33	2880	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 and graphics are not to scale and do not represent detailed images of the respective products.



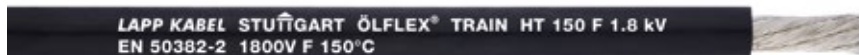
ÖLFLEX® TRAIN HT 150 F 1.8 kV

Single-core cable according to EN 50382-2 type F for high requirements in railway applications



Info

- Meets EN 50382-2 type F and EN 45545-2
- High temperature resistance: -40°C up to +150°C
- Highly oil- and fuel-resistant



Benefits

- Good flexibility – easy installation with tight space requirements
- Good chemical resistance
- For high ambient temperatures
- Reduced flame spreading increases the protection against damage to persons and property in the event of a fire

Application range

- For use in railway vehicles, for fixed and protected installation 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
- Chemical properties:
 - Oil resistant acc. to EN 50382-2
 - Acid resistant acc. to EN 50382-2
 - Alkali resistant acc. to EN 50382-2
 - Ozone resistant acc. to EN 50382-2
- Current rating acc. to EN 50355, appendix A

Norm references / Approvals

- EN 50382-2 type F
- EN 45545-2 HL1, HL2, HL3

Product Make-up

- Tinned-copper strand, fine-wire
- Insulation: Silicone rubber compound, type EI 111
- Colour: Black

Technical data

- Conductor stranding**
 Fine-wired/Finely stranded acc. to IEC 60228, conductor class 5
- Minimum bending radius**
 Fixed installation: 3 × outer diameter
 Occasional flexing: 5 × 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**
 -40°C to +150°C

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN HT 150 F 1.8kV				
15382000	1 X 1.5	6.8	14.4	57
15382001	1 X 2.5	7.3	24	69
15382002	1 X 4	7.8	38.4	86
15382003	1 X 6	8.4	57.6	107
15382004	1 X 10	9.3	96	151
15382005	1 X 16	10.4	153.6	219
15382006	1 X 25	11.8	240	305
15382007	1 X 35	13.1	336	394
15382008	1 X 50	14.7	480	540
15382009	1 X 70	16.5	672	725
15382010	1 X 95	18.5	912	961
15382011	1 X 120	20.2	1152	1182
15382012	1 X 150	21.8	1440	1438
15382013	1 X 185	23.6	1776	1760
15382014	1 X 240	26.2	2304	2249
15382015	1 X 300	28.7	2880	2680
15382016	1 X 400	32.4	3840	3450

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



ÖLFLEX® TRAIN HT 150 F 3.6 kV

Single-core cable according to EN 50382-2 type F for high requirements in railway applications



Info

- Meets EN 50382-2 type F and EN 45545-2
- High temperature resistance: -40°C up to +150°C
- Highly oil- and fuel-resistant

Benefits

- Good flexibility – easy installation with tight space requirements
- Good chemical resistance
- For high ambient temperatures
- 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, for fixed and protected installation 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
- Chemical properties:
 - Oil resistant acc. to EN 50382-2
 - Acid resistant acc. to EN 50382-2
 - Alkali resistant acc. to EN 50382-2
 - Ozone resistant acc. to EN 50382-2
- Current rating acc. to EN 50355, appendix A

Norm references / Approvals

- EN 50382-2 type F
- EN 45545-2 HL1, HL2, HL3

Product Make-up

- Tinned-copper strand, fine-wire
- Insulation: Silicone rubber compound, type EI 111
- Colour: Black

Technical data



Conductor stranding

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



Minimum bending radius

Fixed installation:
3 × outer diameter
Occasional flexing:
5 × outer diameter



Nominal voltage

U₀/U AC 3.6/6 kV
U_m AC 7.2 kV
V₀ DC 5.4 kV



Test voltage

11 kV AC; 26 kV DC



Temperature range

Fixed installation:
-40°C to +150°C

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN HT 150 F 3.6kV				
15382020	1 X 2.5	8.3	24	84
15382021	1 X 4	8.8	38.4	102
15382022	1 X 6	9.8	57.6	124
15382023	1 X 10	10.3	96	170
15382024	1 X 16	11.4	153.6	241
15382025	1 X 25	12.8	240	329
15382026	1 X 35	14.1	336	422
15382027	1 X 50	15.7	480	571
15382028	1 X 70	17.5	672	760
15382029	1 X 95	19	912	984
15382030	1 X 120	21	1152	1216
15382031	1 X 150	22.6	1440	1474
15382032	1 X 185	24.6	1776	1810
15382033	1 X 240	27.6	2304	2326
15382034	1 X 300	30.1	2880	2780
15382035	1 X 400	33.4	3840	3610

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



ÖLFLEX® TRAIN HT 150 FF 1.8 kV

Single-core cable according to EN 50382-2 type FF for high requirements in railway applications



Info

- Meets EN 50382-2 type FF and EN 45545-2
- High temperature resistance: -40°C up to +150°C
- Highly oil- and fuel-resistant

Benefits

- Good flexibility – easy installation with tight space requirements
- Good chemical resistance
- For high ambient temperatures
- Reduced flame spreading increases the protection against damage to persons and property in the event of a fire

Application range

- For use in railway vehicles, 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

- Chemical properties:
 - Oil resistant acc. to EN 50382-2
 - Acid resistant acc. to EN 50382-2
 - Alkali resistant acc. to EN 50382-2
 - Ozone resistant acc. to EN 50382-2
- Current rating acc. to EN 50355, appendix A

Norm references / Approvals

- EN 50382-2 type FF
- EN 45545-2 HL1, HL2, HL3

Product Make-up

- Tinned-copper strand, fine-wire
- Insulation: Silicone rubber compound, type EI 111
- Wrapping: Halogen-free plastic foil (optional)
- Outer sheath: Silicone rubber compound, type EM 107
- Outer sheath colour: Black

Technical data

- Conductor stranding**
 Fine-wired/Finely stranded acc. to IEC 60228, conductor class 5
- Minimum bending radius**
 Fixed installation: 3 × outer diameter
 Occasional flexing: 5 × 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: -40°C to +150°C

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN HT 150 FF 1.8kV				
15382040	1 X 1.5	7.4	14.4	63
15382041	1 X 2.5	7.8	24	76
15382042	1 X 4	8.4	38.4	93
15382043	1 X 6	8.9	57.6	115
15382044	1 X 10	10.2	96	168
15382045	1 X 16	11.4	153.6	236
15382046	1 X 25	13.4	240	339
15382047	1 X 35	14.8	336	432
15382048	1 X 50	16.3	480	583
15382049	1 X 70	18.3	672	780
15382050	1 X 95	20.6	912	1039
15382051	1 X 120	22.6	1152	1276
15382052	1 X 150	24.2	1440	1539
15382053	1 X 185	26.6	1776	1871
15382054	1 X 240	29.4	2304	2417
15382055	1 X 300	32.1	2880	2760
15382056	1 X 400	36.1	3840	3620

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



ÖLFLEX® TRAIN HT 150 FF 3.6 kV

Single-core cable according to EN 50382-2 type FF for high requirements in railway applications



Info

- Meets EN 50382-2 type FF and EN 45545-2
- High temperature resistance: -40°C up to +150°C
- Highly oil- and fuel-resistant

Benefits

- Good flexibility – easy installation with tight space requirements
- Good chemical resistance
- For high ambient temperatures
- Reduced flame spreading increases the protection against damage to persons and property in the event of a fire

- Chemical properties:
 - Oil resistant acc. to EN 50382-2
 - Acid resistant acc. to EN 50382-2
 - Alkali resistant acc. to EN 50382-2
 - Ozone resistant acc. to EN 50382-2
- Current rating acc. to EN 50355, appendix A

Norm references / Approvals

- EN 50382-2 type FF
- EN 45545-2 HL1, HL2, HL3

Product Make-up

- Tinned-copper strand, fine-wire
- Insulation: Silicone rubber compound, type EI 111
- Wrapping: Halogen-free plastic foil (optional)
- Outer sheath: Silicone rubber compound, type EM 107
- Outer sheath colour: Black

Application range

- For use in railway vehicles, 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

Technical data



Conductor stranding

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



Minimum bending radius

Fixed installation:
3 × outer diameter
Occasional flexing:
5 × outer diameter



Nominal voltage

U₀/U AC 3.6/6 kV
U_m AC 7.2 kV
V₀ DC 5.4 kV



Test voltage

11 kV AC; 26 kV DC



Temperature range

Fixed installation:
-40°C to +150°C

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN HT 150 F 3.6kV				
15382060	1 X 2.5	10.8	24	122
15382061	1 X 4	11.3	38.4	143
15382062	1 X 6	11.9	57.6	167
15382063	1 X 10	12.8	96	217
15382064	1 X 16	13.9	153.6	291
15382065	1 X 25	16	240	403
15382066	1 X 35	17.3	336	503
15382067	1 X 50	19	480	668
15382068	1 X 70	20.8	672	867
15382069	1 X 95	22.6	912	1110
15382070	1 X 120	24.3	1152	1343
15382071	1 X 150	26.2	1440	1621
15382072	1 X 185	28.7	1776	2004
15382073	1 X 240	31.9	2304	2555
15382074	1 X 300	34.4	2880	3070
15382075	1 X 400	38	3840	3970

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



ÖLFLEX® TRAIN HT 150 FX 3.6 kV

Single-core cable according to EN 50382-2 type FX for high requirements in railway applications



Info

- Meets EN 50382-2 type FX and EN 45545-2
- High temperature resistance: -40°C up to +150°C
- Highly oil- and fuel-resistant

Benefits

- Good flexibility – easy installation with tight space requirements
- Good chemical resistance
- For high ambient temperatures
- 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, 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

Chemical properties:

- Oil resistant acc. to EN 50382-2
- Acid resistant acc. to EN 50382-2
- Alkali resistant acc. to EN 50382-2
- Ozone resistant acc. to EN 50382-2
- Current rating acc. to EN 50355, appendix A

Norm references / Approvals

- EN 50382-2 type FX
- EN 45545-2 HL1, HL2, HL3

Product Make-up

- Tinned-copper strand, extra-fine-wired
- Insulation: Silicone rubber compound, type EI 111
- Colour: Black

Technical data



Conductor stranding
Extra-fine-wire
acc. to VDE0295, class 6/
IEC 60228, conductor class 6



Minimum bending radius
Fixed installation:
3 × outer diameter
Occasional flexing:
5 × outer diameter



Nominal voltage
U₀/U AC 3,6/6 kV
U_m AC 7,2 kV
V₀ DC 5,4 kV



Test voltage
11 kV AC; 26 kV DC



Temperature range
Fixed installation:
-40°C to +150°C

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TRAIN HT 150 F 1.8kV				
15382080	1 X 50	16.5	480	580
15382081	1 X 70	18.4	672	770
15382082	1 X 95	19.9	912	995
15382083	1 X 120	21.8	1152	1240
15382084	1 X 150	23.5	1440	1485
15382085	1 X 185	25.4	1776	1830

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



ÖLFLEX® CLASSIC 110 H SF

Halogen-free control cable, EN 45545-2 certified, oil resistant and very flexible



Info

- EN 45545-2 HL 1, HL2, HL3
- High flexibility and oil-resistance
- Other sizes on request

Benefits

- Easy handling and installation due to very flexible cable type
- Wide application range due to excellent product features
- EN 45545-2 certified for rolling stock applications

Application range

- Railway applications
- Public buildings like airports or railway stations
- Plant engineering, Industrial machinery Heating and air-conditioning systems Stage applications
- Particularly where human and animal life as well as valuable property are exposed to high risk of fire hazards

Product features

- Flame-retardant according to IEC 60332-1-2 (flame spread on a single cable)
- No flame-propagation according to IEC 60332-3-24 respectively IEC 60332-3-25 (Flame spread on vertical cable or wire bundle)

- Halogen-free according to IEC 60754-1 (amount of halogen acid gas) Corrosiveness of combustion gases according to IEC 60754-2 (degree of acidity)
- Low smoke density according to IEC 61034-2
- Oil-resistant according to EN 50363-4-1 (TM5) and UL OIL RES I and UL OIL RES II
- UV and weather-resistant according to ISO 4892-2
- Ozone-resistant according to EN 50396

Norm references / Approvals

- EN 45545-2 HL 1, HL2, HL3
- Based on EN 50525-3-11
- Based on EN 50525-2-51

Product Make-up

- Extra-fine wire strand made of bare copper wires
- Core insulation: Halogen-free
- Cores twisted in layers
- Outer sheath: Special halogen-free compound, black

Technical data



Core identification code

Black with white numbers according to VDE 0293-1



Conductor stranding

Extra-fine wire according to VDE 0295, class 6/IEC 60228 class 6



Minimum bending radius

Occasional flexing:
10 × outer diameter
Fixed installation:
4 × outer diameter



Nominal voltage

U0/U: 300/500 V



Test voltage

4000 V



Protective conductor

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



Temperature range

Occasional flexing: -30°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® CLASSIC 110 H SF				
1002140	5 G 0.5	6.3	24	83
1002141	3 G 1	6.1	28.8	75
1002142	5 G 1	7.3	48	123
1002143	7 G 1	8.1	67	159
1002144	13 G 1	11.4	124.8	295
1002145	25 G 1	15	240	515
1002146	43 G 1	19.8	412.8	899
1002147	73 G 1	25.3	700.8	1402
1002148	3 G 1.5	6.8	43.2	96
1002149	5 G 1.5	8.3	72	163
1002150	7 G 1.5	9	100.8	208
1002151	13 G 1.5	13	187.2	394
1002152	25 G 1.5	17.2	360	704
1002153	43 G 1.5	22.6	619.2	1198
1002154	61 G 1.5	25.6	878.4	1637
1002155	3 G 2.5	8.3	72	147
1002156	5 G 2.5	10.1	120	255
1002157	7 G 2.5	11.2	168	333
1002158	3 G 6	11.7	172.8	321
1002159	5 G 6	14.5	288	541
1002160	7 G 6	16	403.2	712
1002161	5 G 10	18.4	480	915
1002162	5 G 16	22.3	768	1344
1002163	5 G 35	31.1	1680	2778

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.

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

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

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

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



ÖLFLEX® CLASSIC 115 CH SF

Screened halogen-free control cable, oil resistant and very flexible



Info

- EN 45545-2 HL1, HL2, HL3
- High flexibility and oil-resistance
- Other sizes on request



Benefits

- Easy handling and installation due to very flexible cable type
- Wide application range due to excellent product features
- EN 45545-2 certified for rolling stock applications
- Copper screening complies with EMC requirements and protects against electromagnetic interference

Application range

- Railway applications
- Public buildings like airports or railway stations
- Plant engineering, Industrial machinery Heating and air-conditioning systems Stage applications
- Particularly where human and animal life as well as valuable property are exposed to high risk of fire hazards
- In EMC-sensitive environments

Product features

- Flame-retardant according to IEC 60332-1-2 (flame spread on a single cable)
- No flame-propagation according to IEC 60332-3-24 respectively IEC 60332-3-25 (Flame spread on vertical cable or wire bundle)

- Halogen-free according to IEC 60754-1 (amount of halogen acid gas) Corrosiveness of combustion gases according to IEC 60754-2 (degree of acidity)
- Low smoke density according to IEC 61034-2
- Oil-resistant according to EN 50363-4-1 (TM5) and UL OIL RES I and UL OIL RES II
- UV and weather-resistant according to ISO 4892-2
- Ozone-resistant according to EN 50396

Norm references / Approvals

- EN 45545-2 HL1, HL2, HL3
- Based on EN 50525-3-11
- Based on EN 50525-2-51

Product Make-up

- Extra-fine wire strand made of bare copper wires
- Core insulation: Halogen-free
- Cores twisted in layers
- Wrapping: Halogen-free plastic foil
- Tinned-copper braiding
- Outer sheath: Special halogen-free compound, black

Technical data

- Core identification code**
Black with white numbers according to VDE 0293-1
- Conductor stranding**
Extra-fine wire according to VDE 0295, class 6/IEC 60228 class 6
- Minimum bending radius**
Occasional flexing: 15 × outer diameter
Fixed installation: 6 × outer diameter
- Nominal voltage**
U0/U: 300/500 V
- Test voltage**
Core/core: 4000 V
Core/screen: 2000 V
- Protective conductor**
G = with GN-YE protective conductor
X = without protective conductor
- Temperature range**
Occasional flexing: -30°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® CLASSIC 115 CH SF				
1002164	5 G 0.5	7.1	43.3	97
1002165	36 X 0.5	16.1	267.1	538
1002166	3 G 0.75	6.6	40.9	86
1002167	5 G 0.75	7.9	58.1	122
1002168	7 G 0.75	8.5	85.8	160
1002169	25 G 0.75	15.1	248.4	485
1002170	7 G 1	8.9	92.3	172
1002171	13 G 1	12.4	162	318
1002172	25 G 1	16.2	306	600
1002173	2 X 1.5	7.2	56.5	103
1002174	3 G 1.5	7.6	65.3	119
1002175	5 G 1.5	9.1	108.9	186
1002176	4 G 2.5	10	124.9	217
1002177	4 G 4	11.9	188.2	303
1002178	4 G 6	14.2	271.7	443
1002179	4 G 10	17.5	453.8	725

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.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 × 500 m drum or 5 × 100 m coils).
Single lengths for sizes: ≥ 4G50 max. 500 m
Photographs and graphics are not to scale and do not represent detailed images of the respective products.



ÖLFLEX® CLASSIC 115 CH SF (TP)

Screened halogen-free control cable, EN 45545-2 certified, oil resistant, very flexible with twisted pairs



Info

- EN 45545-2 HL 1, HL2, HL3
- High flexibility and oil-resistance
- Other sizes on request

Benefits

- Easy handling and installation due to very flexible cable type
- Wide application range due to excellent product features
- EN 45545-2 certified for rolling stock applications
- Copper screening complies with EMC requirements and protects against electromagnetic interference

Application range

- Railway applications
- Public buildings like airports or railway stations
- Plant engineering, Industrial machinery Heating and air-conditioning systems Stage applications
- Particularly where human and animal life as well as valuable property are exposed to high risk of fire hazards
- In EMC-sensitive environments

Product features

- Flame-retardant according to IEC 60332-1-2 (flame spread on a single cable)
- No flame-propagation according to IEC 60332-3-24 respectively IEC 60332-3-25 (Flame spread on vertical cable or wire bundle)

- Halogen-free according to IEC 60754-1 (amount of halogen acid gas) Corrosiveness of combustion gases according to IEC 60754-2 (degree of acidity)
- Low smoke density according to IEC 61034-2
- Oil-resistant according to EN 50363-4-1 (TM5) and UL OIL RES I and UL OIL RES II
- UV and weather-resistant according to ISO 4892-2
- Ozone-resistant according to EN 50396

Norm references / Approvals

- EN 45545-2 HL 1, HL2, HL3
- Based on EN 50525-3-11
- Based on EN 50525-2-51

Product Make-up

- Extra-fine wire strand made of bare copper wires
- Core insulation: Halogen-free
- TP structure
- Wrapping: Halogen-free plastic foil
- Tinned-copper braiding
- Outer sheath: Special halogen-free compound, black

Technical data



Core identification code

Coloured according to DIN 47100



Conductor stranding

Extra-fine wire according to VDE 0295, class 6/IEC 60228 class 6



Minimum bending radius

Occasional flexing:
15 × outer diameter
Fixed installation:
6 × outer diameter



Nominal voltage

U0/U: 300/500 V



Test voltage

Core/core: 4000 V
Core/screen: 2000 V



Protective conductor

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



Temperature range

Occasional flexing: -30°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® CLASSIC 115 CH SF (TP)				
1002180	3 X (2 × 0.75)	9.6	69	171
1002181	4 X (2 × 0.75)	10.9	90.4	202
1002182	6 X (2 × 0.75)	12.3	130	287
1002183	12 X (2 × 0.75)	16.4	271.8	530
1002184	2 X (2 × 1)	9.2	72.1	174
1002185	4 X (2 × 1)	11.5	126.2	244
1002186	12 X (2 × 1)	17.4	336.5	615
1002187	3 X (2 × 1.5)	11.7	139.5	259

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.

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

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

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

Single lengths for sizes: ≥ 4G50 max. 500 m

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



UNITRONIC® TRAIN

Bus cables – MVB and WTB – Electron beam cross-linked for high requirements in railway applications



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

- Peak operating voltage**
(not for power applications)
125 V
- Minimum bending radius**
Flexing:
10 × outer diameter
Fixed installation:
6 × outer diameter
- Test voltage**
Core/core: 1000 V
Core/screen: 1000 V
- Characteristic impedance**
120 ohm (±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 1 × 2 × 0.5	1 × 2 × 0.5	7.6	29
2173001	UNITRONIC® TRAIN MVB 1 × 2 × 0.5 + 1 × 0.5	1 × 2 × 0.5 + 1 × 0.5	7.6	34
2173002	UNITRONIC® TRAIN MVB 2 × 2 × 0.5	2 × 2 × 0.5	8.3	40
2173003	UNITRONIC® TRAIN MVB 2 × 2 × 0.5 + 4 × 0.25	2 × 2 × 0.5 + 4 × 0.25	8.1	50
Cables for WTB				
2173004	UNITRONIC® TRAIN WTB 1 × 2 × 0.75	1 × 2 × 0.75	8.4	41

Photographs and graphics 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 50264-3-1 type XM and EN 45545-2
- Cat.5e Performance up to 100/1000 MBit/s
- Cat.6A & 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

- 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

Application range

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

Norm references / Approvals

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

Product Make-up

- 7-wire tinned stranded copper 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



Peak operating voltage
(not for power applications)
125 V



Minimum bending radius
Flexing:
10 × outer diameter
Fixed installation:
8 × outer diameter



Test voltage
Core/core: 1000 V
Core/screen: 1000 V



Characteristic impedance
nom. 100 Ω acc. to IEC 61156-6



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

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter (mm)	Outer diameter (mm)	Copper index (kg/km)
Cat.5e, 2-pair version					
2170906	ETHERLINE® TRAIN FLEX Cat.5e 1 × 4 × 22/7 PE	1 × 4 × AWG22/7	1.5	6.5	30
2170910	ETHERLINE® TRAIN FLEX Cat.5e 1 × 4 × 0.5 PE	1 × 4 × 0.5/7	2	7.6	41
Cat.5e, 4-pair version					
2170907	ETHERLINE® TRAIN Cat.5e 4 × 2 × 24/7 PE	4 × 2 × AWG24/7	1.2	7.7	38
Cat.6_A					
2170908	ETHERLINE® TRAIN FLEX Cat.6 _A 4 × 2 × 24/7 PE	4 × 2 × AWG24/7	1.4	8.4	38
Cat.7					
2170909	ETHERLINE® TRAIN FLEX Cat.7 4 × 2 × 24/7 PE	4 × 2 × AWG24/7	1.4	8.4	43

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

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		IEC	UL/USR	CSA/CNR	IEC	UL/USR	CSA/CNR	
 													
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		●				Koax	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				●		ø 2.5/4.0 mm ø 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	18A	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	–	–	–

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

At a glance

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® offers two different modular systems:
 - the MC system with an easy to assemble plastic frame
 - the MH system with the metal frame, mateable with the market standard

The two systems are stand alone and cannot be combined.

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



EPIC® H-A 3

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



EPIC® H-A 4

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



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

Benefits

- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL3.
- 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

- Recommended crimping tool when conductor end-sleeves are used: PEW 8.186

Technical data



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



Pollution degree

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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EPIC® H-BE 6 Screw termination

The proven standard inserts for easy assembly



Info

- Proven screw for easy installation
- Railway applications

EPIC® H-BE 6 Push-In termination

The proven standard inserts for easy assembly



Info

- Push-In version – fast and easy tool free connection technology
- Multifunctional insert for versatile applications

Suitable housing

- EPIC® ULTRA H-B 6
- EPIC® H-B 6 Housings
- EPIC® QUICK & EASY Mounting system

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 HL3.
- UL tested for application in control cabinets according UL 508/UL 2237

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 2 mm 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 HL3.
- The EPIC® H-BE series is suitable for applications that require a reliable connection when working with high voltages and currents

Technical data



Rated voltage (V)

IEC: 500 V UL: 600 V CSA: 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



Pollution degree

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

500



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

- Kraftform® adjustable torque screwdriver/Kraftform Kompakt® Set
- 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 and graphics 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 10
- EPIC® H-B 10 Housings
- EPIC® QUICK & EASY Mounting systems

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 HL3.
- UL tested for application in control cabinets according UL 508 / UL 2237

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 2 mm test pin 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 HL3.
- The EPIC® H-BE series is suitable for applications that require a reliable connection when working with high voltages and currents

Technical data

	Rated voltage (V) IEC: 500 V UL: 600 V CSA: 600 V	Stripping length (mm) EPIC® H-BE 10 Screw termination 8 EPIC® H-BE 10 Push-In termination 10	
	Rated impulse voltage 6 kV	Cycle of mechanical operation 500	
	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		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
	Pollution degree 3		Temperature range -40°C to +100°C, short-term up to +125°C
	Contact resistance < 2 mOhm		
	Contacts Copper alloy, hard silver-plated		
	Number of contacts 10 + PE		
	Termination methods EPIC® H-BE 6 Screw termination Screw termination: 0.5 – 2.5 mm ² EPIC® H-BE 10 Push-In termination Push-In termination: 0.14 – 2.5 mm ²		

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

- Kraftform® adjustable torque screwdriver/Kraftform Kompakt® Set
- 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 and graphics are not to scale and do not represent detailed images of the respective products.



EPIC® H-BE 16 Screw termination

The proven standard inserts for easy assembly



Info

- Proven screw for easy installation
- Screw, crimp, cage clamp and Push-In version – freely combinable
- Also as EPIC® H-BE 32 available

EPIC® H-BE 16 Push-In termination

The proven standard inserts for easy assembly



Info

- Push-In version – fast and easy tool free connection technology
- Multifunctional insert for versatile applications

Suitable housing

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

Similar products

EPIC® H-BE 16 Screw termination

- 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 HL3.
- UL tested for application in control cabinets according UL 508 / UL 2237

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 2 mm 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 HL3.

Technical data



Rated voltage (V)

IEC: 500 V UL: 600 V CSA: 600 V

Rated impulse voltage

6 kV



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



Pollution degree

3

Contact resistance

< 2 mOhm



Contacts

Copper alloy, hard silver-plated



Number of contacts

16 + PE



Termination methods

EPIC® H-BE 16 Screw termination

Screw termination: 0.5 – 2.5 mm²

EPIC® H-BE 16 Push-In termination

Push-In termination: 0.14 – 2.5 mm²

Stripping length (mm)

EPIC® H-BE 16 Screw termination

8

EPIC® H-BE 16 Push-In termination

10



Cycle of mechanical operation

500



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



Temperature range

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

- The EPIC® H-BE series is suitable for applications that require a reliable connection when working with high voltages and currents

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

Suitable tools

EPIC® H-BE 16 Screw termination

- Kraftform® adjustable torque screwdriver/Kraftform Kompakt® Set
- 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 and graphics 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 48 available
- Railway applications



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

Similar products

EPIC® H-BE 24 Screw termination

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

Benefits

EPIC® H-BE 24 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 to EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL3.
- UL tested for application in control cabinets according to UL 508 / UL 2237

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 2 mm test tip for easy testing of Push-In inserts
- Railway applications
 - Fire protection on railway vehicles: Test according to EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL3.
- The EPIC® H-BE series is suitable for applications that require a reliable connection when working with high voltages and currents

Technical data



Rated voltage (V)

IEC: 500 V UL: 600 V CSA: 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



Pollution degree

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 mm²

EPIC® H-BE 24 Push-In termination

Push-In termination: 0.14 – 2.5 mm²

Stripping length (mm)

EPIC® H-BE 24 Screw termination

8

EPIC® H-BE 24 Push-In termination

10



Cycle of mechanical operation

500



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

Suitable tools

EPIC® H-BE 24 Screw termination

- Kraftform® adjustable torque screwdriver/Kraftform Kompakt® Set
- 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

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For current information see: www.lappgroup.com



EPIC® H-BS 6

Inserts for high currents.



Info

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

EPIC® H-BS 12

Inserts for high currents.



Info

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

Suitable housing

EPIC® H-BS 6

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

EPIC® H-BS 12

- EPIC® H-B 32 Housing

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 HL3.

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



Rated voltage (V)

IEC: 500 V UL: 600 V CSA: 600 V
Conductor – conductor: 690 V

Rated impulse voltage

6 kV



Rated current (A)

IEC: 35 A UL: 35 A CSA: 35 A



Pollution degree

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 mm²

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

- Kraftform® adjustable torque screwdriver/Kraftform Kompakt® Set

EPIC® H-BS 12

- Kraftform® adjustable torque screwdriver/Kraftform Kompakt® Set

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

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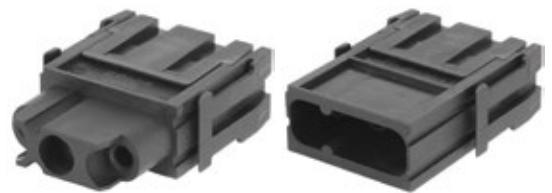
EPIC® MH 2

High flexibility by the use of any combination of inserts in one connector



EPIC® MH 3

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard
- High power module 2pole for compact power transmission



Info

- Modular connector system, plugable with the market standard
- Power module 3pole for compact power transmission

Suitable housing

- EPIC® H-B housing use in high version

Benefits

- Crimp connection for permanent vibration proof contact
- EPIC® MH system is mateable with the market standard
- The mix of different functions in one plug guarantees high flexibility
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2.
 - Requirement sets R22 and R23.
 - Hazard level HL1, HL2 and HL3.

EPIC® MH 2

- High power module 2pole for compact power transmission

EPIC® MH 3

- High power module 3pole for compact power transmission

Application range

- Mechanical engineering
- Robotics industry
- Plant engineering
- Renewable energy
- Railway applications/vehicle construction

Technical data



Rated voltage (V)

EPIC® MH 2
 1000 V
EPIC® MH 3
 400 V (conductor – ground)
 690 V (conductor – conductor)

Rated impulse voltage

8 kV



Rated current (A)

EPIC® MH 2
 100 A
EPIC® MH 3
 40 A



Pollution degree

3



Flammability

UL94 V-0

Contact resistance

< 5 mOhm



Number of contacts

EPIC® MH 2
 2
EPIC® MH 3
 3



Termination methods

EPIC® MH 2
 Crimp termination: 10 – 35 mm²
EPIC® MH 3
 Crimp termination: 1.5 – 10 mm²



Material

Polyamide, glass fibre-reinforced



Cycle of mechanical operation

500



Certifications

UL-tested:
 UL File Number: E75770



Temperature range

-40°C to +125°C

Article number	Article description	Contact type	Number of operating contacts	Slots	Pieces / PU
EPIC® MH 2					
44423212	EPIC® MHS 2 CM	male	2	2	10
44423213	EPIC® MHB 2 CM	female	2	2	10
EPIC® MH 3					
44423214	EPIC® MHS 3 CM	male	3	1	10
44423215	EPIC® MHB 3 CM	female	3	1	10

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EPIC® MH 3 + 4

The mixed assembly guarantees high flexibility. For applications in mechanical and plant engineering, for printing machines and slide-in technology.



Info

- Modular connector system, mateable with the market standard
- Modul with 3 power contacts and 4 signal contacts

EPIC® MH 4

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard
- Power module 4 pole for compact power transmission

Suitable housing

EPIC® MH 4

- EPIC® H-B housing use in high version

Benefits

- Crimp connection for permanent vibration proof contact
- EPIC® MH system is mateable with the market standard
- The mix of different functions in one plug guarantees high flexibility
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL3.

EPIC® MH 3 + 4

- Hybridmodul for energy- and signal transmission in a minimum of space

EPIC® MH 4

- Power module 4 pole for compact power transmission

Application range

- Mechanical engineering
- Robotics industry
- Plant engineering
- Renewable energy
- Railway applications/vehicle construction

Technical data



Rated voltage (V)
830 V

Rated impulse voltage
8 kV



Rated current (A)
EPIC® MH 3+4
40 A
10 A
EPIC® MH 4
40 A



Pollution degree
3



Flammability
UL94 V-0



Number of contacts
EPIC® MH 3+4
3 + 4
EPIC® MH 4
4



Termination methods
EPIC® MH 4

Crimp termination: 1.5 – 10 mm²



Material

EPIC® MH 3+4
PA
EPIC® MH 4
Polyamide, glass fibre-reinforced



Cycle of mechanical operation
500



Certifications

EPIC® MH 4
UL-tested:
UL File Number: E75770



Temperature range
-40°C to +125°C

Article number	Article description	Contact type	Number of operating contacts	Slots	Pieces / PU
EPIC® MH 3+4					
44423293	EPIC® MHS 3+4 CM	male	3 + 4	1	10
44423294	EPIC® MHB 3+4 CM	female	3 + 4	1	10
EPIC® MH 4					
44423216	EPIC® MHS 4 CM	male	4	1	10
44423217	EPIC® MHB 4 CM	female	4	1	10

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EPIC® MH 6

High flexibility by the use of any combination of inserts in one connector



EPIC® MH 8

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard
- Module 6 pole for control signals



Info

- Modular connector system, plugable with the market standard
- Module 8 pole for control signals

Suitable housing

- EPIC® H-B housing use in high version

Benefits

- Crimp connection for permanent vibration proof contact
- EPIC® MH system is mateable with the market standard
- The mix of different functions in one plug guarantees high flexibility
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2.
 - Requirement sets R22 and R23.
 - Hazard level HL1, HL2 and HL3.

EPIC® MH 6

- Module 6 pole for control signals

EPIC® MH 8

- Module 8 pole for control signals

Application range

- Mechanical engineering
- Robotics industry
- Plant engineering
- Renewable energy
- Railway applications/vehicle construction

Technical data



Rated voltage (V)

EPIC® MH 6

500 V

EPIC® MH 8

400 V

Rated impulse voltage

6 kV



Rated current (A)

16 A



Pollution degree

3



Flammability

UL94 V-0

Contact resistance

< 5 mOhm



Number of contacts

EPIC® MH 6

6

EPIC® MH 8

8



Termination methods

Crimp termination: 0.14 – 4 mm²



Material

Polyamide, glass fibre-reinforced



Cycle of mechanical operation

500



Certifications

UL-tested:

UL File Number: E75770



Temperature range

-40°C to +125°C

Article number	Article description	Contact type	Number of operating contacts	Slots	Pieces / PU
EPIC® MH 6					
44423218	EPIC® MHS 6 CM	male	6	1	10
44423219	EPIC® MHB 6 CM	female	6	1	10
EPIC® MH 8					
44423220	EPIC® MHS 8 CM	male	8	1	10
44423221	EPIC® MHB 8 CM	female	8	1	10

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



EPIC® MH 12

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard
- Module 12 pole for control signals

EPIC® MH 17

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard
- Universal module for 17 contacts in smallest space

Suitable housing

- EPIC® H-B housing use in high version

Benefits

- Crimp connection for permanent vibration proof contact
- EPIC® MH system is mateable with the market standard
- The mix of different functions in one plug guarantees high flexibility
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2.
 - Requirement sets R22 and R23.
 - Hazard level HL1, HL2 and HL3.

EPIC® MH 12

- Module 12 pole for control signals

EPIC® MH 17

- Universal module for 17 contacts in smallest space

Application range

- Mechanical engineering
- Robotics industry
- Plant engineering
- Renewable energy
- Railway applications/vehicle construction

Technical data



Rated voltage (V)

EPIC® MH 12

250 V

EPIC® MH 17

160 V

Rated impulse voltage

4 kV



Rated current (A)

10 A



Pollution degree

3



Flammability

UL94 V-0

Contact resistance

< 5 mOhm



Number of contacts

EPIC® MH 12

12

EPIC® MH 17

17



Termination methods

Crimp termination: 0.14 – 2.5 mm²



Material

Polyamide, glass fibre-reinforced



Cycle of mechanical operation

500



Certifications

UL-tested:

UL File Number: E75770



Temperature range

-40°C to +125°C

Article number	Article description	Contact type	Number of operating contacts	Slots	Pieces / PU
EPIC® MH 12					
44423222	EPIC® MHS 12 CM	male	12	1	10
44423223	EPIC® MHB 12 CM	female	12	1	10
EPIC® MH 17					
44423224	EPIC® MHS 17 CM	male	17	1	10
44423225	EPIC® MHB 17 CM	female	17	1	10

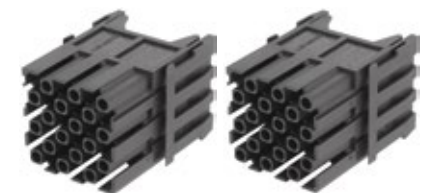
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**EPIC® MH 20**

High flexibility by the use of any combination of inserts in one connector

**EPIC® MH 36**

High flexibility by the use of any combination of inserts in one connector

**Info**

- Modular connector system, plugable with the market standard
- Double module 20 pole for control signals

Info

- Modular connector system, plugable with the market standard
- Double module for 36 contacts in smallest space

Suitable housing

- EPIC® H-B housing use in high version

Benefits

- Crimp connection for permanent vibration proof contact
- EPIC® MH system is mateable with the market standard
- The mix of different functions in one plug guarantees high flexibility
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2.
 - Requirement sets R22 and R23.
 - Hazard level HL1, HL2 and HL3.

EPIC® MH 20

- Double module 20 pole for control signals

EPIC® MH 36

- Double module for 36 contacts in smallest space

Application range

- Mechanical engineering
- Robotics industry
- Plant engineering
- Renewable energy
- Railway applications/vehicle construction

Technical data**Rated voltage (V)****EPIC® MH 20**

500 V

EPIC® MH 36

250 V

Rated impulse voltage**EPIC® MH 20**

6 kV

EPIC® MH 36

4 kV

**Rated current (A)****EPIC® MH 20**

16 A

EPIC® MH 36

10 A

**Pollution degree**

3

**Flammability**

UL94 V-0

Contact resistance

< 5 mOhm

**Number of contacts****EPIC® MH 20**

20

EPIC® MH 36

36

**Termination methods****EPIC® MH 20**Crimp termination: 0.14 – 4 mm²**EPIC® MH 36**Crimp termination: 0.14 – 2.5 mm²**Material**

Polyamide, glass fibre-reinforced

**Cycle of mechanical operation**

500

**Certifications**

UL-tested:

UL File Number: E75770

**Temperature range**

-40°C to +125°C

Article number	Article description	Contact type	Number of operating contacts	Slots	Pieces / PU
EPIC® MH 20					
44423226	EPIC® MHS 20 CM	male	20	2	10
44423227	EPIC® MHB 20 CM	female	20	2	10
EPIC® MH 36					
44423266	EPIC® MHS 36 CM	male	36	2	10
44423267	EPIC® MHB 36 CM	female	36	2	10

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



EPIC® MH Gigabit Modul

The mixed assembly guarantees high flexibility. For applications in mechanical and plant engineering, for printing machines and slide-in technology.



Info

- Modular connector system, mateable with the market standard
- Gigabit module for Ethernet data rates up to 10 GBit/s, Cat. 7

Suitable housing

- EPIC® MH 6 R
- EPIC® MH 10 R
- EPIC® MH 16 R
- EPIC® MH 24 R

Suitable contacts

- EPIC® MH 1.0 mm contacts machined

Benefits

- Gigabitmodule, all around shielded, 4 pair of wires, for Ethernet data rates up to 10 GBit/s, Cat. 7
- EPIC® MH system is mateable with the market standard
- The mix of different functions in one plug guarantees high flexibility
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL3.

Application range

- Industrial machinery and plant engineering
- Industry 4.0 applications
- Robotics industry
- Renewable energy
- Railway applications/vehicle construction

Technical data



Rated voltage (V)
50 V

Rated impulse voltage
0.8 kV



Rated current (A)
5 A



Flammability
UL94 V-0



Number of contacts
8



Termination methods
Crimp termination: AWG 20 - 28



Material
PA Polyamid
Zinc die-cast



Cycle of mechanical operation
500



Temperature range
-40°C to +125°C

Article number	Article description	Contact type	Clamping range (mm)	Slots	Pieces / PU
EPIC® MH Gigabit Kit					
44423291	EPIC® MHS Gigabit Kit small	male	5 - 7	1	1
44423292	EPIC® MHB Gigabit Kit small	female	5 - 7	1	1
44423326	EPIC® MHS Gigabit Kit medium	male	7 - 10	1	1
44423327	EPIC® MHB Gigabit Kit medium	female	7 - 10	1	1
EPIC® MH Gigabit Insulating body					
44423276	EPIC® MHS Gigabit	male	—	1	10
44423277	EPIC® MHB Gigabit	female	—	1	10
EPIC® MH Gigabit contact body metal					
44423278	EPIC® MHS Gigabit PIN	male	—	—	10
44423279	EPIC® MHS Gigabit PIN + GND	male	—	—	10
44423280	EPIC® MHB Gigabit PIN	female	—	—	10
44423281	EPIC® MHB Gigabit PIN + GND	female	—	—	10
EPIC® MH Gigabit cable clamp					
44423282	EPIC® MH Clamp 5 - 7 mm	—	5 - 7	—	10
44423283	EPIC® MH Clamp 7 - 10 mm	—	7 - 10	—	10
44423284	EPIC® MH Clamp 10 - 12 mm	—	10 - 12	—	10

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

EPIC® MH BUS

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard
- Shielded modul for data and signal transmission. Usable for Ethernet CAT.5e

EPIC® MH Bus PIN 1 x (4) contact holder

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard
- Shielded modul for data and signal transmission. Usable for Ethernet CAT.5e

Suitable housing

EPIC® MH BUS

- EPIC® MH 6 R
- EPIC® MH 10 R
- EPIC® MH 16 R
- EPIC® MH 24 R
- EPIC® H-B housing use in high version

Suitable contacts

EPIC® MH BUS

- EPIC® H-D 1.6 machined contacts
- EPIC® MH Bus PIN 1 x (4)
- EPIC® MH Coax 1.6 mm
- EPIC® MH Coax 2.5 mm
- EPIC® MH Potential set

EPIC® MH Bus PIN 1 x (4) contact holder

- EPIC® H-D 1.6 machined contacts

Technical data

Rated voltage (V)
50 V

Rated impulse voltage
0.8 kV

 Rated current (A)
10 A

 Pollution degree
3

 Flammability
UL94 V-0

 EPIC® MH Bus PIN 1 x (4) contact holder
4

 Termination methods
Crimp termination: 0.14 – 2.5 mm²
Material
PA

 Cycle of mechanical operation
500

 Certifications
UL-tested:
UL File Number: E75770

 Temperature range
-40°C to +125°C

Benefits

- Shielded modul for data and signal transmission. Usable for Ethernet CAT.5e
- EPIC® MH system is mateable with the market standard
- Crimp connection for permanent vibration proof contact
- The mix of different functions in one plug guarantees high flexibility
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL3.

Application range

- Mechanical engineering
- Robotics industry
- Plant engineering
- Renewable energy
- Railway applications/vehicle construction

Article number	Article description	Contact type	Number of operating contacts	Slots	Pieces / PU
EPIC® MH BUS					
44423228	EPIC® MHS Bus	male	2	2	10
44423230	EPIC® MHB Bus	female	2	2	10
EPIC® MH BUS 1x(4) Kontaktträger					
44423229	EPIC® MHS Bus PIN 1 x (4) CM	male	4 + shield	—	10
44423231	EPIC® MHB Bus PIN 1 x (4) CM	female	4 + shield	—	10

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



EPIC® MH Potential set

High flexibility by the use of any combination of inserts in one connector



Benefits

- Potential spring for EPIC® MH multi frame
- For use in EPIC® MH BUS modules
- Two springs can be used for an EPIC® MH BUS module

Application range

- Mechanical engineering
- Robotics industry
- Plant engineering
- Renewable energy
- Railway applications/vehicle construction



Info

- Potential spring for EPIC® MH multi frame

Article number	Article description	Contact type	Pieces / PU
EPIC® MH Potential set			
44423265	EPIC® MHS Potential Set	male	20
44423275	EPIC® MHB Potential Set	female	20

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EPIC® MH 0 blind modul

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard
- Dummy module as a placeholder for future expansion

Suitable housing

- EPIC® H-B housing use in high version

Benefits

- Dummy module as a placeholder for future expansion
- EPIC® MH system is mateable with the market standard
- "Z" version with centering function for plug in technique
- The mix of different functions in one plug guarantees high flexibility
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL3.

Technical data

	Number of contacts 0
	Material Polyamide, glass fibre-reinforced



Temperature range
-40°C to +125°C

Application range

- Mechanical engineering
- Robotics industry
- Plant engineering
- Renewable energy
- Railway applications/vehicle construction

Article number	Article description	Slots	Pieces / PU
EPIC® MH 0 blind modul			
44423232	EPIC® MH 0	1	10
EPIC® MH 0 blind modul with centering			
44423233	EPIC® MH 0 Z	1	10

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EPIC® MH 8.0 mm Contacts

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard

Benefits

- Crimp connection for permanent vibration proof contact
- EPIC® MH system is mateable with the market standard

Application range

- Mechanical engineering
- Robot-building
- Plant engineering
- Renewable energy
- Railway applications/vehicle construction

Technical data

Contact resistance
< 5 mOhm

Stripping length (mm)
18



Termination methods

Crimp termination: 10 ... 35 mm²



Cycle of mechanical operation
500

Suitable tools

- EPIC® TOOL DIE 8.0mm
- For use in battery hydraulic crimping tool Klauke type EK 120/42-L

Article number	Article description	Contact type	Connection cross section (mm²)	Pieces / PU
EPIC® MH D = 8.0 Contacts				
44423242	EPIC® MH SCEM AG 10mm² D=8.0	male	10	10
44423246	EPIC® MH BCEM AG 10mm² D=8.0	female	10	10
44423243	EPIC® MH SCEM AG 16mm² D=8.0	male	16	10
44423247	EPIC® MH BCEM AG 16mm² D=8.0	female	16	10
44423244	EPIC® MH SCEM AG 25mm² D=8.0	male	25	10
44423248	EPIC® MH BCEM AG 25mm² D=8.0	female	25	10
44423245	EPIC® MH SCEM AG 35mm² D=8.0	male	35	10
44423249	EPIC® MH BCEM AG 35mm² D=8.0	female	35	10

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



Info

- Crimp dies for electro hydraulic crimp tool



Info

- Tool for removing the 8.0 mm contacts from the EPIC® MH modules

Suitable Contacts

EPIC® TOOL DIE 8.0 mm

- EPIC® MH 8.0 mm Contacts

Benefits

EPIC® MH contact removal tool 8.0 mm

- Tool for removing the 8.0 mm contacts from the EPIC® MH modules

Suitable tools

EPIC® TOOL DIE 8.0 mm

- For use in battery hydraulic crimping tool Klauke type EK 120/42-L



Article number	Article description	Connection cross section (mm²)	Pieces / PU
Crimping dies			
44423271	EPIC® TOOL DIE D=8.0 16sqmm	16	1
44423272	EPIC® TOOL DIE D=8.0 25sqmm	25	1
44423273	EPIC® TOOL DIE D=8.0 35sqmm	35	1
EPIC® MH contact removal tool 8.0 mm			
44423269	EPIC® MH Contact Removal Tool D=8.0	—	1

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



EPIC® MH 4.0 mm Contacts

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard



Benefits

- Crimp connection for permanent vibration proof contact
- EPIC® MH system is mateable with the market standard

Application range

- Mechanical engineering
- Robotics industry
- Plant engineering
- Renewable energy
- Railway applications/vehicle construction

Suitable tools

- EPIC® MH tools for 4.0 mm contacts

Technical data

Contact resistance
< 5 mOhm



Termination methods
Crimp termination: 1.5 – 10 mm²

Stripping length (mm)
10



Cycle of mechanical operation
500

Article number	Article description	Contact type	Connection cross section (mm ²)	Pieces / PU
EPIC® MH 4.0 mm Contacts				
44423250	EPIC® MH SCEM AG 1.5sqmm D=4.0	male	1.5	100
44423255	EPIC® MH BCEM AG 1.5sqmm D=4.0	female	1.5	100
44423251	EPIC® MH SCEM AG 2.5sqmm D=4.0	male	2.5	100
44423256	EPIC® MH BCEM AG 2.5sqmm D=4.0	female	2.5	100
44423252	EPIC® MH SCEM AG 4sqmm D=4.0	male	4	100
44423257	EPIC® MH BCEM AG 4sqmm D=4.0	female	4	100
44423253	EPIC® MH SCEM AG 6sqmm D=4.0	male	6	100
44423258	EPIC® MH BCEM AG 6sqmm D=4.0	female	6	100
44423254	EPIC® MH SCEM AG 10sqmm D=4.0	male	10	100
44423259	EPIC® MH BCEM AG 10sqmm D=4.0	female	10	100

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EPIC® Tools for contacts MH 4.0 mm machined

For inserts and modules of the EPIC® rectangular connectors



Product features

- Locator and crimping dies fit together with the crimping tool 11147000 and the crimping machine 11147001

Article number	Article description	Inserts	Conductor cross-section (mm ²)	Note	Pieces / PU
Tools					
11147000	Crimping tool	without crimping dies, without locator	—	In tool case	1
11147001	Crimping machine	without crimping dies, without locator	—	Pneumatic, 5–10 bar	1
11147100	Crimping dies	For crimping tools: 11147000, 11147001	0.14 – 4	For contacts: H-D 1.6 machined, H-BE 2.5 machined, MC 2.5 machined, MH 4.0	1
11147101	Crimping dies	For crimping tools: 11147000, 11147001	4 – 10	For contacts: MH 4.0	1
11147201	Locator	For crimping tools: 11147000, 11147001	0.14 – 10	For contacts: MH 4.0	1

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EPIC® MH 1.0 mm contacts machined

The mixed assembly guarantees high flexibility. For applications in mechanical and plant engineering, for printing machines and slide-in technology.



Info

- Machined gold plated contacts with 1 mm diameter for EPIC® MH Gigabit module
- Gold-plated contacts for low transfer resistance

Benefits

- Machined gold plated contacts with 1 mm diameter for EPIC® MH Gigabit module
- Gold-plated contacts for low transfer resistance

Application range

- Mechanical and plant engineering
- Robotics industry
- Renewable energy
- Railway applications/vehicle construction

Technical data

Stripping length (mm)

4.2 ± 0,5 mm



Cycle of mechanical operation

500



Material

brass gold plated CuZn/Au

Article number	Article description	Contact type	Conductor cross-section AWG	Pieces / PU
EPIC® MH 1.0 mm Contacts machined				
44423285	EPIC® MH SCEM AU 0.09 – 0.25sqmm D=1.0	male	28 – 24	100
44423286	EPIC® MH BCEM AU 0.09 – 0.25sqmm D=1.0	female	28 – 24	100
44423287	EPIC® MH SCEM AU 0.13 – 0.33sqmm D=1.0	male	26 – 22	100
44423288	EPIC® MH BCEM AU 0.13 – 0.33sqmm D=1.0	female	26 – 22	100
44423289	EPIC® MH SCEM AU 0.25 – 0.52sqmm D=1.0	male	24 – 20	100
44423290	EPIC® MH BCEM AU 0.25 – 0.52sqmm D=1.0	female	24 – 20	100

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EPIC® Industrial connectors

Rectangular connectors • EPIC® MH Modular System frame



EPIC® MH 6 multi frame

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard
- Frame system for modules

EPIC® MH 10 multi frame

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard
- Frame system for modules

EPIC® MH 16 multi frame

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard
- Frame system for modules

EPIC® MH 24 multi frame

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard
- Frame system for modules

EPIC® MH Clip

High flexibility by the use of any combination of inserts in one connector



Info

- Modular connector system, plugable with the market standard
- Adapter clip for modules of competition

Suitable housing**EPIC® MH 6 multi frame**

- EPIC® ULTRA H-B 6
- EPIC® H-B 6 Housings

EPIC® MH 10 multi frame

- EPIC® ULTRA H-B 10
- EPIC® H-B 10 Housings

EPIC® MH 16 multi frame

- EPIC® ULTRA H-B 16
- EPIC® H-B 16 Housings

EPIC® MH 24 multi frame

- EPIC® ULTRA H-B 24
- EPIC® H-B 24 Housings

Benefits**EPIC® MH 6 multi frame****EPIC® MH 10 multi frame****EPIC® MH 16 multi frame****EPIC® MH 24 multi frame**

- Multi frame for own and competition modules
- EPIC® MH system is mateable with the market standard
- The mix of different functions in one plug guarantees high flexibility
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL3.
- PE connection from 1 mm² up to 6 mm² with end sleeve, 10 mm² with adapter

Technical data**Material****EPIC® MH 6 multi frame**

Zinc die-cast

EPIC® MH 10 multi frame

Zinc die-cast

EPIC® MH 16 multi frame

Zinc die-cast

EPIC® MH 24 multi frame

Zinc die-cast

**Cycle of mechanical operation****EPIC® MH 6 multi frame**

500

EPIC® MH 10 multi frame

500

EPIC® MH 16 multi frame

500

EPIC® MH 24 multi frame

500

**Temperature range**

-40°C to +125°C

EPIC® MH Clip

- EPIC® MH Clip for mounting of competition modules in EPIC® MH frame
- EPIC® MH system is mateable with the market standard
- The mix of different functions in one plug guarantees high flexibility
- Railway applications
 - Fire protection on railway vehicles: Test according EN 45545-2. Requirement sets R22 and R23. Hazard level HL1, HL2 and HL3.

Application range

- Mechanical engineering
- Robotics industry
- Plant engineering
- Renewable energy
- Railway applications/vehicle construction

Article number	Article description	Contact type	Slots	Pieces / PU
EPIC® MH 6 multi frame				
44423234	EPIC® MHS 6 R (A,B)	male	2	10
44423235	EPIC® MHB 6 R (a, b)	female	2	10
EPIC® MH 10 multi frame				
44423236	EPIC® MHS 10 R (A, B, C)	male	3	10
44423237	EPIC® MHB 10 R (a, b, c)	female	3	10
EPIC® MH 16 multi frame				
44423238	EPIC® MHS 16 R (A, B, C, D)	male	4	10
44423239	EPIC® MHB 16 R (a, b, c, d)	female	4	10
EPIC® MH 24 multi frame				
44423240	EPIC® MHS 24 R (A, B, C, D, E, F)	male	6	10
44423241	EPIC® MHB 24 R (a, b, c, d, e, f)	female	6	10
EPIC® MH Clip				
44423264	EPIC® MH Clip	—	—	20

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

Features

- Standardised design – mateable with many rectangular connectors
- Robust, impact-proof
- Tight for application in inner and outer area
- UV resistant
- Single lever for onehanded operation and double lever for extra hold
- Cable entry for metric and PG cable glands
- EMC version available

Design types



Hood

Mateable with a panel mount base, surface mount base or cable coupler



Panel mount base

Big rectangular cable entry for mounting on machine components



Surface mount base

Complete enclosure only offering cable entry through a cable gland mounted either on one or both sides of the base



Cable coupler

Cable to cable connection frequently used for extend cables

EPIC® ULTRA Series



Robust and reliable industrial connector with EMC

- Offers EMC protection
- Corrosion-resistant
- High-quality design

EPIC® Housing Designer



- Online tool for individualised designing of EPIC® housing
- Over 138 Million possible variation
- Available at:
www.lappgroup.com/connector-housing



SKINTOP® ST-HF-M



Info

- Cable gland for railway applications
- Hazard Level: HL3



Benefits

- Extremely flame-retardant acc. to UL 94 V0
- Completely halogen-free (including sealing material)
- Maximum reliability
- 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 acc. 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

- Caution**
Refer to Appendix T21 for the installation dimensions and torques
- Colour delivered**
Light grey (RAL 7035)
Black (RAL 9005)
- Material**
Body: halogen-free polyamide acc. to UL 94 V0
Sealing ring: special elastomer
O-ring: NBR, halogen-free
- Protection rating**
IP 68 – 5 bar
- Temperature range**
fixed: -40°C to +100°C
dynamic: -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 light grey						
53111407	M 12 × 1.5	4 – 5.5	15	30	8	100
53111417	M 16 × 1.5	4.5 – 9	19	34	8	100
53111427	M 20 × 1.5	7 – 13	25	37	9	100
53111437	M 25 × 1.5	9 – 17	30	40	10	50
53111447	M 32 × 1.5	11 – 21	36	47	10	25
53111457	M 40 × 1.5	19 – 28	46	52	10	10
53111467	M 50 × 1.5	27 – 35	55	62	12	5
53111477	M 63 × 1.5	34 – 45	66	71	12	5
SKINTOP® ST-HF-M black						
53111408	M 12 × 1.5	4 – 5.5	15	30	8	100
53111418	M 16 × 1.5	4.5 – 9	19	34	8	100
53111422	M 20 × 1.5	7 – 13	25	37	9	100
53111438	M 25 × 1.5	9 – 17	30	40	10	50
53111448	M 32 × 1.5	11 – 21	36	47	10	25
53111458	M 40 × 1.5	19 – 28	46	52	10	10
53111468	M 50 × 1.5	27 – 35	55	62	12	5
53111478	M 63 × 1.5	34 – 45	66	71	12	5

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



SKINTOP® GMP-HF-M



Benefits

- Halogen-free
- Extremely flame-retardant acc. 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

Technical data



Colour delivered

Light grey (RAL 7035)
Black (RAL 9005)



Material

halogenfree polyamide
acc. to UL 94 V0



Temperature range

fixed: -40°C to +100°C
dynamic: -20°C to +100°C

Article number	Article designation / size	SW wrench size (mm)	PU
SKINTOP® GMP-HF-M light grey			
53119200	M 12 × 1.5	17	100
53119210	M 16 × 1.5	22	100
53119220	M 20 × 1.5	27	100
53119230	M 25 × 1.5	34	100
53119240	M 32 × 1.5	41	100
53119250	M 40 × 1.5	50	25
53119260	M 50 × 1.5	60	25
53119270	M 63 × 1.5	75	25
SKINTOP® GMP-HF-M black			
53119205	M 12 × 1.5	17	100
53119215	M 16 × 1.5	22	100
53119225	M 20 × 1.5	27	100
53119235	M 25 × 1.5	34	100
53119245	M 32 × 1.5	41	100
53119255	M 40 × 1.5	50	25
53119265	M 50 × 1.5	60	25
53119275	M 63 × 1.5	75	25

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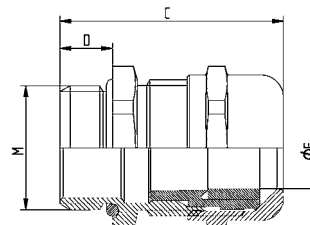


SKINTOP® MS-HF-M



Info

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



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



Caution

Refer to Appendix T21 for the installation dimensions and torques



Material

Body: nickel-plated brass
Insert: halogenfree polyamide acc. to UL 94 V0
Sealing: special elastomere
O-ring: NBR, halogen-free



Protection rating

IP 68 – 5 bar



Temperature range

fixed: -40°C to +100°C
dynamic: -25°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 × 1.5	3.5 – 7	16	26.5	6.5	100
53112571	M 16 × 1.5	4.5 – 10	20	33	7	100
53112572	M 20 × 1.5	7 – 13	24	37	8	50
53112573	M 25 × 1.5	9 – 17	29	38.5	8	25
53112574	M 32 × 1.5	11 – 21	36	45.5	9	25
53112575	M 40 × 1.5	19 – 28	45	48	9	10
53112576	M 50 × 1.5	27 – 35	54	55.5	10	5
53112577	M 63 × 1.5	34 – 45	67	67	15	5

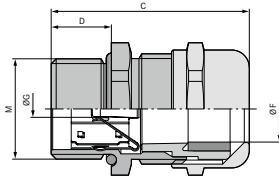
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Cable glands

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



SKINTOP® MS-HF-M SC



i 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

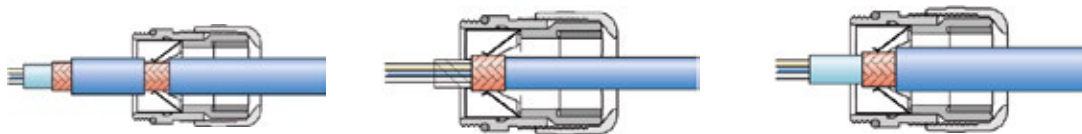
- SKINDICHT® SM-PE-M counter nut should be used to ensure optimum contact with painted, anodised or powder-coated housings
- Refer to SKINTOP® metric accessories for suitable accessories

Technical data

- ⚠ Caution**
Refer to Appendix T21 for the installation dimensions and torques
- 🧩 Material**
Body: nickel plated brass
Insert: halogen-free polyamid acc. to UL 94 V0
Sealing: special elastomer
O-ring: NBR, halogen-free
- 🛡 IP** **Protection rating**
IP 68 – 5 bar
- 🌡 Temperature range**
fixed: -40°C to +100°C
dynamic: -25°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 SC							
53112530	M 12 × 1.5	3.5 – 7	1	16	26.5	6.5	50
53112531	M 16 × 1.5	4.5 – 10	4	20	33	7	50
53112532	M 20 × 1.5	7 – 13	5	24	37	8.5	25
53112533	M 25 × 1.5	9 – 17	7.5	29	38.5	8	25
53112534	M 32 × 1.5	11 – 21	9	36	45.5	9	25
53112535	M 40 × 1.5	19 – 28	15	45	48	9	10
53112536	M 50 × 1.5	27 – 35	21	54	55.5	10	5

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



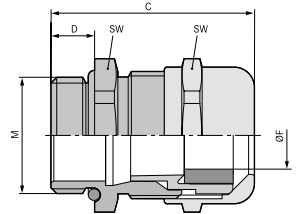


SKINTOP® MS-HF-M BRUSH



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



Caution

Refer to Appendix T21 for the installation dimensions and torques



Material

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



Protection rating

IP 68 – 5 bar



Temperature range

fixed: -40°C to +100°C
dynamic: -25°C to + 100°C

Article number	Article designation / size	Clamping range $\varnothing F$ (mm)	Minimum $\varnothing$ 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 × 1.5	9 – 17	6	29	36	8	10
53112544	M 32 × 1.5	11 – 21	8	36	42.2	9	5
53112545	M 40 × 1.5	19 – 28	10	45	49.5	9	5
53112546	M 50 × 1.5	27 – 35	14	54	52	10	5
53112547	M 63 × 1.5	34 – 45	20	67	61.3	15	1

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



SKINTOP® MS-HF-M GRIP



Info

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

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

Technical data



Caution

Refer to the instruction leaflet for the installation dimensions and torques



Material

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



Protection rating

IP 68 – 5 bar



Temperature range

fixed: -40°C to +100°C
dynamic: -25°C to +100°C

Article number	Article designation / size	Clamping range $\varnothing F$ (mm)	SW wrench size (mm)	Overall length, C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® MS-HF-M GRIP						
53112551	M 16 × 1.5	4.5 – 10	20	41	7	25
53112552	M 20 × 1.5	7 – 13	24	46	8.5	25
53112553	M 25 × 1.5	9 – 17	29	48.5	8	25
53112554	M 32 × 1.5	11 – 21	36	56.6	9	25

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





Info

- Compact multi cable bushing system with innovative gel technology



Benefits

- Large clamping range of 4 mm and AS-I BUS entry system by elastic gel technology with innovative membrane technology
- Easy installation, high packing density
- Optimum strain relief at the entire cable bundle
- Error reduction through clear assignment of cable to be installed by a clear marker of implementing points
- Not used holes remain securely sealed

Application range

- Used in areas where a lot of cables and wires need to be inserted into housings with minimum space requirements
- For not harnessed cables and media hoses
- Apparatus and switch cabinet construction
- Automation technology

Product features

- Integrated seal for the cable & housing (captive)
- Halogen-free
- UV-, Ozon and oil resistant
- The adhesive gel provides a very easy positioning at the enclosure during the assembling

Norm references / Approvals

- UL 508A for Industrial Control Panels
- UL File No. E349737

Product Make-up

- For cut-outs for 24-pin industrial connectors (36 × 112 mm)

Included

- SKINTOP® MULTI including mounting material

Technical data



Certifications

UL File No. E349737
Fire behaviour acc. to UL94 V-2



Note

HL2-enabled material upon request



Material

Frame: Polycarbonat
Sealing: Gel



Protection rating

IP 68



Temperature range

-30°C to +110°C

Article number	Article designation / size	Max. number of executions	Number of cables × clamping range	Pieces / PU
SKINTOP® MULTI				
52220065	SKINTOP® MULTI Version 1	22	6 × 8 – 12 mm, 16 × 3 – 7 mm	1
52220073	SKINTOP® MULTI Version 2	21	5 × 2 – 6 mm, 8 × 4 – 8 mm, 3 × 5 – 9 mm, 2 × 8 – 12 mm, 1 × 12 – 16 mm, 2 × AS-I BUS / 2 × 2 – 4 mm	1
52220080	SKINTOP® MULTI Version 3	30	30 × 2 – 6 mm	1
52220085	SKINTOP® MULTI Version 4	11	8 × 8 – 12 mm, 2 × 12 – 16 mm, 1 × 16 – 20 mm	1

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

Cable glands



SKINTOP® cable bushing systems • EMC



SKINTOP® BRUSH ADD-ON 24



Info

- EMC Kit with brush technology suitable for the SKINTOP® multi cable bushing systems for the 24 pin cut-outs

Benefits

- Faster, easier screen contact
- Optimum EMC protection
- Quicker installation and EMC contacting compared with other systems
- Maximum assembly freedom during adjustment
- Usable with different cable diameters at the same time

Product features

- Low-resistance screen contact
- Visible, large-scale screen contact

Included

- Brush frame
- Spacers
- Mounting material

Technical data



Material

Frame: Aluminium
EMC brush: brass



Temperature range

-30°C to +110°C

Application range

- For the EMC screen contacting of cables when using the SKINTOP® multi-cable entry systems
- For EMC-compliant earthing of the copper braiding, or for cables with copper shaft sheath
- Control cabinet manufacturing
- Automation systems

Article number	Dimension overall (mm)	Bushing section (mm)	Bore (mm)	PU
SKINTOP® BRUSH ADD-ON 24				
52220089	60 – 140	36 × 112	4.2	1

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



SKINDICHT® VENT PA6



Info

- Breathable pressure compensation element with membrane technology



Benefits

- Ventilation system for housing
- Formation of condensation in electronic housings is prevented
- Pressure compensation elements guarantee a trouble-free and maintenance-free operation

Application range

- Lighting engineering
- Railway applications
- Weather station
- Housing and distribution boxes
- Manufacturing of control cabinets and equipment

Product features

- Closure element and a pressure equalization in one system
- Lower space requirement
- High air flow

Norm references / Approvals

- Optionally approved acc. to UL 508 A

Product Make-up

- Air flow rates:
100 mbar = 0.8 l/min – Standard version
- Air flow rates:
100 mbar = 3.5 l/min – UL version

Note

- Refer to data sheet for more details

Technical data



Certifications
Metric thread acc. to EN 60423



Note
Membrane: Acryl – CoPolymere



Colour delivered
Light grey (RAL 7035)
Black/UV-resistant (RAL 9005)



Material
Polyamide 6 – Standard version / UL 94 V2
Polyamide 66 – UL Version / UL 94 V0
Flat sealing NBR – Standard version
O-ring NBR – UL version



Protection rating
Standard: IP66 / IP68 / IP69
UL: IP66 / IP67 / IP69



Temperature range
-20°C to +100°C

Article number	Article designation / size	Overall length, C (mm)	Thread length, D (mm)	Pieces / PU
Not certified version				
51730200	SKINDICHT® VENT 12 × 1.5 BK	17.3	10	25
51730202	SKINDICHT® VENT 12 × 1.5 LGY	17.3	10	25
cURus certified version				
51730201	SKINDICHT® VENT 12 × 1.5 BK plus	17.3	10	25
51730203	SKINDICHT® VENT 12 × 1.5 LGY plus	17.3	10	25

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



SKINDICHT® VENT INOX



Info

- Breathable pressure compensation element with membrane technology

Benefits

- Ventilation system for housing
- Formation of condensation in electronic housings is prevented
- Pressure compensation elements guarantee a trouble-free and maintenance-free operation

Application range

- Lighting engineering
- Railway applications
- Manufacturing of control cabinets and equipment
- Housing and distribution boxes

Product features

- Closure element and a pressure equalization in one system
- Lower space requirement
- High air flow

Norm references / Approvals

- Optionally approved acc. to UL 508 A

Product Make-up

- Air flow rates:
100 mbar = 0.4 l/min – Standard version
- Air flow rates:
100 mbar = 2.4 l/min – UL version

Note

- Refer to data sheet for more details

Technical data



Certifications

Metric thread acc. to EN 60423



Note

Membrane: Acryl – CoPolymere



Material

Stainless steel 303
O-ring: NBR



Protection rating

Standard: IP66 / IP68 / IP69
UL: IP66 / IP67 / IP69



Temperature range

- 40°C to + 105°C

Article number	Article designation / size	Overall length, C (mm)	Thread length, D (mm)	Pieces / PU
Not certified version				
51730204	SKINDICHT® VENT INOX 12 × 1.5	21	10	10
cURus certified version				
51730205	SKINDICHT® VENT INOX 12 × 1.5 plus	21	10	10

Photographs and graphics 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



Certifications
IEC EN 61386-23
EN 45545-2 HL3



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



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



Temperature range
-45°C to +120°C

Article number	Nominal size	ID × OD (mm)	Bending radius (mm)	Suitable for FIPLOCK® ONE M	Colour	PU ring (m)
FPAF – Standard weight version (closed)						
61803908	7	6.2 × 10	15	12 × 1.5	black	50
61803909	10	9.6 × 12.8	20	12 × 1.5/16 × 1.5/20 × 1.5	black	50
61803910	12	12 × 15.7	30	16 × 1.5/20 × 1.5	black	50
61803911	17	16.1 × 21.1	35	20 × 1.5/25 × 1.5	black	50
61803912	23	22 × 28.4	40	25 × 1.5/32 × 1.5	black	50
61803913	29	28.3 × 34.5	50	32 × 1.5/40 × 1.5	black	50
61803914	36	35.8 × 42.2	55	40 × 1.5/50 × 1.5	black	25
61803915	48	46.7 × 53.8	65	50 × 1.5/63 × 1.5	black	25
61803916	56	56.3 × 67.2	100	–	black	25
61803917	70	67.2 × 79.6	130	–	black	25
61803918	95	91.3 × 106	170	–	black	10
61803919	125	126.5 × 146.5	380	–	black	10
61803920	7	6.2 × 10	15	12 × 1.5	grey	50
61803921	10	9.6 × 12.8	20	12 × 1.5/16 × 1.5/20 × 1.5	grey	50
61803922	12	12 × 15.7	30	16 × 1.5/20 × 1.5	grey	50
61803923	17	16.1 × 21.1	35	20 × 1.5/25 × 1.5	grey	50
61803924	23	22 × 28.4	40	25 × 1.5/32 × 1.5	grey	50
61803925	29	28.3 × 34.5	50	32 × 1.5/40 × 1.5	grey	50
61803926	36	35.8 × 42.2	55	40 × 1.5/50 × 1.5	grey	25
61803927	48	46.7 × 53.8	65	50 × 1.5/63 × 1.5	grey	25
61803928	56	56.3 × 67.2	100	–	grey	25
61803929	70	67.2 × 79.6	130	–	grey	25
61803930	95	91.3 × 106	170	–	grey	10
61803931	125	126.5 × 146.5	380	–	grey	10
HPAF – Heavy duty version (closed)						
61803932	17	16.1 × 21.1	35	20 × 1.5/25 × 1.5	black	50
61803933	23	22 × 28.5	45	25 × 1.5/32 × 1.5	black	50
61803934	29	28.3 × 34.7	55	32 × 1.5/40 × 1.5	black	50
61803935	36	35.8 × 42.3	60	40 × 1.5/50 × 1.5	black	25
61803936	48	46.7 × 54.2	70	50 × 1.5/63 × 1.5	black	25
61803937	17	16.1 × 21.1	35	20 × 1.5/25 × 1.5	grey	50
61803938	23	22 × 28.5	45	25 × 1.5/32 × 1.5	grey	50
61803939	29	28.3 × 34.7	55	32 × 1.5/40 × 1.5	grey	50
61803940	36	35.8 × 42.3	60	40 × 1.5/50 × 1.5	grey	25
61803941	48	46.7 × 54.2	70	50 × 1.5/63 × 1.5	grey	25
2PAF – Divisible version						
61803942	7	6.3 × 10	25	–	black	50
61803943	10	8.8 × 13.5	30	–	black	50
61803944	11	11 × 16.1	30	–	black	50
61803945	14	13.2 × 18.7	35	–	black	50
61803946	16	16 × 21.5	40	–	black	50
61803947	20	20.2 × 25.7	50	–	black	50
61803948	23	23.9 × 31.3	60	–	black	50
61803949	29	27.3 × 35.5	110	–	black	25
61803950	37	32.5 × 43.2	135	–	black	25
61803951	45	43.1 × 54.2	140	–	black	25

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



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

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



Certifications

IEC EN 61386-23
EN 45545-2 HL3



Colour delivered

Black (RAL 9005), UV-resistant



Material

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



Temperature range

-45°C to +105°C

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

Article number	Nominal size	ID × OD (mm)	Bending radius (mm)	Suitable for FIPLOCK® ONE M	Colour	PU ring (m)
FPDF - Standard weight version (closed)						
61803952	7	6.2 × 10	15	12 × 1.5	black	50
61803953	10	9.6 × 12.8	20	12 × 1.5/16 × 1.5/20 × 1.5	black	50
61803954	12	12 × 15.7	25	16 × 1.5/20 × 1.5	black	50
61803955	17	16.1 × 21.1	30	20 × 1.5/25 × 1.5	black	50
61803956	23	22 × 28.5	40	25 × 1.5/32 × 1.5	black	50
61803957	29	28.3 × 34.7	50	32 × 1.5/40 × 1.5	black	50
61803958	36	36.6 × 42.3	55	40 × 1.5/50 × 1.5	black	25
61803959	48	47 × 54.4	65	50 × 1.5/63 × 1.5	black	25
61803960	56	56.3 × 67.2	100	—	black	25
61803961	70	67.2 × 79.6	135	—	black	25
61803962	95	91.3 × 106	150	—	black	10
61803963	125	126.5 × 146.5	320	—	black	10
61803964	170	172 × 193	440	—	black	10
HPDF - Heavy duty version (closed)						
61803965	7	6 × 10	15	12 × 1.5	black	50
61803966	10	9.2 × 12.8	20	12 × 1.5/16 × 1.5/20 × 1.5	black	50
61803967	12	11.8 × 15.7	25	16 × 1.5/20 × 1.5	black	50
61803968	17	16.1 × 21.1	35	20 × 1.5/25 × 1.5	black	50
61803969	23	22 × 28.5	40	25 × 1.5/32 × 1.5	black	50
61803970	29	28.3 × 34.7	50	32 × 1.5/40 × 1.5	black	50
61803971	36	35.8 × 42.3	60	40 × 1.5/50 × 1.5	black	25
61803972	48	46.7 × 54.2	70	50 × 1.5/63 × 1.5	black	25
2PDF - Divisible version						
61803973	7	6.3 × 10	20	—	black	50
61803974	10	8.8 × 13.5	25	—	black	50
61803975	11	11 × 16.1	25	—	black	50
61803976	14	13.2 × 18.7	30	—	black	50
61803977	16	16 × 21.5	35	—	black	50
61803978	20	20.2 × 25.7	45	—	black	50
61803979	23	23.9 × 31.3	55	—	black	50
61803980	29	27.3 × 35.5	105	—	black	25
61803981	37	32.5 × 43.2	130	—	black	25
61803982	45	43.1 × 54.2	135	—	black	25
61803983	70	67 × 79.8	175	—	black	10
61803984	100	87.5 × 102.5	195	—	black	10

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FIPLOCK® ONE M

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



Info

- New conduit fitting system with innovative locking system
- Hazard Level: HL 3

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



Certifications

IEC EN 61386-23
EN 45545-2 HL3



Colour delivered

Grey (RAL 7005)
Black (RAL 9005), UV-resistant



Material

PA 6
Halogen-free
Fire behaviour acc. to UL 94V-0



Protection rating

IP66 / IP67 / IP68 / IP69



Temperature range

-50°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 × 1.5	17	7.2	7	black	10
61804212	12 × 1.5	20	10	10	black	10
61804213	16 × 1.5	20	10	10	black	10
61804214	16 × 1.5	22	9	12	black	10
61804215	20 × 1.5	20	10	10	black	10
61804216	20 × 1.5	22	13	12	black	10
61804217	20 × 1.5	27	13	17	black	10
61804218	25 × 1.5	27	17.2	17	black	10
61804219	25 × 1.5	36	18	23	black	6
61804220	32 × 1.5	36	23	23	black	6
61804221	32 × 1.5	41	25	29	black	6
61804222	40 × 1.5	41	29	29	black	6
61804223	40 × 1.5	52	31.9	36	black	4
61804224	50 × 1.5	52	36	36	black	4
61804225	50 × 1.5	65	41.9	48	black	4
61804226	63 × 1.5	65	50.5	48	black	4
FIPLOCK® ONE M grey						
61804227	12 × 1.5	17	7.2	7	grey	10
61804228	12 × 1.5	20	10	10	grey	10
61804229	16 × 1.5	20	10	10	grey	10
61804230	16 × 1.5	22	9	12	grey	10
61804231	20 × 1.5	20	10	10	grey	10
61804232	20 × 1.5	22	13	12	grey	10
61804233	20 × 1.5	27	13	17	grey	10
61804234	25 × 1.5	27	17.2	17	grey	10
61804235	25 × 1.5	36	18	23	grey	6
61804236	32 × 1.5	36	23	23	grey	6
61804237	32 × 1.5	41	25	29	grey	6
61804238	40 × 1.5	41	29	29	grey	6
61804239	40 × 1.5	52	31.9	36	grey	4
61804240	50 × 1.5	52	36	36	grey	4
61804241	50 × 1.5	65	41.9	48	grey	4
61804242	63 × 1.5	65	50.5	48	grey	4

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

Plastic threaded fittings

FIPLOCK® ONE 90°

Conduit fitting with metric, PG or NPT thread



FIPLOCK® ONE-S

with integrated SKINTOP® cable strain relief

Conduit fitting with metric, PG or NPT thread as well as innovative CLICK connection



Metal threaded fittings

FIPLOCK® ONE Metal

Conduit fitting with metric or PG thread (short/long)



FIPLOCK® ONE 90° Metal

90 degree elbow conduit fitting with metric or PG thread (short/long)



FIPLOCK® ONE-S Metal

with integrated SKINTOP® cable strain relief

Conduit fitting with metric, PG or NPT thread



Divider systems

FIPLOCK® ONE-T

T piece and T-connection system



FIPLOCK® ONE-Y

Y divider system



FIPLOCK® ONE-C

Conduit coupler with and without screw hole



FIPLOCK® ONE-R

Reducer for T- and Y divider





SILVYN® HFX-V0 / SILVYN® FCE-V0

Interlocked metal conduit with thick-walled Polyurethane jacket



Info

- Hazard Level: HL 2



SILVYN® HFX-V0



SILVYN® FCE-V0

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
- Liquidtight

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



Certifications
IEC EN 61386-23
EN 45545-2 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 × 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 × 14.4	65	16 × 1.5/20 × 1.5	—	30
64400241	3/8"	12.6 × 17.8	85	16 × 1.5/20 × 1.5	—	30
64400253	1/2"	16 × 21.1	110	20 × 1.5	—	30
64400242	3/4"	21 × 26.4	140	25 × 1.5	—	30
64400243	1"	26.5 × 33.1	170	32 × 1.5	—	30
64400244	1 1/4"	35.1 × 41.8	215	40 × 1.5	—	15
64400245	1 1/2"	40.3 × 47.8	250	50 × 1.5	—	15
64400246	2"	51.6 × 59.9	300	63 × 1.5	—	15
SILVYN® FCE-V0						
61814708	12	10 × 14	50	—	12 × 1.5	25
61814709	16	13 × 17	60	—	16 × 1.5/20 × 1.5	25
61814710	20	17 × 21.5	80	—	20 × 1.5	25
61814711	25	21.2 × 26	100	—	25 × 1.5	25
61814712	32	28.1 × 34	125	—	32 × 1.5	25
61814713	40	37.7 × 44.5	160	—	40 × 1.5	10
61814714	50	48.4 × 55.5	190	—	50 × 1.5	10

* Trade product, no Lapp product

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



SILVYN® ZHLS / SILVYN® FCE-LFH

Interlocked metal conduit with thick-walled Polyolefin jacket



SILVYN® ZHLS

SILVYN® FCE-LFH



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
- Liquidtight

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
- Outer sheath: halogen-free, thermoplastic polyolefin compound

Technical data



Certifications

IEC EN 61386-23
EN 45545-2 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 × 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 × 11.5	40	—	—	30
64400255	5/16"	10.1 × 14.4	50	16 × 1.5/20 × 1.5	—	30
64400256	3/8"	12.6 × 17.8	60	16 × 1.5/20 × 1.5	—	30
64400257	1/2"	16 × 21.1	75	20 × 1.5	—	30
64400258	3/4"	21 × 26.4	90	25 × 1.5	—	30
64400259	1"	26.5 × 33.1	120	32 × 1.5	—	30
64400260	1 1/4"	35.1 × 41.8	135	40 × 1.5	—	15
64400261	1 1/2"	40.3 × 47.8	165	50 × 1.5	—	15
64400266	2"	51.6 × 59.9	210	63 × 1.5	—	15
SILVYN® FCE-LFH						
61814717	12	10 × 14	50	—	12 × 1.5	25
61814718	16	13 × 17	60	—	16 × 1.5/20 × 1.5	25
61814719	20	17 × 21.5	80	—	20 × 1.5	25
61814720	25	21.2 × 26	100	—	25 × 1.5	25
61814721	32	28.1 × 34	125	—	32 × 1.5	25
61814722	40	37.7 × 45	160	—	40 × 1.5	10
61814723	50	48.4 × 56	190	—	50 × 1.5	10

* Trade product, no Lapp product

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



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-V0/2HLS
- Railway applications

Product Make-up

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

Technical data



Norm references / Approvals
UL 514B



On request
Available in stainless steel



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



Protection rating
IP 66
IP 67



Temperature range
-45°C to +105°C

Article number	Metric size	Suitable for SILVYN® HTDL / EF / OR / HCX / HFX	Pieces / PU
SILVYN® COMPACT M			
61803846	16 × 1.5	5/16"	10
61803800	16 × 1.5	3/8"	10
61803847	20 × 1.5	5/16"	10
61803801	20 × 1.5	3/8"	10
61803802	20 × 1.5	1/2"	10
61803803	25 × 1.5	3/4"	5
61803804	32 × 1.5	1"	5
61803805	40 × 1.5	1 1/4"	5
61803806	50 × 1.5	1 1/2"	2
61803807	63 × 1.5	2"	2
SILVYN® COMPACT 45° M			
61803848	16 × 1.5	5/16"	10
61803850	16 × 1.5	3/8"	10
61803849	20 × 1.5	5/16"	10
61803851	20 × 1.5	3/8"	10
61803852	20 × 1.5	1/2"	10
61803853	25 × 1.5	3/4"	5
61803854	32 × 1.5	1"	5
SILVYN® COMPACT 90° M			
61803808	16 × 1.5	3/8"	10
61803809	20 × 1.5	3/8"	10
61803810	20 × 1.5	1/2"	10
61803811	25 × 1.5	3/4"	5
61803812	32 × 1.5	1"	5
61803813	40 × 1.5	1 1/4"	5
61803814	50 × 1.5	1 1/2"	2
61803815	63 × 1.5	2"	2

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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

Product Make-up

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

Application range

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

Technical data



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 × 1.5	8.5	12	10
55503625	16 × 1.5	11.2	16	10
55503626	20 × 1.5	11.2	16	10
55503627	20 × 1.5	15.2	20	10
55503628	25 × 1.5	19.2	25	5
61803855	32 × 1.5	25.9	32	5
61803856	40 × 1.5	34.5	40	2
SILVYN® FCE COMPACT 90° M				
61803860	16 × 1.5	11.2	16	10
61803861	20 × 1.5	11.2	16	10
61803862	20 × 1.5	15.2	20	10
61803863	25 × 1.5	19.2	25	5
61803864	32 × 1.5	25.9	32	5
SILVYN® FCE-F M				
55503602	12 × 1.5	8.5	12	10
55503603	16 × 1.5	8.5	12	10
55503604	16 × 1.5	11.2	16	10
55503605	20 × 1.5	11.2	16	10
55503606	20 × 1.5	15.2	20	10
55503607	25 × 1.5	19.2	25	5
55503608	32 × 1.5	25.9	32	5
55503609	40 × 1.5	34.8	40	2
55503610	50 × 1.5	44.8	50	2
55503611	63 × 1.5	44.8	50	2
SILVYN® FCE-S M				
55503614	12 × 1.5	8.5	12	10
55503615	16 × 1.5	8.5	12	10
55503616	16 × 1.5	11.2	16	10
55503617	20 × 1.5	11.2	16	10
55503618	20 × 1.5	15.2	20	10
55503619	25 × 1.5	19.2	25	5
55503620	32 × 1.5	25.9	32	5
55503621	40 × 1.5	34.8	40	2
55503622	50 × 1.5	44.8	50	2
55503623	63 × 1.5	44.8	50	2

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SILVYN® HIPROJACKET / SILVYN® HIPROSILTAPE

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



Info

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



SILVYN® HIPROJACKET



SILVYN® HIPROSILTAPE

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

- Brake system
- 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



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
30 m PU



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)
+1,640°C for approx. 15 – 30 sec (liquid-metal contact)
SILVYN® HIPROSILTAPE
-55°C to +260 °C permanent temp.

Article number	Nominal size	ID × OD (mm)	Suitable gland size	PU ring (m)
SILVYN® HIPROJACKET				
52021385	6	6 × 15	—	15
61713003	10	10 × 15	M16/2 + PG 9/2, 11/2, 13.5	15
61713005	13	13 × 18	M16/2, M20 PG 9/2, 11/2, 13.5, 16	15
61713007	16	16 × 22	M20 + PG 16	15
61713010	19	19 × 25	M25 + PG 21	15
61713011	22	22 × 28	M25 + PG 21	15
61713000	25	25 × 31	M32 + PG 29	15
61713014	29	29 × 35	—	15
61713015	32	32 × 38	M40 + PG 36	15
61713016	35	35 × 41	M40 + PG 36	15
61713017	38	38 × 44	M50 + PG 42	15
61713018	41	41 × 47	—	15
61713021	44	44 × 50	—	15
61713019	51	51 × 57	M63 + PG 48	15
61713022	57	57 × 63	—	15
61713025	64	64 × 70	—	15
61713027	70	70 × 76	—	15
61713028	76	76 × 82	—	15
61713029	83	83 × 89	—	15
61713037	89	89 × 95	—	15
61713038	95	95 × 101	—	15
61713039	102	102 × 108	—	15
SILVYN® HIPROSILTAPE				
61713040	25	25 × 0.5	—	11

* Trade product, no Lapp product

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SILVYN® HIPROJACKET AMG



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



Info

- Suitable fitting for use with SILVYN® HIPROJACKET

Technical data



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 × 1.5	—	50
55503517	20 × 1.5	—	50
55503518	25 × 1.5	—	25
55503519	32 × 1.5	—	10
55503520	40 × 1.5	—	5
55503521	50 × 1.5	—	5
55503522	63 × 1.5	—	4
SILVYN® HIPROJACKET AMG 45° M			
55503523	16 × 1.5	—	50
55503524	20 × 1.5	—	50
55503525	25 × 1.5	—	25
55503526	32 × 1.5	—	10
55503527	40 × 1.5	—	5
55503528	50 × 1.5	—	5
55503529	63 × 1.5	—	4
SILVYN® HIPROJACKET AMG 90° M			
55503530	16 × 1.5	—	50
55503531	20 × 1.5	—	50
55503532	25 × 1.5	—	25
55503533	32 × 1.5	—	10
55503534	40 × 1.5	—	5
55503535	50 × 1.5	—	5
55503536	63 × 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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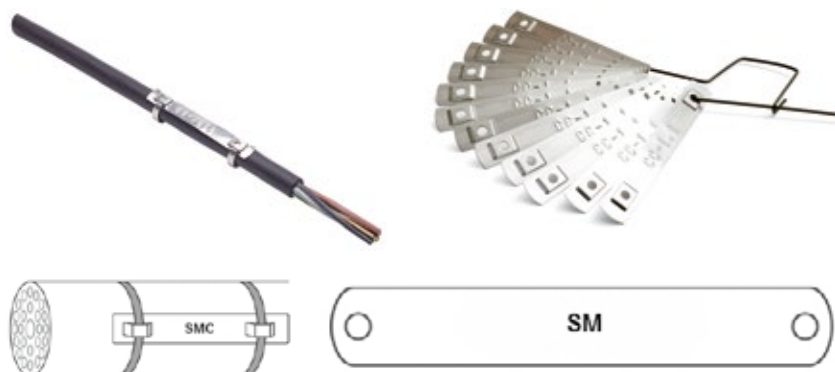


FLEXIMARK® Stainless steel FCC



Info

- Included in FLEXIMARK® sample bag (article no. M3251010)



Benefits

- Acid-resistant
- Excellent chemical resistance
- High-temperature resistant
- Extremely durable

Application range

- Resists harsh environmental influences and extreme weather conditions
- Railway industry, food industry, wind industry, oil and gas industry

Norm references / Approvals

- Achilles JQS certified

Note

- Markers will be delivered with the desired text (printing service is included in the price)
- Ordering process: Customer-specific data will be emailed as an Excel file to the responsible Lapp employee when the order is made
Column A: Row 1 content
Column B: Row 2 content
Column B or C: Number of markers with corresponding text

- 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)

Included

- 1 PU = 1 marker, there is no minimum purchase quantity
- Markers are sorted prior to delivery
- Included cable ties in article no.83251406, 83251456, 83251426, 83251468: Stainless steel cable ties LS 4.6-200 (article no.61812950)

Suitable tools

- STEEL GUN HT-338 cable tie pliers

Technical data



Dimensions

Character height: 4.2 mm
Gap between 2 characters: approx. 1 mm
Borehole diameter: 3.2 mm
Cable tie width: max. 7.9 mm



Note

Blanko version
Article no. 83251575 and 83251576



Info

Available characters:
A-Ü 0-9 + - / . : , = Earth sign



Material

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



Temperature range

-80°C to +500°C

Article number	Article designation	Height (mm)	Product Make-up	Number of characters	Markers / PU
One line embossing / with cable tie brackets					
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
One line embossing / with screw hole					
83251450	FLEXIMARK® Stainless steel SM FCC 0 - 15	9.9	with screw hole	0 - 15	1
83251478	FLEXIMARK® Stainless steel SM FCC 16 - 25	9.9	with screw hole	16 - 25	1
Two-line embossing / with cable tie brackets					
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
Two-line embossing / with screw hole					
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

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Blank markers could be found on the product page "SP Metalprint" (article no. 83251575 and 83251576).



FLEXIMARK® Organized shrink tube



Technical data



On request

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



Colour delivered

Standard colour: Yellow
Also available in white



Material

Polyolefin
Shrink ratio:
Halogen-free version: 2:1
Not halogen-free version: 3:1



Temperature range

Halogen-free version:
-30°C to +105°C
Not halogen-free Version:
-55°C to +135°C
Shrinking temperature:
+90°C

Benefits

- Reduced working time
- Already cut to the exact length

Application range

- Covers a wide range of cable diameters,
even applicable for single core marking

Norm references / Approvals

- Not halogen-free version:
UL 224 certified

Note

- Can be printed with the FLEXIMARK®
Software and the FLEXIMARK® Thermal
transfer printer SQUIX or EOS4
- Recommended ribbon: FTI-X 60-300 BK
(article no. 83260206)

Included

- Delivered as a roll of labels

Article number	Article designation	Colour	Shrinkage range (mm)	Length (mm)	Markers / PU	PU
Halogen-free						
83260225	FLEXIMARK® O.shr 2.4/1.2 – 12.5 YE	yellow	1.2 – 2.4	12	4000	1
83260228	FLEXIMARK® O.shr 2.4/1.2 – 16.6 YE	yellow	1.2 – 2.4	16	3000	1
83260100	FLEXIMARK® O.shr 2.4/1.2 – 25 YE	yellow	1.2 – 2.4	25	2000	1
83260090	FLEXIMARK® O.shr 2.4/1.2 – 38 YE	yellow	1.2 – 2.4	38	1000	1
83260080	FLEXIMARK® O.shr 2.4/1.2 – 50 YE	yellow	1.2 – 2.4	50	1000	1
83260226	FLEXIMARK® O.shr 3.2/1.6 – 12.5 YE	yellow	1.6 – 3.2	12	4000	1
83260229	FLEXIMARK® O.shr 3.2/1.6 – 16.6 YE	yellow	1.6 – 3.2	16	3000	1
83260101	FLEXIMARK® O.shr 3.2/1.6 – 25 YE	yellow	1.6 – 3.2	25	2000	1
83260091	FLEXIMARK® O.shr 3.2/1.6 – 38 YE	yellow	1.6 – 3.2	38	1000	1
83260081	FLEXIMARK® O.shr 3.2/1.6 – 50 YE	yellow	1.6 – 3.2	50	1000	1
83260227	FLEXIMARK® O.shr 4.8/2.4 – 12.5 YE	yellow	2.4 – 4.8	12	4000	1
83260230	FLEXIMARK® O.shr 4.8/2.4 – 16.6 YE	yellow	2.4 – 4.8	16	3000	1
83260102	FLEXIMARK® O.shr 4.8/2.4 – 25 YE	yellow	2.4 – 4.8	25	2000	1
83260092	FLEXIMARK® O.shr 4.8/2.4 – 38 YE	yellow	2.4 – 4.8	38	1000	1
83260082	FLEXIMARK® O.shr 4.8/2.4 – 50 YE	yellow	2.4 – 4.8	50	1000	1
83260103	FLEXIMARK® O.shr 6.4/3.2 – 25 YE	yellow	3.2 – 6.4	25	2000	1
83260093	FLEXIMARK® O.shr 6.4/3.2 – 38 YE	yellow	3.2 – 6.4	38	1000	1
83260083	FLEXIMARK® O.shr 6.4/3.2 – 50 YE	yellow	3.2 – 6.4	50	1000	1
83260104	FLEXIMARK® O.shr 9.5/4.8 – 25 YE	yellow	4.8 – 9.5	25	1000	1
83260094	FLEXIMARK® O.shr 9.5/4.8 – 38 YE	yellow	4.8 – 9.5	38	500	1
83260084	FLEXIMARK® O.shr 9.5/4.8 – 50 YE	yellow	4.8 – 9.5	50	500	1
83260105	FLEXIMARK® O.shr 12.7/6.4 – 25 YE	yellow	6.4 – 12.7	25	1000	1
83260095	FLEXIMARK® O.shr 12.7/6.4 – 38 YE	yellow	6.4 – 12.7	38	500	1
83260085	FLEXIMARK® O.shr 12.7/6.4 – 50 YE	yellow	6.4 – 12.7	50	500	1
83260106	FLEXIMARK® O.shr 19.1/9.5 – 25 YE	yellow	9.5 – 19.1	25	1000	1
83260096	FLEXIMARK® O.shr 19.1/9.5 – 38 YE	yellow	9.5 – 19.1	38	500	1
83260086	FLEXIMARK® O.shr 19.1/9.5 – 50 YE	yellow	9.5 – 19.1	50	500	1
83260107	FLEXIMARK® O.shr 25.4/12.7 – 25 YE	yellow	12.7 – 25.4	25	600	1
83260097	FLEXIMARK® O.shr 25.4/12.7 – 38 YE	yellow	12.7 – 25.4	38	300	1
83260087	FLEXIMARK® O.shr 25.4/12.7 – 50 YE	yellow	12.7 – 25.4	50	300	1
83260098	FLEXIMARK® O.shr 38.1/19.1 – 38 YE	yellow	19.1 – 38.1	38	100	1
83260088	FLEXIMARK® O.shr 38.1/19.1 – 50 YE	yellow	19.1 – 38.1	50	100	1
83260099	FLEXIMARK® O.shr 50.8/25.4 – 38 YE	yellow	25.4 – 50.8	38	100	1
83260089	FLEXIMARK® O.shr 50.8/25.4 – 50 YE	yellow	25.4 – 50.8	50	100	1

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

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.



FLEXIMARK® Warning signs / Prohibition signs / Mandatory signs



Info

- All symbols according to ISO 7010

Benefits

- Very resistant to UV, moisture, chemicals (e.g. glass cleaner, alcohol, oil)
- Scratch resistant
- Powerful adhesive

Application range

- Control cabinet manufacturing
- Mechanical engineering
- Robotics
- Safety marking in industrial environment
- Indoor and outdoor applications

Product features

- Self-adhesive labels

Technical data



On request

Further dimensions and symbols



Colour delivered

FLEXIMARK® Warning signs

yellow

FLEXIMARK® Prohibition signs

red

FLEXIMARK® Mandatory signs

blue



Material

Laminated polyester (halogen-free)



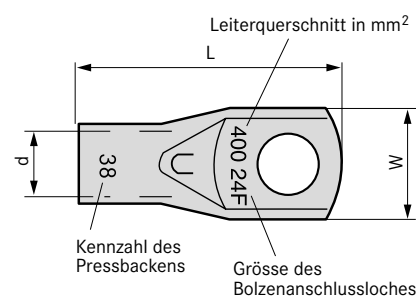
Temperature range

-40°C to +150°C

Processing: min. +10°C

Picture	Article designation	Description	Side length / diameter			Markings / PU	PU
			25 mm	50 mm	100 mm		
FLEXIMARK® Warning signs							
	FLEXIMARK® W001	General warning sign	83880016	83880017	83880018	10	1
	FLEXIMARK® W002	Warning; explosive material	83880019	83880020	83880021	10	1
	FLEXIMARK® W012	Warning; Electricity	83880049	83880050	83880051	10	1
	FLEXIMARK® W017	Warning; Hot surface	83880064	83880065	83880066	10	1
	FLEXIMARK® W021	Warning; Flammable material	83880076	83880077	83880078	10	1
	FLEXIMARK® W025	Warning; Counterrotating rollers	83880088	83880089	83880090	10	1
	FLEXIMARK® W026	Warning; Battery charging	83880091	83880092	83880093	10	1
FLEXIMARK® Prohibition signs							
	FLEXIMARK® P003	No open flame; Fire, open ignition source and smoking prohibited	83880190	83880191	83880192	10	1
	FLEXIMARK® P007	No access for people with active implanted cardiac devices	83880202	83880203	83880204	10	1
	FLEXIMARK® P024	Do not walk or stand here	83880253	83880254	83880255	10	1
	FLEXIMARK® P031	Do not alter the state of the switch	83880274	83880275	83880276	10	1
FLEXIMARK® Mandatory signs							
	FLEXIMARK® M003	Wear ear protection	83880112	83880113	83880114	10	1
	FLEXIMARK® M004	Wear eye protection	83880115	83880116	83880117	10	1
	FLEXIMARK® M008	Wear safety footwear	83880127	83880128	83880129	10	1
	FLEXIMARK® M009	Wear protective gloves	83880130	83880131	83880132	10	1

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



Material

Tinned electrolytic copper



Temperature range

Temperature range up to +90°C
Working temperature: 110°C, max. +140°C

Article number	Article designation	Screw hole ϕ (mm)	UL certification	Length (mm)	Pressing dies	d (mm)	W (mm)	Pieces / PU
Rohrkabelschuhe 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 and graphics are not to scale and do not represent detailed images of the respective products.



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

	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 × width (mm)	Bundling Ø (mm)	Tensile strength (N)	PU
TY-RAP® Railway						
61723330	TY 23 MFR RW	no	92 × 2.4	2 – 16	80	1000
61723331	TY 232 MFR RW	no	203 × 2.4	2 – 50	80	1000
61723332	TY 24 MFR RW	no	140 × 3.6	2 – 29	180	1000
61723333	TY 25 MFR RW	no	186 × 4.8	3.5 – 45	220	1000
61723334	TY 28 MFR RW	no	360 × 4.8	3.5 – 102	220	500
61723335	TY 27 MFR RW	no	340 × 7	6 – 90	540	100

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Notes

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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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