

# THE WORLD OF LAPP

APAC Edition · Photovoltaic 2016/17



# Legend for icons

## INDUSTRIES



Automation



Mechanical and  
Plant Engineering



Solar Energy

## PRODUCT CHARACTERISTICS



Suitable for outdoor use



Good chemical  
resistance



Flame-retardant



Wide clamping range



Halogen-free



Cold-resistant



Corrosion-resistant



Maximum vibration  
protection



Mechanical resistance



Assembly time



Low weight



Optimum strain relief



Robust



Voltage



Interference signals



Temperature-resistant



UV-resistant



Waterproof



Variety of approval  
certifications

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

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## Success through values

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

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

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

the daily commitment of our skilled staff and partnerships with our customers based on trust. Each of them has made a decisive contribution to our mutual success. Today, Lapp is one of the world's leading manufacturers of cables, leads, cable accessories and systems of the highest level of quality. We have approximately 3,200 employees worldwide. With 18 production sites on four continents, more than 40 sales companies and hundreds of dedicated consulting experts, we are always close by. And not just physically: customer proximity cannot be meas-

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

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

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

- Founded in 1957
- A leading manufacturer of cables, leads, accessories and complete system solutions for connection technology
- Approximately 3,200 employees worldwide
- 18 production facilities
- More than 40 sales companies
- Hundreds of dedicated consulting experts worldwide
- Years of experience in the rail industry



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

# Eight brands, one promise: uncompromising quality – worldwide



**ÖLFLEX®**  
Power and control cables

ÖLFLEX® has become synonymous with power and control cables. Our flexible and oil-resistant cables satisfy the highest demands and can withstand even the very toughest conditions.



**UNITRONIC®**  
Data communication systems

Our high-quality UNITRONIC® data network cables and field bus components provide a forward-looking solution for all applications in industrial machinery and plant engineering. From transmission of simple control signals to field bus signals in complex network structures – we offer a dependable cabling and connection solution for almost every situation.



**ETHERLINE®**  
Data communication systems  
for ETHERNET technology

Our ETHERLINE® branded products open up a secure, fast and reliable path to the future of Ethernet applications. The systems are made up of durable and robust cables and connection components for passive network technology, and deliver an effective solution for almost any application, particularly in an industrial environment.



**HITRONIC®**  
Optical transmission systems

HITRONIC® fibre optic cables make transmitting large data volumes easy: fault free, bug proof and at almost light speed. Even electromagnetic radiation does not interfere with the transmission. The HITRONIC® range includes the ideal solution for indoor or outdoor use, for demanding conditions, and even for use in power chains.



**EPIC®**  
Industrial connectors

EPIC® industrial connectors can be found everywhere in industrial machinery and plant engineering, for measuring, control and drives. EPIC® is a flexible system of housings, inserts and contacts: all extremely robust, absolutely safe and simplicity itself to assemble.



**SKINTOP®**  
Cable glands

Simply feed in the cable and twist. That's it. Our SKINTOP® cable glands provide secure connections in no time. The universal systems are simple but effective. They secure and centre the cable, hermetically seal it and guarantee optimum strain relief.



**SILVYN®**  
Protective cable conduit systems  
and cable carrier systems

The universal range of SILVYN® protection and guidance systems protect cables effectively against dust, moisture, mechanical, thermal and chemical influences. The versatile SILVYN® CHAIN range of energy supply cables also protects and guides cables in dynamic applications.



**FLEXIMARK®**  
Marking systems

The requirement: permanent marking. The solution: FLEXIMARK®. These sophisticated systems mean that a clear overview inside a control cabinet is no longer just a pipe dream. From simple labels for manual marking through to electronic markings, the FLEXIMARK® range is guaranteed to be permanent.

## Reliably connecting the world

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

No matter where you are – we are always by your side. Our plants, sales companies, partners and, above all, our competent

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

that Lapp will provide you with the quality that you require and that you demand.

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

**8**  
Strong  
brands

**100**  
Sales partners

**18**  
Production  
sites

**1**  
Innovation  
after  
another

Employees from  
**152**  
countries

More than  
**40,000**  
Standard products

Over  
**40**  
of its own sales  
companies

**3,200**  
Employees

## Complete range for photovoltaics

“Nothing is more environment-friendly than receiving energy directly from the sun. This is our commitment to the solar technology.” says Siegbert Lapp, member of the board of Lapp Holding AG.

The fact that we recognised the potential of this market very early on and have built up specialist expertise in this area demonstrates once again the innovative tradition

of our company. Our offering ranges from developing tailored products to advising you on planning and conversion matters.

After taking into account the full range of operational requirements, Lapp offers a specifically tailored comprehensive range of cables, connectors and photovoltaic accessories for cabling photovoltaic plants – we are the system of choice!

In collaboration with users, the TÜV (German Association for Technical Inspection) and the North American UL approval organisation, a variety of tests have been carried out on our ÖLFLEX® cables, SOLAR cables, SKINTOP® cable glands and EPIC® SOLAR connectors to guarantee highest quality standards. Our products can be used throughout the world and naturally also comply with the RoHS directive.







Organic photovoltaic objects on German pavilion at the world exhibition in Milan

## Connection technology for solar trees from Lapp

At the world exhibition in Milan, Expo Milano 2015, the German pavilion will grab the visitors' attention with its energy-generating solar trees. These solar trees integrate organic photovoltaics (OPV) technology and, unlike conventional solar modules, are made from flexible, film-integrated OPV modules. The revolutionary connection technology needed to produce these comes from the Stuttgart-based Lapp Group.

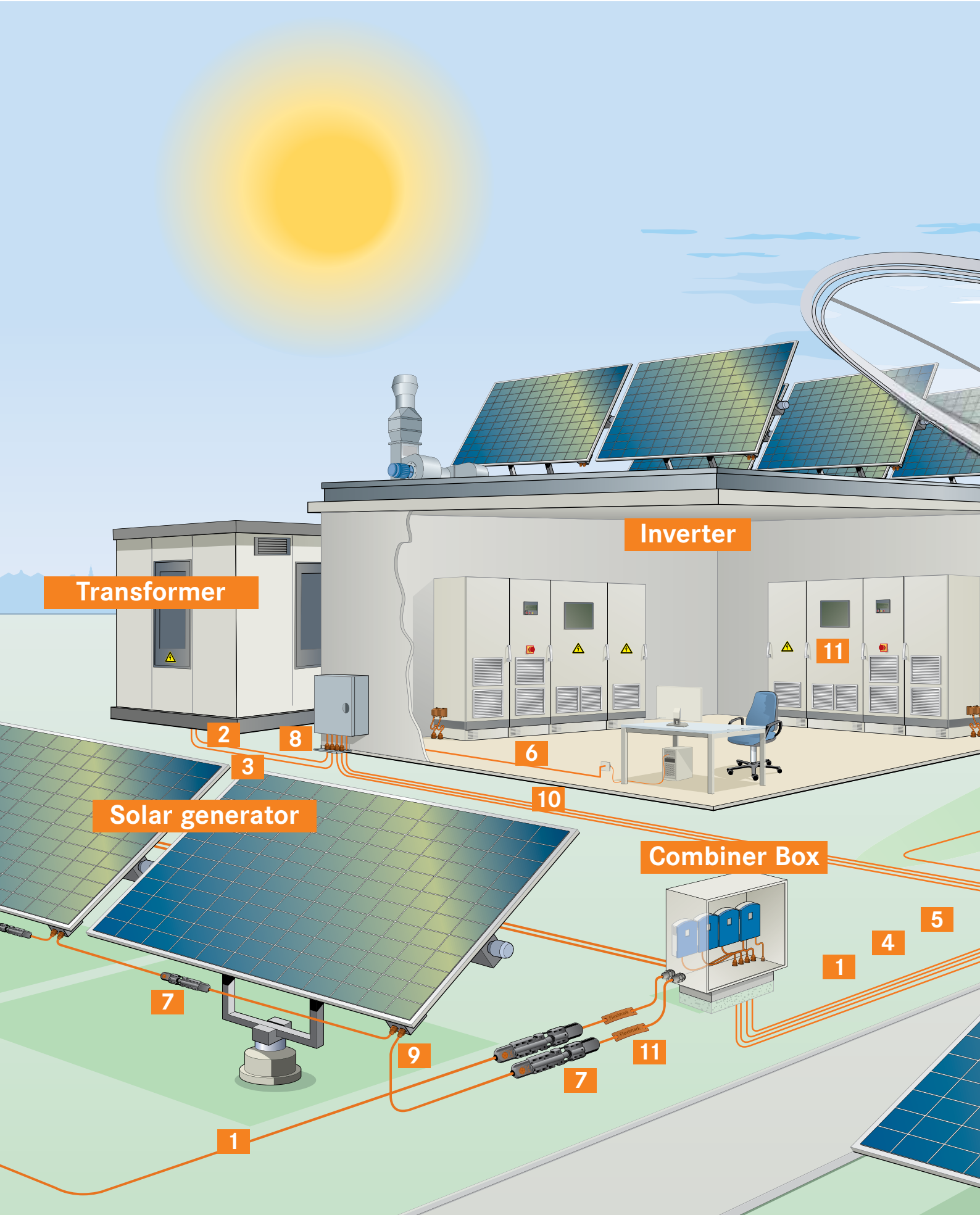
For over ten years, Lapp has been successfully developing connection systems

for photovoltaic modules and has regularly pushed the market forward with its intelligent innovations, for example the well-known connector system EPIC® SOLAR and the cable series ÖLFLEX® SOLAR.

The OPV modules and the innovative connections are made from one cast – unlike with conventional photovoltaic modules, there is no longer a junction box attached; instead, there is a so-called access point that is cast directly onto the flexible OPV film and merges with the film. This method prevents capillary action and therefore al-

so damage due to corrosion. Additionally, the connection components are, at only 30 mm x 20 mm, considerably smaller than those in conventional systems. The cables to be used by the modules were also selected according to customer-specific requirements and are only 2mm wide. They have been produced in grey for use on the German pavilion so that they can be integrated virtually unnoticeably into the grey wire braiding of the design components.

# The Solar system by Lapp



**1** ÖLFLEX® SOLAR  
Photovoltaic cables

**2** PVC UNDERGROUND CABLE  
Power and control cable

**3** Medium Voltage Cable

**4** UNITRONIC® BUS  
Data- and BUS cables

**5** UNITRONIC® Feldbus  
S/A cabling

**6** ETHERLINE®  
Ethernet cabling

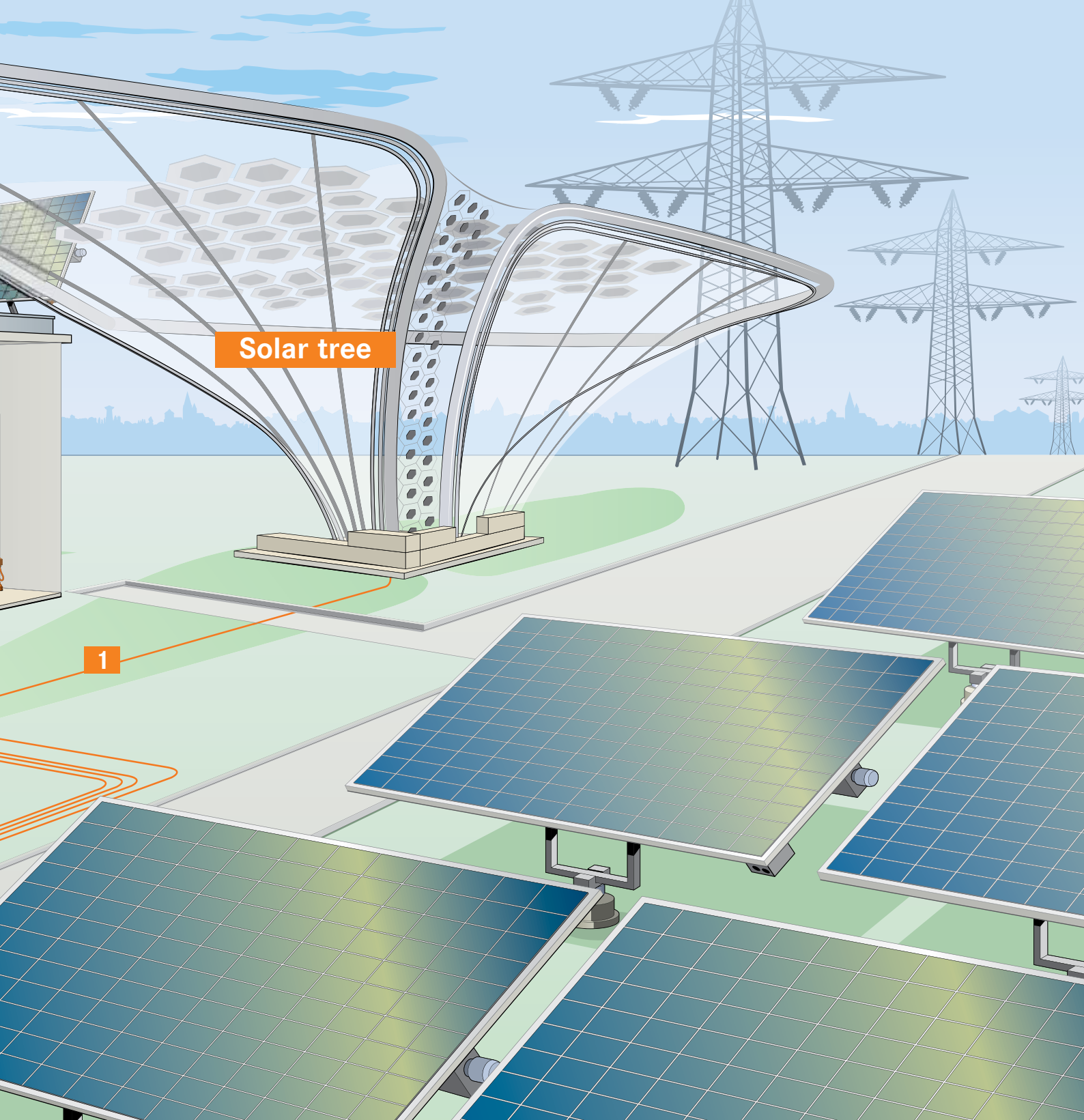
**7** EPIC® SOLAR  
Photovoltaic connectors

**8** SKINTOP® ST-M/CLICK  
Cable glands

**9** SKINTOP® SOLAR  
Photovoltaic cable glands

**10** SILVYN®  
Protective cable conduit- and cable  
carrier systems

**11** FLEXIMARK®  
Cable marking products





## ÖLFLEX® SOLAR XLS-R

Electron beam cross-linked solar cables with reduced outer diameters



**Info**

- Optimised cable design - thin, light and robust

### Benefits

- Reduced outer diameters enable space and weight saving installation
- Robust against mechanical impacts
- Reduction of flame propagation and of toxic combustion gases in the event of fire
- Extruded colour stripe serves as reverse polarity protection during installation.
- Exact quantity control during installation by meter marking on the cable sheath

### Application range

- For the cabling between the solar modules and as extension cable between the module strings and the DC/AC inverter
- Gable and flat roof photovoltaic systems
- Photovoltaic plants and solar parks
- Flexible or building-integrated PV systems
- Not suitable for direct burial, Installation according to IEC 60364-5-52, respectively HD 60364-5-52

### Product features

- Weather/UV-resistant acc. to HD 605/A1
- Ozone-resistant according to EN 50396
- Halogen-free and flame-retardant
- Good notch and abrasion resistance
- XLS-R = X-Linked Standard - Reduced Proven electron beam cross-linked quality

### Product Make-up

- Fine-wire, tinned-copper conductor
- Core insulation made of electron beam cross-linked copolymer
- Colour of core insulation: white
- Outer sheath made of electron beam cross-linked copolymer
- Outer sheath colour: black respectively black with red or blue stripe

### Technical data

- Classification**  
ETIM 5.0 Class-ID: EC001578  
ETIM 5.0 Class-Description: Flexible cable
- Conductor stranding**  
Fine wire according to VDE 0295, class 5/IEC 60228 class 5
- Minimum bending radius**  
Fixed installation: 4 x outer diameter
- Nominal voltage**  
AC  $U_o/U$  : 600/1000 V  
DC  $U_o/U$  : 900/1500 V  
Max. permissible operating voltage: DC 1,8 kV (Conductor-conductor, non earthed system)
- Test voltage**  
AC 6500 V
- Temperature range**  
Fixed installation: -40°C to +100°C max. conductor temperature

Article number	Conductor cross-section (mm <sup>2</sup> )	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
<b>Core insulation: white / Outer sheath: black</b>				
0023136	2.5	4.8	24	46
0023137	4.0	5.2	38.4	63
0023138	6.0	5.8	57.6	86
0023104	10.0	7	96	132
0023105	16.0	8.3	153.6	197
<b>Core insulation: white / Outer sheath: black with red stripe</b>				
0023390	2.5	4.8	24	46
0023391	4.0	5.2	38.4	63
0023392	6.0	5.8	57.6	86
0023393	10.0	7	96	132
0023394	16.0	8.3	153.6	197
<b>Core insulation: white / Outer sheath: black with blue stripe</b>				
0023395	2.5	4.8	24	46
0023396	4.0	5.2	38.4	63
0023397	6.0	5.8	57.6	86
0023398	10.0	7	96	132
0023399	16.0	8.3	153.6	197

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](http://www.lappkabel.de/en/cable-standardlengths)  
Packaging size: Coil 100 m; Drum (500; 1000) m  
Photographs are not to scale and do not represent detailed images of the respective products.

### Similar products

- ÖLFLEX® SOLAR XLR-R refer to main catalogue 2016/17

### Accessories

- EPIC® SOLAR 4 M refer to main catalogue 2016/17
- EPIC® SOLAR 4 F refer to main catalogue 2016/17
- UNIVERSAL STRIP stripping tool refer to page 33
- KS 20 cable shears refer to page 33



## ÖLFLEX® SOLAR XLR-E

Cross-linked solar cables - type H1Z2Z2-K certified according to EN 50618

**Info**

- H1Z2Z2-K (code designation according to EN 50618)
- Substitutes previous ÖLFLEX® SOLAR XLR-R



### Benefits

- Robust against mechanical impacts
- For outdoor applications
- Extruded colour stripe serves as reverse polarity protection during installation.
- Exact quantity control during installation by meter marking on the cable sheath
- Reduction of flame propagation and of toxic combustion gases in the event of fire

### Application range

- For use in photovoltaic-systems with rated voltage 1500 V DC
- For the cabling between the solar modules and as extension cable between the module strings and the DC/AC inverter
- Gable and flat roof photovoltaic systems
- Photovoltaic plants and solar parks
- Not suitable for direct burial, Installation according to IEC 60364-5-52, respectively HD 60364-5-52

### Product features

- Halogen-free and flame-retardant
- Weather/UV-resistant acc. to EN 50618, appendix E
- Ozone-resistant according to EN 50396
- XLR-E = X-Linked Radiated-EN Standard Proven electron beam cross-linked quality

### Norm references / Approvals

- H1Z2Z2-K (code designation according to EN 50618)
- Items with other cross-sections on request

### Product Make-up

- Fine-wire, tinned-copper conductor
- Core insulation made of electron beam cross-linked copolymer
- Colour of core insulation: white
- Outer sheath made of electron beam cross-linked copolymer
- Outer sheath colour: black respectively black with red stripe

### Technical data

**Classification**  
ETIM 5.0 Class-ID: EC001578  
ETIM 5.0 Class-Description: Flexible cable

**Conductor stranding**  
Fine wire according to VDE 0295, class 5/IEC 60228 class 5

**Minimum bending radius**  
Fixed installation: 4 x outer diameter

**Nominal voltage**  
AC  $U_0/U$  : 1,0/1,0 kV  
DC  $U_0/U$  : 1,5/1,5 kV  
Max. permissible operating voltage: DC 1,8 kV

**Test voltage**  
AC 6500 V

**Current rating**  
Im compliance with EN 50618, Table A.3

**Temperature range**  
-40°C to +120°C max. conductor temperature based on EN 60216-1  
Ambient temperature range according to EN 50618: -40°C to +90°C

Article number	Conductor cross-section (mm²)	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
<b>ÖLFLEX® SOLAR XLR-E</b>				
<b>Core insulation: white / Outer sheath: black</b>				
1023652	4.0	5.4	38.4	66
1023653	6.0	6	57.6	89.4
1023654	10.0	7.2	96	136.3
1023655	16.0	8.4	153.6	207.2
<b>Core insulation: white / Outer sheath: black with red stripe</b>				
1023667	4.0	5.4	38.4	66
1023668	6.0	6	57.6	89.4
1023669	10.0	7.2	96	136.3
1023670	16.0	8.4	153.6	207.2

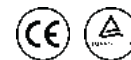
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.  
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.  
Please find our standard lengths at: [www.lappkabel.de/en/cable-standardlengths](http://www.lappkabel.de/en/cable-standardlengths)  
Packaging size: Coil 100 m; Drum (500; 1000) m  
Photographs are not to scale and do not represent detailed images of the respective products.

### Similar products

- ÖLFLEX® SOLAR XLWP refer to main catalogue 2016/17

### Accessories

- EPIC® CRIMPTOOL refer to main catalogue 2016/17
- EPIC® SOLAR 4 M refer to main catalogue 2016/17
- EPIC® SOLAR 4 F refer to main catalogue 2016/17
- KS 20 cable shears refer to page 33



## ÖLFLEX® SOLAR XLWP

Electron beam cross-linked solar cables with optimized performance in water - EN 50618 type



**Info**

- Optimised cable design - constant high volume resistance even after long-term period in water
- H1Z2Z2-K (code designation according to EN 50618)
- Substitutes previous ÖLFLEX® SOLAR XLR WP

### Benefits

- The alternative for long-term storage in water, e.g. as it can occur in case after flooding or in buried conduits
- Reduction of flame propagation and of toxic combustion gases in the event of fire
- Robust against mechanical impacts
- Extruded colour stripe serves as reverse polarity protection during installation.
- Exact quantity control during installation by meter marking on the cable sheath

### Application range

- For underground installation in conduits, in which water, heat and moisture can accumulate
- For the cabling between the solar modules and as extension cable between the module strings and the DC/AC inverter
- Gable and flat roof photovoltaic systems
- Photovoltaic plants and solar parks
- Suitable for direct burial: see data sheet

### Product features

- Weather/UV-resistant acc. to EN 50618, appendix E
- Ozone-resistant according to EN 50396
- Halogen-free and flame-retardant
- Good notch and abrasion resistance
- XLWP = X-Linked Water-Proof  
Proven electron beam cross-linked quality

### Norm references / Approvals

- H1Z2Z2-K (code designation according to EN 50618)
- Items with other cross-sections on request

### Product Make-up

- Fine-wire, tinned-copper conductor
- Core insulation made of electron beam cross-linked copolymer
- Colour of core insulation: white
- Outer sheath made of electron beam cross-linked copolymer
- Outer sheath colour: black respectively black with red stripe

### Technical data

**Classification**  
ETIM 5.0 Class-ID: EC001578  
ETIM 5.0 Class-Description:  
Flexible cable

**Conductor stranding**  
Fine wire according to VDE 0295, class 5/IEC 60228 class 5

**Minimum bending radius**  
Fixed installation: 4 x outer diameter

**Nominal voltage**  
AC  $U_0/U$  : 1,0/1,0 kV  
DC  $U_0/U$  : 1,5/1,5 kV  
Max. permissible operating voltage:  
DC 1,8 kV

**Test voltage**  
AC 6500 V

**Current rating**  
Im compliance with EN 50618, Table A.3

**Temperature range**  
-40°C to +120°C max. conductor temperature based on EN 60216-1  
Ambient temperature range according to EN 50618: -40°C to +90°C

Article number	Conductor cross-section (mm <sup>2</sup> )	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
<b>ÖLFLEX® SOLAR XLWP</b>				
<b>Core insulation: white / Outer sheath: black</b>				
1023601	4.0	5.8	38.4	68.1
1023602	6.0	6.4	57.6	91.6
1023603	10.0	7.6	96	138.6
1023604	16.0	9.1	153.6	209.7
<b>Core insulation: white / Outer sheath: black with red stripe</b>				
1023621	4.0	5.8	38.4	68.1
1023622	6.0	6.4	57.6	91.6
1023623	10.0	7.6	96	138.6
1023624	16.0	9.1	153.6	209.7

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](http://www.lappkabel.de/en/cable-standardlengths)

Packaging size: Coil 100 m; Drum (500; 1000) m

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

### Accessories

- EPIC® SOLAR 4 M refer to main catalogue 2016/17
- EPIC® SOLAR 4 F refer to main catalogue 2016/17
- UNIVERSAL STRIP stripping tool refer to page 33
- KS 20 cable shears refer to page 33



## ÖLFLEX® SOLAR XLR-E T

Electron beam cross-linked solar twin-cables, separable - EN 50618 type



**i Info**

- Optimised cable design - thin, light and robust
- Time-saving installation
- Ideal for stand-alone PV power systems

### Benefits

- Easy to split into two separate cables
- Reduced outer diameters enable space and weight saving installation
- Robust against mechanical impacts
- Reduction of flame propagation and of toxic combustion gases in the event of fire
- Exact quantity control during installation by meter marking on the cable sheath

### Application range

- For use in photovoltaic-systems with rated voltage 1500 V DC
- Ideal for stand-alone PV power systems
- Gable and flat roof photovoltaic systems
- Photovoltaic plants and solar parks
- Flexible or building-integrated PV systems

### Product features

- Weather/UV-resistant acc. to EN 50618, appendix E
- Ozone-resistant according to EN 50396
- Good notch and abrasion resistance
- Halogen-free according to IEC 60754-1 (amount of halogen acid gas)  
Corrosiveness of combustion gases according to IEC 60754-2 (degree of acidity)

### Norm references / Approvals

- H1Z2Z2-K (code designation according to EN 50618)

### Product Make-up

- Fine-wire, tinned-copper conductor
- Core insulation made of electron beam cross-linked copolymer
- Outer sheath made of electron beam cross-linked copolymer
- Outer sheath colour: Black
- Cores connected in parallel with a separating strip

### Technical data

**Classification**  
ETIM 5.0 Class-ID: EC001578  
ETIM 5.0 Class-Description: Flexible cable

**Core identification code**  
black / red

**Conductor stranding**  
Fine wire according to VDE 0295, class 5/IEC 60228 class 5

**Minimum bending radius**  
Fixed installation: 4 x outer diameter

**Nominal voltage**  
AC  $U_0/U$  : 1,0/1,0 kV  
DC  $U_0/U$  : 1,5/1,5 kV  
Max. permissible operating voltage: DC 1,8 kV

**Test voltage**  
AC 6500 V

**Current rating**  
Im compliance with EN 50618, Table A.3

**Temperature range**  
-40°C to +120°C max. conductor temperature based on EN 60216-1  
Ambient temperature range according to EN 50618: -40°C to +90°C

Article number	Number of cores and mm <sup>2</sup> per conductor	Outer dimensions, width x height (mm)	Copper index (kg/km)	Weight (kg/km)
<b>Core insulation: red / black</b>				
1023701	2 X 2.5	10.3 x 5.0	48	99
1023702	2 X 4.0	11.1 x 5.4	76.8	134
1023703	2 X 6.0	12.3 x 6.0	115.2	181

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](http://www.lappkabel.de/en/cable-standardlengths)  
Packaging size: Coil 100 m; Drum (500; 1000) m  
Photographs are not to scale and do not represent detailed images of the respective products.

### Similar products

- ÖLFLEX® SOLAR XLR-E refer to main catalogue 2016/17

### Accessories

- EPIC® SOLAR 4 M refer to main catalogue 2016/17
- EPIC® SOLAR 4 F refer to main catalogue 2016/17
- UNIVERSAL STRIP stripping tool refer to page 33
- KS 20 cable shears refer to page 33



# ÖLFLEX® SOLAR AL FLEX



### Info

- Aluminum conductor According to ISO 6722-2-B
- Lightweight and economical solar cable.

### Benefits

- Applied to aluminum conductor, which is less expensive than copper conductor
- Easy installation due to light weight aluminum conductor than copper conductor
- Flexible aluminum conductors (class 5 grade) for high workability.
- Use of insulation & sheath compound meeting EN506 18, the new TuV certification standard.High durability due to high insulation resistance and thermal stability.

### Application range

- For the cabling between the solar modules and as extension cable between the module strings
- Gable and flat roof photovoltaic systems
- Photovoltaic plants and solar parks

### Product features

- High Weathering & UV-resistance
- High thermal stability
- Halogen-free and flame-re
- Acid and alkaline resistance
- Low smoke density

### Norm references / Approvals

- Flame retardant according to IEC 60332-1-2
- Halogen free according to EN 50267-2-1/-2 & EN 60684-2
- Ozone resistance according to EN 50396
- Weathering/UV-resistance according to HD 605/A1
- Acid and alkaline resistance according to EN 60811-2-1
- Low smoke density according to EN 61034-2

### Product Make-up

- Conductor: Fine wire strands of Aluminum conductor According to ISO 6722-2-B
- Core insulation: Electron beam cross-linked Polyolefin (XLPO)
- Core colour: White
- Outer sheath : Electron beam cross-linked Polyolefin (XLPO)
- Outer sheath colour: Black & Black with red or blue stripe

### Technical data



#### Conductor stranding

Fine wire strands of Aluminum conductor According to ISO 6722-2-B



#### Minimum bending radius

Fixed installation: 5 x cable diameter



#### Rated voltage

DC U<sub>0</sub> : 1500 V



#### Test voltage

AC 6500 V



#### Range of temperature

Fixed installation:  
-40° C up to +120 °C  
max. conductor temperature

Article number	Conductor cross-section (mm <sup>2</sup> )	Outer diameter (mm)	Conductor Weight (kg/km)	Weight (kg/km)
<b>ÖLFLEX® SOLAR AL FLEX</b>				
<b>Core insulation: white / Outer sheath: black</b>				
0023177A-	4	5.6	12	39.31
0023178C-	6	6.2	18	49.30
0023363A-	10	7.2	29	66.96
<b>Core insulation: white / Outer sheath: black with red stripe</b>				
0023361A-	4	5.6	12	39.31
0023362A-	6	6.2	18	49.30
0023363A-	10	7.2	29	66.96
<b>Core insulation: white / Outer sheath: black with blue stripe</b>				
0023371A-	4	5.6	12	39.31
0023372A-	6	6.2	18	49.30
0023373A-	10	7.2	29	66.96

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](http://www.lappkabel.de/en/cable-standardlengths)

Packaging size: Coil 100 m; Drum (500; 1000) m

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





**ÖLFLEX® H-CV**

XLPE insulation & High temperature resistance PVC sheath cables - <PS>E certified according to JIS C 3605

**i Info**

- Meets the design standard of JIS C 3605
- High operating temperature up to the + 90 ° C



**Benefits**

- High operating temperature range (Up to + 90 ° C)
- Exact quantity control during installation by meter marking on the cable sheath
- Reduction of flame propagation

**Application range**

- For the cabling between the solar modules and as extension cable between the module strings
- Gable and flat roof photovoltaic systems
- Photovoltaic plants and solar parks

**Product features**

- High flame retardancy
- Oil resistance
- High heat resistance and high operating temperature range

**Norm references / Approvals**

- <PS>E certified according to JIS C 3605
- Flame retardant acc. to JIS C 3005 4.26
- Oil-resistant acc. to JIS C 3605 6.8
- Environmental response acc. to RoHS Rated

**Product Make-up**

- Conductor: Annealed Copper Wire according to JIS C 3102
- Core insulation: Cross-Linked Polyethylene (XLPE)
- Core colour: White or Black
- Outer sheath: Heat-resistant Polyvinyl Chloride (PVC), Lead-free
- Outer sheath colour: Black

**Technical data**

- Conductor stranding**  
Annealed Copper Wire according to JIS C 3102
- Nominal voltage**  
AC U<sub>0</sub> : 600 V
- Test voltage**  
AC 1,500 V
- Minimum bending radius**  
Fixed installation: 5 x outer diameter
- Temperature range**  
UP to + 90 °C

Article number	Conductor cross-section (mm <sup>2</sup> )	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
<b>ÖLFLEX® H-CV</b>				
<b>Core insulation: white / Outer sheath: black</b>				
3923177	3.5	7.0	34	73
3923178	5.5	8.0	53	102
3923179	8.0	8.5	73	132
<b>Core insulation: black / Outer sheath: black</b>				
3923167	3.5	7.0	34	73
3923168	5.5	8.0	53	102
3923169	8.0	8.5	73	132

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 100 m; Drum (500; 1000) m  
 Photographs are not to scale and do not represent detailed images of the respective products.



## ÖLFLEX® PV-CQ

LAPP KABEL JET DC 1500V PV-CQ RoHS



### Info

- Meets the design standard of JCS 4517
- DC 1,500V SOLAR CABLE

### Benefits

- High performance of heat resistance / weatherability / mechanical strength
- Standard cable from 2.0 to 60 mm<sup>2</sup>
- Exact quantity control during installation by meter marking on the cable sheath
- Reduction of flame propagation and of toxic combustion gases in the event of fire

### Application range

- For use in photovoltaic-systems with rated voltage 1500 V DC
- For the cabling between the solar modules and as extension cable between the module strings and the DC/AC inverter
- Gable and flat roof photovoltaic systems
- Photovoltaic plants and solar parks

### Product features

- High mechanical strength acc. to JCS 4517 6.17
- Weather/UV-resistant acc. to JIS K 7350-1 & -2
- Ozone-resistant according to JIS C 3667
- Halogen-free and flame-retardant

### Norm references / Approvals

- Meets the design standard of JCS 4517
- Halogen-free acc. to JIS C 3666-2
- Acid / Alkaline resistance according to JIS C 3660-2-1
- Flame retardant acc. to JIS C 3665-1-2

### Product Make-up

- Conductor: Annealed Copper Wire according to JIS C 3102
- Core insulation: Cross-Linked Polyethylene (XLPE)
- Core colour: White
- Outer sheath : Electron beam cross-linked Polyolefin (XLPO)
- Outer sheath colour: Black

### Technical data



**Conductor stranding**  
Annealed Copper Wire according to JIS C 3102



**Minimum bending radius**  
Fixed installation: 5 x outer diameter



**Nominal voltage**  
DC 1500 V



**Test voltage**  
AC 6500 V



**Temperature range**  
Ambient temperature range according to JCS 4517 : -40°C to +90°C

Article number	Conductor cross-section (mm <sup>2</sup> )	Outer diameter (mm)	Conductor Weight (kg/km)	Weight (kg/km)
<b>ÖLFLEX® PV-CQ</b>				
<b>Core insulation: white / Outer sheath: black</b>				
3923176CQ-	2.0	5.6	19	52.35
3923177CQ-	3.5	6.2	34	70.20
3923178CQ-	5.5	6.8	53	94.24
3923179CQ-	8.0	7.4	75	121.27
3923180CQ-	14	8.8	134	194.63
3923375CQ-	22	10.4	211	290.95
3923376CQ	38	12.4	365	467.51
3923377CQ	60	15.2	576	720.70

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 100 m; Drum (500; 1000) m  
Photographs are not to scale and do not represent detailed images of the respective products.



**ÖLFLEX® TFR-CV/AL**

XLPE insulation & High temperature resistance PVC sheath cables - <PS>E certified according to JIS C 3605

**Info**

- Lightweight and economical power cable with aluminum conductor to meet IEC 60502-1 specifications.



**Benefits**

- Applied to aluminum conductor, which is less expensive than copper conductor
- Easy installation due to light weight aluminum conductor than copper conductor

**Application range**

- Power cable with excellent flame retardancy

**Product features**

- Excellent flame retardancy
- Lightweight aluminum conductor

**Norm references / Approvals**

- Meet the design standard of IEC 60502-1
- Voltage test acc. to IEC 60502-1 (3.5KV/5MIN)
- Conductor resistance acc. to IEC 60228
- Flame retardant acc. to IEC 60332-3-24

**Product Make-up**

- Conductor: Aluminum stranded conductor (Class 2)
- Core insulation: Cross-Linked Polyethylene (XLPE)
- Core colour: Natural color
- Outer sheath : Flame retardant PVC
- Outer sheath colour: Black

**Technical data**

- Conductor stranding**  
Aluminum conductor According to IEC 60228 Class2
- Rated voltage**  
AC U<sub>0</sub> : 0.6/1 KV
- Test voltage**  
AC 3500 V
- Minimum bending radius**  
Fixed installation: 5 x outer diameter
- Temperature range**  
Fixed installation:  
up to +90 °C

Article number	CORE	Conductor cross-section (mm <sup>2</sup> )	Conductor		Thickness of Insulation Nom. mm	Nominal Thickness of Outer sheath mm	Approx. overall diameter m	Approx. weight of cable Kg/km	Max.Conductor resistance Ω /km
			Construction	Approx. Outer Diameter mm					
0023377A	1	No.	No./mm	mm	mm	mm	m	Kg/km	Ω /km
0023378A		50		8.1	1	1.4	12.9	236	0.641
0023379A		70		9.8	1.1	1.4	14.8	314	0.443
0023380A		95		11.4	1.1	1.5	16.6	411	0.320
0023381A		120	Compressed Conductor	12.9	1.2	1.5	18.3	504	0.253
0023382A		150		14.4	1.4	1.6	20.4	620	0.206
0023383A		185		15.9	1.6	1.6	22.3	755	0.164
0023384A		240		18.3	1.7	1.7	25.1	972	0.125
		300		20.5	1.8	1.8	27.7	1,196	0.100

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.  
 Packaging size: Coil 100 m; Drum (500; 1000) m  
 Photographs are not to scale and do not represent detailed images of the respective products.



## ÖLFLEX® SOLAR V4A

Extra robust solar cables with high-grade steel protection braiding



**Info**

- Protected against martens, rodents and termites

### Benefits

- High-grade stainless steel wire braiding (class V4A) provides highly effective protection against martens, rodents and even termites
- Robust against mechanical impacts
- Reduction of flame propagation and of toxic combustion gases in the event of fire

### Application range

- For use in PV systems that are installed on the roofs of stables or barns situated in farmsteads or densely-forested areas
- Gable and flat roof photovoltaic systems
- Photovoltaic plants and solar parks

### Product features

- Weather/UV-resistant acc. to HD 605/A1
- Halogen-free and flame-retardant
- Good mechanical strength

### Product Make-up

- Fine-wire, tinned-copper conductor
- Core insulation made of electron beam cross-linked copolymer
- Outer sheath made of electron beam cross-linked copolymer
- Outer sheath colour: Black
- Armouring made of stainless V4A high-grade steel wire braiding

### Technical data

**Classification**  
 ETIM 5.0 Class-ID: EC001578  
 ETIM 5.0 Class-Description: Flexible cable

**Core identification code**  
 Black

**Conductor stranding**  
 Fine wire according to VDE 0295, class 5/IEC 60228 class 5

**Minimum bending radius**  
 Fixed installation: 5 x outer diameter

**Nominal voltage**  
 AC  $U_0/U$  : 600/1000 V  
 DC  $U_0/U$  : 900/1500 V  
 Max. permissible operating voltage: DC 1,8 kV (Conductor-conductor, non earthed system)

**Test voltage**  
 AC 6500 V

**Temperature range**  
 Fixed installation: -40°C to +100°C  
 max. conductor temperature

Article number	Conductor cross-section (mm <sup>2</sup> )	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
<b>ÖLFLEX® SOLAR V4A stainless steel</b>				
0025960	4.0	7	38.4	98
0025961	6.0	8	57.6	158

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](http://www.lappkabel.de/en/cable-standardlengths)  
 Packaging size: Coil 100 m; Drum (500; 1000) m  
 Photographs are not to scale and do not represent detailed images of the respective products.

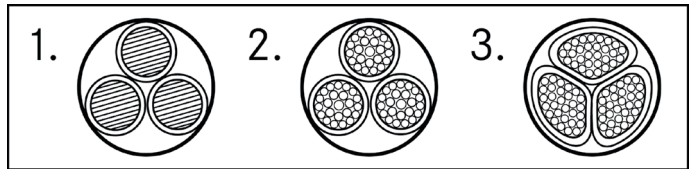


**NAYY-J**

Fixed installation, direct burial; PVC cable with solid aluminium conductors

**Info**

- With solid aluminium conductor



**Application range**

- Power and control cable for fixed installation in the following applications:
- For indoor and outdoor use
- Burial without additional, suitable underground protection according to VDE standard HD 603/VDE 0276-603 - Part 3-G (point 4) governing PVC cables for direct burial: normal minimum installation depth 0.6 m, but at least 0.8 m under roads
- In concrete with a temperature below the maximum cable operating temperature of +70 °C according to the VDE standard HD 603/VDE 0276-603 - Part 3-G (point 4) governing PVC cables for direct burial
- In water: no longer than 2 weeks at a time, maximum submersion depth 10 metres, only in static water/bodies of water without shipping traffic

- Current rating according to HD 603/VDE 0276-603, Part 3-G, Table 14 (buried at +20 °C ground temperature according to HD 603/VDE 0276-603, Part 3-G, point 5) for routing underground and Table 15 (in the air at an air temperature of +30 °C according to HD 603/VDE 0276-603, Part 3-G, point 5) when used outdoors; but always taking into consideration corrections/reductions to the current rating that may be necessary according to VDE 0298-4, and VDE 0298-4 (also refer to the catalogue appendix T12) for installation in and on buildings

**Norm references / Approvals**

- HD 603/VDE 0276-603

**Product Make-up**

- Aluminium conductor
- Abbreviations “re”, “se”:  
r = round conductor form;  
s = sectorial conductor form;  
e = single-wire conductor;
- Core insulation: Based on PVC
- Filling compound over the core assembly
- Outer sheath: Based on PVC

**Technical data**

- Classification**  
ETIM 5.0 Class-ID: EC000057  
ETIM 5.0 Class-Description: Low voltage power cable
- Core identification code**  
According to VDE 0293-308 (table T9)
- Conductor stranding**  
Single-wire
- Minimum bending radius**  
Fixed installation: 12 x outer diameter
- Nominal voltage**  
U<sub>0</sub>/U: 0.6/1.0 kV
- Test voltage**  
4000 V
- Protective conductor**  
J = with GN-YE protective conductor
- Temperature range**  
During installation: -5°C to +50°C  
Fixed installation: -30°C to +70°C

**Product features**

- Flame-retardant according IEC 60332-1-2
- Maximum tensile strain for aluminium conductors during installation is 30 N/mm<sup>2</sup> according to HD 603/VDE 0276-603: Part 1 Appendix A.4.12 and Part 3-G point 4

Article number	Number of cores and mm <sup>2</sup> per conductor	Outer diameter (mm)	Alu index (kg/km)	Weight (kg/km)
<b>NAYY-J</b>				
1552010	4 x 35re	29.0	406	1170
1552011	4 x 50se	30.0	580	1305
1552012	4 x 70se	35.0	812	1730
1552013	4 x 95se	39.0	1102	2205
1552014	4 x 120se	42.0	1392	2655
1552015	4 x 150se	46.0	1740	3150
1552016	4 x 185se	51.0	2146	3925
1552017	4 x 240se	60.0	2784	4880

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.  
Aluminium price basis: excludes aluminium. Refer to catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”.  
Please find our standard lengths at: [www.lappkabel.de/en/cable-standardlengths](http://www.lappkabel.de/en/cable-standardlengths)  
Photographs are not to scale and do not represent detailed images of the respective products.

**Similar products**

- NYY-J, NYY-O refer to page 14

**Accessories**

- V 1311-A pressing pliers, hydraulic refer to main catalogue 2016/17
- STAR STRIP stripping tool refer to main catalogue 2016/17
- PVL 1300 pressing pliers battery-operated refer to main catalogue 2016/17
- Cable lugs and other connectors made of aluminium or bi-metal Al-Cu are available upon request



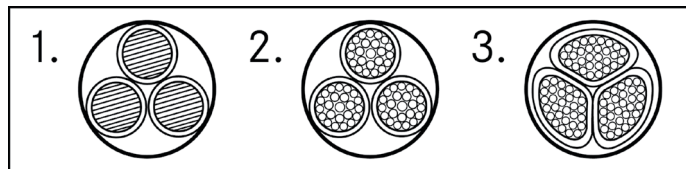
## NYCWY

Fixed installation, direct burial; PVC cable with concentric, wave-like copper conductor and cross-conductive spiral



### Info

- With concentric, wave-like copper conductor



### Benefits

- Concentric conductor above all as PE
- Easier connection due to the waveform of the concentric copper conductor

### Application range

- Power and control cable for fixed installation in the following applications:
  - For indoor and outdoor use
- Burial without additional, suitable underground protection according to VDE standard HD 603/VDE 0276-603 - Part 3-G (point 4) governing PVC cables for direct burial: normal minimum installation depth 0.6 m, but at least 0.8 m under roads
- In concrete with a temperature below the maximum cable operating temperature of +70 °C according to the VDE standard HD 603/VDE 0276-603 - Part 3-G (point 4) governing PVC cables for direct burial
- In water: no longer than 2 weeks at a time, maximum submersion depth 10 metres, only in static water/bodies of water without shipping traffic

### Product features

- Flame-retardant according IEC 60332-1-2

- Current rating according to HD 603/VDE 0276-603, Part 3-G, Table 14 (buried at +20 °C ground temperature according to HD 603/VDE 0276-603, Part 3-G, point 5) for routing underground and Table 15 (in the air at an air temperature of +30 °C according to HD 603/VDE 0276-603, Part 3-G, point 5) when used outdoors; but always taking into consideration corrections/reductions to the current rating that may be necessary according to VDE 0298-4, and VDE 0298-4 (also refer to the catalogue appendix T 12) for installation in and on buildings

### Norm references / Approvals

- HD 603/VDE 0276-603 for NYCWY with 3 or 4 cores and the relevant concentric protective conductor

### Product Make-up

- Bare copper wire conductor
- Abbreviations “re”, “rm”, “se”, “sm”:
  - r = round conductor form;
  - s = sectorial conductor form;
  - e = single-wire conductor;
  - m = multi-wire conductor;
- Core insulation: Based on PVC
- Filling compound over the core assembly

### Technical data



#### Classification

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



#### Core identification code

Up to 5 cores: colour-coded according to VDE 0293-308, refer to Appendix T9



#### Conductor stranding

Single or multi-wire



#### Minimum bending radius

Fixed installation: 12 x outer diameter



#### Nominal voltage

U<sub>0</sub>/U: 0.6/1.0 kV



#### Test voltage

4000 V



#### Temperature range

During installation: -5°C to +50°C  
Fixed installation: -40°C to +70°C

- Concentric, wave-like, outer conductor made of bare copper strands with inductance-reducing, cross-conductive copper bond counter spiral
- Outer sheath: Based on PVC

Article number	Number of cores and mm <sup>2</sup> per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
<b>NYCWY</b>				
15505003	2 x 10re/10	19.0	312	610
15505263	3 x 10re/10	20.0	408	775
15505403	4 x 10re/10	21.0	504	897
15505273	3 x 16re/16	22.0	643	1066
15505413	4 x 16re/16	24.0	796	1250
15505283	3 x 25rm/25	26.0	1003	1584
15505423	4 x 25rm/16	28.0	1142	1822
15505303	3 x 35sm/35	26.0	1402	1710
15505433	4 x 35sm/16	29.0	1526	2146
15505163	3 x 50sm/50	30.0	2000	2368
15505443	4 x 50sm/25	33.0	2203	3031
15505453	4 x 70sm/35	38.0	3082	4056
15505143	3 x 95sm/50	38.0	3296	4256
15505323	3 x 95sm/95	39.0	3791	4600
15505463	4 x 95sm/50	43.0	4208	5364
15505153	3 x 120sm/70	41.0	4236	5314
15505473	4 x 120sm/70	46.0	5388	6748
15505353	3 x 150sm/70	45.0	5100	6344
15505483	4 x 150sm/70	51.0	6540	8159
15505173	3 x 185sm/95	50.0	6383	8054

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

Copper price basis: excluding copper. 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](http://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 x 500 m drum or 5 x 100 m coils).

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

### Similar products

- NYY-J, NYY-O refer to page 14

### Accessories

- V 1311-A pressing pliers, hydraulic refer to main catalogue 2016/17
- KT cable shears refer to main catalogue 2016/17
- PVL 1300 pressing pliers battery-operated refer to main catalogue 2016/17





### UNITRONIC® BUS PB

Fixed installation



**Info**

- Lapp Kabel is a member of the PROFIBUS User Organisation (PNO)
- A for Advanced here: UL and CSA certifications

#### Application range

- For fixed installation
- Maximum electromagnetic screening
- Dry or damp rooms
- Item nos. 2170233, 2170333, 2170820, 2170824, 2170826 are all UV-resistant

#### Product features

- These bus cables can be used for PROFIBUS-DP as well as for PROFIBUS-FMS and FIP
- Based on the bit rates listed, in accordance with PNO specifications the following maximum cable lengths for a bus segment apply (cable type A, PROFIBUS-DP):
  - 93.75 kbit/s = 1200 m
  - 187.5 kbit/s = 1000 m
  - 500 kbit/s = 400 m
  - 1.5 Mbit/s = 200 m
  - 12.0 Mbit/s = 100 m

#### Norm references / Approvals

- In accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC NET, also suitable for FIP (Factory Instrumentation Protocol)
- See below for UL certification type

#### Product Make-up

- FC: "Fast Connect" cable design
- P: Polyurethane
- H: Halogen-free
- PE: polyethylene, black Outer sheath, e.g. for the food and beverage industry
- 7-W: 7-wire, e.g. for applications where vibrations occur
- COMBI: Data transmission and power supply in one cable

#### Technical data

- Classification**  
ETIM 5.0 Class-ID: EC000830  
ETIM 5.0 Class-Description: Data cable
- Mutual capacitance**  
(800 Hz): max. 30 nF/km
- Peak operating voltage**  
(not for power applications) 250 V
- Conductor resistance**  
(loop): max. 186 Ohm/km.  
see also datasheet
- Minimum bending radius**  
Fixed installation: see data sheet
- Test voltage**  
Core/core: 1500 V rms
- Characteristic impedance**  
150 ± 15 Ohm

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
<b>For fixed installation - conventional cable assembly</b>					
2170220	UNITRONIC® BUS PB	1 x 2 x 0.64	8	30.1	74
2170233	UNITRONIC® PB PE	1 x 2 x 0.64	8	30.1	57
2170226	UNITRONIC® BUS PB H 7-W	1 x 2 x 0.64	8	30.1	55
2170225	UNITRONIC® BUS PB COMBI 7-W	1 x 2 x 0,64 Ø + 3 x 1,0 mm <sup>2</sup>	9.8	59	92
<b>For fixed installation - UL/CSA CMX certification</b>					
2170219	UNITRONIC® BUS PB A	1 x 2 x 0.64	8	30.1	57
<b>For fixed installation - UL/CSA CMG certification</b>					
2170824	UNITRONIC® BUS PB 7-W A	1 x 2 x 0.64	8	30.1	55
<b>For fixed installation - "Fast Connect" cable assembly</b>					
2170333	UNITRONIC® BUS PB PE FC	1 x 2 x 0.64	8	26	67
<b>For fixed installation - UL/CSA CMX certification</b>					
2170330	UNITRONIC® BUS PB P FC	1 x 2 x 0.64	8	26	71
<b>For fixed installation - "Fast Connect" cable assembly - UL/CSA CMG certification</b>					
2170820	UNITRONIC® BUS PB FC	1 x 2 x 0.64	8	26	84
2170826	UNITRONIC® BUS PB 7-W FC	1 x 2 x 0.64	8	26	67
2170326	UNITRONIC® BUS PB-H FC	1 x 2 x 0.64	8	26	72

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](http://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 x 500 m drum or 5 x 100 m coils).

SIMATIC NET® is a registered trademark of Siemens AG

Lapp Kabel is a member of the PROFIBUS user organisation (PNO)

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

#### Similar products

- UNITRONIC® BUS PB ROBUST refer to main catalogue 2016/17
- UNITRONIC® BUS PB 105 refer to main catalogue 2016/17

#### Accessories

- Sub-D Bus-Connectors refer to main catalogue 2016/17
- FC STRIP stripping tool refer to main catalogue 2016/17
- SENSOR STRIP stripping tool refer to main catalogue 2016/17





## UNITRONIC® Li2YCYv (TP)

Screened data transmission cable mit PE core insulation, reinforced outer sheath and twisted pairs

**Info**

- Cables for RS485/RS422



### Benefits

- 7-wire stranded conductor (UNITRONIC® Li2YCY (TP) and UNITRONIC® Li2YCYv (TP) can be used for Maxi TERMI-POINT® wiring
- Overall braid minimises electrical interference
- Decoupling of circuits by means of twisted-pair (TP) design (crosstalk effects)

### Application range

- Particularly suitable for wiring data systems with transmission rates up to 10 Megabits per second, and is qualified for the RS422 and RS485 interfaces.
- For fixed and limited flexible installation
- Can be used in dry or damp rooms
- Signal-, control- and measuring cable, for transmission of low, sensitive signals and high bit rates
- UNITRONIC® Li2YCYv (TP)** with reinforced black outer sheath (Yv) is suitable for indoors and outdoors and provides enhanced appropriateness for direct burial in the ground

### Product features

- Flame-retardant according IEC 60332-1-2

### Norm references / Approvals

- Based on VDE 0812

### Product Make-up

- 7-wire bare stranded copper conductor
- Core insulation made of polyethylene (PE)
- TP structure
- Tinned-copper braiding
- Outer sheath made of PVC  
Outer sheath colour: pebble grey (RAL 7032)
- Wall thickness of the outer sheath is increased ("Yv")
- Outer sheath colour: black (RAL 9005)

### Technical data

	<b>Classification</b> ETIM 5.0 Class-ID: EC000104 ETIM 5.0 Class-Description: Control cable
	<b>Core identification code</b> DIN 47100, refer to Appendix T9
	<b>Mutual capacitance</b> At 800 Hz: max. 60 nF/km
	<b>Peak operating voltage</b> (not for power applications) 250 V
	<b>Inductivity</b> approx. 0.65 mH/km
	<b>Conductor stranding</b> Stranded conductor, based on VDE 0881, 7-wire
	<b>Minimum bending radius</b> Occasional flexing: 15 x outer diameter Fixed installation: 6 x outer diameter
	<b>Short-range crosstalk attenuation</b> Up to 1 MHz min. 50 dB Up to 10 MHz min. 40 dB
	<b>Test voltage</b> Core/core: 2000 V Core/screen: 1000 V
	<b>Characteristic impedance</b> 100 ± 15 Ohm (> 1 MHz)
	<b>Temperature range</b> Occasional flexing: -5°C to +70°C Fixed installation: -40°C to +80°C

Article number	Number of pairs and mm <sup>2</sup> per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
<b>UNITRONIC® Li2YCYv (TP) black for outdoor installation and direct burial, 7-wire</b>				
0031350	2 x 2 x 0,22	8.1	24.2	79
0031351	3 x 2 x 0,22	8.7	28.6	93
0031352	4 x 2 x 0,22	8.9	34.2	100
0031355	2 x 2 x 0,34	9.3	34.1	102
0031356	3 x 2 x 0,34	10	43	117
0031357	4 x 2 x 0,34	10.3	52.8	130
0031358	8 x 2 x 0,34	12.6	85.8	206
0031366	1 x 2 x 0,5	7.9	29	79
0031360	2 x 2 x 0,5	10.1	37	120
0031361	3 x 2 x 0,5	10.9	55	142
0031362	4 x 2 x 0,5	11.2	60	160
0031363	8 x 2 x 0,5	13.9	113.3	251
0031364	10 x 2 x 0,5	16	148	303

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](http://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 x 500 m drum or 5 x 100 m coils).  
Photographs are not to scale and do not represent detailed images of the respective products.

### Similar products

- UNITRONIC® BUS LD refer to main catalogue 2016/17

### Accessories

- SKINTOP® MS-SC-M refer to main catalogue 2016/17
- SKINTOP® MS-HF-M SC refer to main catalogue 2016/17
- Multipurpose shears A and B refer to main catalogue 2016/17
- STAR STRIP stripping tool refer to main catalogue 2016/17
- STEEL GUN HT-338 cable tie pliers refer to main catalogue 2016/17
- LS steel cable ties refer to main catalogue 2016/17



## UNITRONIC® ST

Static screened data transmission cable similar to UL AWM 2092



### Benefits

- Aluminium-laminated plastic foil static screen with tin-plated drain wire minimises the interference of high frequency, electromagnetic fields

### Application range

- Especially designed for the transmission of the smallest measurement and control signals at minimal space requirements
- Internal wiring of electronic equipment
- For fixed and limited flexible installation
- For use in dry, damp and wet rooms

### Product features

- Protection against interferences at medium and high frequencies by aluminium-laminated plastic foil, combination of flexibility and good screening (normal requirements)
- Flame-retardant according IEC 60332-1-2

### Norm references / Approvals

- Based on UL AWM Style 2092 / 2093

### Product Make-up

- 7-wire tinned stranded copper conductor
- Core insulation made of polyethylene (PE)
- Plastic-laminated aluminium foil with tinned copper drain wire
- Outer sheath made of PVC, Colour of the outer sheath: Similar to Silver-grey/ RAL 7001

### Technical data

	<b>Classification</b> ETIM 5.0 Class-ID: EC000104 ETIM 5.0 Class-Description: Control cable
	<b>Core identification code</b> 2 cores: black, transparent 3 cores: black, red, transparent
	<b>Mutual capacitance</b> C/C approx. 90 nF/km C/S approx. 160 nF/km
	<b>Peak operating voltage</b> (not for power applications) 500 V
	<b>Inductivity</b> approx. 0.65 mH/km
	<b>Minimum bending radius</b> Occasional flexing: 10 x outer diameter Fixed installation: 6 x outer diameter
	<b>Test voltage</b> 1500 V
	<b>Characteristic impedance</b> Approx. 95 Ohm
	<b>Temperature range</b> Occasional flexing: -5 °C to +70 °C Fixed installation: -40 °C to +80 °C

Article number	Number of conductors and AWG size	Conductor cross-section (mm <sup>2</sup> )	Core insulation material	Outer sheath material	Outer diameter (mm)	Copper index (kg/km)
<b>UNITRONIC® ST</b>						
0033000	2 x AWG 20/7	0.52	PE	PVC	5.2	17.2
0033001	3 x AWG 20/7	0.52	PE	PVC	5.3	23

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](http://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 x 500 m drum or 5 x 100 m coils).  
Photographs are not to scale and do not represent detailed images of the respective products.

### Accessories

- UNIVERSAL STRIP stripping tool refer to page 33
- DATA STRIP stripping tool refer to main catalogue 2016/17



**EPIC® SOLAR 4L M**

Connector system for weatherproof cabling of photovoltaic systems



**Info**

- 4 mm connector system with double hook
- Field-mountable solar connector

**EPIC® SOLAR 4L F**

Connector system for weatherproof cabling of photovoltaic systems



**Info**

- 4 mm connector system with double hook
- Field-mountable solar connector

**Benefits**

- Low contact-resistance for efficient power transmission
- Crimp connection for field mounting
- Suitable for various ÖLFLEX® SOLAR cables

**Application range**

- Photovoltaic plants
- Crystalline and thin-film constructions
- Solartracker

**Product features**

- 4 mm connector system with double hook
- Inclusive contacts
- Tested according EN 50521: 2008+A1
- TÜV Rheinland certified

**Suitable cables**

- H1Z2Z2-K Page 11
- ÖLFLEX® SOLAR XLWP Page 12
- ÖLFLEX® SOLAR XLS-R Page 10
- ÖLFLEX® SOLAR XLR-E refer to main catalogue 2016/17

**Suitable tools**

- EPIC® SOLAR TOOL Page 25

**Technical data**

	<b>Classification</b> ETIM 5.0 Class-ID: EC002635 ETIM 5.0 Class-Description: Circular connector (industrial connector)	<b>Contact resistance</b> < 0.5 mOhm
	<b>Rated voltage (V)</b> 1000 V DC	
	<b>Rated impulse voltage</b> 8 kV	
	<b>Degree of soiling</b> 3	
		<b>Protection rating</b> IP 67
		<b>Cycle of mechanical operation</b> 100
		<b>Protection class</b> II
		<b>Temperature range</b> -40°C ... +85°C

**Suitable connectors**

**EPIC® SOLAR 4L M**

- EPIC® SOLAR 4Plus F Page 22
- EPIC® SOLAR 4L F Page 21
- EPIC® SOLAR 4 F refer to main catalogue 2016/17
- EPIC® SOLAR 4 Splitter Page 23
- EPIC® SOLAR 4 Built in socket Page 24
- EPIC® SOLAR 4 THIN F pre-assembled refer to main catalogue 2016/17

**EPIC® SOLAR 4L F**

- EPIC® SOLAR 4 Thin M pre-assembled refer to main catalogue 2016/17
- EPIC® SOLAR 4L M Page 21
- EPIC® SOLAR 4Plus M Page 22
- EPIC® SOLAR 4 M refer to main catalogue 2016/17
- EPIC® SOLAR 4 Splitter Page 23
- EPIC® SOLAR 4 Built in socket Page 24

Article number	Article designation	Cross-section (mm²)	Clamping range in mm	Rated current (A)	PU
<b>EPIC® SOLAR 4L male field-mountable, inclusive contacts</b>					
44428251	EPIC® SOLAR 4L M 4mm² ... 6mm²	4.0 - 6.0	5.2 - 7.1	30	100
<b>EPIC® SOLAR 4 male contacts as spare part</b>					
44428219	EPIC® SOLAR 4 PIN M 4mm² ... 6mm²	4.0 - 6.0			100
<b>EPIC® SOLAR 4L female field-mountable, inclusive contacts</b>					
44428252	EPIC® SOLAR 4L F 4mm² ... 6mm²	4.0 - 6.0	5.2 - 7.1	30	100
<b>EPIC® SOLAR 4 female contacts as spare part</b>					
44428220	EPIC® SOLAR 4 PIN F 4mm²... 6mm²	4.0 - 6.0			100

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



## EPIC® SOLAR 4Plus M

Connector system for weatherproof cabling of photovoltaic systems



### Info

- 4 mm connector system with double hook
- For photovoltaic plants up to 1.5kV system voltage
- Available 2017

## EPIC® SOLAR 4Plus F

Connector system for weatherproof cabling of photovoltaic systems



### Info

- 4 mm connector system with double hook
- For photovoltaic plants up to 1.5kV system voltage
- Available 2017

### Benefits

- Low contact-resistance for efficient power transmission
- Crimp connection for field mounting
- Suitable for various ÖLFLEX® SOLAR cables
- Reliable connection, only possible to unlock with a tool, according to NEC standard

### Application range

- Photovoltaic plants
- Crystalline and thin-film constructions
- Solartracker

### Product features

- 4 mm connector system with double hook
- 10mm<sup>2</sup> maximum crimp connection for high currents and long cables
- TÜV Rheinland: in preparation

### Technical data

	<b>Classification</b> ETIM 5.0 Class-ID: EC002635 ETIM 5.0 Class-Description: Circular connector (industrial connector)
	<b>Rated voltage (V)</b> 1.5 kV
	<b>Rated impulse voltage</b> 16 kV
	<b>Degree of soiling</b> 3

	<b>Contact resistance</b> < 0.5 mOhm
	<b>Protection rating</b> IP68 (10h/1m)
	<b>Cycle of mechanical operation</b> 100
	<b>Protection class</b> II
	<b>Temperature range</b> -40°C ... +105°C

### Suitable cables

- H1ZZ2-K Page 11
- ÖLFLEX® SOLAR XLWP Page 12
- ÖLFLEX® SOLAR XLS-R Page 10
- ÖLFLEX® SOLAR XLR-E refer to main catalogue 2016/17

### Suitable tools

- EPIC® SOLAR TOOL refer to main catalogue 2016/17

### Suitable connectors

- EPIC® SOLAR 4 THIN
- EPIC® SOLAR 4L
- EPIC® SOLAR 4 Splitter
- EPIC® SOLAR 4 Built in socket

Article number	Article designation	Cross-section (mm <sup>2</sup> )	Clamping range in mm	Rated current (A)	PU
<b>EPIC® SOLAR 4Plus male field-mountable, inclusive contacts</b>					
44428233	EPIC® SOLAR 4Plus M 2.5mm <sup>2</sup>	2.5	4.8 - 6.0	22	100
44428235	EPIC® SOLAR 4Plus M 4mm <sup>2</sup> ... 6mm <sup>2</sup>	4 - 6	5.2 - 7.1	30	100
44428237	EPIC® SOLAR 4Plus M 10mm <sup>2</sup>	10	7.0 - 10.0	35	100
<b>EPIC® SOLAR 4Plus male contacts as spare part</b>					
44428217	EPIC® SOLAR 4Plus PIN M 2.5mm <sup>2</sup>	2.5			100
44428219	EPIC® SOLAR 4Plus PIN M 4mm <sup>2</sup> ... 6mm <sup>2</sup>	4.0 - 6.0			100
44428239	EPIC® SOLAR 4Plus PIN M 10mm <sup>2</sup>	10			100
<b>EPIC® SOLAR 4Plus female field-mountable, inclusive contacts</b>					
44428234	EPIC® SOLAR 4Plus F 2.5mm <sup>2</sup>	2.5	4.8 - 6.0	22	100
44428236	EPIC® SOLAR 4Plus F 4mm <sup>2</sup> ... 6mm <sup>2</sup>	4 - 6	5.2 - 7.1	30	100
44428238	EPIC® SOLAR 4Plus F 10mm <sup>2</sup>	10	7.0 - 10.0	35	100
<b>EPIC® SOLAR 4Plus female contacts as spare part</b>					
44428218	EPIC® SOLAR 4Plus PIN F 2.5mm <sup>2</sup>	2.5			100
44428220	EPIC® SOLAR 4Plus PIN F 4mm <sup>2</sup> ... 6mm <sup>2</sup>	4.0 - 6.0			100
44428240	EPIC® SOLAR 4Plus PIN F 10mm <sup>2</sup>	10			100

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



## EPIC® SOLAR 4 Splitter

Connector system for weatherproof cabling of photovoltaic systems



### Info

- 4 mm connector system with double hook
- Splitter for parallel connection of photovoltaic modules

### Benefits

- Splitter for parallel connection of PV-modules and strings
- Easy plug and play
- Fixing option for a clear installation with a Ø 5mm mounting hole

### Application range

- Photovoltaic plants
- Crystalline and thin-film constructions
- Solartracker

### Product features

- Mateable with EPIC® SOLAR 4 THIN, EPIC® SOLAR 4PLUS,
- EPIC® SOLAR 4L
- Splitter MFF 1x connection male, 2x connection female
- Splitter MFF 1x connection female, 2x connection male

### Suitable connectors

- EPIC® SOLAR 4L
- EPIC® SOLAR 4 THIN
- EPIC® SOLAR 4Plus
- EPIC® SOLAR 4 Built in socket

### Technical data



#### Classification

ETIM 5.0 Class-ID: EC002635  
ETIM 5.0 Class-Description: Circular connector (industrial connector)



#### Rated voltage (V)

1000 V AC/DC

#### Rated impulse voltage

8 kV



#### Rated current (A)

30 A



#### Degree of soiling

3



#### Protection rating

IP65/IP67



#### Cycle of mechanical operation

100

#### Protection class

II



#### Temperature range

-40 °C ... +85 °C

Article number	Article designation	PU
<b>EPIC® SOLAR 4 Splitter</b>		
44428226	EPIC® SOLAR 4 Splitter MFF	25
44428227	EPIC® SOLAR 4 Splitter FMM	25

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



## EPIC® SOLAR 4 Built in socket

Connector system for weatherproof cabling of photovoltaic systems



**Info**

- 4 mm connector system with double hook
- Built in socket for use in inverters

### Benefits

- Built in fitting for inverters, PV string circuit breakers and fuse boxes

### Application range

- Photovoltaic plants
- Inverters
- PV string circuit breakers

### Product features

- PV panel connector to be screwed in directly or fastening with the included plastic locknut
- Internal plug connector diameter 2.5mm, flush connector pin
- Installation hole: drilling diameter 12mm
- Other types of connection on request

### Suitable connectors

- EPIC® SOLAR 4L
- EPIC® SOLAR 4 THIN
- EPIC® SOLAR 4Plus
- EPIC® SOLAR 4 Splitter

### Technical data

**Classification**  
ETIM 5.0 Class-ID: EC002635  
ETIM 5.0 Class-Description: Circular connector (industrial connector)

**Rated voltage (V)**  
1000 V AC/DC

**Rated impulse voltage**  
8 kV

**Rated current (A)**  
30 A

**Degree of soiling**  
3

**Contact resistance**  
< 0.5 mOhm

**Protection rating**  
IP 67

**Cycle of mechanical operation**  
100

**Protection class**  
II

**Temperature range**  
-40°C ... +105°C

Article number	Article designation	PU
<b>EPIC® SOLAR 4 built in socket with counter nut</b>		
44428222	EPIC® SOLAR 4 AD M Pin 2.5	100
44428223	EPIC® SOLAR 4 AD F Pin 2.5	100

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

## EPIC® CRIMPTOOL

For inserts and modules of the EPIC® rectangular connectors



## EPIC® SOLAR TOOL CSC

Cutting, stripping and crimping with just one tool



## EPIC® SOLAR TOOL

3 cross section in one tool



### Info

- Cutting, stripping and crimping with just one tool



### Info

- 3 cross section in one tool

### Application range

#### EPIC® SOLAR TOOL CSC

- For crimping of the photovoltaic connector EPIC® SOLAR 4 in the field
- For EPIC® SOLAR 4 and MC4 suitable

#### EPIC® SOLAR TOOL

- For crimping of the photovoltaic connector EPIC® SOLAR 4 in the field
- For EPIC® SOLAR 4 and MC4 suitable

### Product features

#### EPIC® SOLAR TOOL CSC

- Multifunctional die for cutting, stripping and crimping with just one tool
- Locator for the safe and accurate positioning of the crimping contacts

#### EPIC® SOLAR TOOL

- Crimping die for the cable cross sections of 2.5mm<sup>2</sup>, 4mm<sup>2</sup> and 6mm<sup>2</sup>
- Locator for the safe and accurate positioning of the crimping contacts

### Suitable cables

#### EPIC® SOLAR TOOL CSC

- H1Z2Z2-K Page 11
- ÖLFLEX® SOLAR XLWP Page 12
- ÖLFLEX® SOLAR XLS-R Page 10
- ÖLFLEX® SOLAR XLR-E refer to main catalogue 2016/17

#### EPIC® SOLAR TOOL

- H1Z2Z2-K Page 11
- ÖLFLEX® SOLAR XLWP Page 12
- ÖLFLEX® SOLAR XLS-R Page 10
- ÖLFLEX® SOLAR XLR-E refer to main catalogue 2016/17

### Suitable connectors

#### EPIC® SOLAR TOOL CSC

- EPIC® SOLAR 4

#### EPIC® SOLAR TOOL

- EPIC® SOLAR 4

### Technical data



#### Classification

ETIM 5.0 Class-ID: EC000168  
ETIM 5.0 Class-Description: Crimp tool cable lugs, cable end sleeves, screen connection

Article number	Article description	Cross-section (min) in mm <sup>2</sup>	Cross-section (max) in mm <sup>2</sup>	Version	Note	PU
<b>Tools</b>						
11147000	Crimping tool			In tool case	without crimping dies, without locator	1
<b>Multi-functional die CSC</b>						
44428992	EPIC® SOLAR TOOL CSC DIE 4mm <sup>2</sup>		4			1
44428993	EPIC® SOLAR Tool CSC DIE 6mm <sup>2</sup>		6			1
44428994	EPIC® SOLAR TOOL LOC 4, 6mm <sup>2</sup>	4	6			1
<b>Crimping die</b>						
44428995	EPIC® SOLAR Tool DIE 2.5, 4, 6mm <sup>2</sup>	2.5	6			1
44428996	EPIC® SOLAR Tool LOC 2.5, 4, 6mm <sup>2</sup>	2.5	6			1
44428995A	EPIC® SOLAR Tool DIE 4, 6, 10mm <sup>2</sup>	4	10			1
44428996A	EPIC® SOLAR Tool LOC 4, 6, 10mm <sup>2</sup>	4	10			1

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



## SKINTOP® ST-M / SKINTOP® STR-M



**Info**

- Now with IP69 approval! Proven to withstand the most demanding cleaning procedures for industrial machinery with high-pressure cleaners and hot water!

### Benefits

#### SKINTOP® ST-M

- High oil-resistance for maximum reliability
- Permanent vibration protection
- Wide, variable clamping ranges
- Optimum strain relief
- Various accessories (e.g. multiple sealing inserts)

### Application range

#### SKINTOP® ST-M

- Used in areas where a lot of cables and wires need to be inserted into housings with minimum space requirements
- Machine and equipment manufacturing
- Photovoltaic
- Automation technology
- Offshore platforms, equipment and shipyards

#### SKINTOP® STR-M

- With reducing seal insert, to seal cables with smaller outer diameters.

### Norm references / Approvals

- UL File Nr. E79903
- GGVS: TÜ.EGG.020-95

### Product Make-up

- Metric connection thread acc. to DIN EN 60423
- Basis for technical information EN 50262

### Note

- Refer to SKINTOP® metric accessories for suitable accessories
- Counter nut to be used: SKINTOP® GMP-GL-M
- SKINTOP® ST(R) M ISO types have an extra-long connection thread
- SKINTOP® ST(R) M ISO versions with extra-long connection thread, see table, no DNV approval

### Suitable cables

#### SKINTOP® STR-M

- The following cables are recommended for IP 69 applications:
  - ÖLFLEX® ROBUST 200
  - H07RN8-F
  - H07RN-F

### Suitable tools

#### SKINTOP® ST-M

- SKINTOP® LOCATOR refer to main catalogue 2016/17
- SKINMATIC® QUICK Set 1 refer to main catalogue 2016/17
- SKINMATIC® RZ refer to main catalogue 2016/17
- SKINMATIC® MH Set refer to main catalogue 2016/17

### Technical data

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

**Caution**  
**SKINTOP® ST-M**  
Refer to Appendix T21 for the installation dimensions and torques  
Size M 40 x 1,5 up tp M 63 x 1,5 with O-ring  
**SKINTOP® STR-M**  
Refer to Appendix T21 for the installation dimensions and torques

**Colour delivered**  
Silver grey (RAL 7001)  
Light grey (RAL 7035)  
Black (RAL 9005), UV-resistant

**Material**  
Body: Polyamide  
Seal: CR

**Tests**  
GGVS: TÜ.EGG.020-95

**Protection rating**  
IP 68 - 5 bar  
IP 69

**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
<b>SKINTOP® ST-M silver grey</b>						
53111000	ST-M 12 x 1,5	3,5-7	15	30.0	8	100
53111010	ST-M 16 x 1,5	4,5-10	19	34.0	8	100
53111020	ST-M 20 x 1,5	7-13	25	37.0	9	100
53111030	ST-M 25 x 1,5	10-17	30	40.0	10	50
53111040	ST-M 32 x 1,5	11-21	36	47.0	10	25
53111050	ST-M 40 x 1,5	19-28	46	52.0	10	10
53111060	ST-M 50 x 1,5	27-35	55	62.0	12	5
53111070	ST-M 63 x 1,5	34-45	66	71.0	12	5
<b>SKINTOP® ST-M black</b>						
53111200	ST-M 12 x 1,5	3,5-7	15	30.0	8	100
53111210	ST-M 16 x 1,5	4,5-10	19	34.0	8	100
53111220	ST-M 20 x 1,5	7-13	25	37.0	9	100
53111230	ST-M 25 x 1,5	10-17	30	40.0	10	50
53111240	ST-M 32 x 1,5	11-21	36	47.0	10	25
53111250	ST-M 40 x 1,5	19-28	46	52.0	10	10
53111260	ST-M 50 x 1,5	27-35	55	62.0	12	5
53111270	ST-M 63 x 1,5	34-45	66	71.0	12	5
<b>SKINTOP® ST-M light grey</b>						
53111400	ST-M 12 x 1,5	3,5-7	15	30.0	8	100
53111410	ST-M 16 x 1,5	4,5-10	19	34.0	8	100
53111420	ST-M 20 x 1,5	7-13	25	37.0	9	100
53111430	ST-M 25 x 1,5	10-17	30	40.0	10	50
53111440	ST-M 32 x 1,5	11-21	36	47.0	10	25
53111450	ST-M 40 x 1,5	19-28	46	52.0	10	10
53111460	ST-M 50 x 1,5	27-35	55	62.0	12	5
53111470	ST-M 63 x 1,5	34-45	66	71.0	12	5



Article number	Article designation / size	Clamping range ØF (mm)	SW wrench size mm	Overall length, C (mm)	Thread length, D (mm)	Pieces / PU
<b>SKINTOP® ST M ISO silver-grey (with long metric connecting thread)</b>						
53017010	ST M 16 x 1,5	3,5-8	19	40.0	12	100
53017030	ST M 20 x 1,5	5-12	24	45.0	13	100
53017040	ST M 25 x 1,5	9-14	27	47.0	13	50
<b>SKINTOP® ST M ISO black (with long metric connecting thread)</b>						
53010000	ST-M 12 x 1,5	3,5-7	15	36.7	15	100
53017210	ST M 16 x 1,5	3,5-8	19	40.0	12	100
53017230	ST M 20 x 1,5	5-12	24	45.0	13	100
53017240	ST M 25 x 1,5	9-14	27	47.0	13	50
<b>SKINTOP® STR-M silver grey</b>						
53111100	STR-M 12 x 1,5	1-5	15	30.0	8	100
53111110	STR-M 16 x 1,5	2-7	19	34.0	8	100
53111120	STR-M 20 x 1,5	5-10	25	37.0	9	100
53111130	STR-M 25 x 1,5	6-13	30	40.0	10	50
53111140	STR-M 32 x 1,5	7-15	36	47.0	10	25
53111150	STR-M 40 x 1,5	15-23	46	52.0	10	10
53111160	STR-M 50 x 1,5	22-29	55	62.0	12	5
53111170	STR-M 63 x 1,5	28-39	66	71.0	12	5
<b>SKINTOP® STR-M black</b>						
53111300	STR-M 12 x 1,5	1-5	15	30.0	8	100
53111310	STR-M 16 x 1,5	2-7	19	34.0	8	100
53111320	STR-M 20 x 1,5	5-10	25	37.0	9	100
53111330	STR-M 25 x 1,5	6-13	30	40.0	10	50
53111340	STR-M 32 x 1,5	7-15	36	47.0	10	25
53111350	STR-M 40 x 1,5	15-23	46	52.0	10	10
53111360	STR-M 50 x 1,5	22-29	55	62.0	12	5
53111370	STR-M 63 x 1,5	28-39	66	71.0	12	5
<b>SKINTOP® STR-M light grey</b>						
53111500	STR-M 12 x 1,5	1-5	15	30.0	8	100
53111510	STR-M 16 x 1,5	2-7	19	34.0	8	100
53111520	STR-M 20 x 1,5	5-10	25	37.0	9	100
53111530	STR-M 25 x 1,5	6-13	30	40.0	10	50
53111540	STR-M 32 x 1,5	7-15	36	47.0	10	25
53111550	STR-M 40 x 1,5	15-23	46	52.0	10	10
53111560	STR-M 50 x 1,5	22-29	55	62.0	12	5
53111570	STR-M 63 x 1,5	28-39	66	71.0	12	5
<b>SKINTOP® STR M ISO silver-grey (with long metric connecting thread)</b>						
53017110	STR M 16 x 1,5	2-6	19	40.0	12	100
53017130	STR M 20 x 1,5	4-9	24	45.0	13	100
53017140	STR M 25 x 1,5	6-12	27	47.0	13	50
<b>SKINTOP® STR M ISO black (with long metric connecting thread)</b>						
53017310	STR M 16 x 1,5	2-6	19	40.0	12	100
53017330	STR M 20 x 1,5	4-9	24	45.0	13	100
53017340	STR M 25 x 1,5	6-12	27	47.0	13	50

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

**Accessories**

**SKINTOP® ST-M**

- SKINTOP® DIX-M refer to main catalogue 2016/17
- SKINTOP® GMP-GL-M refer to main catalogue 2016/17
- SKINTOP® DIX-M AUTOMATION refer to main catalogue 2016/17
- SKINTOP® SDV-M ATEX refer to main catalogue 2016/17
- SKINTOP® SD-M refer to main catalogue 2016/17
- SKINTOP® DV-M refer to main catalogue 2016/17

**SKINTOP® STR-M**

- SKINTOP® GMP-GL-M refer to main catalogue 2016/17
- SKINTOP® SDVR-M ATEX refer to main catalogue 2016/17
- SKINTOP® SD-M refer to main catalogue 2016/17

SKINTOP® metric plastic cable glands • SKINTOP® for photovoltaics



## SKINTOP® SOLAR / SKINTOP® SOLAR plus

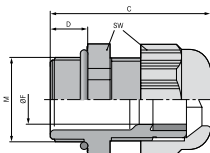
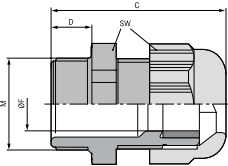
SKINTOP® for photovoltaics



SKINTOP® SOLAR



SKINTOP® SOLAR plus



### Benefits

- UV and ozone-resistant
- UL 746 C - UL F1 outdoor use
- High strain relief
- Permanent vibration protection
- Extremely flame-retardant according to UL 94V-0 / 94-5VA

### Application range

- Photovoltaic plants and solar parks

### Norm references / Approvals

- UL File Nr. E79903

### Product Make-up

- Metric connection thread acc. to DIN EN 60423
- Basis for technical information EN 50262

### Note

#### SKINTOP® SOLAR plus

- Counter nut to be used: SKINDICHT® SM-M
- Counter nut to be used: SKINTOP® GMP-GL-M

#### Suitable cables

- ÖLFLEX® SOLAR

#### Suitable tools

- SKINMATIC® RZ
- SKINMATIC® QUICK SET 1



### Info

- Cable gland for photovoltaic applications, based on EN 50262, EN 50548 and UL 1703.
- Extended temperature range

### Technical data



#### Classification

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



#### Caution

Refer to Appendix T21 for the installation dimensions and torques



#### Colour delivered

RAL 9005 black/UV-resistant



#### Material

##### SKINTOP® SOLAR

Body: Polycarbonate

Seal: CR

##### SKINTOP® SOLAR plus

Body: Polycarbonate

Seal: Silicone

O-Ring: Silicone

#### Tests

Cold impact test according to UL 1703/UL 746 C



#### Protection rating

IP 68 - 5 bar



#### Temperature range

##### SKINTOP® SOLAR

-40°C to +100°C

##### SKINTOP® SOLAR plus

-40°C to +125°C

Article number	Article designation / size	Clamping range ØF (mm)	SW wrench size mm	Overall length, C (mm)	Thread length, D (mm)	Pieces / PU
<b>SKINTOP® SOLAR</b>						
53113300	SOLAR M12x1,5	3,5-7	15	36.0	15	100
53113310	SOLAR M16x1,5	7-9	19	34.0	8	100
<b>SKINTOP® SOLAR plus</b>						
53113321	SOLAR plus M12x1,5	3,5-7	15	36.0	15	100
53113331	SOLAR plus M16x1,5	7-9	19	34.0	8	100

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

### Accessories

#### SKINTOP® SOLAR

- SKINTOP® GMP-GL-M refer to main catalogue 2016/17



**SILVYN® SPLIT**

**i Info**

- New sizes are available



**Benefits**

- Dimensionally stable
- Flexible
- Crush-resistant
- Subsequent cable protection after cable installation
- Fast and easy assembly

**Application range**

- Vehicle construction
- Shipbuilding
- Mechanical engineering
- Electrical industry
- Used in areas where cables and wires need to be protected after assembly

**Product features**

- Halogen-free (PA6)
- Abrasion-resistant
- High resistance to oil, petrol, acids and other chemicals
- Very good UV- and Weathering performance (SILVYN® SPLIT PP UV)

**Product Make-up**

- Divisible corrugated conduit

**Technical data**

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

**RAL** Colour delivered  
Black (RAL 9005), UV-resistant

**Material**  
Polyamide 6 (PA6)  
Polypropylene (PP)

**IP** Protection rating  
IP 43 with SILVYN® SPLIT COV

**Temperature range**  
PA6 : -40°C to +120°C  
PP : -40°C to +135°C  
PP UV: -40°C to +105°C

Article number	Nominal size	ID x OD mm	Bending radius (mm)	Suitable for SILVYN® COV	PU (m)
<b>SILVYN® SPLIT PA6</b>					
61806621	6	6.3 x 10.0	15		50
61806620	10	8.4 x 13.4	15	M16/PG9	50
61806631	11	11.0 x 16.1	15		50
61806630	14	12.5 x 18.5	15	M20/PG13,5	50
61806641	16	16.0 x 21.5	20		50
61806640	20	19.2 x 25.3	25	M25/PG21	50
61806650	23	23.4 x 30.8	35	M32/PG29	50
61806651	29	27.3 x 35.5	35		50
61806660	37	31.0 x 41.4	40	M40/PG29	25
61806670	45	42.7 x 54.0	70	M50	25
61806671	70	67.5 x 79.8	95		10
61806672	100	87.5 x 102.5	100		10
<b>SILVYN® SPLIT PP</b>					
61806615	6	6.3 x 10.0	15		50
61806625	10	8.4 x 13.4	15	M16/PG9	50
61806616	11	11.0 x 16.1	15		50
61806635	14	12.5 x 18.5	15	M20/PG13,5	50
61806617	16	16.0 x 21.5	20		50
61806645	20	19.2 x 25.3	20	M25/PG21	50
61806655	23	23.4 x 30.8	45	M32/PG29	50
61806618	29	27.3 x 35.5	50		50
61806665	37	31.0 x 41.4	60	M40/PG29	25
61806675	45	42.7 x 54.0	75	M50	25
61806619	70	67.5 x 79.8	95		10
61806622	100	87.5 x 102.5	100		10
<b>SILVYN® SPLIT PP UV</b>					
61806100	6	6.3 x 10.0	15		50
61806110	10	8.4 x 13.4	15	M16/PG9	50
61806120	11	11.0 x 16.1	15		50
61806130	14	12.5 x 18.5	15	M20/PG13,5	50
61806140	16	16.0 x 21.5	20		50
61806150	20	19.2 x 25.3	20	M25/PG21	50
61806160	23	23.4 x 30.8	45	M32/PG29	50
61806170	29	27.3 x 35.5	50		50
61806180	37	31.0 x 41.4	60	M40/PG29	25
61806190	45	42.7 x 54.0	75	M50	25
61806200	70	67.5 x 79.8	95		10
61806210	100	87.5 x 102.5	100		10

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

**Similar products**

- SILVYN® SINUS refer to main catalogue 2016/17

**Accessories**

- SILVYN® SPLIT COV refer to page 30
- SILVYN® SPLIT GMP-M refer to page 30
- SILVYN® SPLIT COS refer to page 30
- Spare tool Cable - Eater refer to main catalogue 2016/17



**SILVYN® SPLIT COV / SILVYN® SPLIT GMP-M / SILVYN® SPLIT COS**



**SILVYN® SPLIT COV**



**SILVYN® SPLIT GMP-M**



**SILVYN® SPLIT COS**

**Benefits**

**SILVYN® SPLIT COV**

- Fast and easy assembly
- Subsequent mountable conduit insertion

**SILVYN® SPLIT GMP-M**

- Fast assembly
- Easy to disassemble

**SILVYN® SPLIT COS**

- Fast assembly
- Easy to disassemble
- High tensile strength
- Conduit retained by rib
- No loose parts

**Application range**

**SILVYN® SPLIT COV**

- In combination with protective conduit:
- SILVYN® SPLIT
- Mechanical engineering

- Electrical industry
- Used in areas where cables and wires need to be protected after assembly

**SILVYN® SPLIT COS**

- In combination with protective conduit:
- SILVYN® SPLIT
- Fastening of conduits on machine walls for all applications

**Product features**

**SILVYN® SPLIT COV**

- Included: divisible counter nut

**SILVYN® SPLIT COS**

- One-piece conduit holder

**Note**

- UV-resistant and weather-resistant

**Suitable conduits**

- SILVYN® SPLIT Page 29

**Technical data**



**Classification**

**SILVYN® SPLIT COV**

ETIM 5.0 Class-ID: EC001176  
ETIM 5.0 Class-Description: Screw connection for corrugated plastic hose

**SILVYN® SPLIT GMP-M**

ETIM 5.0 Class-ID: EC001176  
ETIM 5.0 Class-Description: Screw connection for corrugated plastic hose

**SILVYN® SPLIT COS**

ETIM 5.0 Class-ID: EC001171  
ETIM 5.0 Class-Description: Holder for protective hose



**Colour delivered**

Black (RAL 9005), UV-resistant



**Material**

Halogen-free PA



**Temperature range**

-40°C to +120°C

Article number	Nominal size	Metric size	PG size	Hole Ø (mm)	Suitable for SILVYN® SPLIT	Pieces / PU
<b>SILVYN® SPLIT COV (counter nut included)</b>						
61806760			9		10	100
61806770			13.5		14	100
61806780			21		20	50
61806790			29		23	50
61806800			29		37	25
<b>SILVYN® SPLIT COV-M (counter nut not included)</b>						
61806680		16 x 1.5			10	100
61806681		20 x 1.5			14	100
61806682		25 x 1.5			20	50
61806683		32 x 1.5			23	50
61806684		40 x 1.5			37	25
61806685		50 x 1.5			45	25
<b>SILVYN® SPLIT GMP-M (metric counter nut)</b>						
61806686		16 x 1.5				100
61806687		20 x 1.5				100
61806688		25 x 1.5				50
61806689		32 x 1.5				50
61806691		40 x 1.5				25
61806692		50 x 1.5				25
<b>SILVYN® SPLIT COS</b>						
61806693	6			M3	6	100
61806690	10			M3	10	100
61806676	10			M5	10	100
61806694	11			M3	11	100
61806700	14			M3	14	100
61806677	14			M5	14	50
61806695	16			M5	16	50
61806696	16			M6	16	50
61806710	20			M5	20	50
61806678	20			M6	20	50
61806720	23			M5	23	50
61806679	23			M6	23	50
61806697	29			M5	29	50
61806698	29			M6	29	50
61806730	37			M6	37	20
61806740	45			M6	45	20
61806699	70			M6	70	10

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



**SILVYN® RILL PA 6**



**i Info**

- Maximum safety in the event of a fire

**Benefits**

- Dimensionally stable
- Flexible
- High flame-retardance and self-extinguishing in accordance with UL 94V-0
- Crush-resistant
- Lightweight

**Application range**

- Mechanical engineering
- Public utilities
- Railway applications / vehicle construction
- Moving applications
- Outdoor application (in black)

**Product features**

- Halogen and cadmium-free
- Abrasion-resistant
- High resistance to oil, petrol, acids and other chemicals

**Norm references / Approvals**

- UL FILENUMBER E308201

**Product Make-up**

- Fine-profile corrugated polyamide 6 conduit

**Note**

- UV and weather-resistant in black

**Technical data**

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

**Certifications**  
 IEC EN 61386-23  
 UL File No. E308201  
 DNV, Lloyd's Register  
 Rail:  
 DB DIN 5510 Part 2 (S4/SR2/ST2)  
 EN 45545-2 (HL-3)  
 SNCF NFF 16 101 / 102 (I2/F2)  
 UNDERGROUND BS 6853

**Colour delivered**  
 Grey (RAL 7031)  
 Black (RAL 9011), UV-resistant

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

**Temperature range**  
 -40°C to +115°C  
 short-term +150°C

Article number	Nominal size	ID x OD mm	Bending radius (mm)	Suitable for SILVYN® KCLICK-M/90°M	Suitable for SILVYN® KCLICK PG/90°PG	Suitable for SILVYN® KCLICK-GPZ-M/GPZ	PU (m)
<b>SILVYN® RILL PA 6 grey</b>							
61746939	10	6.5 x 10.0	13	10 x 1,0	7/-	12 x 1,5/7	50
61746940	13	10.0 x 13.0	20	12 x 1,5/16 x 1,5	9	16x1,5/9	50
61746950	16	12.0 x 15.8	35	16 x 1,5/20 x 1,5	11	20x1,5/11	50
61747010	18	14.3 x 18.5	40		13,5	-/13,5	50
61746960	21	16.5 x 21.2	45	20 x 1,5	16	25x1,5/16	50
61746970	28	23.0 x 28.5	55	25 x 1,5	21	32x1,5/21	50
61746980	34	29.0 x 34.5	65	32 x 1,5	29	40x1,5/29	25
61746990	42	36.0 x 42.5	90	40 x 1,5	36	50x1,5/36	25
61747000	54	48.0 x 54.5	100	50 x 1,5	48	63x1,5/48	25
<b>SILVYN® RILL PA 6 black</b>							
61746935	10	6.5 x 10.0	13	10 x 1,0	7/-	12 x 1,5/7	50
61746945	13	10.0 x 13.0	20	12 x 1,5/16 x 1,5	9	16x1,5/9	50
61746955	16	12.0 x 15.8	35	16 x 1,5/20 x 1,5	11	20x1,5/11	50
61747015	18	14.3 x 18.5	40		13,5	-/13,5	50
61746965	21	16.5 x 21.2	45	20 x 1,5	16	25x1,5/16	50
61746975	28	23.0 x 28.5	55	25 x 1,5	21	32x1,5/21	50
61746985	34	29.0 x 34.5	65	32 x 1,5	29	40x1,5/29	25
61746995	42	36.0 x 42.5	90	40 x 1,5	36	50x1,5/36	25
61747005	54	48.0 x 54.5	100	50 x 1,5	48	63x1,5/48	25

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

**Similar products**

- SILVYN® FPAS refer to main catalogue 2016/17
- SILVYN® RILL PA 12 refer to main catalogue 2016/17

**Accessories**

- SILVYN® KCLICK-M refer to main catalogue 2016/17
- SILVYN® KCLICK 90° M refer to main catalogue 2016/17
- SILVYN® KCLICK GPZ-M refer to main catalogue 2016/17
- SILVYN® KSE refer to main catalogue 2016/17
- SILVYN® KCLICK PG refer to main catalogue 2016/17
- SILVYN® KCLICK 90° PG refer to main catalogue 2016/17
- SILVYN® KCLICK-GPZ refer to main catalogue 2016/17
- SILVYN® KCLICK-Y refer to main catalogue 2016/17
- SILVYN® KCLICK-RH refer to main catalogue 2016/17
- SILVYN® K-EM refer to main catalogue 2016/17

Binding, bundling, fastening • Premium cable ties with steel nose



## UV-stabilised cable ties with steel nose



### Benefits

- Weather-resistant for harsh environmental conditions
- Contain 2 % Carbon to meet military specifications
- Steel nose ensures secure and durable binding
- High strength is constant even under harsh conditions: extreme temperature ranges, humidity and extreme cold
- Lock is also resistant to shocks and vibrations

### Application range

- Used for outdoor installation and maintenance of power plants

### Product features

- Strong Tie with higher pull-out forces

### Norm references / Approvals

- File Number TY-RAP®: E49405
- Fire behaviour according to UL94 V-2

### Included

- Strong Tie and TY-X: Packed in a recyclable plastic bag



### Info

- Convince yourself of the good price/performance ratio of the new Strong Tie series.

### Technical data



#### Classification

ETIM 5.0 Class-ID: EC000046  
ETIM 5.0 Class-Description: Cable tie



#### Colour delivered

RAL 9005 black/UV-resistant



#### Material

Polyamide 6.6  
Halogen-free and silicone-free



#### Temperature range

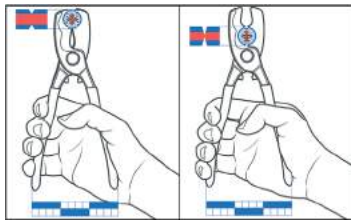
-40°C to +85°C

Article number	Article description	UL certification	Length x width (mm)	Bundling Ø (mm)	Tensile strength (N)	Pieces / PU
<b>Cable ties with steel nose- type Strong Tie</b>						
61723001	Strong Tie UV 100x2,5 BK	no	100.0 x 2.5	2.0 - 24.0	180	1000
61723007	Strong Tie UV 200 x 2,5 BK	no	200.0 x 2.5	3.0 - 55.0	180	1000
61723002	Strong Tie UV 140 x 3,5 BK	no	140.0 x 3.5	3.0 - 36.0	280	1000
61723008	Strong Tie UV 200 x 3,5 BK	no	200.0 x 3.5	3.0 - 55.0	280	1000
61723004	Strong Tie UV 280 x 3,5 BK	no	280.0 x 3.5	3.0 - 80.0	280	1000
61723009	Strong Tie UV 360 x 3,5 BK	no	360.0 x 3.5	3.0 - 101.0	280	1000
61723003	Strong Tie UV 186 x 4,5 BK	no	186.0 x 4.5	3.0 - 51.0	400	1000
61723011	Strong Tie UV 290 x 4,5 BK	no	290.0 x 4.5	3.0 - 80.0	400	1000
61723006	Strong Tie UV 360 x 4,5 BK	no	360.0 x 4.5	3.0 - 103.0	400	1000
61723005	Strong Tie UV 340 x 7,0 BK	no	340.0 x 7.0	6.0 - 90.0	700	500
61723012	Strong Tie UV 220 x 7,5 BK	no	220.0 x 7.5	6.0 - 57.0	800	500
<b>Cable ties with steel nose- type TY-RAP®</b>						
61723010	TYB* 23 MX	no	92.0 x 2.3	2.0 - 16.0	80	1000
61723110	TY 232 MX	no	203.0 x 2.3	2.0 - 50.0	80	1000
61723120	TY 234 MX	no	356.0 x 2.3	2.0 - 102.0	80	1000
61723020	TYB* 24 MX	no	140.0 x 3.6	2.0 - 29.0	180	1000
61723130	TY 242 MX	yes	208.0 x 3.6	2.0 - 50.0	180	1000
61723040	TY 26 MX	yes	284.0 x 3.6	2.0 - 76.0	180	1000
61723140	TY 244 MX	no	368.0 x 3.6	2.0 - 103.0	180	1000
61723030	TYB* 25 MX	no	186.0 x 4.8	3.5 - 45.0	220	1000
61723150	TY 253 MX	no	290.0 x 4.8	3.5 - 78.0	220	1000
61723060	TY 28 MX	yes	361.0 x 4.8	3.5 - 102.0	220	1000
61723160	TY 272 MX	no	223.0 x 6.9	6.0 - 50.0	540	500
61723050	TY 27 MX	yes	340.0 x 7.0	6.0 - 90.0	540	500
61723070	TY 29 MX	no	771.0 x 6.9	6.0 - 229.0	540	500

TY-RAP® is a registered trademark of ABB.

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

## KS 20 cable shears



### Benefits

- Less force required due to favourable transmission ratio and new blade geometry
- High ergonomics thanks to multi-component-handles
- Particular two-blades-system (see drawings)
- Cutting with precision grinding
- Easy and clean cut by using only one hand

### Application range

- Cuts copper and aluminium cables with up to 20 mm outer diameter
- Not suitable for steel wire and hard-drawn copper conductors

### Product features

- Material: special tool steel, forged, burnished head
- Made in Germany

### Technical data



#### Classification

ETIM 5.0 Class-ID: EC000142  
ETIM 5.0 Class-Description: Cable shears

Article number	Article designation	For outer diameter (mm)	Weight (kg)	Length (mm)	Pieces / PU
<b>KS 20 cable shears</b>					
62120045	KS 20	20	0.3	200	1

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

## UNIVERSAL STRIP stripping tool

### Benefits

- No pinching or deforming of cable ends thanks to a special cutting mode
- Interchangeable blades for different cable cross sections
- For use with a great variety of insulation with differing hardness and dimension
- Automatic release after operation

### Technical data



#### Classification

ETIM 5.0 Class-ID: EC000163  
ETIM 5.0 Class-Description: Cable stripping tool



#### Colour delivered

Orange



### Application range

- Universal stripping pliers with interchangeable stripping blades for special applications
- Suitable for fluoropolymer & PVC cores, AS-I, Solar, POF cables
- For stripping of sheath and insulation from all single wires and multi-wire cables from 0.03 to 16 mm<sup>2</sup> (Please check the application range of each blade)

### Product features

- Design: chrome-plated with plastic handle cover

### Included

- Tool and blades could be ordered separately or in a set, where the tool and one blade is included (but please note that the blade is not already assembled in the tool)
- Tool is always delivered with a length stop

Article number	Article designation	For mm <sup>2</sup>	For insulation	Length (mm)	Weight (kg)	Pieces / PU
<b>Tool without blades</b>						
21920005	Universal Strip without stripping knife			194	0.41	1
<b>Interchangeable blade</b>						
21920009	Blade DIN single cores	0.14 - 6	PVC			1
21920122	Solar stripping knife	1.5 - 6				1
21920126	POF 1, 2, 4-wire stripping knife		PVC/PUR			1
21920006	Fluoropolymer stripping knife	0.03 - 2	Fluoropolymer			1
21920004	Fluoropolymer stripping knife	2.5 - 10	Fluoropolymer			1
21920008	Fluoropolymer stripping knife	16	Fluoropolymer			1
21920135	AS I stripping knife		rubber/TPE/PVC			1
<b>Complete tool (incl. assembled blade)</b>						
21920141	Universal Strip DIN single wires	0.14 - 6	PVC			1
21920125	Universal Strip POF 1, 2, 4-wire		PVC/PUR			1
21920129	Universal Strip Fluoropolymer 0,03-2,08	0.03 - 2.08	Fluoropolymer			1
21920130	Universal Strip Fluoropolymer 2,5-10 mm <sup>2</sup>	2.5 - 10	Fluoropolymer			1
21920131	Universal Strip Fluoropolymer 16	16	Fluoropolymer			1
21920140	Universal Strip AS-I		rubber/TPE/PVC			1
21920120	Universal Strip Solar	1.5 - 6				1

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

Short manual is included- manuals could be also downloaded here: <http://www.lappkabel.com/instructions.html>

### Accessories

- Additional blades are available upon request

# Not afraid of the water

## ÖLFLEX® SOLAR XLR WP – the first permanently waterproof solar cable from Lapp

It is increasingly the case that users want to make use of areas in damp as well as dry surroundings for the installation of photovoltaic systems. Until now, it was not possible to achieve this without special protective measures when using regular photovoltaic cables. This is because when these cables are exposed to the wet for extended periods, there may be an ingress of moisture into the cable. This leads to a reduction in the insulation resistance, which may in turn cause malfunctions and damage to the solar units. The Stuttgart-based Lapp Group has developed the

ÖLFLEX® SOLAR XLR WP, the first permanently waterproof solar cable. The cable in question is an electron beam cross-linked solar cable of type PV1-F in accordance with TÜV 2PFG 1169/08.07 for durable, weather-resistant use in photovoltaic systems. Its optimised cable design and the constantly high contact resistance mean that it will still function reliably even after years in the water. The ÖLFLEX® SOLAR XLR WP guarantees continuous system performance – particularly in areas which are prone to flooding, or where cables are installed underground in protective conduits where water, heat and moisture can accumulate.

JJ-Lapp Cable, a joint venture company from Lapp Group and Jepsen & Jessen,

initially put the new waterproof cable ÖLFLEX® SOLAR XLR WP through its paces in a testing facility in Thailand. In order to ensure the performance of the cable, Lapp experts performed on-site insulation resistance measurements every three months over the course of a year. The measured values remained constant at 11 gigaohm on each occasion. „The new waterproof cable is the perfect solution for solar units in areas at high risk of flooding“, explains Vorada Serios, Sales Engineer at JJ-Lapp.

The new waterproof solar cable saw its first major use in Kanchanaburi Province in Thailand, where 192,000 metres of ÖLFLEX® SOLAR XLR WP were installed by Ensys Co. Ltd. The operator and principal of the 18 MWp solar unit is Conservation



Bernd Leushake and Vorada Serios show the waterproof solar cable, which is aimed above all at areas at risk of flooding.



An employee installs the waterproof solar cable.





The 18 MWp solar unit in Kanchanaburi Province.

of Energy Co. Ltd. A total of 500 kilometres of these waterproof solar cables have already been sold in Thailand. The cable is also currently in the process of certification according to the new DIN standard EN 50618, which describes cables for increased requirements relating to the operating voltage of 1.5 kV.

The ÖLFLEX® SOLAR XLR WP was produced in the Lapp Korea factory, where the first in-house electron beam cross-linking unit was commissioned two years ago. In the electron beam cross-linking process,

the energy of the radiation used is absorbed in the plastic and forms so-called ‚radicals‘. These react chemically with one another and create a connection between the chains of molecules, which leads to improvements in the mechanical and chemical properties. Using this technology, normal plastics such as polyethylene or polyamide are converted into high-performance polymers in the blink of an eye. These materials feature far superior dimensional stability under heat at higher usage temperatures, improved wear and abrasion resistance, better recovery properties, and

greater resistance to solvents and cleaning agents or other operating media. Electron beam cross-linked cables are ideal for use in photovoltaics, rail transport, shipping and exceptionally hot environments.

#### Nice to know:

The design of the „WP“-version is also used for our new product ÖLFLEX® SOLAR XLWP which is certified according to the new standard EN 50618 (type H1Z2Z2-K).



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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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