PHOTOVOLTAIC CABLES

As the worldwide leader in the cable industry, Prysmian Group believes in the effective, efficient and sustainable supply of energy and information as a primary driver in the development of communities.

With this in mind, we provide major global organisations in many industries with best-in-class cable solutions, based on state-of-the-art technology.

Through two renowned commercial brands - Prysmian and Draka - based in almost 50 countries, we’re constantly close to our customers, enabling them to further develop the world’s energy and telecoms infrastructures, and achieve sustainable, profitable growth.

In our energy business, we design, produce, distribute and install cables and systems for the transmission and distribution of power at low, medium, high and extra-high voltage.

In telecoms, the Group is a leading manufacturer of all types of copper and fibre cables, systems and accessories - covering voice, video and data transmission.

Drawing on over 130 years’ experience and continuously investing in R&D, we apply excellence, understanding and integrity to every thing we do, meeting and exceeding the precise needs of our customers across all continents, at the same time shaping the evolution of our industry.
We link sustainable ideas to real-world results

We enable production and supply of renewable energy

To meet an ever-growing need for power, the world is increasingly turning to renewable and sustainably sourced solar energy. In response to this demand, Prysmian cables are helping businesses in the renewable industry around the globe convert these new opportunities into reality.

Our technologies - which cover cables used in photovoltaic plants - are at work across the renewables sector, supporting the operations of contractors and developers, grid operators, system integrators and panel makers.

Always aware of our responsibility to the planet, we’re constantly driving innovation in our industry, aiming to help renewable industry partners deliver projects with benefits for the future of both our world and their businesses.
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Photovoltaic system
„Our strategy is to have a full cable portfolio and deliver all the cable types demanded for photovoltaic installation“

**Energy Cables**
- LV cables
- MV cables
- HV cables

**Solar Cables**
- TECSUN (PV) H1Z2Z2-K
- TECSUN (PV) S3Z2Z2-K

**Special Cables**
- Fibre optic cables
- Data cables
- Control cables
FIXED & FLEXIBLE INSTALLATION

INSTALLATION CABLE HALOGEN-FREE
TECSUN (PV) H1Z2Z2-K

Application
PRYSMIAN Solar cables TECSUN (PV) – H1Z2Z2-K is intended for use in photovoltaic power supply systems indoors and outdoors, in industrial and agriculture fields. Suitable for application in equipment with protective insulation (Class II), in explosion hazard areas and may be installed as fixed or freely suspended or free movable.

Applicable for installation in cable trays, conduits, on and in walls as well as for direct burial. The cable is designed to operate at a normal maximum conductor temperature of 90°C, but for a maximum of 20,000 hours a max. conductor temperature of 120 °C at a max. ambient temperature of 90°C, is permitted.

The version TECSUN (PV)(C) H1Z2Z2-K has an additional metallic screen braid, made of tinned copper wires, as a protective element against rodents or impact.

Installation note
TECSUN(PV) cables are suitable for direct burial in ground. Installation conditions per VDE 0800 Section 174 § 5.4.2 and VDE 0891 Section 6 § 4.2 should be taken into consideration.

Technical data
> Rated voltage: 1.5 kV DC and 1.0 kV AC
> Max. voltage: 1.8 kV DC and 1.2 kV AC
> Test voltage: 15 kV DC and 6.5 kV AC
> Current carrying cap: EN 50618, A-3
> Electrical tests: EN 50618, Table 2

Temperature range
> Conductor temperature: +90°C
> Max. conductor temperature: +120°C for max. 20,000 hours
> Short circuit temperature: +250°C 5 sec.
> Installation temperature: -25°C to +60°C
> Operating temperature: -40°C to +90°C
> Resistance to cold: EN 50618, table 2

Standard & Direktive & Approval
> Standard: DIN EN 50618
> Direktive: CE, RoHS, REACH
> Approval: <VDE>, TÜV-certificate no. 60103637

Construction
Conductor:
> Electrolytic tinned copper
> Finely stranded
> Class 5 acc. to IEC 60228

Insulation:
> Halogen-free
> Cross-linked HEPR 120°C, white

Outer sheath:
> Halogen-free cross-linked
> EVA rubber 120°C
> Insulation and sheath solidly bound
> Color: Black, blue or red
> UV-resistant EN 50289-4-17, method A

All information is presumed accurate upon issuing. Prysmian Group reserves the right to change in specifications without prior warning. Product specifications are not contractually binding without prior permission from Prysmian Group.
**FIXED & FLEXIBLE INSTALLATION**

**INSTALLATION CABLE HALOGEN-FREE**

**TECSUN (PV) H1Z2Z2-K**

**Chemical parameters**

Resistance to fire:
- Acc. to EN 50618, Table 2
- Single Cable Flame Test: EN 60332-1-2
- Low Smoke Emission: EN 61034-2 (Light Transmittance > 70%)
- Halogen-free per EN 50525-1, Annex B.
- Prysmian internal tests:
  - Multiple Cable Flame Test: EN 50305-9
  - Low Toxicity per EN 50305 (ITC < 3)

Resistance to oil:
- PRYSMIAN internal test, on sheath
  - 24h, 100°C (meets VDE 0473-811-404 and EN 60811-404)

Weather resistance:
- Acc. to EN 50618, Annex E and Table 2:
- UV Resistance on sheath: tensile strength and elongation at break after 720h (360 Cycles) of exposure to UV lights acc. to EN 50289-4-17, Method A.
- Ozone resistance: per Test Type B (DIN EN 50396), PRYSMIAN internal test:
- Water Absorption (Gravimetric) per DIN EN 60811-402.
- Acid and alkaline resistance Acc. to EN 50618, Annex B:
  - 7 days, 23°C (N-Oxalic Acid, N-Sodium Hydroxide) acc. to EN 60811-404.

Ammonia Resistance:
- PRYSMIAN Internal Testing:
  - 30 days in Saturated Ammonia Atmosphere. Environmentally Friendly TECSUN (PV) PV-Wire complies with the RoHS directive 2011/65/EU of the European Union.

**Thermal parameters**

Max. operating temperature of the conductor:
- Max. 90 °C at conductor (lifetime acc. to EN 50618 = 25 years lifetime acc. to Arrhenius-Diagram TECSUN = 30 years).
- For a maximum of 20,000 hours a max. conductor temperature of 120 °C at a max. ambient temperature of 90 °C is permitted.
Max. short circuit temperature of the conductor:
- 250 °C (5 s.)

Ambient temperature:
- Installation and handling: -25°C up to 60°C
- In operation: -40°C up to +90°C

Resistance to cold:
- Acc. to EN 50618, Table 2:
- Cold Bending Test at -40°C acc. to DIN EN 60811-504;
- Cold Elongation Test at -40°C acc. to DIN EN 60811-505;
- Cold Impact Test at -40°C acc. to DIN EN 60811-506, EN 50618-C.
- Damp-Heat Test Acc. to EN 50618, Table 2:
  - 1,000h at 90°C and 85% humidity (test acc. to EN 60068-2-78).

**Mechanical parameters**

Max. tensile load 15 N/mm² in operation:
- 50 N/mm² during installation per HD 516, DIN VDE 0298 section 3 § 7.1 and Section 300 § 5.4.1

Bending radius:
- Acc. to EN 50565-1, See table

Abrasion resistance:
- PRYSMIAN Internal Testing:
  - Acc. to DIN ISO 4649 against abrasive paper;
  - Sheath against sheath;
  - Sheath against metal;
  - Sheath against plastics.

Shrinkage Test:
- Acc. to EN 50618, See table
- Maximum Shrinkage <2% (test acc. to EN 60811-503)

Pressure Test at High Temperature:
- PRYSMIAN Internal Testing:
  - 50% acc. to EN 60811-508.

Dynamic Penetration Test:
- Acc. to EN 50618, Annex D:
- Meets requirements of EN 50618.

Shore-Hardness:
- PRYSMIAN Internal Testing:
  - Type A: 85 acc. to DIN EN ISO 868

Durability of Print:
- Acc. to EN 50618:
- Test acc. to EN 50396.

Rodent resistance:
- Safety can be optimized by utilizing protective hoses and cables with spinning or braid metallic coatings.
### TECSUN (PV)

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### TECSUN (PV)(C)

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<th>Max conductor resistance at 20°C Ω/km</th>
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FIXED & FLEXIBLE INSTALLATION

INSTALLATION CABLE HALOGEN-FREE
TECSUN (PV) S3Z2Z2-K 1,8/3 kV AC

Application
Halogen-free single core cables, sheathed, for junction boxes and inverters, with improved fire performance, increased heat resistance and suitable for direct burial. Intended for use in photovoltaic power supply systems, at nominal voltage rate of 1.8/3 kV AC, as interconnection between central inverter and transformer station.

Applicable indoor and outdoor in explosive and hazardous areas within industry and agriculture. Also suitable for applications in equipment with protective insulation class II or as short and ground fault protection. Can also be used as unfused connections in switchgear and distribution boards up to 1000 V (DIN VDE 0100-520 and DIN VDE 0660-500) and in accumulator circuits (DIN 5510 part 5).

Installation note
TECSUN(PV) cables are suitable for direct burial in ground. Installation conditions per VDE 0800 Section 174 § 5.4.2 and VDE 0891 Section 6 § 4.2 should be taken in consideration.

Technical data
- Rated voltage: 1.8/3 kV AC
- Max. operating voltage AC: 2.1/3.6 kV
- Max. operating voltage DC: 2.7/5.4 kV
- AC test voltage: 6.5 kV (5 min)
- Current carrying capacity: DIN VDE 0298-4

Mechanical data
- Tensile load:
  - Max. 15 N/mm² in operation
  - Max. 50 N/mm² during installation
- Torsion stress:
  - Max. ± 150°/m during installation
- Bending radius:
  - Acc. to DIN VDE 0298 part 3.

Temperature range
- Operating temperature: +90°C
- Max. conductor temperature: +120°C for max. 20,000 hours
- Short circuit temperature: +250°C
- Fixed installation: -40°C to +90°C
- Flexible installation: -40°C to +90°C

Standard & Directive
- Standard: DIN EN 50618
- Directive: CE, RoHS, REACH

Construction
- Conductor:
  - Finely stranded tinned copper
  - Class 5 acc. to IEC 60228
- Insulation:
  - Halogen-free
  - Heat resistant
  - Cross-linked rubber compound
  - Acc. to DIN VDE 0250-606
- Outer sheath:
  - Halogen-free cross-linked
  - Heat resistant
  - Cross-linked rubber compound
  - Acc. to DIN VDE 0250-606
  - Black and meter marked
  - UV-resistant

Chemical data
- Fire retardant:
  - IEC 60332-1-2 single cable
  - IEC 60332-3-24 bunched cables
- Smoke emission:
  - EN 61034-2 light emission ≥ 70%
- Halogen-free:
  - EN 60754-1
- Corrosivity:
  - EN 60754-1
  - pH ≥ 4.3 and
  - Conductivity ≤ 2.5 µS/mm
- Toxicity:
  - EN 50305 index ITC = 3
- Weather resistance:
  - EN 50618
  - Ozone resistant
  - UV-resistant
- Acidity and alkaline resistance:
  - EN 50618
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<th>Conductor resistance 20°C max Ω/km</th>
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FIXED INSTALLATION

INSTALLATION CABLE HALOGEN-FREE
HIK AL-M 0,6/1 kV

Application
Halogen-free fire retardant cable with low smoke and corrosive gas emission during fire. Suitable for application indoors and outdoors in cable pipes, trays or directly in soil. Can be ploughed down with caution. Must be installed according to S.B.

Technical data
- Rated voltage: 0,6/1 kV
- Test voltage: 4000 V
- Bending radius: 15 x D

Temperature area
- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -20°C
- Below 0°C caution must be exercised

Standard & Direktive & Approval
Standard:
- Cenelec HD 604-5D, IEC 60502-1
- Cenelec N1ZC7Z1-U (R-S), N1ZA5Z1-U
Direktive:
- Fulfills LVD, RoHS & REACH
CPR:
- CE-marked acc. to class Eca
- DoP no. 1002845 (≤25 mm²) download
- DoP no. 1004273 (≥50 mm²) download
- DoP finder: www.dop.prysmian.dk

Material characteristics
- Fire retardant: IEC 60332-1
- Halogen-free: IEC 60754-1
- Corrosivity: IEC 60754-2
- Smoke density: IEC 61034
- Current load: Acc. to SB 2001:6

Conductor
- Solid annealed aluminium
- Aacc. to IEC 60228 class 1.
- From 16-25mm²: round
- From 150-240mm²: sector shaped

Insulation:
- PEX

Core coloring:
- 4-core: brown, black, grey, blue
- 5-core: brown, black, grey, blue, yellow/green

Separator:
- Plastic tape

Outer sheath:
- Halogen-free compound
- UV-resistant
- Grey and meter marked

Construction
Conductor:
- Solid annealed aluminium
- Aacc. to IEC 60228 class 1.
- From 16-25mm²: round
- From 150-240mm²: sector shaped

Insulation:
- PEX

Core coloring:
- 4-core: brown, black, grey, blue
- 5-core: brown, black, grey, blue, yellow/green

Separator:
- Plastic tape

Outer sheath:
- Halogen-free compound
- UV-resistant
- Grey and meter marked

Material characteristics
- Fire retardant: IEC 60332-1
- Halogen-free: IEC 60754-1
- Corrosivity: IEC 60754-2
- Smoke density: IEC 61034
- Current load: Acc. to SB 2001:6

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FIXED INSTALLATION

INSTALLATION CABLE HALOGEN-FREE
HIK AL-S 0,6/1 kV

Application
Halogen-free fire retardant cable with low smoke and corrosive gas emission during fire. Suitable for application indoors and outdoors in cable pipes, trays or directly in soil. Can be ploughed down with caution. Must be installed according to S.B.

Technical data
- Rated voltage: 0,6/1 kV
- Test voltage: 4000 V
- Bending radius: 15 x D

Temperature area
- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -20°C
- Below 0°C caution must be exercised

Standard & Direktive & Godkendelse
Norm:
- Cenelec HD 604-5D, IEC 60502-1
Direktive:
- Fulfills LVD, RoHS & REACH
CPR:
- CE-mærket iht. klasse Eca
- DoP nr. 1002844 - download PDF
- DoP finder: www.dop.prysmian.dk

Construction
Conductor:
- Stranded annealed aluminium
- Acc. to EC 60228 class 2.
- From 50-240 mm²: sector shaped
Insulation:
- PEX
Core coloring:
- 4-core: brown, black, gray, blue
Separator:
- Plastic tape
Outer sheath:
- Halogen-free compound
- UV-resistant
- Gray and meter marked

Material characteristics
- Fire retardand: IEC 60332-1
- Halogen-free: IEC 60754-1
- Corrosivity: IEC 60754-2
- Smoke density: IEC 61034
- Current load: Acc. to SB 20016

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All information is presumed accurate upon issuing. Prysmian Group reserves the right to change in specifications without prior warning. Product specifications are not contractually binding without prior permission from Prysmian Group.
FIXED INSTALLATION

INSTALLATION CABLE HALOGEN-FREE
AXQJ PURE 0,6/1 kV

Application
Halogen-free, flame retardant and self-extinguishing in case of fire. Smoke emission during fire is low, transparent (facilitates evacuation) and not harmful to electronic equipment. Applicable as power cable for fixed installation indoors and outdoors, in pipes, ground or water as well as in switchgear and explosive environments. Can with caution be plowed.

Technical data
- Rated voltage: 0.6/1 kV
- Test voltage: 4000 V

Bending radius:
- Fixed installation 8 x D
- During installation 12 x D
- Ploughed down: 8 x D

Temperature area
- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -20°C
- Below 0°C caution must be exercised

Standard & Directive & Approval
Standard:
- Cenelec HD 603 part 3, section L
- Cenelec HD 604 – HF materials

Direktive:
- Fulfills LVD, RoHS, REACH-direktives
- CE-marked acc. to class Dca-s2d2a2
- DoP no. see table
- DoP finder: www.dop.prysmian.dk

Construction
Conductor:
- Multi stranded annealed
- Sector shaped
- Aluminium acc. to IEC/EN 60228 class 2.

Insulation:
- PEX

Core coloring:
- 3-core: brown, black, grey
- 4-core: brown, black, grey, blue

Screen:
- Concentric screen of annealed copper wire with counter spiral of copper band

Inner sheath:
- Halogen-free compound

Outer sheath:
- Halogen-free compound
- UV-resistant
- Black and meter marked

Material characteristics
- Fire retardant: IEC 6332-1 & 3
- Halogen-free: IEC 60754-1 & 2
- Smoke density: IEC 61034
- Corrosivity: IEC 60754-1 & 2
- Current load: Acc. to SB 2001:6

DoP classification
- Dcas2d2a2

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* Additional cross-sections can be ordered upon request

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LV cable

Prysmian Group - Solar (PV) Cable Portfolio 17
FIXED INSTALLATION

INSTALLATION CABLE HALOGEN-FREE
FXQJ PURE 0,6/1 kV

Application
Halogen-free, flame retardant and self-extinguishing in case of fire. Smoke emission during fire is low, transparent (facilitates evacuation) and not harmful to electronic equipment. Applicable as power cable for fixed installation indoors and outdoors, in pipes, ground or water as well as in switchgear and explosive environments. Can with caution be plowed.

Technical data
- Rated voltage: 0,6/1 kV
- Test voltage: 4000 V

Bending radius:
- Fixed installation 8 x D
- During installation 12 x D
- Ploughed down: 8 x D

Temperature area
- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -20°C
- Below 0°C caution must be exercised

Standard & Direktive & Approval
Standard:
- Cenelec HD 603 part 3, section L
- Cenelec HD 604 – HF materials

Direktive:
- Fulfills LVD, RoHS & REACH
- CPR
- CE-marked acc. to class Dca-s2d2a2
- DoP no. 1001413 - download PDF
- DoP finder: www.dop.prysmian.dk

Construction
Conductor:
- Multi stranded annealed copper
- Acc. to IEC/EN 60228 class 2.
- Round

Insulation:
- PEX

Core coloring:
- 3-core: brown, black, grey
- 4-core: brown, black, grey, blue

Screen:
- Concentric screen of annealed copper wire with counter spiral of copper band

Inner sheath:
- Halogen-free compound, extruded

Outer sheath:
- Halogen-free compound
- UV-resistant
- Black and meter marked

Material characteristics
- Fire retardant: IEC 6332-1 & 3
- Halogen-free: IEC 60754-1, -2
- Smoke density: IEC 61034-1, -2
- Corrosivity: IEC 60754-1 & 2
- Current load: Acc. to SB 2001:6

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<table>
<thead>
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<th>Conductor cross section mm</th>
<th>Outer diameter mm</th>
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**Power Cable Halogen-Free**
**AXLJ-RMF 6/10 (12) kV**

**Application**
AXLJ-RMF is a 3-core cable designed for replacement of bare overhead lines. Primary developed to be ploughed down but thanks to the robust design the cable can stand the stresses that appear when laid in water with moderate currents and limited depth.

**Technical data**
- Rated voltage: 6/12 kV
- Bending radius: Fixed 8 x D
  - During laying: 12 x D
  - Ploughed down: 8 x D

**Temperature area**
- Max. conductor temperature: +90°C
- Short-circuit temperature: +250°C
- Lowest temp. at installation: -20°C
- Below 0°C caution must be exercised

**Standard & Directive**
**Standard:**
- Cenelec HD 620 part 10, section M

**Direktive:**
- Fulfills LVD
- Fulfills RoHS and REACH-direktives

**Construction**
**Conductor:**
- Multi stranded aluminium
- Round and compacted
- Acc. to IEC 60228 class 2.
- Longitudinal watertight

**Inner conductive layer:**
- Sprayed

**Insulation:**
- XLPE, thickness 2.96 mm

**Outer conductive layer:**
- Adherent

**Separator:**
- Conductive tape

**Core coloring:**
- 3-core: brown, black, grey
- 4-core: brown, black, grey, blue

**Screen:**
- Concentric screen of annealed copper wires

**Draw string:**
- Kevlar

**Outer sheath:**
- Composite PE
- Black, meter marked

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<th>Current rating at core temp. 65 °C in air A</th>
<th>Current rating at core temp. 90 °C in air A</th>
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Nominal values unless otherwise specified.

Conditions:
- Maximum operating temperature 90 °C
- Soil temperature 15 °C
- Air temperature 20 °C
- Soil heat resistivity 1.0 °K * m / W
- Accommodation depth 0.65 m
- Frequency 50 Hz
FIXED INSTALLATION

UC FIBRE - OUTDOOR CENTRAL TUBE CABLE
1000N 2-24 FIBRES LLDPE - A-DQ(ZN)B2Y (E16a)

Application
Outdoor central tube cable with 2-24 fibres, glass elements and LLDPE sheath. Applicable for LAN and WAN backbones, telecom access lines, fibre to business and fibre to the building drop connections as well as fibre to the home drop and access connections. With its LLDPE sheathing this cable is ideal for outdoor installation where the installation conditions are not too harsh.

The cable features a high tensile strength and a degree of rodent protection, effective in many cases. It is equally suited for installation in ducts and on trays.

The cable is also UV-resistant, metal-free and longitudinally watertight.

Standard
- IEC 60794-1
- ISO 11801 2nd edition
- EN 50173-1:2002

Construction
Loose tube:
- ø2.8 mm jelly filled tube with 2–16 fibres
- ø3.5 mm loose tube with 24 fibres

Strength member:
- Waterblocker E-Glass fiber element

Fiber color code ø2.8 mm:
- Red, green, blue, yellow, white, grey, brown, violet, turquoise, black, orange, pink

Fiber color code ø3.5 mm:
- Yellow, white, grey, turquoise, orange, pink, yellow, white, grey, turquoise, orange, pink.

Sheath:
- LLDPE 1.0 mm
- Acc. to IEC 60811 and IEC 60708
- Black

Physical properties
Nominal outer diameter:
- 2-16 fibres: 6.0 mm
- 18-24 fibres: 6.5 mm

Nominal weight:
- 2-6 fibres: 40 kg/km
- 18-24 fibres: 45 kg/km

Tensile strength:
- Test E1 acc. to IEC 60794-1-2
- Max. installation: 1000 N
- Short term: 750 N

Compressive strength (crush):
- E3 test method: 1500 N

Impact:
- E4 test method: 15 Nm

Torsion (E7 test method):
- 5 cycles ± 1 turn

Kink(E10 test method):
- No kink for loop of diameter 100mm

Bending radius (E11 test method):
- Unloaded: min. R = 60 mm
- Loaded: min. R = 100 mm

Temperature range (F1 test method):
- Storage: -40°C to +60°C
- Installation: -20°C to +40°C
- Operations: -20°C to +60°C

Water penetration (F5B test method):
- No water on free end

All information is presumed accurate upon issuing. Prysmian Group reserves the right to change in specifications without prior warning. Product specifications are not contractually binding without prior permission from Prysmian Group.
<table>
<thead>
<tr>
<th>Product name: E16a datasheet</th>
<th>Fiber count</th>
<th>Fiber type</th>
<th>Fiber datasheet</th>
<th>Material code</th>
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<tr>
<td>UCFIBRE O CT D DA PE 1.0kN 2 MM51</td>
<td>2</td>
<td>OM2 50/125 multi mode 500/500</td>
<td>C23</td>
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<tr>
<td>UCFIBRE O CT D DA PE 1.0kN 4 MM51</td>
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<td>OM2 50/125 multi mode 500/500</td>
<td>C23</td>
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<tr>
<td>UCFIBRE O CT D DA PE 1.0kN 6 MM51</td>
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<td>OM2 50/125 multi mode 500/500</td>
<td>C23</td>
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<tr>
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<td>C23</td>
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<td>UCFIBRE O CT D DA PE 1.0kN 8 MM61</td>
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<td>UCFIBRE O CT D DA PE 1.0kN 4 SM2D</td>
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<td>C03e</td>
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</tbody>
</table>
**FIXED INSTALLATION**

**UC FIBRE - OUTDOOR CENTRAL TUBE CABLE**

**1500N 2-24 FIBERS LLDPE A-DQ(ZN)B2Y (E08a)**

**Application**

Central tube cable with up to 24 fibers and a diameter of 2.8 or 3.5 mm. Coated glass rovings gives the cable a high tensile strength and a certain rodent protection. With its LLDPE sheathing this cable is ideal for outdoor installation. Applicable for primary area (campus backbone) for medium and long distances, with installation in ducts or trays as well as for direct burial with proper sand back filling.

The cable is also UV-resistant, metal-free and longitudinally watertight.

**Standard**

- IEC 60794-1
- ISO 11801 2nd edition
- EN 50173-1

**Construction**

Loose tube:

- ø2.8 mm jelly filled with 2–16 fibres
- ø3.5 mm loose tube with 24 fibres

Strength member:

- Waterblocker E-Glass fiber element

Fiber color code ø2.8 mm:

- Red, green, blue, yellow, white, grey, brown, violet, turquoise, black, orange, pink

Fiber color code ø3.5 mm:

- Yellow, white, grey, turquoise, orange, pink, yellow, white, grey, turquoise, orange, pink

Sheath:

- LLDPE 1.2 mm
- Acc. to IEC 60811 and IEC 60708
- Black

**Physical properties**

- Nominal outer diameter:
  - 2-6 fibres: 6.5 mm
  - 24 fibres: 7.0 mm

- Nominal weight:
  - 2-6 fibres: 40 kg/km
  - 24 fibres: 45 kg/km

- Maximum installation tensile strength:
  - 1500 N

- Tensile strength (E1 test method):
  - Dynamic: 1000 N
  - Permanent: 750 N

- Compressive strength (crush):
  - E3 test method: 2000 N

- Impact:
  - E7 test method: 20 Nm

- Torsion (E7 test method):
  - 5 cycles ± 1 turn

- Kink (E10 test method):
  - No kink for loop of 200 mm

- Bending radius (E11 test method):
  - Unloaded: min. R = 60 mm
  - Loaded: min. R = 100 mm

- Temperature range (F1 test method):
  - Storage: -40°C to +60°C
  - Installation: -15°C to +40°C
  - Operations: -30°C to +60°C

- Water penetration (F5B test method):
  - No water on free end

All information is presumed accurate upon issuing. Prysmian Group reserves the right to change in specifications without prior warning. Product specifications are not contractually binding without prior permission from Prysmian Group.
<table>
<thead>
<tr>
<th>Fiber count</th>
<th>Fiber type</th>
<th>Fiber datasheet</th>
<th>Material code</th>
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<td>C34</td>
<td>60011397</td>
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</table>
Properties of TECSUN (PV) H1Z2Z2-K acc. to DIN EN 50618

Electrical Parameters

Voltage Rating

<table>
<thead>
<tr>
<th>Rated Voltage DC</th>
<th>Rated Voltage AC</th>
<th>Max. permissible operating voltage DC</th>
<th>Max. permissible operating voltage AC</th>
<th>Test voltage</th>
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</thead>
<tbody>
<tr>
<td>$U_0/U$</td>
<td>$U_0/U$</td>
<td>$U_0/U$</td>
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<td>1.5/1.5 kV</td>
<td>1.0/1.0 kV</td>
<td>1.8/1.8 kV</td>
<td>1.2/1.2 kV</td>
<td>AC: 6.5 kV (5 min.) DC: 15 kV (5 min.)</td>
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</tbody>
</table>

Current Carrying Capacity

The current carrying capacity values (in ampere) for each installation method at an ambient temperature of 60°C are according to EN50618, Table A3.

<table>
<thead>
<tr>
<th>Number of cores x nominal cross section</th>
<th>Single cable free in air</th>
<th>Single cable on surface</th>
<th>Two loaded cables touching, on a surface</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x 1.5</td>
<td>30</td>
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<tr>
<td>1 x 2.5</td>
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</tr>
<tr>
<td>1 x 4</td>
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<td>1 x 6</td>
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<td>1 x 10</td>
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<tr>
<td>1 x 240</td>
<td>775</td>
<td>736</td>
<td>620</td>
</tr>
</tbody>
</table>

Long-Term immersion in water

TECSUN (PV) cables are tested for minimum 10 days completely immersed in water at 85°C, with 1.8kV DC voltage applied.

De-rating factors

De-rating factors are used to properly calculate the current carrying capacity, taking into account the installation and operating conditions. In case of use at an ambient temperature greater than 60°C, please consider the de-rating factors indicated in EN50618, Table A4. For installation in groups, the de-rating factors from HD60364-5-52 shall apply.

<table>
<thead>
<tr>
<th>Ambient Temperature (°C)</th>
<th>Reduction Factor</th>
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<tbody>
<tr>
<td>up to 60</td>
<td>1.00</td>
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<td>70</td>
<td>0.92</td>
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<tr>
<td>80</td>
<td>0.84</td>
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<tr>
<td>90</td>
<td>0.75</td>
</tr>
</tbody>
</table>
Properties of TECSUN (PV) H1Z2Z2-K acc. to DIN EN 50618

**Mechanical Parameters**

**Tensile Load**
The maximum tensile load on the TECSUN (PV) cables is equal to 15 N/mm² in operation and 50 N/mm² only during installation, according to HD 516, DIN VDE 0298-3 and DIN VDE 0298-300.

**Bending Radius**
The minimum bending radius is indicated as the product of the overall diameter of the finished cable (D) and a factor (i.e. 3xD). For TECSUN (PV) the minimum bending radius according to EN 50565-1, is 3xD (for D≤12mm) or 4xD (for D>12mm). Smaller bending radii than permitted can cause a reduced service lifetime.

**Mechanical Characteristics of Insulation and Sheathing Materials**
The properties of the materials (tensile strength and elongation at break) are tested before and after ageing. Hot-Set test and thermal endurance test are performed in addition.

**Abrasion Resistance**
TECSUN (PV) cables are tested against several abrasive materials:
- sheath against abrasive paper
- sheath against sheath
- sheath against metal
- sheath against plastics

**Additional Tests**
- Shrinkage Test
- Pressure Test at High Temperature
- Dynamic Penetration Test
- Durability of Print
- Shore-Hardness
Properties of TECSUN (PV) H1Z2Z2-K acc. to DIN EN 50618

Thermal Parameters

Maximum Temperature of the Conductor during Operation
TECSUN (PV) cables are designed to operate at 90°C for a total lifetime equal to 30 years, according to Arrhenius-Diagram (EN 50618 requires a minimum of 25 years). For a maximum of 20,000 hours (= 2.3 years) the cables can operate at a maximum conductor temperature of 120 °C.

Maximum Temperature of the Conductor during Short Circuit
The maximum permitted short-circuit temperature is 250°C, for a duration of 5 seconds.

Ambient Temperature
The temperature range on the surface of the cable during operation is from -40°C to +90°C. During installation and handling, the range is from -25°C to +60°C.

Resistance to Cold
The following tests are performed on TECSUN (PV) cables:
• Cold impact at -40°C
• Cold bending at -40°C
• Cold elongation at -40°C

Damp Heat Test
Mechanical properties of the materials are tested after a 1,000 hours conditioning at +90°C and 85% relative humidity.
Properties of TECSUN (PV) H1Z2Z2-K acc. to DIN EN 50618

**Chemical Parameters**

**Behaviour against Fire**
TECSUN (PV) cables are tested for flame propagation on single cable according to EN 60332-1-2 and on multiple cables according to EN 50305-9. The smoke evolution is tested according to EN 61034-2, with Light Transmittance > 70%. The cables are halogen-free according to EN 50525-1 - Annex B, and with a toxicity index < 3 (per EN 50305).

**Oil Resistance**
In addition to the normative requirements, sheathing material is tested for 24 hours immersion in oil at 100°C.

**Weather Resistance**
External agents related to weather conditions (such as UV radiations, ozone and water) can degrade the rubber materials, causing a reduction of the performances of the cables. Therefore TECSUN (PV) cables are tested in order to ensure:

- Ozone resistance: complete cable has no cracks after 72 hours at 40°C, with 55% relative humidity and 2ppm of ozone concentration
- UV resistance: tensile strength and elongation at break are measured after a conditioning of 720 hours (360 cycles) exposed to UV light

**Acid and Alkaline Resistance**
Resistance of the sheathing material against a 23°C acid (N-Oxalic Acid) and alkaline solution (N-Sodium Hydroxide) is tested for 7 days.

**Ammonia Resistance**
In addition to the normative requirements, TECSUN (PV) is tested for 30 days in saturated ammonia atmosphere.
Ageing and Misuse Effects

Cable overheating effect

Ozone damage effect

Cable overheating effect

Ozone damage effect

Cable handling misuse - bending radius too small

Installation misuse - violent pressure
We are here for you
You are always welcome to contact us directly with technical questions or sales enquiries.

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Customer support:
Telephone: +35

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fi-info@prysmiangroup.com

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90620 Oulu
Finland

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