CATCH THE SUN

Prysmian’s full capabilities on solar landscape

prysmian

The planet’s pathways

CONNECTING THE WORLD. TODAY AND IN THE FUTURE

Prysmian – the world leader in the energy and telecom cables and systems industry.

With 140 years' experience, Prysmian is strongly positioned in high-tech markets and offers the widest possible range of products, services, technologies and know-how.

140
YEARS OF EXPERIENCE

25
R&D CENTERS AROUND THE WORLD

+50
COUNTRIES

30K
EMPLOYEES

ABOUT US

We specialise in underground and submarine cables and systems for power transmission and distribution, special cables for applications in many different industries, and medium and low voltage cables for the construction and infrastructure sectors.

For the telecommunications industry, the Group is the world's largest provider of cutting-edge cables and accessories for voice, video and data transmission, offering a comprehensive range of optical fibres, optical and copper cables and connectivity systems.

We are committed to environmental responsibility in our production processes, the protection of the global environment, and the responsible management of relations with the local communities in which we work.

For us, innovation means meeting the needs of our customers and communities by understanding their business drivers as quickly as they do. To do that, our team of over 900 Research & Development professionals is constantly looking to the future, predicting and identifying emerging trends in each of our industries and sectors. Acting on this intelligence from 26 R&D centres around the world, we're constantly close to our customers in their own local markets.

SOLAR PHOTOVOLTAIC CABLES

To meet an ever-growing need for power, the world is increasingly turning to renewable and sustainably sourced solar energy. Prysmian's cables are helping businesses in the renewable industry around the globe to convert this opportunity into reality. Our technologies – which cover cables used in photovoltaic plants – support the operations of contractors and developers, grid operators, transmission and distribution system operators and panel makers. Always aware of our responsibility to the planet, we are 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.

The choice of components is critical in any PV system. Good quality and properly sized cables provide optimized safety and longer-lasting systems.

Solar PV cables are often exposed to harsh environmental conditions: UV radiation, moisture, temperature fluctuations as well as wind, snow and rain. Inadequate or low-quality cables can deteriorate quickly, thus reducing a system's power generation capacity and, therefore, its revenues. Every KW lost in generation due to poor quality cables is a loss in terms of return on investment.

Cables are one of the first components of a system to show failures, causing power generation disruptions and implying high replacement costs related not only to the replacement of cables, but also, and mostly, to the works required and the possible collateral damages to panels or other components.

WHAT WE OFFER

Prysmian offers complete cable solutions to enable the production and supply of solar photovoltaic power. In addition to the Solar PV cables, our cable portfolio includes low, medium and high voltage cables according to the most known standards of each region, as well as special cables for communication and control. In addition to cables, Prysmian offers electrical asset management solutions with PRY-CAM, the revolutionary technology for on-line, accurate and reliable partial discharge measurements, diagnosis and defect localization.

GLOBAL GROUP, LOCAL FORCE

Prysmian is world leader in the energy and telecommunications cable systems industry. No matter how large, we are always present to serve both our global and our local customers and business partners. In order to offer bespoke and tailor-made solutions, we appreciate the importance of understanding local pre-conditions and special needs. This is why we believe that it is crucial to be present within local geographies, while being backed-up by the capacity that only a truly global group possesses.

COMPLETE SOLUTIONS

1 SOLAR ARRAY CABLE RANGE (DC 1.5kV)

- PRYSUN H1Z2Z2-K DC 1.5 kV
- PRYSUN H1Z2Z2-K TWIN DC 1.5 kV
- Solar Cable with Anti-Termite Solution for Australian Environment

SOLAR HARNESSES

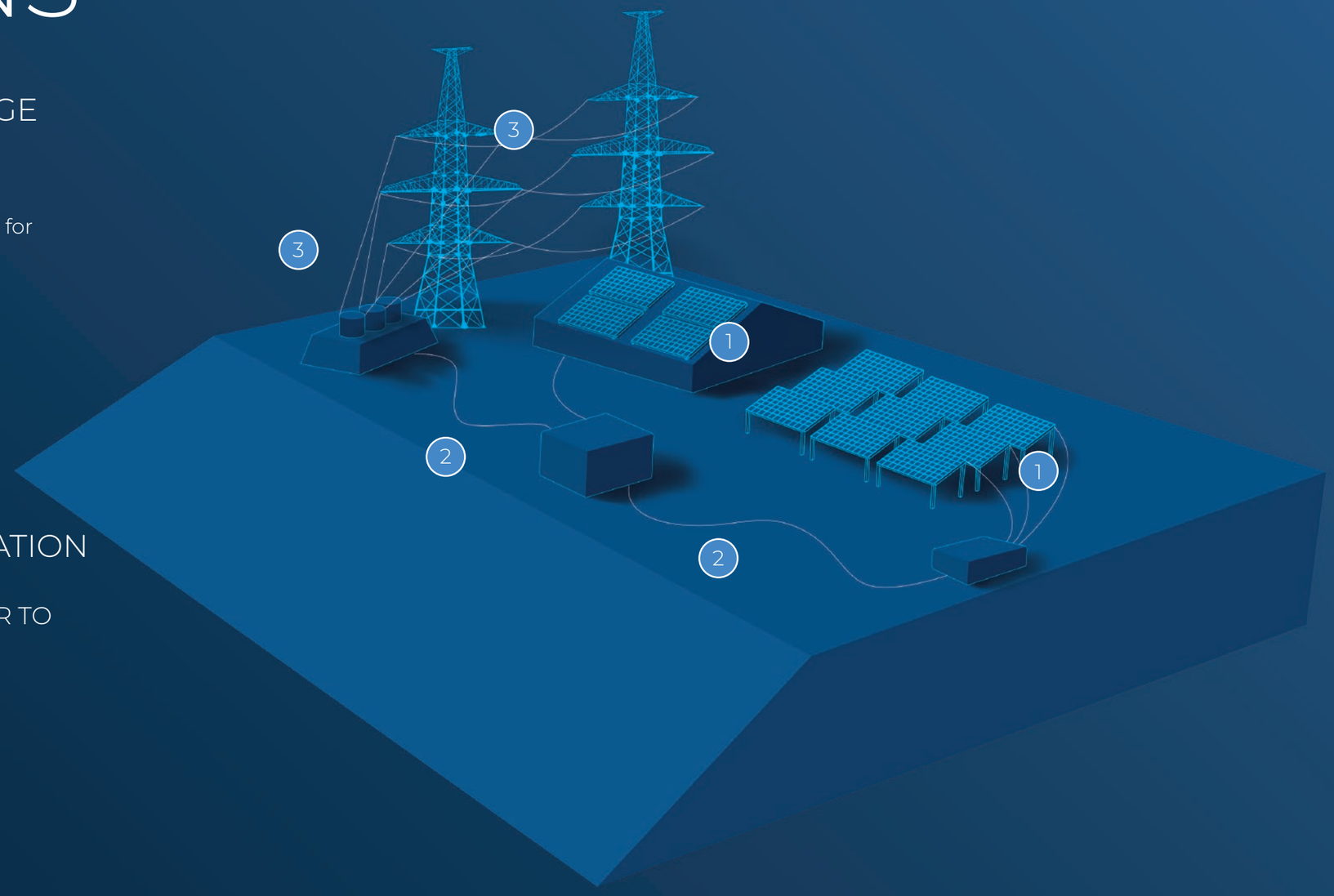
- Pre- assembled with MC4 connectors and in- line fuses
- String motor jumper cables
- String bearing jumper cables
- Home Run cables
- Pre-assembled IPC Harness
- Solar Trunk cable XLPO/XLPO

2 ENERGY AND COMMUNICATION CABLE RANGE (SUB ARRAY AND DC/AC INVERTER TO SUBSTATION)

- Direct Current Low Voltage
- Medium Voltage
- Communication cables
- Earth cables
- Accessories and components

3 SUBSTATION AND GRID CONNECTION

- Overhead lines
- High voltage underground
- Extra high voltage
- Accessories and components



CABLE SOLUTIONS

We have a vast and unabridged photovoltaic cable offer that can be tailor-made to fit specific customer needs.

Solar Array Cable Range

Reflecting our cable commitment to both innovation and sustainability, we offer a full range of quality photovoltaic products, renowned in the field for their easy installation, reliability and longevity attributes and complying with all major international standards.

Our technologies are hard at work across the renewables sector, connecting PV Panels to Combiner Boxes supporting the reliable operations of PV Solar Farms for contractors, developers, grid operators, PV panel makers, PV power generation system integrators and solar parks.

Sub Array and Energy Cable

Prysmian supports the design, development and operations of Solar Farms getting them connected to the transmission grid. Prysmian energy cable range includes MV, DC and LV suitable for connecting Combiner Boxes to Invertors and Invertors to Substations.

Prysmian cables are also approved by all Transmission companies in Australia for transmission lines and Substations.

Harnessing

Prysmian can manufacture pre-assembled solar harnesses using Prysmian solar cable to suit the design layout of the solar farm.

The solar harnesses are provided with Prysmian warranty and design life and manufactured in accordance with EN and IEC standards.

PRYSUN SOLAR CABLE

TÜV Certified

Photovoltaic DC cable according to IEC 60930/EN 50618 with TÜV certification.

Outer sheath colour option

The black and black with a red stripe version have the same UV resistance and non discolouration over time. Another option is available in a red sheath.

Additional tests

In addition to the standard tests required according to IEC 60930/EN 50618, PRYSUN has been tested for AD8 Water resistance according to EN-50525-2-21 Annex D.1, D.3 and Annex E to document its superior performance.

Anti-termite Protection

According to the Australian environment, we are providing an anti-termite solution polyamide 12 (PA 12).

SOLAR ARRAY CABLES

Prysmian Solar array cable range is designed and tested to EN50618 and IEC62930, are intended for use in Photovoltaic Power Supply Systems: Indoor and/or outdoor.

PRYSUN Single Core Solar Cable

PRYSUN Twin Core Solar Cable

Application

They are suitable for applications in/at equipment with protective insulation (Protecting Class II), and may be installed as fixed or freely suspended or free movable. Installation in cable trays, conduits, on and in walls is permissible, the cable also suitable for floating solar application.

H1Z2Z2-K DC 1.5 kV	
Standard	IEC 62930/ EN50618
Conductor	Tinned copper
Insulation	Halogen-free cross-linked elastomer
Outer Sheath	Halogen-free cross-linked elastomer
Rated voltage	1.5 kV DC
Water resistance	Meets AD8 classification
Max. operating temperature	90 °C
Min. laying temperature	-5 °C
Short circuit temperature	250 °C

PRYSUN Solar PVC–(PRYSUN H1Z2Z2-K DC 1.5 kV–Single Core)								
Spec	Conductor diameter	Insulation Thickness	Sheath Thickness	Overall Diameter	Approx. Cable Weight	Min. Insulation Resistance At 20 °C	Min. Insulation Resistance At 90 °C	DC resistance at 20°C
mm2	mm	mm	mm	mm	kg/km	MΩ*km	MΩ*km	max.Ω/km
1X1.5	1.52	0.7	0.8	4.4-5.2	35	860	0.86	13.7
1X2.5	2.0	0.7	0.8	4.9-5.7	47	690	0.69	8.21
1X4	2.49	0.7	0.8	5.4-6.2	61	580	0.58	5.09
1X6	2.95	0.7	0.8	5.9-6.4	81	500	0.50	3.39
1X10	4.1	0.7	0.8	6.8-7.8	123	420	0.42	1.95
1X16	5.2	0.7	0.9	8.2-9.8	189	340	0.34	1.24
1X25	6.5	0.9	1.0	9.9-11.5	288	340	0.34	0.795
1X35	7.6	0.9	1.1	11.2-12.8	379	290	0.29	0.565
1X50	8.9	1.0	1.2	13.4-15.0	535	270	0.27	0.393
1X70	10.8	1.1	1.2	15.4-17.0	745	250	0.25	0.277
1X95	12.5	1.1	1.3	17.4-19.0	965	220	0.22	0.210
1X120	13.9	1.2	1.3	18.6-20.4	1211	210	0.21	0.164
1X150	15.8	1.4	1.4	21.0-22.8	1481	210	0.21	0.132
1X185	17.4	1.6	1.6	23.7-25.5	1822	200	0.20	0.108
1X240	19.9	1.7	1.7	26.7-28.5	2353	200	0.20	0.0817
1X300	23.2	1.8	1.8	28.6-32.6	2912	200	0.20	0.0654

PRYSUN H1Z2Z2-K TWIN DC1.5kV (Twin)					
Spec	Conductor diameter	Insulation Thickness	Sheath Thickness	Overall Diameter (±10%)	Max. DC resistance at 20°C
mm2	mm	mm	mm	mm	Ω/km
2X4	2.43	0.7	0.8	5.7*11.5	5.09
2X6	2.98	0.7	0.8	6.3*12.6	3.39

Solar Cable with Anti-Termite Solution for Australian Environment

Designed and tested to EN50618 and IEC 62930, are intended for use in Photovoltaic Power Supply Systems: Indoor and/or outdoor.

Application

They are suitable for applications in/at equipment with protective insulation (Protecting Class II). Fixed installation for indoor or outdoor. Installation is also possible in ducts and pipes.

TCU(R)/XLPO/NJ/XLPO	
Standard	IEC 62930
Conductor	Tinned copper
Insulation	Halogen free cross-linked
Termite Protection	Nylon Polyamide 12
Outer Sheath	Halogen free cross-linked
Rated voltage	1.5 kV DC
Water resistance	Meets AD8 classification
Max. operating temperature	90 °C
Min. laying temperature	-5 °C
Short circuit temperature	250 °C

TCU(R)/XLPO/NJ/XLPO – Single Core

Spec	Conductor Diameter	Insulation Thickness	Nylon Polyamide 12 Diameter Approximate	Insulation Thickness	Overall Diameter (±10%)	DC resistance at 20°C
mm2	mm	mm	mm	mm	mm	max.Ω/km
1X4	2.43	0.7	4.7	0.8	6.4	5.09
1X6	2.98	0.7	5.3	0.8	6.9	3.39
1X10	3.94	0.7	6.2	0.8	7.8	1.95
1X16	5.2	0.7	7.4	0.9	9.3	1.24

TCU(R)/XLPO/NJ/XLPO – Twin

Spec	Conductor Diameter	Insulation Thickness	Nylon Polyamide 12 Diameter Approximate	Insulation Thickness	Overall Diameter (±10%)	DC resistance at 20°C
mm2	mm	mm	mm	mm	mm	max.Ω/km
2X6	2.98	0.7	5.3	0.8	7.1*14.2	3.39
2x10	3.94	0.7	6.4	0.8	8.2*16.3	1.95

Sub-Array DC 1.5 kV

Designed for the interconnection between Combiner Boxes and DC/AC inverter.
2KV Option is available

1C DC 1.5kV-2kV AL XLPE/HDPE BLK

Application

They are suitable for applications in/at equipment with protective insulation (Protecting Class II). Fixed installation for indoor or outdoor/direct buried. Installation is also possible in ducts and pipes.

AL/XLPE/HDPE DC 1.5 kV	
Standard	Generally to AS/NZS 5000.1
Conductor	Circular stranded Compacted Class 2 Aluminium
Insulation	XLPE
Outer Sheath	HDPE
Rated voltage	1.5 kV DC
Water resistance	Meets AD8 classification
Max. operating temperature	90 °C
Min. laying temperature	-5 °C
Short circuit temperature	250 °C
Min Bending Radius	
During installation	25D*
Final installed position	15D*

*D: Outer Diameter

Spec	Nominal Conductor diameter	Nominal Insulation Thickness	Nominal Sheath Thickness	Approx. Outer diameter (±10%)	Weight	Conductor DC resistance at 20°C max.
	mm	mm	mm	mm	kg/km	
1X185	16.2	2.0	1.7	23.8	727	0.164
1X240	18.3	2.0	1.8	26.1	911	0.125
1X300	20.6	2.0	1.8	28.4	1112	0.100
1X400	23.5	2.0	1.9	31.5	1365	0.0778

Sub-Array DC 1.5 kV with Anti-Termite Solution for Australian Environment

1C DC 1.5kV-2kV AL/XLPE/NY/HDPE BLK

AL/XLPE/NY/HDPE DC 1.5 kV	
Standard	Generally to AS/NZS 5000.1
Conductor	Circular stranded Compacted Class 2 Aluminium
Insulation	XLPE
Termite Protection	Nylon Polyamide 12
Outer Sheath	HDPE
Rated voltage	1.5 kV DC
Water resistance	Meets AD8 classification
Max. operating temperature	90 °C
Min. laying temperature	-5 °C
Short circuit temperature	250 °C
Min Bending Radius	
During installation	30Dn*
Final installed position	20Dn*

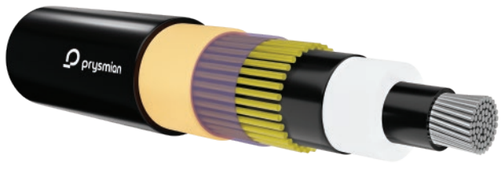
Dn* : Diameter over polyamide layer

Spec	Nominal Conductor diameter	Nominal Insulation Thickness	Polyamide Diameter approximate	Nominal Sheath Thickness	Approx. Outer diameter (±10%)	Approx. Weight kg/km.	Conductor DC resistance at 20°C max.
	mm	mm	mm	mm	mm	kg/km	Ω/km
1X185	16.2	2.0	21.2	1.7	24.6	758	0.164
1X240	18.3	2.0	23.3	1.8	26.9	945	0.125
1X300	20.6	2.0	25.6	1.9	29.4	1158	0.100
1X400	23.5	2.0	28.5	2.0	32.5	1415	0.0778

Medium Voltage Cable for Solar Solution

The Medium Voltage cables are power cables with aluminium or copper, 1C or 3C, conductors, XLPE insulation and Copper wire as metallic screen, and PVC/HDPE composite sheath. Termitex™ Prysmian's anti-termite solution is also available without impacting cable attributes.

33 kV 1C AL/XLPE/CWS/PVC/HDPE BK



Application

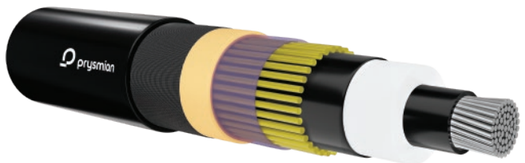
The MV cables are renewable cables manufactured by Prysmian, designed for their use for solar farm project. Typically, the rated voltage U0/U(Um) of the MV systems is 19/33(36)kV. 3.3kV to 22kV options are also available. Suitable for low fault level or fast fault clearing cable systems. Their installation conditions could be in free air, in duct, in trench and in ground with protection.

19/33(36)kV AL/XLPE/CWS/PVC/HDPE	
Standard	AS/NZS 1429.1
Conductor	Circular stranded Compacted Class 2 Aluminium
Inner screen	Semiconductive polymer
Insulation	XLPE
Outer screen	Semiconductive polymer
Metallic screen	Copper wire screen
Binder	Wrapped binder tape
Inner sheath	PVC,5V-90, orange
Outer Sheath	HDPE, Black
Rated Voltage	19/33 kV
Max. operating temperature	90 °C
Short circuit temperature	250 °C
Min Bending Radius	
During installation	25D*
Final installed position	15D*

Conductor size	Nominal Conductor diameter	Nominal Insulation diameter	Outer diameter approx.	Cable Weight approx.	Conductor DC resistance at 20°C max.	Current carrying capacity	Short Circuit Current for 1s (conductor/ screen)
mm2	mm	mm	mm	kg/km	Ω/km	A	kA
1C70	9.5	26.8	32.7	1095	0.443	190	6.6/3
1C95	11.3	28.6	34.6	1221	0.320	225	9.0/3
1C120	12.7	30.0	36.0	1330	0.253	260	11.3/3
1C150	14.0	31.3	37.8	1476	0.206	290	14.2/3
1C185	15.8	33.1	39.6	1639	0.164	330	17.5/3
1C240	18.1	35.4	41.9	1869	0.125	380	22.7/3
1C300	20.2	37.5	44.4	2131	0.100	430	28.3/3
1C400	23.1	40.9	47.7	2487	0.0778	490	37.8/3
1C500	26.2	44.0	51.2	2923	0.0605	560	47.2/3
1C630	29.7	47.5	54.7	3443	0.0469	640	59.5/3
1C800	34.0	51.8	59.4	4135	0.0367	722	75.6/3
1C1000	38.0	56.5	64.5	4978	0.0291	805	94.5/3
1C1200	41.5	60.0	67.7	5568	0.0247	860	113.4/3

Note: Ambient ground temperature = 25°C;Depth of laying = 0.8m;Thermal resistivity of soil = 1.2°C.m/W

MV Cable with Termite Protection for Australian Environment



33 kV 1C AL/XLPE/CWS-LD/NYLON/HDPE BK

AL/XLPE/CWS-LD/PVC/HDPE	
Standard	AS/NZS 1429.1
Conductor	Circular stranded Compac-ted Class 2 Aluminium
Inner screen	Semiconductive polymer
Insulation	XLPE
Outer screen	Semiconductive polymer
Metallic screen	Copper wire screen
Binder	Wrapped binder tape
Inner sheath	PVC,5V-90, orange
Termite Protection	Nylon Polyamide 12
Outer Sheath	HDPE, Black
Rated Voltage	19/33 kV
Max. operating temperature	90 °C
Short circuit temperature	250 °C
Min Bending Radius	
During installation	30D*
Final installed position	20Dn*

Dn* : Diameter over polyamide layer

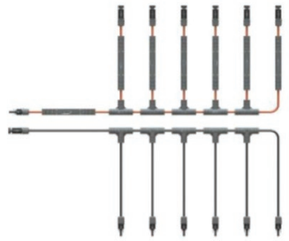
Conductor size	Nominal Conductor diameter	Nominal Insulation diameter	Diameter over nylon layer approx.	Outer diameter approx.	Cable Weight approx.	Conductor DC resistance at 20°C max.	Current carrying capacity	Short Circuit Current for 1s (conductor/ screen)
mm2	mm	mm	mm	mm	kg/km	max.Ω/km	A	kA
1C70	9.5	26.8	32.1	33.7	1148	0.443	190	6.6/3
1C95	11.3	28.6	34.0	35.6	1276	0.320	225	9.0/3
1C120	12.7	30.0	35.4	37.0	1388	0.253	260	11.3/3
1C150	14.0	31.3	37.0	38.8	1537	0.206	290	14.2/3
1C185	15.8	33.1	38.8	40.6	1702	0.164	330	17.5/3
1C240	18.1	35.4	41.1	42.9	1936	0.125	380	22.7/3
1C300	20.2	37.5	43.4	45.4	2202	0.100	430	28.3/3
1C400	23.1	40.9	46.7	48.7	2564	0.0778	490	37.8/3
1C500	26.2	44.0	50.0	52.2	3005	0.0605	560	47.2/3
1C630	29.7	47.5	53.5	55.7	3531	0.0469	640	59.5/3
1C800	34.0	51.8	58.0	60.4	4229	0.0367	722	75.6/3
1C1000	38.0	56.5	62.9	65.5	5081	0.0291	805	94.5/3
1C1200	41.5	60.0	66.1	68.7	5676	0.0247	860	113.4/3

Note: Ambient ground temperature = 25°C;Depth of laying = 0.8m;Thermal resistivity of soil = 1.2°C.m/W

Pre Assembled Solar Harnesses Solutions

Features

- Max rated current 40A
- Max rated system voltage DC 1500V
- Better BOS cost
- Hi-tech sealing technology
- Autorized patents
- UV Resistance
- IP 68
- IEC & UL qualified and certified



Pre – assembled above ground string harnesses available for both positive and negative harnesses to suit large scale solar farms using 4mm-16mm solar cable

In line fuse with MC 4 connectors for easy replacement

Multiple joiners and over moulded inline fuses for the Solar Harnesses available in 4mm-16mm to support the solar farm design layout for harnesses

Inline Fuses IEC 1100V- 1500V, up to 80amp, 2.5mm2-16mm2

The prefabricated big lead assembly provi-des long term connection integrity and is custom designed by our team of experts for each solar farm for easy installation and connection of the strings in each row

Termitex - Anti Termite Barrier

Prysmian‘s Termitex® is a revolutionary cable protection solution that resists any termite attack from happening. It results from years of research conducted in Prysmian laboratories, collaborating with other significant research organisations such as CSIRO. Prysmian‘s Termitex® solution keeps cables safe and has a successful track record of several decades in Australia‘s most highly populated termite areas.

Breaking down Termitex

Termitex is an effective termite deterrent. The active ingredient in our Termitex is widely used in pest control and agriculture. Prymian’s manufacturing and quality control process uniformly incorporated the ingredients with the appropriate proportion to the sheath material to ensure consistent and reliable performance. It makes our Termitex solution safe for the environment and sets it apart from other anti-termite solutions.

Features & Benefits of Termitex

Durable and Safe

Termitex has been fully tested by CSIRO and HSEQ consultants and is approved for use in Australia. Prysmian MV cable with Termitex has thousands of kilometres installed in the ground over the last 30 years without a single claim against it.

Termitex protects the outer sheath

Termitex makes a significant difference when it comes to protecting not only the cable but also the outer sheath of the cable.

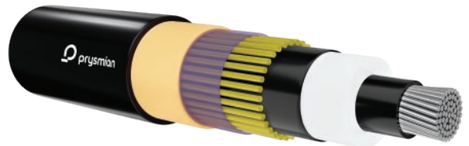
Decrease Bending Radius

Termitex solution provides a smaller bending radius- shorter installation time, and less manpower.

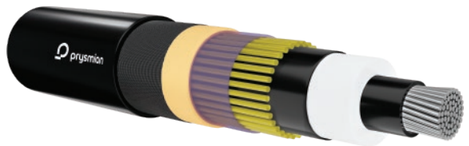
Hassle-free Ease of Installation

Larger drum barrels reduces cable length, ensuring occupation hygiene. The ease of installation also means less time and cost involved.

Termitex vs Nylon



33 kV 1C AL/XLPE/CWS/PVC/HDPE BK



33 kV 1C AL/XLPE/CWS-LD/NYLON/HDPE BK

Termitex

- Lower costs
- Smaller diameter cable , more flexible, easier to install
- Longer cable drums lengths

Nylon

- Higher Price
- Larger diameter
- More rigid, harder to handle
- Shorter cable drum lengths

Protection mode	Material Costw	Installation Time	Cost of Ownership	Install Radius (mm)	Diameter (mm)	Weight (kg/m)
Termitex	$$	-	-	25D and 15D	-	-
Nylon 11/12	$$$$	++	$$	30D and 20D	++	++

- Means the value is same as standard cable
+ Means the value is much more than standard cable

PRY-CAM
Solutions to demanding industrial challenges

PRY-CAM solutions are specifically designed to tackle power failure challenges, help avoiding unplanned outages and provide real time information about the conditions of power assets.

PRY-CAM, for data-driven power

Power failures may happen and cause detrimental impacts on businesses and communities: that's a fact.

No matter the cause, either a fault in cabling and equipment or maintenance and repairing activities, each downtime minute translates into reduced direct profits, increased costs, and reputations losses.

Power failures in factories, refineries, datacentres, or power generation plants lead always to huge costs and the more complex the solution to the failure, the higher the cost incurred.

Fault prediction is the only approach that allows not only to plan power outages, resources mobilization and spare parts procurement, but also to avoid serious physical damages to an infrastructure and reduce inconveniences and financial impacts to a minimum.

Why PRY-CAM solutions are good for your business

PRY-CAM offers a holistic approach to avoid unplanned event.

PRY-CAM solutions are designed to provide simple and clear information about the status of electrical assets quickly and in an efficient way, to identify where and when a fault will occur, to allow adjusting maintenance schemes based on predictive strategies rather than preventive and to reduce financial and reputation damages, accordingly.

All PRY-CAM products feature robust and standardized enclosures to face the challenges of industrial applications.

Each PRY-CAM solution can be configured based on the customers' specific needs in terms of parameters to be monitored to support their specific maintenance and asset management strategies and provide a 360° service.

PRY-CAM solutions are ideal also for retrofitting operations as they do not require power outage to be installed.

All PRY-CAM devices are maintenance-free and can be connected to a central platform.

PRY-CAM solutions are a powerful preventive tool to help saving money on direct cost of repair (no more emergency), indirect costs (reduced outage hours), insurance costs leading to reduced OPEX and extended CAPEX lifetime.

PRY-CAM
A Brand of Prysmian Group

Advantages

- Online activity, no service interruption required
- Easy retrofitting
- On-site and remote support

Targeted Systems

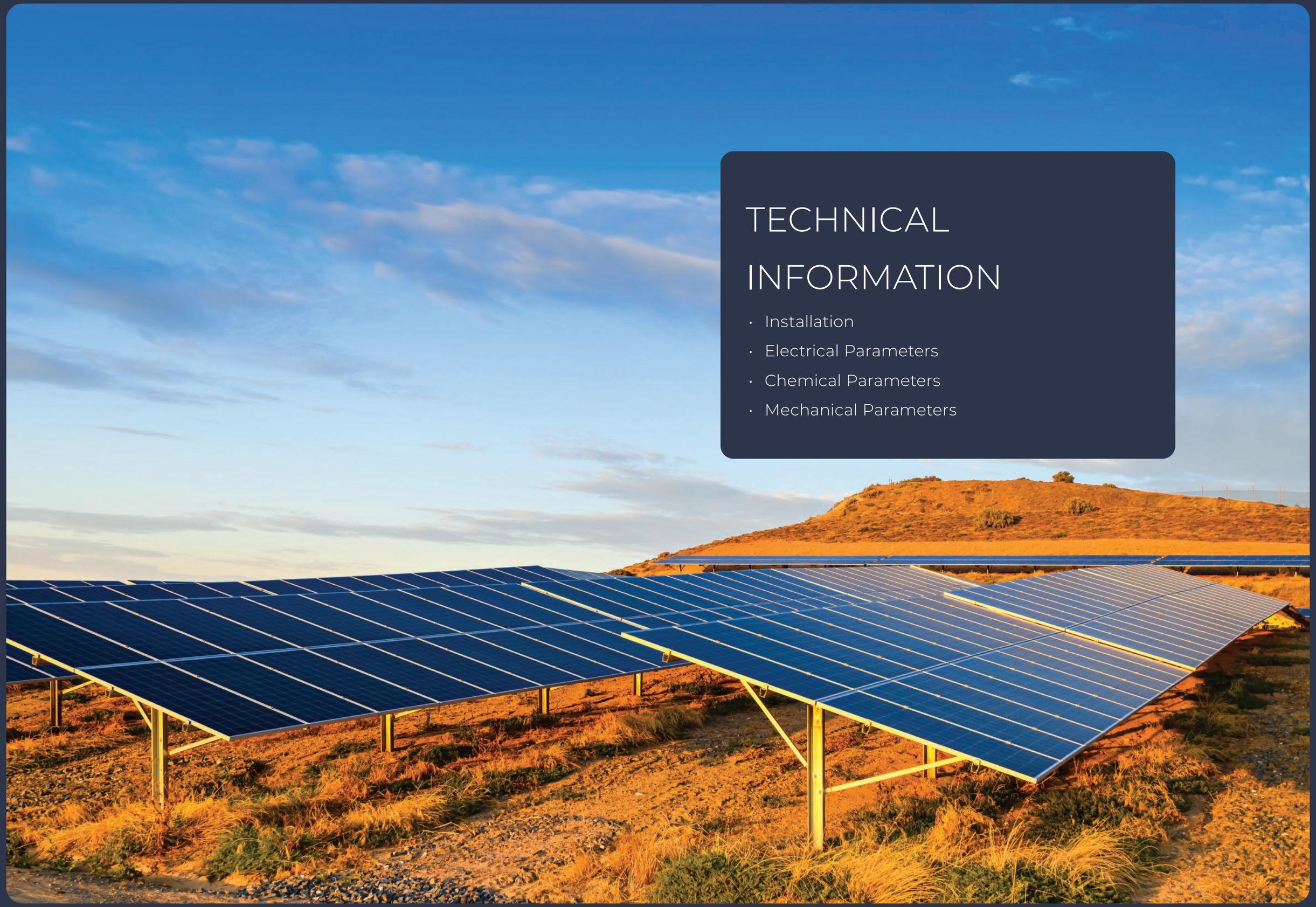
- Switchgear
- Transformers
- Cables and Cable Accessories
- Generators

Industries

- Renewables, Nuclear, Power Generation
- Data Centres
- All applications with a power grid from 3 kV and above

TECHNICAL INFORMATION

- Installation
- Electrical Parameters
- Chemical Parameters
- Mechanical Parameters



Installation

General Information

Cables installed underground shall be:

a. Suitable for the environment in which they are placed;

b. Provided with protection against inadvertent damage likely to be caused by manual or mechanical excavation work; and

c. Provided with suitable warnings, marking or other means to minimize the risk of inadvertent damage likely to be caused by manual or mechanical excavation works.

Laying

Category A System — where the wiring system is inherently suitable for installation below ground and no further mechanical protection is required.

Category B System — where the wiring system is suitable for installation below ground only with additional mechanical protection provided for the cable or cable enclosure.

Category C system — where the wiring system is laid within a channel chased in the surface of the rock.

Any Category A or Category B wiring system that comprises cables not installed in a wiring enclosure shall be laid on a bed of not less than 50mm of sand or friable soil, free of sharp stone, and covered by not less than 50mm of the same material.

For a Category B wiring system, additional mechanical protection shall be provided as follows:

a. The protection shall be placed not more than 75mm above the wiring system.

b. The protection shall be not less than 150mm wide.

c. The protection shall overlap the wiring system by at least 40mm on each side.

d. The protection shall consist of one or a combination of the following:

   i. Precast concrete slabs having a thickness of not less than 40mm and a classification of not less than grade 20 in accordance with AS 3600 or NZS 3104.

   ii. Concrete slabs cast on-site having a thickness of not less than 100mm.

   iii. A continuous concrete pour having a thickness of not less than 75mm.

   iv. Fibrous cement slabs having a thickness of not less than 12mm.

   v. Bricks manufactured specifically for the protection of electric cables.

   vi. Polymeric cable cover strips complying with AS 4702.

   vii. Other materials that offer the same degree of protection afforded by the materials in items (i) to (iv)

Underground Wiring Systems — Minimum Depth of Cover

Location of wiring system	Covering on surface of ground above wiring system	Cat A System	Cat B System	Cat C System
Within confines of a building	Poured concrete of 75mm minimum thickness	0mm (directly below)	0mm (directly below)	0mm (directly below)
	No surface covering or less than 75mm thickness of concrete	500 mm	500 mm	50 mm
Elsewhere external to a building	Poured concrete of 75mm minimum thickness	300 mm	300 mm	50 mm
	No surface covering or less than 75mm thickness of concrete	500 mm	500 mm	50 mm

Wiring systems installed underground shall be identified by an orange marker tape complying with AS/NZS 2648.1. In order to provide early detection of the presence of underground wiring during excavation work, marker tape shall be positioned at approximately 50% of the depth of cover above the wiring system or any additional mechanical protection provided for that system.

Where the wiring system is chased in rock, orange marker tape shall be laid directly on top of the wiring system before the concrete is poured.

All underground wiring systems shall be spaced not less than 100 mm from other underground services.

Comparison of XLPE Insulation Thickness

Nom. Cross section (mm²)	Nom. Thickness of insulation at rated voltage Uo/U (Um)	
	0.6/1 (1.2) kV as per AS/NZS 5000.1 (mm)	1.5/1.5 (1.8) kV DC and 1.9/3.3 (3.6) kV as per AS/NZS 1429.1 (mm)
16	0.7	2.0
25	0.9	2.0
35	0.9	2.0
50	1.0	2.0
70	1.1	2.0
95	1.1	2.0
120	1.2	2.0
150	1.4	2.0
185	1.6	2.0
240	1.7	2.0
300	1.8	2.0
400	2.0	2.0
500	2.2	2.2
630	2.4	2.4
800	2.6	2.6
1000	2.8	2.8

Thermal parameters

Properties of Prysun (PV) H1Z2Z2-K acc. to DIN EN 50618.

Maximum temperature of the conductor during operation

Prysun (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

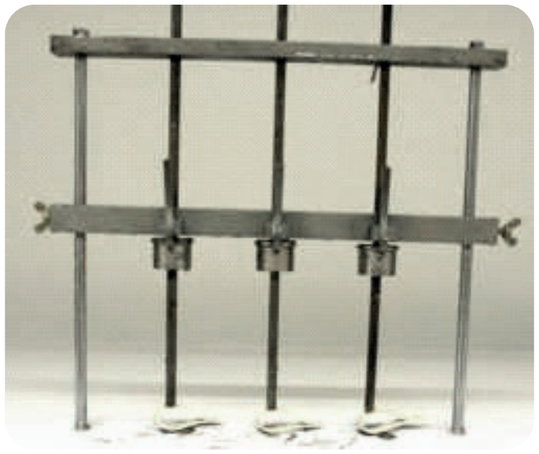
The following tests are performed on Prysun (PV) cables:

- 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 1000 hours conditioning at +90 °C and 85 % relative humidity.

Test equipment for cold impact test.



Test equipment for cold bending.

Chemical parameters

Properties of Prysun (PV) H1Z2Z2-K acc. to DIN EN 50618.

Behaviour against fire

Prysun (PV) cables are tested for flame propagation on single cable according to EN 60332-1-2.

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

Weather resistance

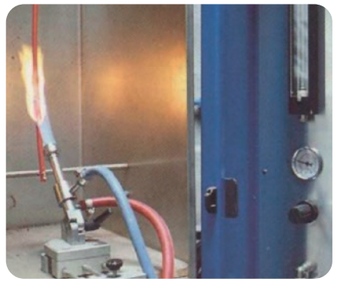
External agents related to weather conditions (such as UV radiations, ozone and water) can degrade the materials, causing a reduction of the performances of the cables.

Therefore Prysun (PV) cables are tested in order to ensure:

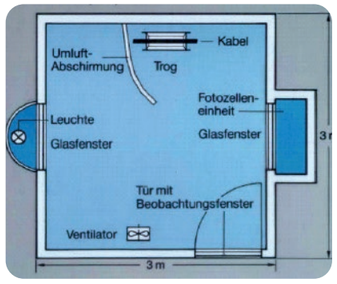
- Ozone resistance: complete cable has no cracks after 72 hours at 40 °C, with 55 % relative humidity and 2 ppm of ozone concentration
- UV resistance: tensile strength and elongation at break are measured after a conditioning of 720 hours (360 cycles) exposed to UV light.

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.



Propagation of vertical flame on complete single cable (acc. to EN 60332-1-2).



Test chamber for evaluation of smoke evolution.

Test chamber for UV test.

Equipment for measuring light conductivity and pH-value (halogen free).

Test equipment for measuring corrosivity of gases (halogen free).

Test chamber for ozone test.

Mechanical parameters

Properties of Prysun (PV) H1Z2Z2-K acc. to Standard IEC 62930/ EN50618

Tensile load

The maximum tensile load on the Prysun (PV) cables is equal to 50 N/mm² only during installation,

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.

Additional tests

- Shrinkage test
- Dynamic penetration test
- Durability of print

Tensile testing equipment.

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