



Did you know, that all cables are not the same ?

Below you will find 10 things that you should know, before you choose a solar cable for your photovoltaic installation.

1. There is a dedicated standard for electric cables for photovoltaic systems

Since October 27th 2017 the European norm EN 50618 that regulates characteristics, requirements and usage of electric cables for photovoltaic systems has been obligatory in member countries. The norm replaces any local guidelines such as TÜV 2 Pfg 1169/08.2007. The norm aims to provide a common quality standard for PV cables in Europe by setting relatively stringent requirements in line with the expected harsh usage conditions. Look for solar cables that are marked as H1Z2Z2-K and comply with standard EN 50618. No inspector will approve a solar project installation without proper DC-cables in place.

3. The best in class cables can be buried directly in the ground.

The right choice of the cable materials can save installation time. The best in class cables are suitable for direct burial in soil and have a proven track-record for this type of application acc. to guidelines for direct burial of cables.

4. Like tires, no solar cables are made of thermoplastic materials

For solar cables to be fully weather proof, they must be made with proper cross-linked elastomer materials. The best in class cables are made of cross-linked high ethylene propylene rubber insulation and cross-linked ethylene-vinyl acetate rubber. Both materials can withstand up to 20 000 hours of operation at conductor temperature up to 120°C.

4. Solar cables need to be weather resistant.

Solar cables are primarily installed outdoors where they are exposed to changing and harsh weather conditions. To maintain optimal performance during their life expectancy, it is vital that they are resistant to factors such as:

- UV - resistance on sheath tested (no cracks allowed) together with tensile strength and elongation at break after 720 hours (360 Cycles) of exposure to UV lights acc. to EN 50289-4-17, method A
- Ozone - resistance tested acc. to EN 50396, test type B
- Water - absorption tested using gravimetric method as per EN 60811-402 and long-term immersion tested according to UL 44 sec. 5.4
- Acid and alkaline - resistance tested according to EN 50618, Annex B and using N-Oxalic Acid, N-Sodium Hydroxide according to EN 60811-404
- Ammonia - ammonia resistance tested 30 days in saturated ammonia atmosphere
- Oil - resistance tested according to EN 60811-404 and VDE 0473-811-404
- Cold - cold bending, elongation and impact test acc. to EN 60811-504/-505/-506
- Heat - heat damp test according to EN 50618 and EN 60068-2-78
- Abrasion - sheath abrasion tested against sheath, metal, plastics and abrasive paper



5. Expect no less than 30 years of operations from your solar cables.

As a general industry rule of thumb, solar panels last about 25-30 years. However, this doesn't mean that they stop producing electricity after 25 years – it just means that energy production will decline, by what manufacturers consider to be a significant amount. While choosing the right cables for your photovoltaic installation, pay closer attention to the quality of the all products. High quality products tend to have a longer lifetime. The best in class cables have a life expectancy of 30 years and can continue working far longer, given that they are correctly installed and avoid abnormal external physical damage.

6. Risk of potential failure is greater than initial savings, for low quality cables.

While the cost of solar cables only represent roughly 1,2% of the total cost of a photovoltaic installation, their performance is critical for the reliability of the whole installation. In the event of a systems failure, a specialized installer is needed for repair. In best case, the installer can quickly determine the cause of the failure and replace the damaged cable. Cable failure may also lead to damage of connected equipment. In case of shrinkage, where the outer sheath becomes disattached from the insulation, connectors can become loosely attached. Sheath cracks can also allow for moisture penetration to the insulation and conductor that can spread longitudinally and reach connected equipment on both ends. This can lead to several weeks of full system down-time and likely tens of thousands of Euro in extra repair costs leading to a loss on return-on-investment.

7. Quality assurance matters.

Make sure that the manufacturers' claims are checked and verified by an independent third party. The two most commonly used independent certification institutes are TÜV Rheinland and the VDE Testing and Certification Institute. TÜV Rheinland carries out one-time product evaluation based on test samples and technical documentation supplied. The VDE Institute in addition to the product testing also inspects the producer's manufacturing and business premises up to 4 times a year, as part of regular conformity control, and carry out separate independent

factory certification. While most of the solar cables are TÜV certified, only best in the class photovoltaic cables are also VDE certified. Look for the VDE approval mark <VDE> on the cable.

List over TÜV-certified cables can be [found here](#).

List over VDE-certified cables can be [found here](#).

8. There are black, red and blue solar cables.

The most commonly used is a black coloured solar cable. While the black sheath colour naturally provides the best UV resistance, additional installation time is required for cable marking and circuit identification. For quicker circuit identification, most cable manufacturers also offer red and blue coloured solar cables. The best in class solar cables offer the same UV resistance regardless of outer sheath colour without significant discoloration over time.

9. Check whether your installation requires CPR approved cables.

If installing a solar cable on or inside buildings the new Construction Product Regulation may apply. CPR is the European legislation that defines the basic requirements and essential harmonized characteristics that all products designed to be permanently installed in construction works must satisfy within the EU market. The directive applies to solar cables installed outdoors on roof tops, with a connection to equipment inside a building - provided that the indoor length is longer than 20 meters. The best in class solar cables are CPR certified and fulfill fire class Eca, Dca or even Cca.

10. The best in class cables have an outstanding track record.

When selecting a solar cable for your photovoltaic installation, ask your supplier for references from their previous projects and customers. The best in class cables have been installed all over the world for more than 15 years without any insulation failure.