

# Safety in PV installations



**With over 30 years of experience in the Australian electrical industry, DKSH have created a best in class solar portfolio from Europe's world leading manufacturers. Our partnership with Multi-Contact, Lapp Kabel, Wieland Electric and ABB has enabled us to be involved in the solar industry in Australia for over a decade.**

Over the years we have seen many new products arrive on the market, and have some serious concerns about the quality of some of these items. When you design a system that should last 25 years, there is no excuse for using sub standard components. In fact the difference between using inferior products and premium products could be as little as \$10 - \$20 (total) on a \$15,000 PV installation.

We have seen Multi-Contact's MC3 and MC4 connectors copied, some copies are very poor quality and although they may work for the first year or two of an installation, serious concerns have been raised about not only the electrical connections, but also the materials they have been made from. As these connectors fail, property and life could be put at risk.

Recently sub standard DC rated circuit breakers have started to enter the market, and we have heard stories of failures at the time of installation. Some installations have had AC rated product installed. AC rated isolators are common, so too is using domestic grade flexible conduits.

Some multi-string installations have used AC fuses, or worse still, they have used polarized DC circuit breakers. In the event of a reverse current fault, a standard polarised DC circuit breaker will offer no protection, and could actually catch fire as the arc extinguishment chamber is designed to work in one direction only. DC fuses designed specifically for PV installations or non-polarised DC circuit breakers are the only products that can be used for this application.

Cable choice should be a major consideration on a PV installation. When you are dealing with 1kW or more of DC power, you should be using a cable that not only has the correct voltage rating, but also the right mechanical construction. The use of TPS for running DC should be looked at with great concern. This cable was originally designed for AC circuits, and could easily be mistaken for an AC cable in a dark rooftop, even if it does have a hand written label on it. Appropriately labelled SDI or TWIN SDI cables should be used for easy identification and to maximise mechanical protection. These cables should be flexible to reduce the risk of damage to the conductors at the time of installation, and the conductors should be tinned to lower the risk of corrosion and poor connections over an extended period of time. DKSH raised these concerns about installers using TPS for solar cabling with our German partner Lapp Kabel and together we designed the TWIN SDI cable specifically for Australian solar installations. There is no longer any reason to use TPS or non solar specific cables for DC cabling in and on Australian roof spaces.

Not only poor product choice, but also poor work practices in the last few years from some businesses have seen substandard installations carried out and customers not receive the quality they are expecting. We have spoken to numerous installation companies and can't believe the excuses given for cutting corners to save a few cents.

Our concern for the safety of PV installations in Australia has led us to compile this publication with articles and products which leave no more reason for sub standard installations. All of these items are designed and rated for specific applications and are all of the highest quality, from well established, world leading European manufacturers.

We ask that you spend the time to read these articles, and the next time you carry out an installation and you are deciding which products to install, ask yourself, "Would I want to use this product on my family home?"

A handwritten signature in blue ink, appearing to read "David Faux".

David Faux  
Product Manager - Solar  
DKSH Australia Pty Ltd

# Safety concerns on the use of counterfeit connectors

Multi-Contact



**A growing number of suspect copies of Multi-Contact's world renowned MC Solar components have recently appeared on the market. Comparative measurements and material tests have revealed substantial deficiencies in quality, and compromised safety and system performance.**

Visually, the copies are virtually indistinguishable from the genuine MC products. Multi-Contact is defending itself on the one hand by taking court action against the imitators and on the other hand by increasing awareness to protect you and your customers from the financial and reputational damage that can result from the use of inferior products. Concerns have been highlighted about the safety characteristics such as UV-resistance, contact resistance, and material quality, that may be dangerous when installed in a PV system.

The serious problems which result from inadequate compatibility or the use of inferior copies frequently occur only after a considerable period of time has elapsed. The use of poorly matched connectors can cause contact problems that can directly or indirectly lead to a marked rise in the temperature of the plug connector due to a higher contact resistance. This can subsequently result in arcing and ultimately to a fire. This can lead to substantial damage to your professional reputation, loss of revenue from the PV system, material damage, and quite possibly personal injury.

Using copies mated with the genuine Multi-Contact connectors can result in a poor fit between insulator parts that can result in system failure due to compromised sealing against the elements such as rain or dust.



## How can you recognise the genuine products?

As a result, the insulating properties are no longer assured and a person touching the connector may be electrocuted.

For your safety, we do not recommend using inferior copies, as the mating forces, plating materials and insulation properties cannot be guaranteed. Effects such as fretting corrosion may be caused by incompatible plating materials, contact forces and other influences. In order to avoid such adverse effects, the contacts and insulating parts of the connectors must have compatible properties. Tests of such properties are time-consuming and are not covered by certification tests.

Multi-Contact has been involved in the solar industry with their high quality plug connector systems for photovoltaic installations for more than 10 years, and has gained considerable experience on the long-term behavior of millions of plug connectors.

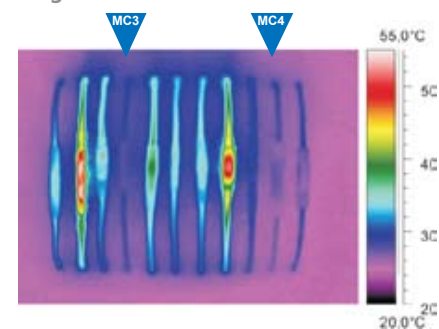
Inferior copies can be disastrous, potentially resulting in overheated connectors and cables which has dangerous consequences. As an installer or OEM, you guarantee your system for 20 years or more, therefore don't risk it, for the sake of saving a few cents in the overall cost of an installation, always ask for, and demand the genuine Multi-Contact MC connector.

If you have any concerns about the authenticity of the product you are currently using or being supplied, please contact Multi-Contact's partner in Australia, DKSH, on 1800 010 113 to confirm if the product you are using is a genuine MC connector.

## Differences in quality



## Original MC connectors and others



**A temperature increase test by the TÜV Rheinland with PV plug connectors from various manufacturers shows significant differences in the rise in temperature and the excellent results of MC-PV connectors.**