



PV Stop

Making Solar Energy Safe



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Nobel Fire Systems Ltd is known for cutting edge firefighting systems, but our interest is not exclusively focused on active fire suppression.

Our ethos is one of safety first. Nobel has recognised the growing risk to the health and safety of personnel that may, during the course of their work or through association, be exposed to potentially lethal amounts of DC electricity generated by Solar Panel systems. In professional terms this is known as the 'DC Danger Zone'.

The Risk has long been acknowledged in countries where the use of Photovoltaic Solar Panels is common place and as a result, Nobel has partnered with the manufacturer of **PVstop**. This ground-breaking safety product is aimed squarely at the specific and potentially deadly risk associated with PV systems and is the only globally recognised patented method of guaranteeing solar panels are made safe.

The risks and the adoption of Safe Systems of Work

The risk from electrocution should be assumed as 'Ever Present' be that in direct initial firefighting attendance or through association with neighbouring properties. There is no way of assessing easily if the electric circuits are still live.

As long as solar PV panels are exposed to light they continue to produce potentially lethal amounts of DC electricity. The solar panels and associated wiring leading down to the isolation switch remain 'live' presenting an ever present electrical hazard for both first responders and electrical contractors. The only 'Safe Operating Procedure' is for attending Utilities to isolate the property from the grid and to coat the PV panels with PVStop to block the light from reaching the solar PV panels and isolate the electricity produced by the solar PV system.

Fire is not the only event that could render a PV Solar Panel system unsafe. Other reasons include:

- Physical damage
- Vermin attack
- Poor workmanship/installation

- Component failure/degradation
 - Lightning and weather events, hails, water ingress etc
- However, in all these cases solar panels will still produce power at a reduced rate, even if the solar panels are damaged.

Fire and Rescue Services recognise the danger of solar PV systems. With a modification to the Safe Operating Procedures undertaken at an incident, the inclusion of PVStop will provide the security and safety for emergency critical personnel, post incident attendances or anyone else required to access the incident perimeter.

Currently the tools available to try and isolate the PV panels from light have been the use of canvas sheets, tarpaulin sheets or thick blankets. All of these methods expose personnel to the risk of electrocution and physical harm and none provide a secure form of coverage.

The only way of rendering a Solar PV Panel System totally safe is to block the light source from reaching the Solar Panel Cells.

The Facts

- Solar PV systems cannot be switched off when exposed to light
- Even with isolation switches installed, solar PV systems continue to produce potentially lethal amounts of DC electricity
- Solar panels and the associated wiring leading to the isolation switch continue to remain live
- DC electricity is different to AC electricity, it has no frequency and its presence or magnitude cannot be remotely detected, so it is potentially more dangerous than typical AC sources
- Up until now Fire & Rescue personnel and electrical contractors have had no fast, effective and safe way to isolate PV generated electricity
- 5 years ago there was less than 1 megawatt of solar PV power installed in the UK. Today, there is over 10.8 megawatts and by 2020 this is forecast to double



Ground breaking PVStop

The Solution

PVStop is the only solution on the global market that safely isolates the power produced by solar panels in all weather conditions. It eliminates the risk of high voltage DC electrocution by acting as a 'liquid tarpaulin', shutting down the solar PV system in seconds. **PVStop** adheres to the surface of the panel and cannot be dislodged by wind, rain, hail or snow and once a threat has been eliminated can simply be peeled off without causing any damage to the system for up to 12 months after application.

PVStop is the only solution that makes solar energy safe.

What is PVStop?

- **PVStop** is a water based polymer that forms a block out coating when applied to a solar PV system
- The delivery system currently employed is a 9 ltr stainless steel pressure vessel that resembles a fire extinguisher. This application system is a user friendly method of deployment familiar to all emergency services personnel and safety professionals
- The delivery range of the portable pressure vessel is approximately 10 metres, allowing application from a safe distance from the panels and the 'DC Danger Zone'
- To render the PV system electrically safe, the application only requires a partial 40% coverage across the centre of the solar PV array
- Once applied, the coating can be peeled off with no damage to the PV system whatsoever

Key Features & Benefits

- Eliminates the risk of DC electrocution
- Non-flammable & fire retardant
- Non-conductive & anti-arcing
- Effective in all weather conditions
- Quick drying
- Delivery range of up to 10m, eliminating the need to climb on the roof
- Encases nano-particles (during fire or salvage operations)
- No damage to the PV System
- Simply peels off after use
- Environmentally friendly and can be exposed of with normal household waste
- Independently tested and verified by BRE Global and the ETV Program

