

Solar PV Panels Safety

With this rapid increase in the number of installations, comes an inevitable increase in the number of faults with the potential to cause fire and other incidents.

Our role as a technical control engineering company is to provide useful instructions to help avoid or minimise the likelihood of an incident in solar panel installation :

- Mounting structure
- Placement of solar panels
- Solar PV panels fire safety
- Electrical safety
- Batteries fire risk
- Ventilation



Mounting structure

- The existing roof should be strong enough to support the weight that comes from solar panels, thus a third-party engineer should evaluate the building and the solar system before the installation.
- The added weight of more than 1m of snow should be evaluated in order to not hurt the panels.
- Snow should not be removed from solar panels to avoid damaging the panels.
- The roof should not leak so if the frame is mounted on the roof through anchoring system, the holes should be filled with waterproofing silicone to avoid water leakage and if the roof is waterproofed thus avoid anchoring in the water proofing layer.

Placement of solar panels

- The open roof space should be measured to make sure that enough area is available for all panels.
- The frame should be sized according to PV panels dimensions before fixing it to make sure that the panels are well fitted on the frame.
- Solar panels positioning should be to south direction and slightly inclined .
- PV panel should be well fixed to the frame and the frame well mounted to the roof to avoid their collapse due to wind effect in which all wind directions to be considered in the design of roof supports.
- The panels should be located where the most effective sunlight is available and avoid placing them in a very shaded area.
- Not connected equipment should be stored in an empty place without humidity and light especially for solar panel in order to protect them from any damage and for the used products, they should be guaranteed for their durability and performance.
- PV system should not be installed near any flammable gases that can cause a fire or explosion.

- Installation should be well applied and should prepare for future loads requirements of amperage thus it is always safe to use thicker wires on initial installation to avoid overheating and fire risk due to overloaded cables.
- Roof coverings should have fire resistance especially for roof integrated PV panels (in-roof panels).
- Cable penetrations through walls, ceilings and floors must not assist the spread of fire and should be well protected.
- When fighting a building fire cut off all sources of electricity as well solar connection AC and DC breakers should be turned off to avoid any risk of electrocution when using water.



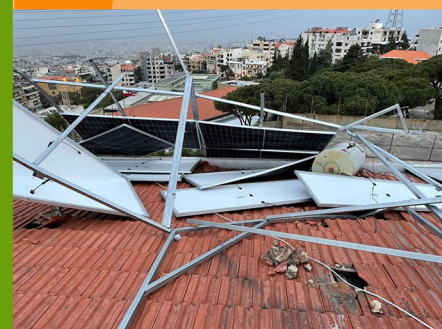
(1) Roof mounted PV panels frame



(2) PV panels oriented to south direction



(3) Solar PV panels fire incident.



(4) Risks of mounting structure collapse under wind loads

Electrical Safety



(5) Solar electric installations

- The electric cables should be correctly used, sized and positioned. Aluminum and copper solar wires are commonly used.
- The wires should handle the load and the amperage rating of the system.
- An earthing system should be available to provide electrical safety and prevent any electrical shock and injury.
- Protective devices such as RCDs, fuses, breakers and isolators should be suitable for DC voltage circuit.
- Surge protection should be installed to protect against lightning storm.
- Choose the best quality products to reduce maintenance costs and have long-lasting system.
- Photovoltaic solar panels should be covered with an opaque material during wiring or installation to stop or prevent electricity production.
- Maintenance should be done every year to check the panels, inverter, current, voltage, roof condition and the generated power.

Batteries fire risk

- Caution must be taken in battery storage area, store batteries in a dry and well-ventilated place at room temperature or lower.
- Over charging or discharging, unbalanced cells, excessive current discharge, short circuits, physical damage, excessively hot storage should be avoided.
- An adequate portable fire extinguisher should be provided.

Ventilation

- Heat emitting equipment such as inverters, solar panels and cables should be positioned correctly and be well ventilated.
- Solar inverter which might be installed outside a house or in the open air, can generate heat as the inverter works to convert DC power to AC power. Thus choose an inverter equipped with cooling system that works efficiently.

Our know how for your safety:

WAK engineering provides safety inspections and technical support.

Our engineers accompany and support the development of your project and provide you with value added services.



(6) Batteries



(7) Inverters