



Safety risk analysis regarding “earthing”



Objective:

Traditional solar mounting structures are typically made of conductive materials such as steel or aluminium.

The Amfisol ground-mounted PV structure is entirely made from non-conductive synthetic polymers. As a result, no conductive path exists between panels via the structure. This design implies a different perspective on the need for structural equipotential bonding.

Risk Analysis:

In order to conclude that there is no need for earthing individual solar panels in combination with the Amfisol mounting structure, you can use this risk analysis :

Risk description	Probability	Impact	Detectability	Score	Remarks
Capacitive energy charging single panel : The aluminum frame of the solar panel can retain static energy that cannot be dissipated via earthing.	5	1	4	20	Acceptable - Because the Amfisol structure is installed on the ground, there is no risk of falling off a roof or in water when the static load is discharged through a person. - PID free panels can be used to minimize the capacitive charging of the alu frame.
Static energy charging single panel : The aluminum frame of the solar panel can retain static energy that cannot be dissipated via earthing.	5	1	4	20	Acceptable - Because the Amfisol structure is installed on the ground, there is no risk of falling off a roof or in water.
Single or multiple defective solar cell	1	1	4	4	Acceptable - Always use solar panels with “Double Insulation” (Class II equipment), this prevents you from making contact with the high DC voltage through the solar cells of the solar panel. Check symbol
String cable gets damaged up to bear copper	2	5	3	30	Tolerable with control - The risk of cable damage is minimized by the integrated AMFISOL cable management. - Every modern inverter has an integrated insulation measurement on the DC side and will generate alarms if an insulation fault is measured. - As with every solar field, set-up a fence around the installation and only allow access to trained staff aware of the risks. - Wear electric insulated safety shoes and gloves. - In case the bear copper touches the solar panel or the mounting structure, the exposure to the risk is limited to the alu frame of max 1 solar panel.
Damaged string cable touches alu frame of solar panel or mounting structure	1	5	3	15	Tolerable with control - The risk of cable damage is minimized by the integrated AMFISOL cable management. - Every modern inverter has an integrated insulation measurement on the DC side and will generate alarms if an insulation fault is measured. - As with every solar field, set-up a fence around the installation and only allow access to trained staff aware of the risks. - Wear electric insulated safety shoes and gloves. - In case the bear copper touches the solar panel or the mounting structure, the exposure to the risk is limited to the alu frame of max 1 solar panel.
String inverter insulation resistance requirements	1	1	1	1	Acceptable - Make sure that the inverter is always correctly earthed. This will make sure the insulation measurement works fine, even if the frames of the solar panels are not earthed.



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Conclusion :

The risk analysis confirms that individual earthing of solar panels is not required when using Amfisol’s non-conductive mounting structure, provided it is properly installed and used within its intended design parameters.

Safety is ensured by design, with all identified risks either eliminated or effectively controlled.

General remarks :

This risk analysis is based on the assumption that generally accepted safety practices for PV installations are applied. These include, but are not limited to, the installation of appropriate safety fencing, the use of personal protective equipment (PPE) and the proper grounding (earthing) of inverters and other electrical equipment.

Any conductive elements within the installation, such as metal cable ducts or trays (excluding the solar panel frames), must be carefully assessed and appropriately earthed in accordance with applicable standards and best practices.