



SOLAR ROOFS

MEETING THE CHALLENGES OF ROOFTOP PV SYSTEMS



Renewable energy on your roof



Solar or photovoltaic (PV) installations have been gaining popularity in the last couple decades as a source of renewable energy used to power commercial and industrial buildings, but also offices and homes.

Flat roofs provide a great set-up for solar roofs. There are three main options for mounting a PV installation on a flat or low slope roof:

- **Penetrating system:**

solar panels are mounted on a rack support system that penetrates the roofing membrane. Proper sealing of the penetrations is critical to ensure the water tightness of the roofing system.

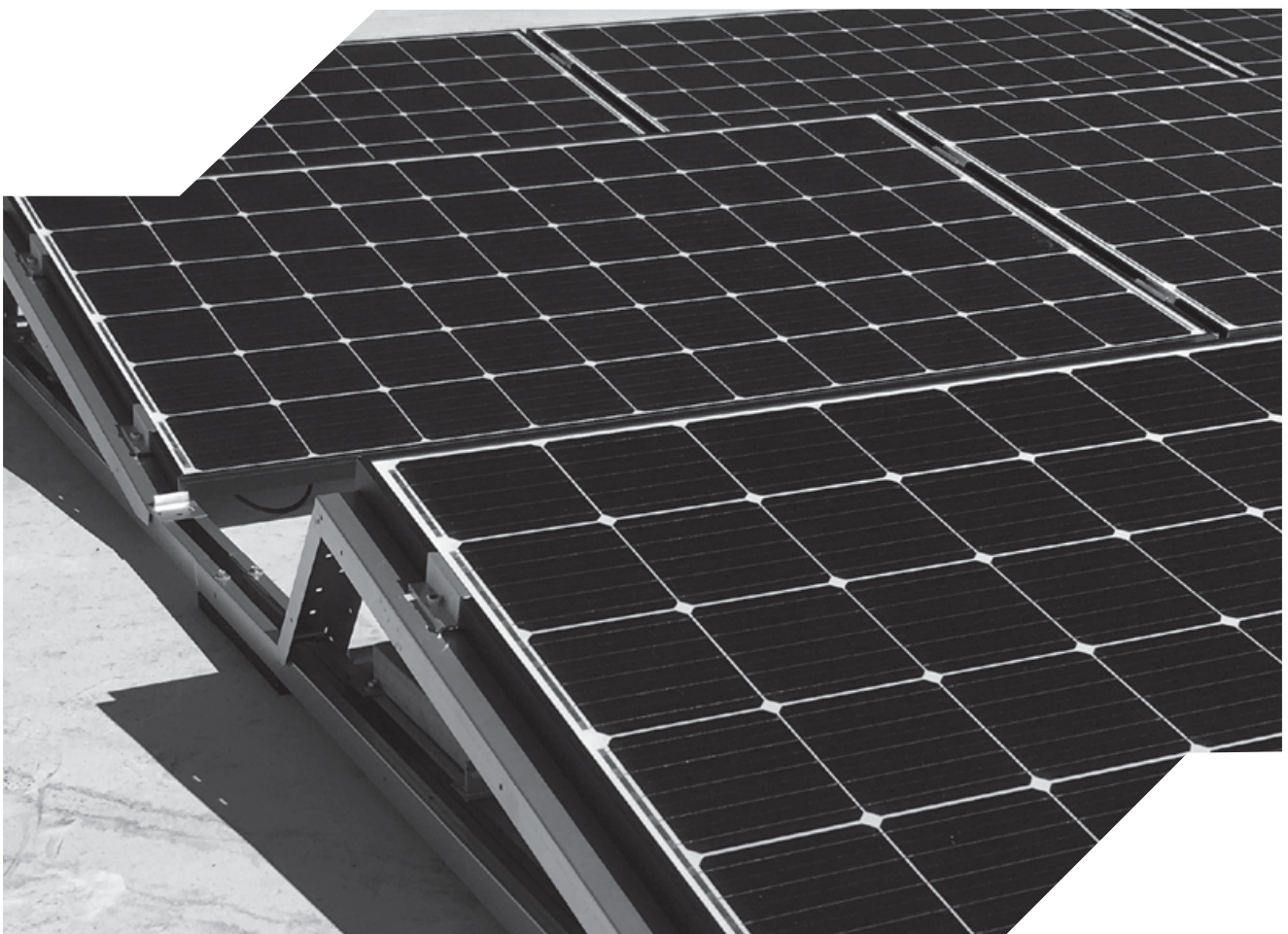
- **Non-penetrating system:**

solar panels are mounted on a rack support system that is installed on top of the roofing membrane and held in place using ballast or welded to the roofing membrane.

- **Laminates:**

thin film photovoltaic strips are adhered to the roofing membrane.

Rooftop PV investments are typically based on a financial projection of minimum 20-25 years, so in order to maximize returns, the roofing system underneath must be able to support the PV installation for at least that period of time.



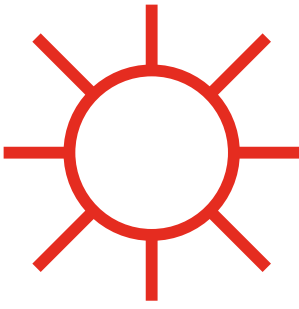
THE RIGHT ROOF ASSEMBLY

Roofing systems with PV installations have to be able to withstand the increased foot traffic that takes place during installation and maintenance, in addition to the weight of the mounting racks and solar panels themselves. Access to the roofing membrane is restricted and PV installations cannot simply be moved if the roofing system is failing and needs repair. If one layer fails, the whole system will fail.

Therefore, the total roofing system must be taken into account during the design phase. The choice of components is critical to avoid damage to the roofing membrane and the insulation layer, and to ensure a high performance, cost-effective and long-term solution.

Do not hesitate to get in touch with your local Elevate representative to discuss the solution that best fits the needs of your PV project.





ROOFING MEMBRANE

All Elevate EPDM and TPO roofing membranes for flat and low slope roofs are compatible with PV installations. They offer excellent weathering performance and heat resistance, first-class mechanical resistance, outstanding durability and can withstand very high and very low temperatures.

Although it is often assumed that light-colored roofing membranes are better for solar roofs because of their high reflectivity, studies show that the color of the membrane has virtually no influence in the performance of PV installations*.

On PV systems, we recommend using a 1.5 mm thick roofing membrane for higher puncture resistance, fully adhered to the support when applicable. Elevate's range of accessories are designed to effectively address the installation details associated with solar panels. The use of Elevate-approved PV rack support systems further contributes to a fully compatible, total solution.

INSULATION

In PV systems, we recommend the use of rigid insulation boards with high compressive strength, such as polyisocyanurate (PIR) boards. However, in order to avoid damage to the insulation layer, the inclusion of a cover board in the roof assembly is crucial.

COVER BOARD

Cover boards are semi-rigid, relatively thin boards which are used on top of the insulation (in new construction) or over the existing roofing system (in renovations) to provide separation and support to the roofing membrane and added impact protection to the insulation layer below.

Cover boards provide an excellent flat surface for high-quality bonding of the roofing membrane, something particularly important in renovations. In combination with quality insulation, they also increase moisture protection and help achieve a better wind uplift and fire performance.

The choice of cover board must be determined depending on the type of insulation used, whether there is an existing roofing system and taking into account local fire performance regulations.

Elevate's ISOGARD™ HD is a high-density, closed-cell, 12.7 mm thick PIR cover board consisting of a polyiso foam core laminated on both sides to a coated fiberglass facer. It has a compressive strength of more than 800 kPa, which is about 5 times that of a standard PIR insulation board.

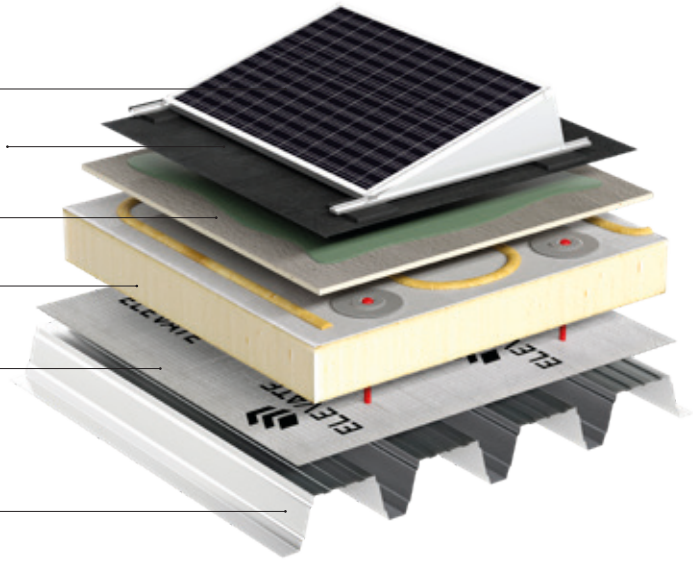
ISOGARD™ HD is easy to cut and handle and is also very lightweight, with each 1.22 m x 2.25 m board weighing only 5 kg. It has the highest thermal performance of any 12 mm cover board and is resistant to extreme weather conditions.

*Analysis of the influence of roofing membrane solar reflectance in performance of PV assets, 3E, 22/09/2021.

TYPICAL SOLAR ROOF BUILD-UPS

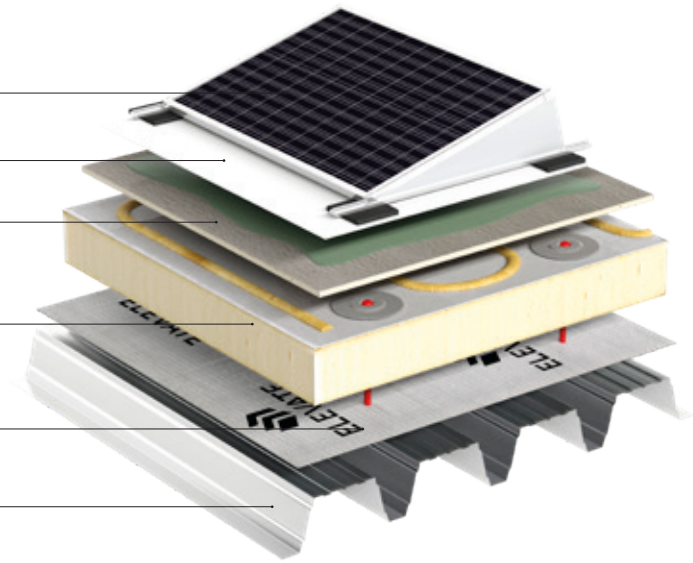
Build-up over RubberGard™ EPDM with ISOGARD™ HD

- PV installation
- RubberGard™ EPDM roofing membrane
- ISOGARD™ HD Cover Board
- PIR insulation
- V-Gard™ Vapor Control Layer
- Roof deck



Build-up over UltraPly™ TPO with ISOGARD™ HD

- PV installation
- UltraPly™ TPO roofing membrane
- ISOGARD™ HD Cover Board
- PIR insulation
- V-Gard™ Vapor Control Layer
- Roof deck



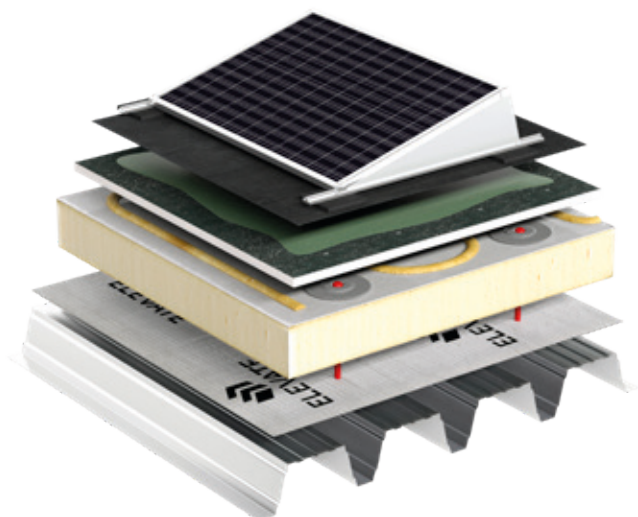
INCREASED FIRE PERFORMANCE

When local building codes require a higher fire performance rating, Elevate proposes the use of the DensDeck® Prime Roof Board, which is a non-flammable cover board. It consists of a water and moisture resistant treated gypsum core laminated on both sides to a mat glass facer.

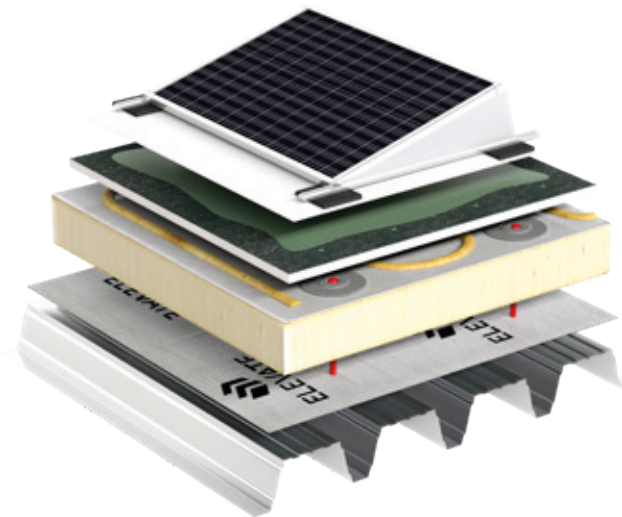
The DensDeck® Prime Roof Board provides an extra layer of resistance in the event of a fire initiated on the roof, preventing its spread on and under the roof and to adjacent buildings. Its high fire performance is independent of the type of insulation material used underneath.

The DensDeck® Prime Roof Board has obtained a FM Approval Class 1 rating and an A1 fire performance rating according to the European Standard EN 13501-1.

**Build-up over RubberGard™ EPDM
with DensDeck® Prime Roof Board**



**Build-up over UltraPly™ TPO with
DensDeck® Prime Roof Board**





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