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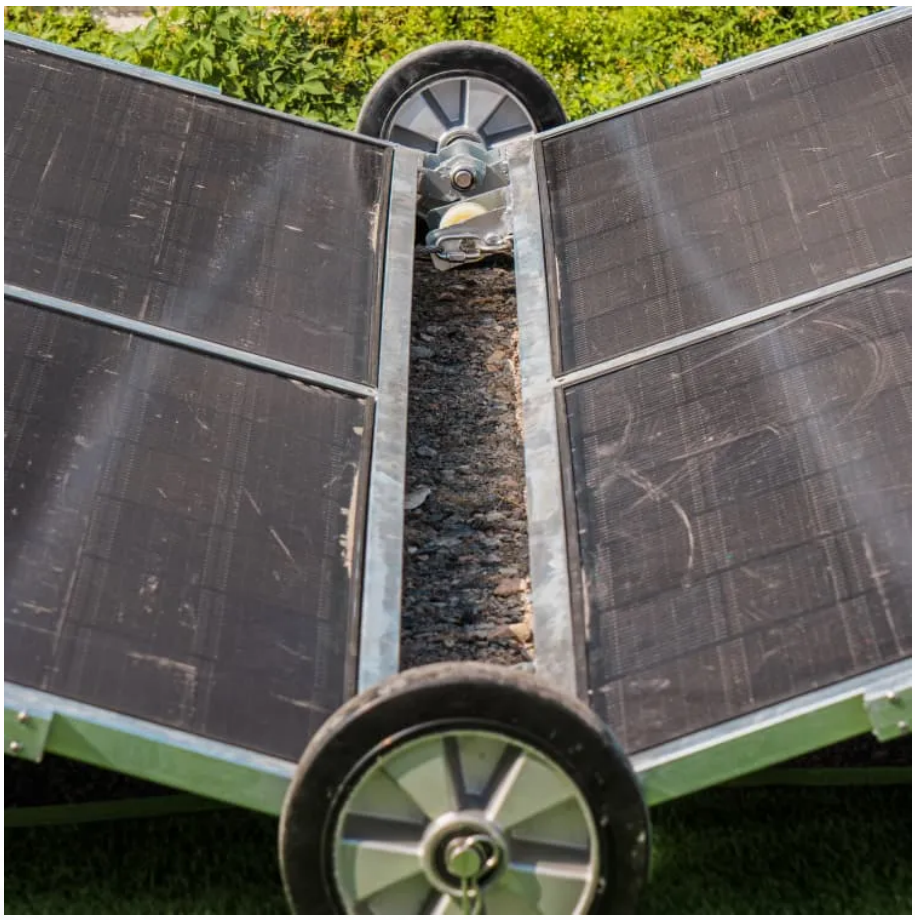
ASEAN thin-film solar system applications



Overview

What are the three types of thin-film solar cell materials?

This chapter is focused upon use of the three major families of thin-film solar cell (TFSC) materials for space applications: amorphous silicon (a-Si), cadmium telluride (CdTe), and copper indium gallium selenide (CIGS).

What is a thin-film solar panel?

Thin-film cells convert solar energy into electricity through the photovoltaic effect. The micron-thick layers that contain photon-absorbing materials form thin-film solar cells that rest on a durable, resilient substrate. The endurance of thin-film solar panels sets them apart from the other competitors. Thin-Film Solar Panel Applications.

What is a thin film solar cell?

Through extensive research and development in materials science, several new thin film solar technologies with significant potential have arisen, including perovskite solar cells, organic solar cells and quantum dot solar cells. Both chemical and vacuum-based deposition processes have been used to create thin films.

Are thin-film solar cells suitable for space applications?

Thin-film solar cell materials for space applications This subsection covers the three main types of inorganic TFSC materials that have been considered for space applications, and a general discussion of studies of their radiation tolerance.

What are the advantages of thin-film solar cells?

The slim design of the thin-film solar cells makes them attractive for many applications. One of the most common thin-film technologies, CdTe solar cells, recorded a maximum efficiency of 22.1% in 2016. In contrast, CIGS solar cells average between 12% to 14% efficiency.

Are thin film solar panels reliable?

The dependability of thin films is uncertain when compared to the rise and manufacturing of affordable, competitive crystalline silicon solar panels. A significant challenge confronting thin film based solar cells has been their reduced efficiency compared to the crystalline silicon based solar cells.

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