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Solar Encapsulation Market by Material (EVA, PVB, PDMS, Ionomer, TPU, Polyolefin), Technology (Crystalline Silicon, Thin-film Solar), Application (Ground-mounted, Building-integrated Photovoltaic, Floating Photovoltaic) & Region - Global Forecast to 2028

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Abstracts

The global solar encapsulation market is estimated to grow from USD 4.9 Billion in 2023 to USD 7.2 Billion by 2028; it is expected to record a CAGR of 8.0% during the forecast period. The growth of the solar encapsulation market is attributed to increased awareness and efforts to decrease carbon emissions and the expansion of hydrogen infrastructure, covering production, storage, and distribution. Additionally, the solar encapsulation market will grow in the future owing to the increased requirement for solar encapsulation setup in power generation and combined heat and power (CHP) applications.

“Polyvinyl Butyral (PVB): The second largest segment of the solar encapsulation market, by materials. “

Based on materials, the solar encapsulation market has been split into six types: Ethylene-vinyl Acetate (EVA), Polyvinyl Butyral (PVB), Polydimethysiloxane (PDMS), Ionomer, Polyolefin, Thermoplastic Polyurethane (TPU). PVB is a robust and resilient material by nature. It outperforms EVA in terms of mechanical strength and shatter resistance, making it the preferred material for safety-critical applications such as building-integrated photovoltaics (BIPV), where falling debris or vandalism are potential issues. It also effectively blocks harmful UV radiation, protecting the sensitive solar cells from degradation and ensuring long-term performance.

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“Crystalline silicon segment is the fastest growing segment of the solar encapsulation market.”

By technology, the solar encapsulation market has been segmented into crystalline silicon and thin-film solar technology. The crystalline silicon technology segment is further sub-segmented into mono crystalline and polycrystalline silicon solar technology. The thin-film solar technology segment is sub-segmented into Cadminum telluride (CdTE), Copper-Indium-gallanium-selenide (CIGS) and Amorphous Silicone. The key factor driving the growth of the photovoltaic industry is ongoing advancements in silicon solar cell technology. The increased emphasis of manufacturers on the production of sophisticated silicon modules is also fueling market expansion. Several players are working to improve the efficiency with which advanced silicon modules are manufactured

“By application, the ground-mounted segment is expected to be the largest segment during the forecast period.”

Based on application, the solar encapsulation market is segmented into Ground-mounted, Building-integrated photovoltaics, Floating Photovoltaics and others. Others segment includes automotive and electronics. The solar encapsulation vehicles segment is expected to be the second-largest segment of the solar encapsulation market during the forecast period. Solar encapsulation vehicles present a zero-emission option compared to conventional internal combustion engine vehicles, appealing to environmentally conscious consumers and governments aiming for cleaner transportation alternatives. The high power output and extended range offered by solar encapsulations are especially enticing for heavy-duty uses such as trucks, buses, and other commercial vehicles, addressing substantial concerns related to battery weight and limited range in these applications.

'Europe': The second largest region in the solar encapsulation market'

Europe is expected to be the second largest region in the solar encapsulation market between 2023–2028, followed by North America. Accelerated implementation of solar technology is central to the EU Solar Energy Strategy, which will be released in May 2022 as part of the REPowerEU plan. It describes multiple projects to unlock rooftop solar generation potential (European Solar Rooftop Initiative), addresses the solar energy sector's skills shortfall (EU large-scale skills collaboration), and ramps up PV manufacturing in the EU (EU Solar PV Industry Alliance). The strategy seeks to bring

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about 320 GW of solar photovoltaic capacity online by 2025, and almost 600 GW by 2030, through these measures.

Breakdown of Primaries:

In-depth interviews have been conducted with various key industry participants, subject-matter experts, C-level executives of key market players, and industry consultants, among other experts, to obtain and verify critical qualitative and quantitative information and assess future market prospects. The distribution of primary interviews is as follows:

By Company Type: Tier 1- 60%, Tier 2- 25%, and Tier 3- 15%

By Designation: C-Level- 35%, Director Levels- 25%, and Others- 40%

By Region: North America- 25%, Europe- 25%, Asia-Pacific - 30%, and RoW- 20%

Note: Others include sales managers, engineers, and regional managers.

Note: The tiers of the companies are defined on the basis of their total revenues as of 2022. Tier 1: > USD 1 billion, Tier 2: From USD 500 million to USD 1 billion, and Tier 3: The solar encapsulation market is dominated by a few major players that have a wide regional presence. The leading players in the solar encapsulation market are Mitsui Chemicals, Inc. (Japan), Elkem ASA (Norway), Dow (US), 3M (US), and DuPont (US). The major strategy adopted by the players includes new product launches, contracts & agreements and, investments & expansions.

Research Coverage:

The report defines, describes, and forecasts the global solar encapsulation market by component, type, size, fuel, end user, application, and region. It also offers a detailed qualitative and quantitative analysis of the market. The report comprehensively reviews the major market drivers, restraints, opportunities, and challenges. It also covers various important aspects of the market. These include an analysis of the competitive landscape, market dynamics, market estimates in terms of value, and future trends in the solar encapsulation market.

Key Benefits of Buying the Report

The solar encapsulation market has undergone substantial progress and

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expansion in recent years. The increasing demand for portable power solutions, fueled by factors like outdoor activities, emergency readiness, and the necessity for dependable off-grid energy, has propelled the market forward. Key market players have been actively engaged in product development, introducing innovative features such as higher power capacities, improved portability, faster charging, integration with renewable energy sources, advanced control systems, connectivity options, and enhanced safety features. Additionally, the market has witnessed the expansion of product offerings with varying sizes, catering to different end-use requirements.

Product Development/ Innovation: Solar encapsulation manufacturers are deeply involved in advancing product development and innovation to elevate the capabilities of their offerings. Their focus lies in augmenting power capacity by leveraging solar technology advancements, refining portability by reducing weight and enhancing form factors, and facilitating quicker charging through improved efficiency. The integration of renewable energy sources, like solar panels, stands out as a significant area of innovation. Additionally, they concentrate on developing advanced control and monitoring systems, aiming to provide users with enhanced control and visibility.

Market Development: The solar encapsulation market is poised for substantial growth, driven by multiple factors. Primarily, the global emphasis on sustainability and the shift toward cleaner energy sources create a conducive landscape for solar encapsulation technology. Solar encapsulations, offering low-emission and pollution-free power generation, align seamlessly with environmental objectives and regulations. Secondly, technological advancements in solar encapsulation technology, including improved efficiency, durability, and cost-effectiveness, have significantly enhanced their performance and attractiveness across various applications. These advancements have broadened the market potential for solar encapsulations in sectors spanning transportation, residential, commercial, and industrial domains. Furthermore, government support through incentives, policies, and funding programs further expedites the adoption of solar encapsulations.

Market Diversification: Dow recently has launched the sis silicon based sealants and adhesives solutions for PV assembly. These products would be used to deliver the durability and performance for frame sealing, rail and junction box, potting and BIPV installation materials.

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Competitive Assessment: In-depth assessment of market shares, growth strategies, and service offerings of leading players like Mitsui Chemicals, Inc. (Japan), Elkem ASA (Norway), Dow (US), 3M (US), and DuPont (US) among others in the solar encapsulation market.

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*Details on Business overview, Products/Services/Solutions offered, Recent developments, MnM view, Key strengths/Right to win, Strategic choices made, and Weaknesses and Competitive threats might not be captured in case of unlisted companies.

12 APPENDIX

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