Solar shingle patent analysis

What are the patents on photovoltaic cells?
The patents on photovoltaic cells are concentrated in the area of semiconductors for the conversion of solar radiation into electric energy, in the area of generators for the direct conversion of light energy into electric energy and in the area of solar panels adapted for roof structures.

What is a patent search & analysis system?
This patent search and analysis system features patent informationextracted from 40 patent-issuing agencies around the world organized into three categories,or sections: Chemical,Engineering and Electrical and Electronic.

How many patents does first solar have?
In the ninth position,with 151 patents,is First Solar,a US company one of the largest manufacturers of photovoltaic solar modules with production units in the United States,Malaysia,Germany and Pakistan.

Why are photovoltaic cell patent registrations important?
Photovoltaic cell patent registrations are a valuable data set in the analysis and diffusion of PV technology and R&D activities. The dynamics of PV R&D activity is considered high,documented in a large increase in PV patent documents .

Which country has the most patent documents on photovoltaic cells?
The evolution of the total number of patent documents on photovoltaic cells per country in the period from 2004 to 2013 is shown in Fig. 7. It can be seen that the first two positions are occupied by the United Statesand China respectively,followed by Japan,Germany and South Korea. Fig. 7.

How has photovoltaic technology developed over the last 30 years?
Photovoltaic technology has developed rapidlyover the last thirty years. The main activities of photovoltaic patents began in the late 1950s and the main photovoltaic patent assignees at that time were involved in the space business ,. Patent data has been widely used in technology assessment and forecasting ,,,.

Embodiments relate to an enhanced method for installing solar roofs by primarily reducing the installation time. The design is for a roofing shingle with an embedded solar module that installs intuitively like normal roofing shingles without special tools, fasteners or alignment. The shingle structure is molded out of low thermal expansion plastic composite and is compatible with ...

Solar Shingles Market Size and Trends. The global solar shingles market is estimated to be valued at USD 370.5 Mn in 2024 and is expected to reach USD 540.3 Mn by 2031, exhibiting a compound annual growth rate (CAGR) of 5.5% from 2024 to 2031.. Discover market dynamics shaping the industry: Request sample copy The market has been witnessing steady growth ...

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ABSTRACT OF THE DISCLOSURE A solar heating roof shingle roof structure which combines the functions of a roof and a fluid conducting solar heating panel. Each shingle is a hollow body of the general size and configuration of a conven-tional shingle, and is provided with a fluid inlet socket at the upper end and a fluid outlet plug at the lower end with a skirt at the lower end ...

The present invention comprises an asphalt roofing shingle with integrated thin film solar cells that is easy to install and scalable to each particular application. The system of the present invention comprises a standard asphalt roofing shingle manufactured with an integrated thin film solar cell connected to two electrodes configured on opposing sides of the shingle.

Embodiments of the present disclosure generally relate to building-integrated photovoltaics (BIPV), and more particularly, but not exclusively, to roofing shingles having a physical appearance and ease of installation that is similar to traditional shingles while also being ...

The solar shingle roofing kit allows an individual solar module to be removed and replaced without removing neighbouring modules or shingles in the event that a solar module fails.

One solar shingle system includes a first solar shingle device and a second solar shingle device. The first solar shingle device includes one or more photovoltaic cells, a first pair of first solar shingle device connectors, and a second pair of first solar shingle device connectors.

A solar shingle having a substrate positioned beneath an upper material layer and at least one photovoltaic cell coupled to the substrate. A first terminal can be electrically coupled to the at least one photovoltaic cell and positioned adjacent to a first sidewall of the solar shingle, and a second terminal can be electrically coupled to the at least one photovoltaic cell and positioned ...

the present invention provides a process for forming bituminous roofing products with high solar heat reflectance, comprising providing a ceramic-forming material comprising kaolin clay; forming the ceramic-forming material into green granules; and sintering the green granules at a temperature of at least 900 degrees Celsius until the crystalline content of the sintered ...

So far at Fraunhofer ISE, the PET approach with Al 2 O 3 passivation has been applied using a lab-scale thermal atomic layer deposition (T-ALD) tool with stacks of the separated solar cells. In the present paper, we demonstrate for the first time the PET on TOPCon shingle cells utilizing a high-throughput plasma-enhanced ALD (PE-ALD) tool for edge ...

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