



DSM  
45 Waterview Blvd  
Parsippany, NJ 07054

March 16, 2018

Re: Comments Regarding Requests for Product Exclusion (of MWT PERx Solar Cells) from the Solar Products Safeguard Measure

To Whom It May Concern:

DSM is a global science-based company active in health, nutrition and materials, which employs over 3,200 people in the United States. Solar photovoltaic (PV) energy is an important market segment for DSM - our company is committed to develop and commercialize innovative materials that reduce the cost of solar electricity. This letter is to request an exemption for a specific PV cell technology under the solar products safeguard measure, in order to enable the growth of the high-efficiency module assembly industry in the USA.

Sustaining the introduction, development and scale-up of back-contact PV module assembly in the US by excluding high performance Metal Wrap Through (MWT) solar cells, and more specifically MWT cells with Passivated Emitter (PERx), from the safeguard measure would benefit the competitiveness of the local solar supply chain. Modules manufactured with such cells have higher energy density and potential within several years to be more cost competitive than standard solar modules. Back contacted modules are also ideal for the growing rooftop market in the USA, resulting in more solar projects being financially attractive and therefore increasing solar installation jobs.

Due to their quality, brand and proximity, American manufacturers are particularly suited to supply the domestic market with back-contact modules. Furthermore, American module manufacturers that adopt back-contact module architecture with MWT PERx cells will position themselves on the forefront of solar module technology for years to come.

For all the above reasons we believe that excluding MWT PERx cells from the safeguard measures will allow American manufacturers to adopt the back-contacted module architecture, and help establish and maintain a domestic manufacturing position in the coming years. Our detailed request is included in the following pages. Thank you for consideration.

Sincerely,

A handwritten signature in blue ink, appearing to read "Hugh Welsh", is written over a faint, circular, light-blue background graphic.

Hugh Welsh  
President and General Counsel  
DSM North America

## Detailed Request for Technology Exclusion of MWT PERx Solar Cells

Metal Wrap Through Passivated Emitter cells (MWT PERx) are an evolution of high efficiency passivated emitter cells, and are utilized for back-contacted solar photovoltaic (PV) module architectures. MWT PERx cells include MWT PERC cells (Passivated Emitter and Rear Contact) as well as MWT PERL (Passivated Emitter, Rear Locally diffused), MWT PERT (Passivated Emitter, Rear Totally diffused) and MWT HJT (HeteroJuncTion). Differently from MWT PERC, the other MWT cell types are currently not yet available at commercial scale. While this request for exclusion is for the larger family of MWT cells, for simplicity we will refer primarily to the MWT PERC variant since it is a commercially-available product.

*“Unlike standard solar cells, Metal Wrap Through (MWT) solar cells are interconnected on the rear side. The front grid is contacted by metallized vias that lead the current onto the rear side. This reduces shading on the front side and ohmic losses due to cell interconnection. [...] The interconnection in the module can be realized by using either structured cell interconnectors or conductive back sheets.”*

*(Source: Fraunhofer ISE)*

Back-contacted modules manufactured using MWT PERC cells have higher electrical performance (up to 3%), energy density and aesthetic appeal than comparable modules that use soldered tabs and strings to interconnect the solar cells. Back-contacted modules are also assembled with a leaner lay-up process, resulting in higher quality and production yield with less waste of materials. This innovative and developing module architecture makes use of back-contacted solar cells such as MWT PERC, which are commercially-available today, but which have not yet been utilized in solar panels assembled or installed in the United States.

The following points respond directly to the USTR information request pertaining to technology exclusion applications:

### **The names and locations of any producers, in the United States and foreign countries, of the particular product**

- There are currently no known US-based manufacturers of MWT PERC cells. Sino-American Silicon Products Inc located in Hsinchu Science Park, Taiwan is the only known manufacturer of MWT PERC cells at commercial scale.

### **Total U.S. consumption of the particular product, if any, by quantity and value for each year from 2014 to 2017, the projected annual consumption for each year from 2018 to 2022, and any related information about the types of consumers**

- No US consumption of MWT PERC cells is known for the period 2014-2017. US consumption for 2018 is estimated in 10 million units with an increase to 60 million yearly units by 2022.
- Consumers of MWT PERC cells are solar module manufacturers that intend to adopt the innovative and differentiated back-contacted architecture. A consumption of 60 million cells corresponds to the production of approximately 1 million solar modules, or ~300 MW of production capacity.

### **Details concerning the typical use or application of the particular product**

- MWT PERC cells are used during the assembly of back-contacted solar modules. This innovative module architecture allows for the cells to be positioned without the need of soldering tabs and strings as per traditional modules. The MWT cells have all contacts on the rear and the interconnection at module level is provided by means of an electro-conductive

backsheet. This architecture allows for higher electrical performance and increased aesthetic appeal.

- Modules built in the USA with MWT PERC cells will be differentiated from standard modules of foreign origin, and better suited to meet the domestic demand for high-efficiency, aesthetically-pleasant, made-in-America PV modules for residential and commercial rooftop applications. Feeding this demand will also increase solar installation jobs.

**Total U.S. production of the particular product for each year from 2014 to 2017, if any**

- No cell manufacturers in the US in the period 2014-2017 produced MWT PERC cells.

**The identity of any U.S.-produced substitute for the particular product, total U.S. production of the substitute for each year from 2014 to 2017, and the names of any U.S. producers of the substitute**

- No substitute product was available in the US in the period 2014-2017.

**Whether the particular product or substitute for the particular product may be obtained from a U.S. producer**

- No solar cell manufacturer in the US is known to provide such a product today.

**Whether qualification requirements affect the requestor's ability to use domestic products**

- The inability to source domestic products as a substitute to MWT PERC cells is not linked to any qualification requirement. It is due to the lack of known domestic production.
- Inability to obtain product exclusion for MWT PERC cells will prevent the adoption of the back contacted module assembly in the US.

**Whether the particular product is under development by a U.S. producer who will imminently be able to produce it in marketable quantities**

- No solar cell manufacturer in the US is known to be developing this product.

**Inventories of the particular product in the United States**

- No inventory of this product is available in the US.

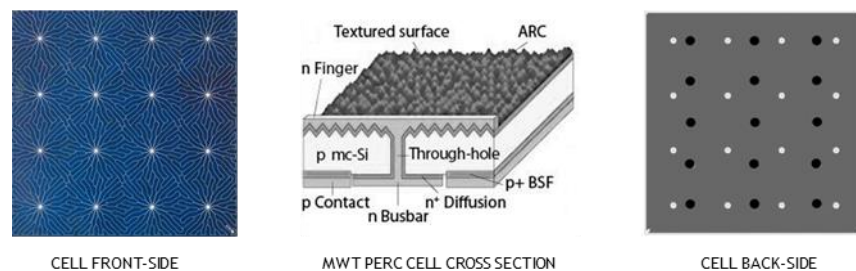
**Whether excluding the particular product from the safeguard measure would result in a benefit or advantage to the long-term competitiveness of the solar manufacturing supply chain in the United States, including by fostering research and development, supporting manufacturing innovation, or by leading to the development of differentiated products that command higher prices**

- Excluding MWT PERC cells from the safeguard measure will enable the adoption and development of back-contacted module assembly technologies in the US. This will trigger a sustainable creation of local jobs, including highly-paid engineering jobs, as well as the sourcing of locally-available materials and locally-delivered services needed for module manufacturing.

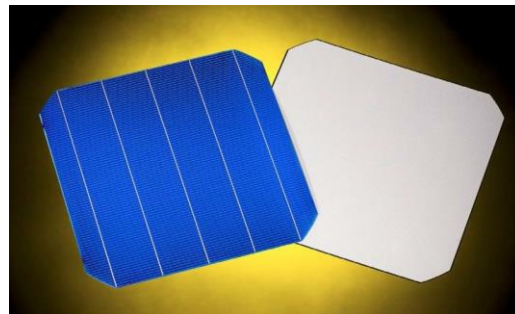
- High-efficiency modules benefit today from a price premium on the market. With access to MWT PERC cells in the USA, back-contact assembly technologies can be pioneered on American land and pave the way to further innovative developments of differentiated, high-value products, compared to standard modules of foreign origin.
- US-based module manufacturers developing and producing back-contact PV modules will position themselves on the forefront of solar module technology for years to come.

**The ability of U.S. Customs and Border Protection to administer the exclusion; and any other information or data that interested persons consider relevant to an evaluation of the request.**

- MWT cells are clearly distinguishable by eye from other sanctioned products, thus enabling the Customs and Border Protection entity to administer the exclusion. These cells can be distinguished by the presence of passthrough vias, contact points on their backside and absence of busbars on the front side as shown in Figures 1 and 2 below.



**Figure 1: Front and Backside of a standard MWT PERx cell**



**Figure 2: Front and backside of a 5 Busbar standard cell**

- Furthermore, MWT PERC cells have an additional characteristic of being currently, and for the period covered by the section 201 provisions, more expensive to produce and to purchase than standard cells. This is due to the different technology, small amounts available on the market and limited economies of scale and scope. If not excluded, the 30% tariff, applied to a more expensive product, would further penalize it, which runs counter to the intent of the tariff to protect the US manufacturing industry.