



**OFFICE OF THE COMMISSIONER OF CUSTOMS (NS-III),  
MUMBAI ZONE-II, JAWAHARLAL NEHRU CUSTOM HOUSE,  
NHAVA SHEVA, TALUKA: URAN, DISTRICT: RAIGAD,  
MAHARASHTRA-400707.**

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**F.No.** S/22-Gen-402/2017-18/AM(I)/Part-I

**Date:** 03.05.2018

**PUBLIC NOTICE NO. 70/2018**

**Subject:- Clarification regarding classification of Solar Panel/Module equipped with Elements –regarding.**

Attention of the Importers, Exporters, General Trade, Custom Brokers and all other stakeholders in the jurisdiction of JNCH, Nhava Sheva is invited to the Board's Instruction No. 08/2018-Customs dated 06.04.2018 regarding classification of solar panel/module equipped with elements.

2. The Board vide letter dated 22.09.2016 on the classification of solar modules, had clarified that:

- (a) If the solar panel/module is equipped with elements and these elements supply the power to an external load i.e. a motor, an electrolyser, etc., then the solar panel/module is classifiable under CTH 8501.
- (b) However, if the solar panel/module is equipped with elements but these elements do not supply the power to an external load i.e. a motor an electrolyser etc., then the solar panel/module is classifiable under CTH 8541.
- (c) Solar panel/module without element is classifiable under CTH 8541.

3. In this regard, Board received representations from the trade regarding classification of solar modules/panels equipped with bypass diodes. The view of the trade was that the function of the bypass diodes in the module is to protect the solar modules/panels at the time of shading of solar cells and not to control the direction of the current. Therefore, in their opinion, solar modules equipped with bypass diode merits classification under Heading 8541.

4. The issue has been examined by the Board with reference to the decisions of World Customs Organizations in the matter and in this regard it is stated that the most common function of a diode is to allow an electric current to pass in one direction (in forward biasing), while blocking it in the opposite direction (in reverse biasing). Depending on its position in the solar module/panel, it is referred as bypass diode or blocking diode.

**Bypass diode:** These are commonly connected in parallel across pairs of solar cells or linear interconnected stands of cells, and prevent damage to solar cells when one or more cells receive much lower solar radiation than the rest of the array (as when the sun's rays are temporarily blocked by a tree limb or other article producing shade). Under normal conditions with no shading, every cell on the module will generate power and the bypass diode will be inactive as it will remain in reverse bias position. However, if part of the module becomes shaded (e.g. by a leaf or an object), the shaded cells will cease to generate power and will consume the energy produced by the active cells. As a result, the shaded cells would overheat and deteriorate. Bypass diode, therefore, protects the shaded cells from overheating, damage by diverting the electrical current around strings with shaded cells and through an external circuit.

When part of the module becomes shaded, the bypass diode wired in parallel to the string with shaded cells will conduct current. As a result, the current will flow through the bypass diode and around the shaded string. Therefore, solar modules/panels equipped with such diodes would not meet the terms of the exclusion of the Explanatory Note to heading 85.41 and merits classification under CTH 8541.

**Blocking Diode:** On the other hand, blocking diodes are usually attached in a series to the final output of the solar panel or module, and control the aggregate output (for example, preventing a reverse power flow from a connected electric accumulator). Therefore, the function of blocking diodes is to prevent a reverse power flow from connected devices. Since the blocking diode blocks the current in the opposite direction, which can be considered as a control of the direction of the current as mentioned in the Explanatory Note to heading 85.01, therefore, solar modules/panels equipped with blocking diode merits classification under CTH 8501.

5. In view of above, the Board has clarified that:

- a. the solar panels or modules equipped with bypass diodes are classifiable in heading 8541,
- b. the solar panels or modules equipped with blocking diodes are classifiable in heading 8501,
- c. the solar panels or modules equipped with blocking diodes and bypass diodes are classifiable in heading 8501.

6. Action to be taken in terms of decisions taken in this Public Notice should be considered as standing order for the purpose of officers and staff.

7. Difficulty, if any may be brought to the notice of Deputy/Assistant Commissioner in-charge of Appraising Main (Import) through email / phones (email address: appraisingmain.jnch@gov.in, Phone No : 022-27244979).

**Sd/-**  
**(SUBHASH AGRAWAL)**  
**COMMISSIONER OF CUSTOMS**  
**NS-III, JNCH**

**Copy to:**

1. The Chief Commissioner of Customs, Mumbai Zone- II.
2. All the Commissioner of Customs, Mumbai Zone- II.
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5. The DC/EDI for uploading on the JNCH website.
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