

SEMI PV83-0318 (Reapproved 0124) GUIDE FOR SAMPLE PREPARATION METHOD FOR PHOTOVOLTAIC BACKSHEET PERFORMANCE TESTS

This Standard was technically approved by the Photovoltaic Global Technical Committee. This edition was approved for publication by the global Audits and Reviews Subcommittee on December 14, 2023. Available at www.semiviews.org and www.semi.org in January 2024; originally published March 2018.

NOTICE: Paragraphs entitled ‘NOTE:’ are not an official part of this Standard or Safety Guideline and are not intended to modify or supersede the official Standard or Safety Guideline. These have been supplied by the global technical committee to enhance the usage of the Standard or Safety Guideline.

1 Purpose

1.1 The purpose of this Guide is to standardize sample preparation method of photovoltaic (PV) backsheet performance tests.

2 Scope

2.1 This Guide is applicable to backsheet for PV modules.

2.2 This Guide provides sample preparation purpose, scope, referenced standards and documents, terms, method, and requirements for backsheet for PV modules.

NOTICE: SEMI Standards and Safety Guidelines do not purport to address all safety issues associated with their use. It is the responsibility of the users of the Documents to establish appropriate safety and health practices, and determine the applicability of regulatory or other limitations prior to use.

3 Limitations

3.1 None.

4 Referenced Standards and Documents

4.1 *ISO® Standards*¹

ISO 4593 — Plastics – Film and Sheeting – Determination of Thickness by Mechanical Scanning

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

5 Terminology

5.1 *Abbreviations and Acronyms*

5.1.1 *PV* — photovoltaic

5.2 *Definitions*

5.2.1 *laminates* — sample that laminated from multiple layers under high temperature.

6 Summary of Test Method

6.1 Laminate a stack as follows: glass, the first encapsulation adhesive film, the second encapsulation adhesive film, high temperature non-stick fabric, and backsheet in sequence. After lamination, not only the materials undergone high temperature treatment but also the EVA layer of backsheet is encapsulated inside of the module during aging tests.

¹ International Organization for Standardization, ISO Central Secretariat, Chemin de Blandonnet 8, CP 401-1214 Vernier, Geneva, Switzerland; Telephone: +41.22.749.01.11, Fax: +41.22.733.34.30, <http://www.iso.org>. ISO trademark is owned by International Organization for Standardization.

7 Reagents and Materials

7.1 *Raw Materials of Sample Preparation* — Backsheet, encapsulation adhesive film, glass, and high temperature non-stick fabric (as the release film of backsheet and encapsulation adhesive film).

8 Preparation of Apparatus

8.1 Before sample preparation, the backsheet should be stored in the environment which the temperature ($23 \pm 2^{\circ}\text{C}$) and relative humidity $\leq 75\%$, with no less than 24 hours.

8.2 Clean glass and high temperature non-stick fabric with absolute ethyl alcohol before sample preparation.

9 Procedure

9.1 Sample Size

9.1.1 The sample specification size of backsheet and encapsulation adhesive film is more than $300\text{ mm} \times 300\text{ mm}$. The size of high temperature non-stick fabric needs to be determined according to exact test requirements and the minimum distance between the high temperature non-stick fabric and the edge of the glass should be not less than 17 mm. The sample dimension should be in accordance with ISO 4593 and the accuracy of measuring tool should be less than 1 mm.

9.2 Preparation of Laminates

9.2.1 Laminate the laminates under qualified lamination parameters (confirm the qualified lamination technology based on different encapsulation materials and equipment) stacking with the structure of glass, the first encapsulation adhesive film, the second encapsulation adhesive film, high temperature non-stick fabric, backsheet in sequence. After lamination, not only the materials undergone high temperature treatment but also the EVA layer of backsheet is encapsulated inside of the module during aging tests. Schematics of exact laying sequence of the laminate are shown as Figures 1, 2, and 3:

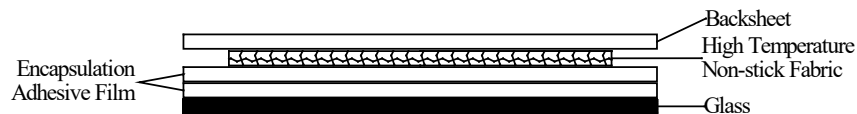


Figure 1
Left View of Laminate Cross-Section

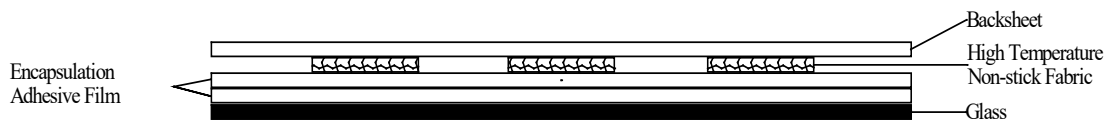


Figure 2
Side View of Laminate Cross-Section