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TANZANIA STANDARD

# Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements - Specification

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Tanzania Commission for Science and Technology (COSTECH)
Ministry of Works and Transportation (MoWT)
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Tanzania National Roads Agency (TANROADS)
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## 0 Foreword

The Tanzania Bureau of standards is the statutory national standards body for Tanzania, established under the act.No.3 of 1975, amended by act.No.2 of 2009.

This draft Tanzania Standard is being prepared by BCDC 2 Masonry Technical Committee under the supervision of the Building and Construction Divisional Standards committee (BCDC).

In the preparation of this draft Tanzania Standard assistance was derived from ASTM D6164/D6164M − 26 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements. published by American Society for Testing and Materials (ASTM)

Styrene Butadiene Styrene (SBS) modified bituminous sheet materials are prefabricated waterproofing products consisting principally of bitumen modified with SBS thermoplastic elastomer and reinforced with polyester fabric. These materials are designed to provide durable and flexible waterproofing systems for buildings and other structures, particularly in roofing and related waterproofing applications.

This Standard specifies requirements for SBS modified bituminous sheet materials using polyester as the primary reinforcement. The products may be manufactured with either a smooth surface or a surface finished with mineral granules, depending on their intended application. The Standard establishes requirements for the physical and dimensional characteristics of the sheet materials and provides methods for assessing their conformity to specified performance requirements.

## 1 Scope

1.1 This specification covers prefabricated modified bituminous sheet materials reinforced with polyester fabric as the primary reinforcement, with or without granules, which use styrene butadiene styrene (SBS) thermoplastic elastomer as the primary modifier and are intended for use in the fabrication of multiple ply roofing and waterproofing membranes.

1.2 Modified bituminous sheets reinforced with polyester fabric containing glass yarns are also covered by this specification (see Note 1).

NOTE 1—When used, glass yarns improve processing of polyester mats in the manufacture of the modified bitumen sheets and reduce distortions that may be introduced during production. Glass yarns are typically a small percentage of the reinforcement and do not contribute to the physical properties of the finished product so much as to make these products meet the requirements of Specification D6162/D6162M.

1.3 This specification is intended as a material specification only. Issues regarding the suitability of the specific roof constructions or application techniques are beyond this scope.

## 2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies:

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2.1 ASTM Standards:

D1079 Terminology Relating to Roofing and Waterproofing

D5147/D5147M Test Methods for Sampling and Testing Modified Bituminous Sheet Material

D6162/D6162M Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements

## 3 Terms and definitions

3.1 Definitions—For definitions of terms used in this specification, refer to Terminology D1079

## 4. Classification

4.1 Modified bituminous sheet materials reinforced with polyester fabric, Type I and Type II, are covered by this specification.

4.2 The following grades are used to describe the material surfacing:

4.2.1 Grade G—Granule surfaced.

4.2.2 Grade S—Smooth surfaced.

## 5. Materials and Manufacture

5.1 In the process of manufacture, the reinforcement is saturated with asphalt or modified asphalt and is impregnated and coated on both sides with an SBS-modified bituminous coating. The SBS-modified bituminous coating shall be per mitted to be compounded with a mineral stabilizer.

5.2 The Grade G sheet is surfaced on the weather side with mineral granules, except for any selvage. To prevent sticking in the roll, the reverse side and any selvage shall be permitted to be covered with a fine mineral surfacing or any other surfacing that will not interfere with adhesion or bonding of the lap during application.

5.3 Sheet material intended for application by heat welding (torching) shall meet the minimum bottom coating requirement found in Table 1.

**TABLE 1 Dimensions and Masses of SBS-Modified Bituminous Sheet Materials Using Polyester Reinforcements**

| Description | Type I | Type II |
|---|---|---|
| Thickness, min, mm, | | |
| Grade S | 2.2 | 2.9 |
| Grade G | 3.3 | 3.3 |
| Net mass/unit area, min, g/m$^2$ | | |
| Grade S | 2636 | 3417 |
| Grade G | 3661 | 4394 |

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| | | |
|---|---|---|
| Bottom coating thickness, heat welding application products, min, mm<br>Grade S<br>Grade G | <br>1.0<br>1.0 | <br>1.0<br>1.0 |

## 6. Physical Properties

6.1 The sheet shall conform to the minimum physical properties prescribed in Table 2.

6.2 The finished product shall not crack nor be so sticky as to cause tearing or other material damage upon being unrolled at any product temperature between 4 and 60 °C.

## 7. Dimensions, Mass, and Permissible Variations

7.1 The finished product shall conform to the following dimensions and variations:

7.1.1 The width of the roll shall be as agreed between the purchaser and the seller and shall not vary more than 1 %.

7.1.2 The area of the roll shall be no less than as agreed between the purchaser and the seller.

7.1.3 The selvage width shall be within 6.4 mm of the nominal selvage width and shall be not less than 76.2 mm width without a laying line and 63.5 mm in width if the sheet has a laying line. If a laying line is provided, the line must not be less than 76.2 mm from the edge of the sheet.

7.2 The mass and thickness of the finished product shall be as prescribed in Table 1.

## 8. Workmanship, Finish, and Appearance

8.1 The finished product shall be coated completely in a continuous, unbroken film and shall be free of such defects as holes, tears, cracks, wrinkles or permanent deformations, blisters, ragged or untrue edges, and areas of uncoated reinforcement.

8.2 The surface of the weather side shall be uniform in finish and texture.

8.3 For Grade G material, the mineral granules shall be distributed uniformly over the entire surface in an even layer excluding any selvage, shall be embedded firmly in the SBS-modified bituminous coating, and the line of demarcation between the granule-surfaced portion of the weather side and any selvage shall be straight and parallel to the edges of the sheet

8.4 When unrolled on a smooth plane, the sheet shall be straight and true so that the lap will mate with the adjacent sheet within the tolerance for the lap without wrinkles, buckles, or fishmouths

## 9. Sampling and Test Methods

9.1 Sample the material and determine the properties described in this specification in accordance with Test Methods D5147/D5147M, except as noted below.

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9.2 Peak Load, Elongation at Peak Load, and Ultimate Elongation—When a load elongation curve obtained in accordance with Test Methods D5147/D5147M exhibits two distinct peaks, the glass peak and the polyester peak shall be identified (see Fig. 1 for guidance). For each specimen, the glass peak shall be ignored. Individual specimen peak load, elongation at peak load, and ultimate elongation results shall be based on the polyester peak only. These results shall be used to calculate average peak load, average percent elongation at peak load, and average ultimate elongation in each direction and test temperature based on the total number of measurements taken. Average peak load, average percent elongation at peak load, and average ultimate elongation shall meet the requirements found in Table 2**.**

**TABLE 2 Physical Properties of SBS-Modified Bituminous Sheet Materials Using Polyester Reinforcements [A]**

| Property | Type I<br>Grade: G and S | Type II<br>Grade: G and S |
|---|---|---|
| Peak load at –18 ± 2 °C, MD and XMD, before and after heat conditioning, min, KN/m | 12.3 | 17.5 |
| Elongation at –18 ± 2 °C, MD and XMD, at peak load, before and after heat conditioning, min, % | 20 | 20 |
| Peak load at 23 ± 2 °C, MD and XMD, before and after heat conditioning, min, KN/m | 8.8 | 12.3 |
| Elongation at 23 ± 2 °C, MD and XMD, at peak load, before and after heat conditioning, min, % | 35 | 50 |
| Ultimate elongation 23 ± 2 °C, MD and XMD, before and after heat conditioning, min, % | 38 | 60 |
| Tear strength at 23 ± 2 °C, min, N | 246 | 311 |
| Low-temperature flexibility, before and after heat conditioning, max, °C | -18 | -18 |
| Dimensional stability, max, % | 1 | 1 |
| Compound stability at 102 °C | No failures | No failures |
| Granule embedment, max loss, g, (Grade G only) | 2 | 2 |

[A] The properties in this table are “as manufactured” unless otherwise noted.

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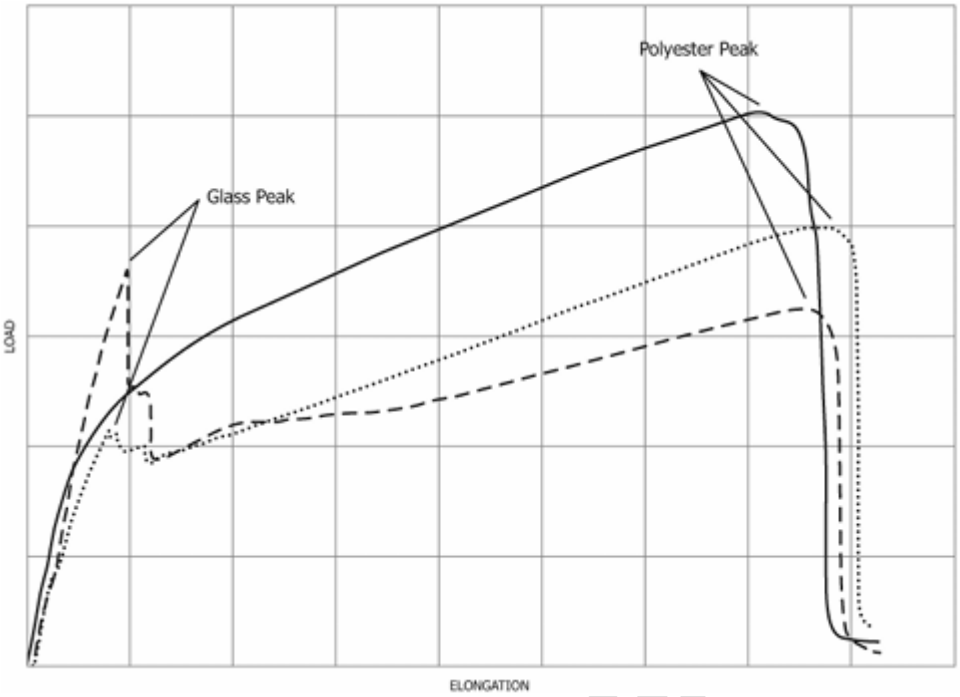



Figure 1 Examples of Load Elongation Curve for SBS-Modified Bituminous Sheet Materials using Polyester Reinforcements.

## 10. Inspection

10.1 Inspection – Inspection shall be in accordance with the requirement of this specification

10.2 Inspection Alternatives—Alternative inspection requirements shall be determined by and as agreed upon between the purchaser and supplier.

## 11. Rejection and Resubmittal

11.1 Failure to Conform - Failure to conform to any of the requirements as stated in this specification constitutes grounds for rejection.

11.2 Rejection Redress - The supplier shall have the right to inspect the rejected materials. The supplier and the purchaser shall agree to the quantity of rolls deemed unacceptable. The supplier shall then have the right to submit the same number of new rolls as replacement.

## 12. Packaging and Package Marking

12.1 The finished material shall be furnished as rolls. The rolls shall be wrapped securely to prevent shifting of material and to permit normal handling. If a roll contains a manufacturing splice, the splice shall be marked clearly; no roll shall contain more than one splice or two pieces.

12.2 Unless otherwise agreed upon by the supplier and purchaser, each product package shall be marked plainly with the supplier's name, the product name, "SBS" or similar indication that the product is an SBS-modified bitumen sheet material, the ASTM designation including type and grade, and the net coverage.

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