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TANZANIA STANDARD

Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using Polyester Reinforcements - Specification

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DRAFT STANDARD

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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 D6222/D6222M − 16 (Reapproved 2023) Standard Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using Polyester Reinforcements. published by American Society for Testing and Materials (ASTM)

Atactic Polypropylene (APP) modified bituminous sheet materials are prefabricated waterproofing products manufactured by modifying bitumen with Atactic Polypropylene (APP) and incorporating polyester reinforcement to enhance the mechanical performance and dimensional stability of the sheets. These materials are widely used in roofing and waterproofing applications where resistance to water penetration, temperature variations, mechanical stresses and environmental exposure is required.

This Standard specifies requirements for prefabricated APP modified bituminous sheet materials reinforced with polyester fabric, with or without granules. It establishes minimum requirements for relevant physical and performance characteristics, including peak load, elongation, tear strength, low-temperature flexibility, dimensional stability, compound stability, granule embedment, water absorption, moisture content and low-temperature unrolling. Requirements relating to dimensions, mass and other characteristics of the finished sheets are also addressed.

DRAFT STANDARD

1 Scope

1.1 This specification covers prefabricated modified bituminous sheet materials reinforced with polyester fabric, with or without granules, that use atactic polypropylene (APP) as the primary modifier and are intended for use in the fabrication of multiple ply roofing and waterproofing membranes.

NOTE. Many modified bituminous sheets are currently marketed with polyester mat reinforced with glass yarns to improve processing in the manufacture of the finished modified bitumen product and to reduce distortions that may be introduced during production. These 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 be classified by Specification D6223/D6223M.

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

1.3 The specified tests and property limits used to characterize the sheet materials covered by this specification are intended to establish minimum properties. In-place roof system design criteria such as fire resistance, field strength, impact/ puncture resistance, material compatibility, uplift resistance, the need for field applied coatings, and others, are factors beyond the scope of this material specification.

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:

ASTM Standards:

D1079 Terminology Relating to Roofing and Waterproofing

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

D5636/D5636M Test Method for Low-Temperature Unrolling of Felt or Sheet Roofing and Waterproofing Materials

D6223/D6223M Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements

3 Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in this specification, refer to Terminology D1079.

4.Classification

4.1 Type I and II modified bituminous sheet materials reinforced with polyester fabric, are covered by this specification (see Table 1).

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

4.2.1 Grade G—Granule surfacing.4.2.2 Grade S—Smooth surfacing.

DRAFT STANDARD

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TABLE 2 Physical Properties of APP Modified Bituminous Sheet Materials Using Polyester Reinforcements [A]

Property	Type I	Type II
Peak load at 23 ± 2 °C, MD and XMD, before and after heat conditioning, min, KN/m	8.8	14
Elongation at 23 ± 2 °C, MD and XMD, at peak load, before and after heat conditioning, min, %	23	40
Peak load at -18 ± 2 °C, MD and XMD, before and after heat conditioning, min, KN/m	10.5	15.8
Elongation at -18 ± 2 °C, MD and XMD, at peak load, before and after heat conditioning, min, %	10	15
Ultimate elongation 23 ± 2 °C, MD and XMD, before and after heat conditioning, min, %	30	50
Tear strength at 23 ± 2 °C, min, N	311	356
Low-temperature flexibility, before and after heat conditioning, max, °C	0	0
Dimensional stability, max, %	1	1
Compound stability at 102 °C	110	110
Granule embedment, max loss, g, (Grade G only)	2	2
Water absorption, max, %	3.2	3.2
Moisture content, max, %	1	1
Low temperature unrolling, max, °C	5	5

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

DRAFT STANDARD

5 Materials and Manufacture

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

5.2 Grade G materials are 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 To prevent sticking in the roll, any selvage will be surfaced with mineral or other surfacing material that will not interfere with adhesion or bonding during application.

6. Physical Properties

6.1 The sheet shall conform to the minimum physical propertiesprescribedinTable1.

6.2 The finished product shall not crack or be so sticky as to cause tearing or other material damage upon being unrolled at any product temperature between 4°C and 60°C

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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 upon between the purchaser and the supplier and shall not vary more than 1%.

7.1.2 The area of the roll shall beno less than as agreed upon between the purchaser and the supplier.

7.1.3 The selvage width shall be within 6mm of the normal selvage width and shall be not less than 76 mm in width from the edge of the sheet.

7.2 The mass and thickness of the finished product shall be as prescribed inTable2.

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

Description	Type I	Type II
Thickness, min, mm,		
Grade S	3.5	3.9
Grade G	4.0	4.3
Net mass/unit area, min, g/m^2		
Grade S	3418	3905
Grade G	4150	4882
Bottom coating thickness, heat welding application products, min, mm	0.76	1.0
Grade S	0.76	1.0
Grade G		

DRAFT STANDARD

8. Workmanship, Finish, and Appearance

8.1 The finished product shall be completely coated 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 products, mineral granules shall be uniformly distributed over the entire surface of the sheet in an even layer excluding any selvage, and shall be firmly embedded in the APP modified bituminous coating. 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 selvage will mate with an adjacent sheet, within the tolerance for the lap without wrinkles, buckles, or fish mouths.

9. Sampling and Test Methods

9.1 Sample the material and determine the properties described in this specification and accordance with Test Methods D5147/D5147 unless otherwise indicated.

9.2 Ultimate Elongation – see Test Methods D5147/5147M, Section 6.

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9.3 High Temperature Stability—Sample the material and determine the high temperature stability in accordance with Test Methods D5147/D5147M, Section 15, and as described herein. Report the highest test temperature at which flowing, dripping, or drop formation does not occur. Materials may be tested in 5.5 °C increments.

9.4 Low Temperature Unrolling—Sample the material and determine the low temperature unrolling in accordance with Test Methods D5636/D5636M, and as described herein. Report the lowest test temperature at which none of the specimens show cracking or surface rupture. The temperature, at or below which the product must pass is stated in Table 1.

10. Inspection

10.1 Inspection - Inspection shall be in accordance with the requirements 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 shall then have the right to submit the same number of new rolls as replacements.

12. Packaging and Package Marking

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

12.2 The rolls shall be securely wrapped or banded in a manner that completely encircles the roll and will prevent slipping or unrolling.

12.3 No roll shall contain more than two pieces, and no more than 3 % of the rolls in any lot shall contain two pieces. If a roll contains a manufacturing splice, the splice shall be clearly marked.

DRAFT STANDARD

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