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Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing¹

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1. Scope

1.1 This specification covers flexible sheet made from thermoplastic polyolefin (TPO) as the principal polymer, intended for use in single-ply roofing membranes exposed to the weather. The sheet shall contain reinforcing fabrics or scrims.

1.2 The tests and property limits used to characterize the sheet are values intended to ensure minimum quality for the intended purpose. In-place roof system design criteria, such as fire resistance, field seaming strength, material compatibility, and uplift resistance, among others, are factors which should be considered but are beyond the scope of this specification.

1.3 The values stated in SI units are to be regarded as the standard. The values stated in parentheses are for information only.

1.4 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

- D 471 Test Method for Rubber Property—Effect of Liquids²
- D 573 Test Method for Rubber—Deterioration in an Air Oven²
- D 751 Test Methods for Coated Fabrics³
- D 1149 Test Method for Rubber Deterioration—Surface Ozone Cracking in a Chamber²
- D 1204 Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature⁴
- D 2137 Test Methods for Rubber Property—Brittleness Point of Flexible Polymers and Coated Fabrics²

¹ This specification is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.18 on Nonbituminous Organic Roof Coverings.

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² *Annual Book of ASTM Standards*, Vol 09.01.

³ *Annual Book of ASTM Standards*, Vol 09.02.

⁴ *Annual Book of ASTM Standards*, Vol 08.03.

D 5538 Practice for Thermoplastic Elastomers—Terminology and Abbreviations²

G 151 Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources⁵

G 155 Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials⁵

3. Materials and Manufacture

3.1 The sheet shall be formulated from ethylene and higher alpha-olefin polymers, copolymers, and mixtures thereof, in amounts greater than 50 %, by weight of the total polymer content suitably compounded to satisfy the physical requirements in the specification (see Practice D 5538).

3.2 The sheet shall be capable of being heat welded, fused, or adhesively bonded to itself for making watertight field splices and repairs, and the supplier or fabricator shall recommend suitable methods and materials.

3.3 Sheet shall be reinforced with fabric or scrim.

4. Physical Properties and Tolerances

4.1 Each sheet specimen shall meet or exceed the physical requirements prescribed in Table 1.

4.2 The tolerance for time conditions (aging, weathering, and so forth) is ± 15 min or ± 1 % of the period, whichever is greater, unless otherwise specified.

4.3 The tolerance for temperature conditions (aging, weathering, and so forth) is $\pm 2^\circ\text{C}$ ($\pm 4^\circ\text{F}$) of the specified temperature, unless otherwise specified.

5. Dimensions and Permissible Variations

5.1 The width and length of the sheet shall be agreed upon between the purchaser and the supplier.

5.1.1 The width and length tolerance shall be +3 %, -0 %.

5.1.2 The thickness tolerance shall be +15 %, -10 % of thickness agreed upon by the purchaser and supplier, but in no case shall it be less than the minimum in Table 1.

6. Workmanship, Finish, and Appearance

6.1 The sheet, including factory seams, if present, shall be watertight and free of pinholes, particles of foreign matter,

⁵ *Annual Book of ASTM Standards*, Vol 14.04.