
Standard Specification for

**Thin Overlay Treatments Using
a Binder Resin System and
Aggregate for Concrete Surfaces**

AASHTO Designation: M 353-24¹

Adopted without Revisions: 2024

Technical Subcommittee: 4c, Markings and Coatings



**American Association of State Highway and Transportation Officials
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1. SCOPE

- 1.1. This specification describes the laboratory performance of materials for thin overlay treatments using a binder resin system and aggregates for concrete surfaces. The application of the thin overlay is comprised of a minimum of two layers of a binder resin system and surface-applied aggregate.
- 1.2. Use of the thin overlay in a double lift application (binder resin system and aggregate) for above-grade horizontal concrete surfaces (such as bridges, ramps, overpasses, directional flyovers, stacked interchanges, and viaducts) is recommended.
- 1.3. Binder resin systems include low modulus epoxy, methyl methacrylate (MMA), and polyester resins.
- 1.4. *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all the safety concerns 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 limitations prior to use.*

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
 - M 235M/M 235, Epoxy Resin Adhesives
 - M 339M/M 339, Thermometers Used in the Testing of Construction Materials
 - R 76, Reducing Samples of Aggregate to Testing Size
 - T 27, Sieve Analysis of Fine and Coarse Aggregates
 - T 255, Total Evaporable Moisture Content of Aggregate by Drying
- 2.2. *ASTM Standards:*
 - C305, Standard Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency.
 - C579, Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes
 - C778, Standard Specification for Standard Sand
 - C881/C881M, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete

- C884/C884M, Standard Test Method for Thermal Compatibility between Concrete and an Epoxy-Resin Overlay
- D570, Standard Test Method for Water Absorption of Plastics
- D638, Standard Test Method for Tensile Properties of Plastics
- D695, Standard Test Method for Compressive Properties of Rigid Plastics
- D2240, Standard Test Method for Rubber Property—Durometer Hardness
- D2471-99, Standard Test Method for Gel Time and Peak Exothermic Temperature of Reacting Thermosetting Resins (withdrawn 2008; no replacement)
- D2556 and D2556-11, Standard Test Method for Apparent Viscosity of Adhesives Having Shear-Rate-Dependent Flow Properties Using Rotational Viscometry
- D3278, Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus
- D7428, Standard Test Method for Resistance of Fine Aggregate to Degradation by Abrasion in Micro-Deval Apparatus
- E1, Standard Specification for ASTM Liquid-in-Glass Thermometers
- E230/E230M, Standard Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples
- E573, Standard Practices for Internal Reflection Spectroscopy
- E879, Standard Specification for Thermistor Sensors for General Purpose and Laboratory Temperature Measurements
- E1137/E1137M, Standard Specification for Industrial Platinum Resistance Thermometers
- E2877, Standard Guide for Digital Contact Thermometers

2.3. *International Electrotechnical Commission Standards:*

- IEC 60584-1: 2013 Thermocouples - Part 1: EMF Specifications and Tolerances
- IEC 60751: 2008 Industrial Platinum Resistance Thermometers and Platinum Temperature Sensors

3. TERMINOLOGY

- 3.1. *binder resin system*—a polymeric resin used to bond a surface-applied aggregate to a concrete pavement or a horizontal concrete surface.
- 3.2. *prime coat*—a polymeric resin that is used to fill cracks and voids in existing concrete surfaces that is compatible with the binder resin system.
- 3.3. *qualifying agency*—the organization or entity that is soliciting/specifying the material for use.
- 3.4. *thin overlay treatment*—a binder resin system and surface-applied aggregate utilized to preserve concrete surfaces against chloride intrusion and provide a suitable wearing surface.

4. SUMMARY OF SPECIFICATION

- 4.1. This specification describes the properties of materials used within a thin overlay for concrete above-grade horizontal surfaces.
- 4.2. The thin overlay is comprised of a double layer of a binder resin system that firmly retains a surface applied aggregate.
- 4.3. The thin overlay may be applied by mechanical or manual techniques.