

DMS-8120, Liquid Membrane-Forming Compounds for Curing Concrete

Overview

Effective Date: May 2003 – July 2004.

This Specification governs for the materials, composition, quality, sampling, and testing of liquid membrane-forming compounds for curing concrete.

Bidders' and Suppliers' Requirements

Before curing compounds are supplied to a contract, the curing compounds must be prequalified in accordance with the requirements of this Specification. Samples to establish quality and set standard properties must be submitted to the Texas Department of Transportation, Construction Division, Materials & Pavements Section, Cedar Park Campus, Bldg. 51, 9500 Lake Creek Parkway, Austin, TX 78717.

Charge for Failing Samples

The cost of sampling and testing failing material is \$250 per sample. The Materials & Pavements Section of the Construction Division (CST/M&P) must receive a cashier's check made payable to the "TxDOT Fund" before further qualification samples will be evaluated or before scheduling inspection or sampling of a replacement for a failed batch of curing compound.

Establishment of Quality

The Department will evaluate at not cost to the supplier, one sample, per type of curing compound to establish specification compliance. If the first sample fails to meet the requirements of the specification, 'Charge for Failing Samples' will apply for each sample submission needed for qualification. Once a supplier has established quality, one submission of reformulation, per type, will be permitted each year at no cost to the supplier.

Except for transition periods not to exceed 3 mo., a supplier may not supply compounds of more than one approved formula per type of compound at the same time.

Disqualification

The Department reserves the right to perform any tests to ascertain if a reformulation was made without securing approval for the reformulation. Any change in formulation detected without requalifying will be cause to withdraw qualification. Requalification is not allowed in less than 6 mo. A supplier who has had a product qualification withdrawn due to formulation change will pay the amount stated in 'Charge for Failing Samples' with each new submission for requalification.

Sampling and Testing

Sampling and testing will be in accordance with the CST/M&P *Manual of Testing Procedures*.

Basis for Rejection

Finished products that fail to meet any of the requirements ('Material Requirements') may be subject to rejection.

Final acceptance will be based on tests performed on finished products as soon as practical after their arrival at the shipping destination.

The judgment of the Director of CST/M&P will be final in all questions relative to conformance with the Specification provisions.

Costs

The Department will normally bear the costs of sampling and testing; however, the bidder or vendor will bear the costs of sampling and testing of materials failing to conform to the requirements. CST/M&P must receive the amount stated in 'Charge for Failing Samples' before scheduling the sampling of a replacement batch. The manufacturer may be required to reimburse the Department for the cost of storage and handling of materials failing to meet specification requirements.

For materials purchased by a Contractor from a manufacturer who does not have a current, valid warehouse agreement for pretested stock with the Department, all costs of sampling and testing will be charged to the Contractor and will be deducted from the amounts due him on monthly and final estimates.

Material Requirements

The general and specific requirements are for 2 types of liquid membrane-forming compounds:

- ◆ Type 1-D – clear or translucent with fugitive dye and

- ◆ Type 2 – white pigmented.

All requirements shall apply to both types unless specifically shown otherwise.

General Requirements

Apply the material to damp concrete, as a fine mist through atomizing nozzles, and at a wet film thickness of 200 to 230 μm (8 to 9 mils). The liquid membrane-forming compound must not react deleteriously with concrete or its components.

It must produce a firm, continuous, uniform moisture-impermeable film that is free of pinholes, cracks, or other film defects. It must also exhibit satisfactory adhesion.

The consistency must be such that the compound can be applied satisfactorily by conventional or airless spray at atmospheric and material temperatures above 5°C (40°F) without thinning. When applied at the manufacturer's recommended thickness, not less than 200 μm (8 mils) wet, to vertical surfaces of damp concrete, the compound must not run off or appreciably sag.

The liquid membrane-forming compound must not disintegrate, check, peel, or crack during the required curing period. It must not peel or pick up under traffic, and must disappear from the surface of the cured concrete by gradual disintegration.

Solids

The total solids, vehicle solids, and pigment solids must not vary more than $\pm 2.0\%$ from those solids established on the qualification sample for Type 2 compound.

The total solids must not vary more than $\pm 2.0\%$ from the total solids established on the qualification sample for Type 1-D compound. (ASTM "D 2369, Standard Test Method for Volatile Content of Coatings")

The vehicle solids must be all resin material as defined in ASTM "D 883, Standard Terminology Relating to Plastics."

Density

The density (gallon weight) must not vary more than $\pm .012$ kg per liter (0.10 lb. per gallon) from the density (gallon weight) established on the qualification sample. (ASTM "D 1475, Standard Test Method for Density of Liquid Coatings, Inks, and Related Products")

Infrared

The infrared spectra of the vehicle must match that of the qualification sample.

Test the infrared spectrum in accordance with "Tex-888-B, Obtaining the Infrared Spectrum of Organic Materials."

X-ray

The X-ray diffraction pattern of the Type 2 compound must match that of the qualification sample.

Test the X-ray spectra in accordance with "Tex-896-B, Qualitative and Semi-Quantitative Analysis of Crystalline Material by X-ray Diffraction."

Flash Point

The flash point must be a minimum of 27°C (80°F) when tested by the Pensky-Martens Closed Cup. (ASTM "D 93, Standard Test Methods for Flash-Point by Pensky-Martens Closed Cup")

Undesirable Particles

The compound must be free of skins, agglomerates, or other undesirable particles. Determine if the contaminants are present in accordance with the last paragraph of the procedure shown in "Tex-805-B, Detecting Undesirable Particles in Coatings and Coating Vehicles."

Settling

A 20 x 150-mm (4/5 x 6-in.) test tube filled with thoroughly mixed compound to 3/4 full and left undisturbed for 72 hr. must show no clear separation in 4 hr. nor exhibit caking of pigment or hard settling after 72 hr.

Moisture Loss

Percentage moisture loss when tested for water retention must not exceed the following:

- ◆ 2% @ 24 hr. after application and
- ◆ 4% @ 72 hr. after application.

Determine moisture retention in accordance with ASTM "C 309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete."

Viscosity

The viscosity must not vary more than ± 4 Krebs Units from the viscosity established by the qualification sample for Type 2 compound.

The viscosity for Type 1-D compound must not vary more than ± 3 sec. @ 75 g or 125 g on a Krebs modified Stormer viscometer from that established by the qualification sample in accordance with ASTM "D 562, Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer."

Sag Resistance

Determine sag resistance in accordance with "Tex-812-B, Evaluating Sag Resistance of Coatings." The material must exhibit no sagging or running at the 150- μm (6-mil) stripe or above.

Color

The Type 2 compound must exhibit a minimum reflectance value (Y) of 50 over black when a 225- μm (9-mil) wet film is applied to a sealed Form 7B – Sag and Leveling Test Chart as produced by the Lenata Company and allowed to air dry at room temperature, $25 \pm 1^\circ\text{C}$ ($77 \pm 2^\circ\text{F}$), for 24 hr.

The resulting film must be a continuous uniform film free of pinholes and holidays and be uniform in color and texture exhibiting no pigment flocculation, floating, or separation. ("Tex-839-B, Determining Color in Reflective Materials")

Drying

A 150- μm (6-mil) wet film of both types must be set-to-touch in not more than 4 hr. and must be dry-through in not more than 12 hr.

Archived Versions

Archived versions of "DMS-8120, Liquid Membrane-Forming Compounds for Curing Concrete" are available through the following links:

Click on [8120-0898](#) for the specification effective August 1998 through April 2003.