
Standard Specification for Materials for Micro Surfacing

AASHTO Designation: MP xx-15



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

- 1.1. Micro surfacing is an application of emulsified asphalt, aggregate, mineral filler, water, and other additives mixed in a specially designed paving machine and placed on the pavement surface.

2. THIS STANDARD SPECIFIES QUALITY REQUIREMENTS FOR EMULSIFIED ASPHALT, AGGREGATE, MINERAL FILLER AND WATER FOR MICRO SURFACING. REFERENCED DOCUMENTS

2.1. *AASHTO Standards:*

- M 17, Mineral Filler for Bituminous Paving Mixtures
- M 85, Portland Cement
- M 295, Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
- M 303, Lime for Asphalt Mixtures
- M 316, Polymer-Modified Cationic Emulsified Asphalt
- PP 83, Micro Surfacing Design
 - T 11, Materials Finer Than 75- μm (No. 200) Sieve in Mineral Aggregates by Washing
 - T 27, Sieve Analysis of Fine and Coarse Aggregates
 - T 96, Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
 - T 104, Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
 - T 176, Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test

3. TERMINOLOGY

- 3.1. *CQS-IP*—a cationic, quick-setting emulsified asphalt containing a polymer modifier.
- 3.2. *CQS-1hP*—a cationic, quick-setting emulsified asphalt containing a polymer modifier and having a harder asphalt residue.

4. SIGNIFICANCE AND USE

- 4.1. This standard may be used to select and evaluate materials for the construction of micro surfacing. The design requirements for Micro Surfacing can be found in MP 28.

5. EMULSIFIED ASPHALT REQUIREMENTS

- 5.1. Emulsified asphalt for micro surfacing shall meet the requirements of CQS-1P or CQS-1hP emulsions in M 316. The emulsified asphalt classification, CQS-1P or CQS-1hP, is determined by the Owner Agency utilizing regional climatic and traffic conditions.

6. AGGREGATE REQUIREMENTS

- 6.1. Mineral aggregate shall be 100 percent crushed, meet the quality requirements in Table 1, and meet the grading requirements in Table 2. The grade of aggregate shall be specified by the Owner Agency.

Table 1—Aggregate Quality Requirements

Test	Test Method	Requirement
Sand Equivalent, min	T 176	65
Los Angeles Abrasion, %, max ^a	T 96	30
Magnesium Sulfate Soundness, max loss, %, 4 cycles	T 104	25

^a The abrasion test is to be run on the parent aggregate.

Table 2—Aggregate Grading Requirements

Sieve Size	Type I ^a Percent Passing	Type II ^a Percent Passing	Type III ^b Percent Passing	Stockpile Tolerance %
9.5 mm (3/8 in)	100	100	100	—
4.75 mm (No. 4)	100	90–100	70–90	± 5
2.36 mm (No. 8)	90–100	65–90	45–70	± 5
1.18 mm (No. 16)	65–90	45–70	28–50	± 5
600 µm (No. 30)	40–65	30–50	19–34	± 5
330 µm (No. 50)	25–42	18–30	12–25	± 4
150 µm (No. 100)	15–30	10–21	7–18	± 3
75 µm (No. 200)	10–20	5–15	8–15	± 2

^a Type I and II aggregates are typically used to fill surface voids, address surface distresses (scratch courses), seal, and provide a durable wearing surface. Type I is finer and is used in residential areas and on airport runways.

^b Type III aggregates are typically used to provide maximum friction resistance and an improved wearing surface. It is appropriate for heavy traffic applications, for rut filling, or for placement on highly textured surfaces requiring larger size aggregate to fill voids.

- 6.2. When tested in accordance with T 11 and T 27, the mix design aggregate gradation shall comply with one of the gradations in Table 2 (or one designated by the Owner Agency).
- 6.3. The gradation of the aggregate stockpile shall not vary by more than the stockpile tolerance, as indicated in Table 2, from the mix design gradation while also remaining within the gradation's specification band. The percentage of aggregate passing any two successive sieves shall not change from one end of the specified range to the other end.

7. MINERAL FILLER

- 7.1. Mineral filler may be used to improve mixture consistency and to adjust mixture breaking and curing properties. Portland cement, hydrated lime, limestone dust, fly ash, or other approved filler meeting the requirements of M 17, M 85, M 295 or M 303 shall be used if required by the mix

design. Typical use levels are 0 to 3.0 percent and may be considered part of the aggregate gradation.

8. WATER

- 8.1. Water shall be free of harmful salts and contaminants. If the quality of the water is in question, it should be submitted to the mix design laboratory for analysis along with the other raw materials to be used in the mix design.

9. ADDITIVES

- 9.1. Additives may be used to accelerate or retard the break or set of the micro surfacing material. Appropriate additives, and their applicable use range, should be approved by the mix design laboratory as part of the mix design process.

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