

GENERAL:

This specification governs the UPM® Permanent Pavement Repair Material. This bituminous patching material shall be composed of an approved aggregate and UPM® liquid asphalt blend mixed in an approved plant or pug with the guidance of a trained UNIQUE Paving Material Corp. (UNIQUE) Representative. The UPM liquid asphalt blend shall not strip from the approved aggregate and shall be available in various grades, which yield a total ambient temperature workability range of -15°F (-26°C) to 100°F (38°C). UPM mix will also be effective and suitable for wet or dry weather conditions. The patching mixture must also exhibit excellent coating, workability and adhesion characteristics. Stockpiles of UPM mix of 100 tons or more will maintain all performance features for at least 12 months. See the UPM mix High-Performance Guarantee.

PREPARATION OF MIXTURE:

- ♦ The UPM mix must include an approved aggregate and UPM liquid asphalt blend.
- ♦ The aggregate must be coated with an asphalt film of $\pm 10\%$ of the optimum calculated film for the specific aggregate used in each production.
- ♦ UNIQUE supervision at each production to adjust and optimize JMF is required.
- ♦ It is essential that a sample from each production be certified by UNIQUE'S lab; a "Certificate of Performance" will be issued following analysis verification.
- ♦ The mixture is to be stored on a paved stockpile pad or an established material base of UPM mix. The pad or material base shall be solely committed to this product.
- ♦ The asphalt shall be heated to a temperature between 185° - 265°F (85° - 130° C).
- ♦ The mixture shall consist of an aggregate and asphalt combined in a pug mill in the following proportions:

Asphalt	5.0 to 6.5% (optimized based on aggregate)
Aggregate	93.5 to 95%

- ♦ Heat should be applied to the aggregate when determined necessary by UNIQUE's laboratory testing prior to production of the mixture, or by a technical representative of UNIQUE Paving Materials.
- ♦ Under any of the above conditions the minimum amount of heat necessary to obtain coating or facilitate the operation of the plant may be utilized. Temperature is not to exceed 175°F (80°C) under any circumstance.
- ♦ When producing in a batch plant, wet mix time in the pug mill should be typically in the range of 30 to 45 seconds or until the aggregate is uniformly coated (greater than 95%) ASTM D 2489.

UPM® cold mix shall meet the following requirements:

Coating	ASTM D 2489	Above 95%
Stripping in distilled water	Visual	Less than 5%
Shelf Life of 100 tons or more		One-Year minimum
Extraction of bituminous materials	ASTM D 2172	3.5 min. 9.0% maximum
Sieve analysis of extracted aggregate	ASTM C 136	See Aggregate Specification
Minus 200 (0.075 mm) of extracted aggregate	ASTM C 117 & ASTM C 136	4.0% maximum ¹

Note 1: This value shall not be confused with the 2.5% maximum allowed for the Minus 200 Wash (0.075mm) loss on the raw aggregate before the production of UPM mix. That value is necessary to minimize the effect of the plant when producing the finished UPM mix.

PERFORMANCE DEMONSTRATION:

A performance demonstration using UPM® cold mix must be completed prior to the bid process. The demonstration must include a performance or lab evaluation documenting expected or actual performance. The following performance criteria must be included in the evaluation:

1. Cohesion & Adhesion

Measures the ability of the material to bond to itself and to the surrounding pavement. Performance is related to the capability of the material to remain in place. Maintaining adequate adhesion and cohesion will determine the degree to which material ravel from the pothole.

2. Workability & Stability

Measures the force required to move and apply the material at greater than 72°F. Workability and stability must be balanced so that the material can be applied and yet stable enough to handle traffic loads. These are functions of gradation, viscosity, and application temperature.

3. Cold Workability & Stability

Measures the force required to move and apply the material in cold weather, less than 32°F. Again, workability and stability must be balanced so that the material can be applied and yet stable enough to handle traffic loads.

Cold workability and stability generate a composite score of five points maximum for each parameter; maximum overall score of ten.

4. Film Thickness

Measures the thickness of the asphalt surrounding the aggregate. Testing for the effective film takes into account aggregate gradation and absorption characteristics. Film thickness determines shelf life, cohesion, and workability.

5. Sieve Analysis

Cold mix is 95% aggregate. Proper sizing, surface texture and absorption characteristics are critical to achieve proper compaction and load carrying capability.

6. Stripping

Measures the separation of asphalt from the aggregate. Performance relates to water handling characteristics of material in wet environment (i.e. heavy rain).

It is recognized that frequent failures requiring re-repairs exponentially increase maintenance costs and will likely result in material rejection. Due to manufacturing variations that occur with cold mix performance, re-verification is performed by UNIQUE's laboratory to maintain consistent quality.

The material shall remain workable in an uncovered stockpile if applicable, for a period of not less than 12 months.

Properly repaired potholes shall not show any significant signs of shoving, rutting, tracking or kick-up or ravel out within a period of 12 months from the time of repair.

In the event the UPM mix does not meet all the above requirements, UNIQUE will replace unsatisfactory material at no extra cost.

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“Providing valuable products from valuable people to valuable customers.”

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