



High Performance Permanent Pavement Repair Material Specifications

QPR No VOC Repair Material Asphalt/Blacktop Permanent Repair

DESCRIPTION

This material shall be a plant or pug mill mixed, high performance pavement patching material capable of storage in an uncovered outdoor stockpile for a maximum of 12 months. It shall be composed of laboratory approved mineral aggregates and modified bituminous QPR[®] No VOC Liquid Blend capable of coating wet aggregates (up to 4% moisture) without stripping and have stripping resistance of retained coating of not less than 95%. The permanent asphalt repair shall be uniform, remain flexible and cohesive to -15°F and be capable of retaining adhesive qualities in wet applications. The patching materials shall be able to repair asphalt, concrete, surface treated roads and shall not require removal and replacement if ever the pavement is overlaid.

ENVIRONMENTAL IMPACT

The modified bituminous asphalt repair must have an independent test conducted by a certified laboratory as to toxicology results in a Static Acute Bio Assay Procedures for Hazardous Materials which determines effect of run-off into waterways, lakes, ponds, and ground water. Furthermore, results of analysis for the toxicity should indicate a 0% mortality rate of Daphnia magna at 100% effluent concentration. Further, the repair material must be classified as non-hazardous, and biologically non-toxic. QPR[®] No VOC Repair Material conforms to ASTM D402 requirements. Independent laboratory results are available for review.

PACKAGED PRODUCT ERGONOMICS

The National Institute for Occupational Safety and Health researched this topic and offered recommended weight limits. As a basic starting point, one person should be able to lift an object weighing up to 51 pounds; If the object is within 7 inches from the front of his or her body. If there is no twisting involved. If there is a handle on the object.

QPR High Performance Cold Mix are packaged in double layer mylar bags with a handle designed with OSHA study recommendations. Handle shape, size and orientation

- Length of handle - minimum of 4 inches
- Handle diameter - minimum of 1.5 inches
- Handle span - maximum of 3 inches

MATERIALS

A) Aggregate

The aggregate shall consist of 100% crushed stone or a laboratory approved equivalent under ASTM C-136. All aggregate is to be from approved sources, and representative samples of both fine and coarse aggregate shall be from the plant site and laboratory tested. Sampling and testing methods shall be in accordance with accepted local practice.

Gradation analysis to comply with all local requirements. Recommended gradation analysis is as follows:

SCREEN SIZES	% Passing
3/8" (9.5mm)	97-100%
#4 (4.75mm)	83-100%
#8 (2.36mm)	58-80%
#16 (1.18mm)	42-62%
#50 (0.75mm)	20-40%
#200	5-20%



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All aggregate percentages are based on the total weight of aggregate.

ASTM	C-88	Soundness Loss	12.0% Max
ASTM	C-131	Los Angeles Abrasion	40.0% Max
ASTM	C-117-200	-200 Sieve (by wash)	2.0% Max
ASTM	C-127, 127	Absorption	1.0 - 2.0% Max
ASTM	C-127, 128	Specific Gravity	2.55 - 2.75% Max
ASTM	C-122	Soft Aggregates	3.0% Max

Aggregate Acceptance

Aggregate compatibility approval must be obtained from the QPR Quality Control Facility in Charleston, South Carolina prior to material mixing at any mixing plant.

B) Bituminous Material

The modified bituminous liquid blend shall be QPR[®] No VOC Liquid which meets the following requirements:

ASTM D-1310	Flashpoint (TOC):	400°F (204°C) Min.	
ASTM D-2170	Kinematic Viscosity at 140°F (60°C):	300-4000	
ASTM D-95	Water	0.2% Max.	
ASTM D-402	Distillate Test (volume of original sample):		
	To 437°F (225°C)	0%	
	To 500°F (260°C)	0%	
	To 600°F (315°C)	0%	
	Residue from distillate at 680°F (360°C)	0.62%	
Residue Tests			
ASTM D-2171	ABS. Viscosity at 140°F (60°C):	125-425	Poises
ASTM D-5	Penetration:	200	Min.
ASTM D-113	Ductility at 39°F (4°C) 0.4 in./Min:	100	Min.
ASTM D-2042	Solubility in Trichloroethylene:	99%	Min.

QPR[®] No VOC Liquid Blend shall be shipped from authorized blending terminal locations. Liquid shall be completely blended at terminal under supervision of authorized Quality Control personnel. No additives, modifiers, or extra ingredients are to be introduced into the liquid blend at any time after shipment from terminal. A copy of bill of lading and material certification shall accompany every shipment. QPR[®] No VOC Liquid Blend shall be shipped in insulated tankers to maintain oil temperature during transportation.

PLANT MIX

The finished material shall consist of aggregates meeting material as specified in Section A) Aggregate, and the bituminous liquid blend meeting material specified in section B) QPR[®] No VOC Bituminous Material as indicated in the proposed job mix formula. QPR[®] No VOC Bituminous Material shall be accepted at the supplier's source and at the plant site on the basis of a supplier material certification.

The preferred mixing ratio shall be 4.0% to 6.0% liquid blend per finished metric ton (2,205 lbs.) of mixed material. Continuous on-site testing will determine exact final mixing ratio which will be identified in the final job mix formula. All aggregate percentages are based on the total weight of the aggregate. The QPR[®] No VOC Liquid Blend content is based on the total



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weight of the mix.

The job mix formula information shall provide:

- Aggregate gradation band and aggregate type.
- QPR® No VOC Liquid Blend - amount and type including any additives used.
- Temperature ranges for material preparation.

MANUFACTURING PREPARATION & OPERATION

Asphalt Plant Production

The mixture is to be produced through a conventional hot asphalt plant only under the direct supervision of a qualified QPR sales representative and finished product will not exceed 180°F (82°C). The QPR® No VOC Liquid Blend shall not be heated above 200°F. The final mixture must be tested in accordance with QPR on-site quality control requirements.

Pug Mill Production

The mixture can be produced through a cold manufacturing process (PUGMILL). The QPR® No VOC Liquid Blend shall be heated between 220°F (104°C) to 260°F (126°C). The QPR® No VOC Liquid Blend temperature is elevated to help with the adhesion process between the bituminous liquid and the aggregate. The finished mix will not exceed 180°F when produced through the pugmill. The final mixture must be tested in accordance with the QPR on-site quality control requirements.

Stockpile Inspection

Prior to production, the stockpile site is to be inspected for any contaminant such as dirt, sand or debris that may affect the quality of the QPR® No VOC Repair Material. The stockpile area should be a hard surface, preferably paved with concrete, or a bituminous surface. Six (6) month shelf life. QPR® No VOC Repair Material may be stockpiled up to 6 months in an uncovered outdoor stockpile.

Specification Sampling

A one quart sample of the QPR® No VOC Liquid Blend will be retained at the asphalt depot prior to shipping. On delivery of the tank truck, an additional one-quart sample will be taken by the QPR sales representative and is to be retained by the customer/producer for a period of one year, or until the stockpile is depleted

QPR® Quality Control

On each load, a Quality Control Report will be prepared by the QPR Quality Control Technician. All phases of production of the plant operation and the material testing on each 150 tons of production will be prepared and entered accordingly in each category. Site tests will be completed which include Spot Test, Strip Resistance, Coating Observation and Roll Test.

Heating of Finished Product

QPR No VOC Material should not be heated above 70°F (21°C) when utilizing a hot box.

Training of Installation Crews

QPR will make available a complete training program for all road crews to ensure correct patching methods, along with updates on this subject.

QPR No VOC High Performance Pavement Repair, when applied according to our directions to deteriorated concrete or bituminous pavement surfaces, is guaranteed to adhere permanently to the repaired area for the life of the repair or until the surrounding pavement area fails. QPR will replace actual volumes of QPR No VOC at no charge for any QPR No VOC High Performance Pavement Repair that should ever ravel or release from a properly repaired area.

'QPR No VOC' is a registered trademark of QPR.