



High Performance Permanent Pavement Repair Material Material Specification

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 minimum of 12 months. It shall be composed of laboratory approved mineral aggregates and modified bituminous QPR[®] Liquid Oil Blend capable of coating wet aggregates 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 material shall be able to repair asphalt, concrete, surface treated roads and shall not require removal and replacement if ever the pavement repair area 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. Laboratory results must be available for review.

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:

<u>SCREEN SIZES</u>	<u>PERCENTAGE PASSING</u>
3/8"	100
#4	20 - 85
#8	2 - 40
#16	0 - 10
#50	0 - 6
#200	0 - 2

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 Sieve (by wash)	2.0% Max.
ASTM	C-127, 128	Absorption	1.0 - 2.0% Max.
ASTM	C-127, 128	Specific Gravity	2.55 - 2.75% Max
ASTM	C-123	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 production at any mixing plant.

B) Bituminous Material

The modified bituminous liquid oil blend shall be QPR® which meets the following requirements:

ASTM D-6373	Performance Graded Asphalt Binder	PG 58 -28 to PG 64 -22
ASTM D-1310	Flashpoint (TOC):	200° F (94° C.) minimum
ASTM D-402	Distillate Test (Volume of original sample):	
	To 437° F (225° C)	None
	To 500° F (260° C)	0 - 5%
	To 600° F (315° C)	0 - 25%
	Residue from distillate at 680° F (360° C)	72 – 95%
ASTM D-113	Ductility at 39° F (4° C) 0.4 in. /Min:	100 Minimum
ASTM D-2042	Solubility in Tricloroethylene:	99% Minimum

RESIDUE TESTS

ASTM D-2171	ABS. Viscosity at 140° F (60° C):	125-425 poises
ASTM D-5	Penetration:	200 Minimum
ASTM D-113	Ductility at 39° F (4° C) 0.4 in. /Min:	100 Minimum
ASTM D-2042	Solubility in Tricloroethylene:	99% Minimum

QPR® Liquid Oil 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 oil blend at any time after shipment from terminal. A copy of bill of lading and material certification shall accompany every shipment. Liquid Oil Blend shall be shipped in insulated tankers to maintain oil temperature during transportation.

PLANT MIX

The cold mix shall consist of aggregates meeting material as specified in Section A) *Aggregate*, and the bituminous liquid oil blend meeting material specified in section B) *Bituminous Material* as indicated in the proposed job mix formula. 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 4.5% to 6% liquid oil blend per finished ton (2000 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 bituminous liquid oil blend content is based on the total weight of the mix.

The job mix formula information shall provide:

- Aggregate gradation band and aggregate type.
- Bituminous material - 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 asphalt plant only under the direct supervision of a qualified QPR sales representative and finished product will not exceed 180°F. The bituminous liquid oil blend shall not be heated above 220°F. The final mixture must be tested in accordance with QPR on-site quality control requirements. When producing in an asphalt plant with heat, the finished QPR® material must be left in dump truck size loads for a minimum of 48 hours prior to pushing the material up into a large cone shaped stock pile, thus allowing the QPR® material to cool off to ambient temperature.

Pug mill Production

The mixture can be produced through a cold manufacturing process (PUG MILL). The QPR® Bituminous Liquid Oil Blend shall be heated between 200°F to 220°F. The QPR® Liquid Oil 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 Pug mill. 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 contaminants that may affect the quality of the QPR® High Performance Permanent Cold Patch. The stockpile area should be a hard clean surface, preferably paved with concrete, or a bituminous surface and have proper retention.

SPECIFICATION SAMPLING

A one quart sample of the QPR® Liquid Oil Blend will be retained at the asphalt blending terminal prior to shipment. Upon delivery of the transport tanker, an additional one-quart sample will be taken at the production site by the QPR sales representative and will be performed at the half way point of the load and is to be retained by the customer / producer for a period of one year, or until the stock pile 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® 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.

STOCKPILING

One (1) year shelf life. QPR® may be stockpiled up to 12 months in an uncovered outdoor stockpile.

QPR® 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® at no charge for any QPR® High Performance Pavement Repair that should ever ravel or release from a properly repaired area.

'QPR®', is a registered trademark of QPR.