



# Florida Department of Transportation

**CHARLIE CRIST**  
GOVERNOR

605 Suwannee Street  
Tallahassee, FL 32399-0450

**STEPHANIE KOPELOUSOS**  
SECRETARY

May 12, 2008

Dr. Leslie McCarthy, PhD, P.E.  
Program Operations Engineer  
Federal Highway Administration  
545 John Knox Road, Suite 200  
Tallahassee, Florida 32303

Re: Office of Design, Specifications  
Section 336  
Proposed Specification: 3360000-Asphalt Rubber Binder

Dear Dr. McCarthy:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

Tom Malerk of the State Materials Office proposed this change to:

- Modify the equipment, testing and certification requirements.

Please review and transmit your comments, if any, within four weeks. Comments should be sent via Email to ST986RP or rudy.powell@dot.state.fl.us.

If you have any questions relating to this specification change, please call Rudy Powell, State Specifications Engineer at 414-4110.

Sincerely,  
Signature on file  
Rudy Powell, Jr., P.E.  
State Specifications Engineer

RP/dm

Attachment

cc: Gregory Jones, General Counsel  
Florida Transportation Builders' Assoc.  
State Construction Engineer  
Marvin Williams, Federal Highway Administration

**ASPHALT RUBBER BINDER.****REV (3-13-08)**

SECTION 336 (Pages 279–282) is deleted and the following substituted:

**SECTION 336  
ASPHALT RUBBER BINDER****336-1 Description.**

Produce asphalt rubber binder for use in Asphalt Concrete Friction Courses and Asphalt Rubber Membrane Interlayers.

**336-2 Materials.**

**336-2.1 Superpave PG Asphalt Binder:** For the particular grade of asphalt as specified in Table 336-1, meet the requirements of Section 916.

**336-2.2 Ground Tire Rubber:** For the type of ground tire rubber, meet the requirements of Section 919.

**336-3 Asphalt Rubber Binder.**

Thoroughly mix and react the asphalt binder and ground tire rubber in accordance with the requirements of Table 336-1. Use a rubber type that is in accordance with the verified mix design. Accomplish blending of the asphalt binder and ground tire rubber at the asphalt-supplier's terminal or at the project site.

**336-4 Equipment.**

Use blending equipment that is designed for asphalt rubber binder and capable of producing a homogeneous mixture of ground tire rubber and asphalt binder meeting the requirements of Table 336-1. *Use a batch type or continuous type blending unit that provides for sampling of the blended and reacted asphalt rubber binder material during normal production and provides for accurate proportioning of the asphalt binder and ground tire rubber either by weight or volume.* ~~The Contractor may use a batch type or continuous type blending unit that provides for sampling of the blended and reacted asphalt rubber binder material during normal production. The unit must provide for accurate proportioning of the asphalt binder and ground tire rubber either by weight or volume. Once every six months, certify the accuracy of the meter used to determine the asphalt rubber binder content of bituminous mixtures. Obtain such certification from an approved scale technician.~~

In order to meet specification requirements, keep the asphalt rubber uniformly blended while in storage. Equip storage tanks with a sampling device.

**336-5 Testing and Certification Requirements.**

**336-5.1 Blending at Project Site:** Monitor the ground tire rubber content in the asphalt rubber binder on a daily basis based on the following:

(1) the weight of the ground tire rubber used and the gallons of asphalt rubber binder used *produced*, or (2) the weight of the ground tire rubber used and the

number of gallons of asphalt binder used. Use the weight per gallon for the various types of asphalt rubber binder shown in Table 336-1 for the calculations in (1) above.

**336-5.2 Blending at Asphalt Supplier's Terminal:** Where blending the asphalt rubber binder at the asphalt-supplier's terminal, *the supplier shall furnish certification on the bill of lading for each load delivered to the project site that includes: the quantity, the asphalt rubber binder type, the customer name, the delivery location, and certify a statement* that for each load delivered to the project site, the asphalt rubber binder has been produced in accordance with and meets the requirements of 336-3. In addition, include, with the certification, *copies of* the certifications for the asphalt binder and ground tire rubber, as specified in ~~916-1.2~~*916-1.3.6* and 919-6, respectively.

**336-5.3 Asphalt Rubber Binder Blending Quality Control Records:** Maintain adequate Quality Control records for the Engineers review of all blending activities. The Quality Control records shall include at a minimum the following information (for each batch of asphalt rubber binder *produced*): financial project number, shipping date, customer name *and delivery location*, asphalt rubber binder ~~grade~~*type*, asphalt binder ~~producer~~*supplier (including QPL number and LOT)*, asphalt binder quantity in gallons, ground tire rubber ~~producer and lot number~~*supplier (including QPL number and LOT)*, ground tire rubber quantity in pounds, and viscosity results.

#### **336-5.4 Testing of Asphalt Rubber Binder:**

**336-5.4.1 Quality Control Requirements:** Test the asphalt rubber binder for the viscosity requirement of Table 336-1 at the following frequencies and situations:

1. One per batch (for batch blending) or two per day (for continuous blending) during blending at the project site *or suppliers terminal*.
2. Each load delivered to the project site when blended at the asphalt-supplier's terminal.

3. Beginning of each day from the storage tank when storing the asphalt rubber binder at the project site, obtain the sample for testing from the discharge piping exiting the storage tank, ~~prior to its incorporation into the mix.~~

Obtain the viscosity testing equipment specified in FM 5-548 and make it available to the Engineer for verification purposes.

If the asphalt rubber binder does not meet the minimum viscosity requirement, make the appropriate adjustments in order to (1) correct the viscosity of the blended material, and (2) correct the blending operation. These corrective actions *within the requirements of Table 336-1* may include increasing the ground tire rubber content, lowering the ~~blended~~*blending* temperature, changing the supply of ground tire rubber or increasing the reaction time. In the event that the corrective actions taken fail to correct the problem, or the material consistently fails to meet the minimum viscosity requirement, stop all asphalt rubber production operations and solve the problem. Do not resume production operations until the Engineer grants approval. The Engineer may require that any mix placed with low viscosity asphalt rubber binder be evaluated in accordance with ~~334-9.4~~*334-5.1.9.55-9.5*. In the event that the viscosity of the asphalt rubber binder increases to the extent that *plant production or* paving operations of the mixture are adversely affected (i.e. density or texture problems occur), stop plant operations and resolve the problem to the Engineer's satisfaction.

**336-5.4.2 Verification Requirements:** The Engineer will test the asphalt rubber in accordance with FM 5-548 randomly on an as needed basis to ensure conformance with the minimum viscosity requirement as specified in Table 336-1.

Table 336-1			
Asphalt Rubber Binder			
Binder Type	ARB 5	ARB 12	ARB 20
Rubber Type	TYPE A (or B)*	TYPE B (or A)**	TYPE C (or B or A)**
Minimum Ground Tire Rubber (by weight of asphalt binder)	5%	12%	20%
Binder Grade	PG 67-22	PG 67-22	PG 64-22
Minimum Temperature	300°F	300°F	335°F
Maximum Temperature	335°F	350°F	375°F
Minimum Reaction Time	10 minutes	15 minutes (Type B)	30 minutes (Type C)
Unit Weight @ 60°F***	8.6 lbs/gal	8.7 lbs/gal	8.8 lbs/gal
Minimum Viscosity ****	4.0 Poise @ 300°F	10.0 Poise @ 300°F	15.0 Poise @ 350°F

\* Use of Type B rubber may require an increase in the mix temperature in order to offset higher viscosity values.  
 \*\* Use of finer rubber could result in the reduction of the minimum reaction time.  
 \*\*\* Conversions to standard 60°F are as specified in 300-9.3.  
 \*\*\*\* FM 5-548, Viscosity of Asphalt Rubber Binder by use of the Rotational Viscometer.  
 NOTE: The Contractor may adjust the minimum reaction time if approved by the Engineer depending upon the temperature, size of the ground tire rubber and viscosity measurement determined from the asphalt rubber binder material prior to or during production. Apply the asphalt rubber binder for use in membrane interlayers within a period of six hours, unless some form of corrective action such as cooling and reheating is approved by the Engineer.

### 336-6 Use of Excess Asphalt Rubber.

The Contractor may use excess asphalt rubber in other asphalt concrete mixes requiring the use of a PG 67-22 binder by blending with straight PG 67-22 binder so that the total amount of ground tire rubber in the binder is less than 2.0%. The Contractor may use excess asphalt rubber in asphalt concrete mixtures requiring the use of a recycling agent in a recycled mixture by blending with a recycling agent in such proportions that the total amount of ground tire rubber in the recycling agent is less than 1.0%.

### 336-7 Basis of Payment.

Payment for Asphalt Rubber Binder will be included in Sections 337 and 341, as appropriate.

**ASPHALT RUBBER BINDER.****REV (3-13-08)**

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**336-2.2 Ground Tire Rubber:** For the type of ground tire rubber, meet the requirements of Section 919.

**336-3 Asphalt Rubber Binder.**

Thoroughly mix and react the asphalt binder and ground tire rubber in accordance with the requirements of Table 336-1. Use a rubber type that is in accordance with the verified mix design. Accomplish blending of the asphalt binder and ground tire rubber at the supplier's terminal or at the project site.

**336-4 Equipment.**

Use blending equipment that is designed for asphalt rubber binder and capable of producing a homogeneous mixture of ground tire rubber and asphalt binder meeting the requirements of Table 336-1. Use a batch type or continuous type blending unit that provides for sampling of the blended and reacted asphalt rubber binder material during normal production and provides for accurate proportioning of the asphalt binder and ground tire rubber either by weight or volume. In order to meet specification requirements, keep the asphalt rubber uniformly blended while in storage. Equip storage tanks with a sampling device.

**336-5 Testing and Certification Requirements.**

**336-5.1 Blending at Project Site:** Monitor the ground tire rubber content in the asphalt rubber binder on a daily basis based on the following:

(1) the weight of the ground tire rubber used and the gallons of asphalt rubber binder produced, or (2) the weight of the ground tire rubber used and the number of gallons of asphalt binder used. Use the weight per gallon for the various types of asphalt rubber binder shown in Table 336-1 for the calculations in (1) above.

**336-5.2 Blending at Supplier's Terminal:** Where blending the asphalt rubber binder at the supplier's terminal, the supplier shall furnish certification on the bill of lading for each load delivered to the project site that includes: the quantity, the asphalt rubber binder type, the customer name, the delivery location, and a statement that the asphalt rubber binder has been produced in accordance with and meets the requirements

of 336. In addition, include, with the certification, copies of the certifications for the asphalt binder and ground tire rubber, as specified in 916-1.3.6 and 919-6, respectively.

**336-5.3 Asphalt Rubber Binder Blending Quality Control Records:** Maintain adequate Quality Control records for the Engineers review of all blending activities. The Quality Control records shall include at a minimum the following information (for each batch of asphalt rubber binder produced): financial project number, shipping date, customer name and delivery location, asphalt rubber binder type, asphalt binder supplier (including QPL number and LOT), asphalt binder quantity in gallons, ground tire rubber supplier (including QPL number and LOT), ground tire rubber quantity in pounds, and viscosity results.

**336-5.4 Testing of Asphalt Rubber Binder:**

**336-5.4.1 Quality Control Requirements:** Test the asphalt rubber binder for the viscosity requirement of Table 336-1 at the following frequencies and situations:

1. One per batch (for batch blending) or two per day (for continuous blending) during blending at the project site or suppliers terminal.
2. Each load delivered to the project site when blended at the supplier's terminal.
3. Beginning of each day from the storage tank when storing the asphalt rubber binder at the project site, obtain the sample for testing from the discharge piping exiting the storage tank.

Obtain the viscosity testing equipment specified in FM 5-548 and make it available to the Engineer for verification purposes.

If the asphalt rubber binder does not meet the minimum viscosity requirement, make the appropriate adjustments in order to (1) correct the viscosity of the blended material, and (2) correct the blending operation. These corrective actions within the requirements of Table 336-1 may include increasing the ground tire rubber content, lowering the blending temperature, changing the supply of ground tire rubber or increasing the reaction time. In the event that the corrective actions taken fail to correct the problem, or the material consistently fails to meet the minimum viscosity requirement, stop all asphalt rubber production operations and solve the problem. Do not resume production operations until the Engineer grants approval. The Engineer may require that any mix placed with low viscosity asphalt rubber binder be evaluated in accordance with 334-5.1.9.5. In the event that the viscosity of the asphalt rubber binder increases to the extent that plant production or paving operations of the mixture are adversely affected (i.e. density or texture problems occur), stop plant operations and resolve the problem to the Engineer's satisfaction.

**336-5.4.2 Verification Requirements:** The Engineer will test the asphalt rubber in accordance with FM 5-548 randomly on an as needed basis to ensure conformance with the minimum viscosity requirement as specified in Table 336-1.

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