EXPECTED IMPLEMENTATION JANUARY 2016

DRAFT

916 BITUMINOUS MATERIALS.
(REV 5-19-15) (FA 7-13-15) (1-16)

SECTION 916 is deleted and the following substituted:

SECTION 916
BITUMINOUS MATERIALS

916-1 General.

All products supplied under this Specification shall be one of the products included on the Approved Product List (APL). Producers seeking evaluation of a product for inclusion on the APL shall submit an application in accordance with Section 6.

For liquid anti-strip agents, in addition to the above, producers shall include a report of test results from an independent laboratory confirming the material meets the requirements of this section. In lieu of submitting test results from an independent laboratory, the Department will evaluate the material. For each liquid anti-strip agent, the producer will submit one pint of a representative sample of liquid anti-strip agent to the State Materials Office when submitting the APL application to the Department's Product Evaluation Section.

Any marked variation from the original test values for a material below the established limits or evidence of inadequate quality control or field performance of a material will be considered sufficient evidence that the properties of the material have changed, and the material will be removed from the APL.

916-2 Superpave PG Asphalt Binder:

916-2.1 Requirements: Superpave Performance Graded (PG) asphalt binders, identified as PG 52-28, PG 58-22, PG 67-22, polymer modified asphalt (PMA) binders, PG 76-22 (PMA) and PG 82-22 (PMA), and asphalt rubber binders (ARB), PG 76-22 (ARB), shall meet the requirements of 916-2 and AASHTO M332-14. All PG asphalt binders shall meet the following additional requirements:

1. The intermediate test temperature at 10 rad/sec. for the Dynamic Shear Rheometer (DSR) test (AASHTO T315-12) shall be 26.5ºC for PG grades PG 67 and higher.
2. An additional high temperature grade of PG 67 is added for which the high test temperature at 10 rad/sec for the DSR test (AASHTO T315-12) shall be 67ºC.
3. All PG asphalt binders having a high temperature designation of PG 67 or lower shall be prepared without modification.
4. All PMA binders having a high temperature designation higher than PG 67 shall only be produced with a styrene-butadiene-styrene (SBS) or styrene-butadiene (SB) elastomeric polymer modifier and the resultant binder shall meet all requirements of this Section.
5. Polyphosphoric acid may be used as a modifier not exceeding 0.75% by weight of asphalt binder for PG 76-22 (PMA), PG 76-22 (ARB), and PG 82-22 (PMA) binders.
6. PG 76-22 (ARB) shall meet the additional requirements of 916-2.1.1.
7. All PG asphalt binders having a high temperature designation of PG 67 or lower shall not have a high temperature true grade more than 5.9°C higher than the specified PG grade, (for example, if a PG 58-22 is specified, do not supply a PG 64-22 or higher).

For all PG binder used in all hot mix asphalt, silicone may be added to the PG binder at the rate of 25 cubic centimeters of silicone mixed to each 5,000 gallons of PG binder. If

DRAFT

a disbursing fluid is used in conjunction with the silicone, the resultant mixture containing the full 25 cubic centimeters of silicone shall be added in accordance with the manufacturer's recommendation. The blending of the silicone with the PG binder shall be done by the supplier prior to the shipment. When the asphalt binder will be used with a foaming warm mix technology, refer to the technology supplier's guidance on the addition of silicone.

Where an anti-strip additive is required, per the requirements of Sections 334 and 337, the amount shall be from 0.25% to 0.75% by weight of asphalt binder. The anti-strip additive shall meet the requirements of 916-4. The anti-strip additive shall be introduced into the PG binder by the supplier during loading.

916-2.1.1 Additional Requirements for PG 76-22 (ARB): The following additional requirements apply only to PG 76-22 (ARB):

1. The asphalt binder shall contain a minimum of 7.0% ground tire rubber (GTR) by weight of asphalt binder.
2. The GTR shall meet the requirements of Section 919.
3. Polymer modification is optional for PG 76-22 (ARB).
4. Use of excess PG 76-22 (ARB): The Contractor may use excess PG 76-22 (ARB) 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 PG 76-22 (ARB) in asphalt concrete mixtures requiring the use of a PG 52-28 or PG 58-22 by blending with the designated binder in such proportions that the total amount of ground tire rubber in the binder is less than 1.0%.

916-2.2 Compliance with Materials Manual: Producers of Superpave PG binders shall meet the requirements of Section 3.5, Volume II of the Department's Material Manual, which may be viewed at the following URL:
http://www.dot.state.fl.us/programmanagement/Implemented/URLinSpecs/files/Section3.5-51815.pdf

916-2.3 Reporting: Specification compliance testing results shall be reported for the tests in the table below, unless noted otherwise. Quality control (QC) testing results shall be reported for original binder DSR (G/sin δ and phase angle, as applicable).

SUPERPAVE PG ASPHALT BINDER		
Test and Method	Conditions	Specification Minimum/Maximum Value
Superpave PG Asphalt Binder Grade		Report
APL Number		Report
Modifier (name and type)	Polymer, Ground Tire Rubber with Approved Product List (APL) number and any Rejuvenating Agents	Report
Original Binder		
Solubility, AASHTO T 44-13	in Trichloroethylene	Minimum 99.0% (Not applicable for PG 76-22 (ARB))

DRAFT

Flash Point, AASHTO T48-06 (2010)	Cleveland Open Cup	Minimum 450ºF
Rotational Viscosity, AASHTO T 316-13	275ºF	Maximum 3 Pa·s[a]
Dynamic Shear Rheometer [b], AASHTO T315-12	$G^*/\sin\delta$	Minimum 1.00 kPa
	Phase Angle, δ[c] PG 76-22 (PMA) and PG 76-22 (ARB)[d] PG 82-22 (PMA)	Maximum 75 degrees Maximum 65 degrees
Separation Test, ASTM D 7173-11 and Softening Point, AASHTO T53-11	163±5°C 48 hours	Maximum 15°F (PG 76-22 (ARB) only)
Rolling Thin Film Oven Test Residue (AASHTO T 240-09)		
Rolling Thin Film Oven, AASHTO T240-13	Mass Change %	Maximum 1.00
Multiple Stress Creep Recovery, $J_{nr,\,3.2}$ AASHTO M322-14	Grade Temperature (Unmodified binders only)	"S" = 4.50kPa^{-1} max
Multiple Stress Creep Recovery, $J_{nr,\,3.2}$[d, e, f] AASHTO M332-14	67°C (Modified binders only)	"V" = 1.0 kPa^{-1} max "E" = 0.5 kPa^{-1} max Maximum $J_{nr,diff}$ = 75%
Multiple Stress Creep Recovery, %Recovery[d, e] AASHTO M332-14	67°C (Modified binders only)	$\%R_{3.2} \geq 29.37 (J_{nr,\,3.2})^{-0.2633}$
Pressure Aging Vessel Residue (AASHTO R 28-12)		
Dynamic Shear Rheometer, AASHTO T315-12	$G^*\sin\delta$, 10 rad/sec.	Maximum 5000 kPa[f, g]
Creep Stiffness, AASHTO T313-12	S (Stiffness), @ 60 sec. m-value, @ 60 sec.	Maximum 300 MPa Minimum 0.300

(a) Binders with values higher than 3 Pa·s should be used with caution and only after consulting with the supplier as to any special handling procedures, including pumping capabilities.
(b) Dynamic Shear Rheometer (AASHTO T 315) shall be performed on original binders for the purposes of QC testing only.
(c) The original binder phase angle (AASHTO T 315-12) shall be performed at grade temperature.
(d) AASHTO T 315-12 and AASHTO T 350-14 will be performed at a 2 mm gap for PG 76-22 (ARB)
(e) All binders with a high temperature designation >67 will be tested at 67°C. PG 76-22 (PMA) and PG 76-22 (ARB) shall pass a "V" graded and PG 82-22 (PMA) shall pass an "E" grade per AASHTO M 332-14.
(f) A maximum Jnr diff = 75% does not apply for any Jnr value < 0.5 kPa-1.
(g) For all PG grades of a PG 67 or higher, perform the PAV residue testing at 26.5°C with a maximum of 5000 kPa.

916-3 Asphalt Emulsions.

916-3.1 Compliance with Materials Manual: Producers of asphalt emulsions shall meet the requirements of Section 3.4, Volume II of the Department's Material Manual, which may be viewed at the following URL:
http://www.dot.state.fl.us/programmanagement/Implemented/URLinSpecs/files/Section3.4-51815.pdf

916-3.2 Requirements: Use a prime coat meeting the requirements of AASHTO M140-08 for anionic emulsions, AASHTO M208-01 (2009) or AASHTO M316-13 for cationic

DRAFT

emulsions, or as specified in the Producer's QC Plan. For anionic emulsions, the cement mixing test will be waived. For tack products the minimum testing requirements shall include percent residue, naphtha content (as needed), one-day storage stability, sieve test, Saybolt Furol viscosity, original DSR, phase angle, and solubility. Residue testing shall be performed on residue obtained from distillation (AASHTO T59-13) or low- temperature evaporation (AASHTO PP72-11(2013) Method B).

916-4 Liquid Anti-strip Agents.

916-4.1 Requirements: Liquid anti-strip agents shall be tested in accordance with FM 5-508. Tensile strength ratios will be calculated for the following two conditions and expressed as percentages: 1) conditioned mixture without anti-strip to unconditioned mixture without anti-strip and 2) conditioned mixture with anti-strip to unconditioned mixture without anti-strip. A 20% gain in tensile strength ratio for condition 2 as compared to condition 1 shall be required.

916-4.2 Mix Design Verification: Inclusion of a liquid anti-strip agent on the APL does not guarantee that the anti-strip will be approved for use in an asphalt mixture. Specifications may require subsequent moisture susceptibility testing per FM 1-T283 for the particular mix design. Results from this testing may indicate the need for a larger dosage rate of anti-strip agent (up to 0.75% maximum) or a different anti-strip agent to meet the specification requirements.