



## Florida Department of Transportation

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**This Memo Has Expired**

**MATERIALS BULLETIN NO. 03-09**

**DCE MEMORANDUM NO. 03-09**

*(FHWA Approved: 3/25/09)*

**TO: DISTRICT MATERIALS RESEARCH ENGINEERS  
DISTRICT CONSTRUCTION ENGINEERS**

**FROM:** Thomas O. Malerk, P.E., Director, Office of Materials  
David A. Sadler, P.E., Director, Office of Construction

**COPIES:** Bob Burleson, Jim Warren, Jim Musselman, Chris Richter (FHWA)

**SUBJECT: WARM MIX ASPHALT**

The use of warm mix asphalt will be addressed in a future revision of the Standard Specifications. In the interim, this memorandum is issued to provide specification language for warm mix asphalt for projects where the Contractor has proposed to use warm mix asphalt and the Engineer has agreed to its use.

Replace subarticle 330-3.2.2 with the following:

**330-3.2.2 Temperature:** Spread the mixture only when the air temperature in the shade and away from artificial heat is at least 40°F for layers greater than 1 inch (100 lb/yd<sup>2</sup>) in thickness and at least 45°F for layers 1 inch (100 lb/yd<sup>2</sup>) or less in thickness (this includes leveling courses). The minimum temperature requirement for leveling courses with a spread rate of 50 lb/yd<sup>2</sup> or less is 50°F. The minimum ambient temperature requirement may be reduced by 5°F when using warm mix technology, if mutually agreed to by both the Engineer and the Contractor.

Replace subarticle 334-3.2.1 with the following:

**334-3.2.1 General:** Design the asphalt mixture in accordance with AASHTO R35 04, except as noted herein. Prior to the production of any asphalt mixture, submit the proposed mix design with supporting test data indicating compliance with all mix design criteria to the Engineer. For Traffic Level B through E mix designs, include representative samples of all component materials, including asphalt binder. Allow the State Materials Engineer a maximum of four weeks to either conditionally verify or reject the mix as designed.

For Traffic Level C through E mix designs, final verification of the mix design will occur when the requirements of 334-5.1.2.1 have been met. Do not use more than three mix designs per nominal maximum aggregate size per traffic level per binder grade per contract year. Exceeding this limitation will result in a maximum Composite Pay Factor of 1.00 as defined in 334-8.2 for all designs used beyond this limit.

Warm mix technologies (additives, foaming techniques, etc.) listed on the Department's website may be used in the production of the mix. The URL for obtaining this information, if available, is:

<http://www.dot.state.fl.us/statematerialsoffice/quality/programs/warmmixasphalt/index.shtm>

The Engineer will consider any marked variations from original test data for a mix design or any evidence of inadequate field performance of a mix design as sufficient evidence that the properties of the mix design have changed, and the Engineer will no longer allow the use of the mix design.

Replace subarticle 334-3.2.7 with the following:

**334-3.2.7 Additional Information:** In addition to the requirements listed above, provide the following information with each proposed mix design submitted for verification:

1. The design traffic level and the design number of gyrations (N<sub>design</sub>).
2. The source and description of the materials to be used.
3. The DOT source number and the DOT product code of the aggregate components furnished from a DOT approved source.
4. The gradation and proportions of the raw materials as intended to be combined in the paving mixture. The gradation of the component materials shall be representative of the material at the time of use. Compensate for any change in aggregate gradation caused by handling and processing as necessary.
5. A single percentage of the combined mineral aggregate passing each specified sieve. Degradation of the aggregate due to processing (particularly material passing the No. 200 sieve) should be accounted for and identified.
6. The bulk specific gravity (G<sub>sb</sub>) value for each individual aggregate and RAP component, as identified in the Department's aggregate control program.
7. A single percentage of asphalt binder by weight of total mix intended to be incorporated in the completed mixture, shown to the nearest 0.1 percent.
8. A target temperature for the mixture at the plant (mixing temperature) and a target temperature for the mixture at the roadway (compaction temperature) in accordance with 330-6.3. Do not exceed a target temperature of 330°F for modified asphalts (PG 76-22, ARB-5, and ARB-12) and 315°F for unmodified asphalts.
9. Provide the physical properties achieved at four different asphalt binder contents. One of which shall be at the optimum asphalt content, and must conform to all specified physical requirements.
10. The name of the CTQP Qualified Mix Designer.
11. The ignition oven calibration factor.
12. The warm mix technology, if used.

Replace subarticle 337-2.1 with the following:

**337-2.1 General Requirements:** Meet the requirements specified in Division III as modified herein. The Engineer will base continuing approval of material sources on field performance. Warm mix technologies (additives, foaming techniques, etc.) listed on the Department's website may be used in the production of the mix. The URL for obtaining this information, if available, is: <http://www.dot.state.fl.us/statematerialsoffice/quality/programs/warmmixasphalt/index.shtm>

Replace subarticle 337-7.3 with the following:

**337-7.3 Temperature Requirements for FC-5:**

**337-7.3.1 Air Temperature at Laydown:** Spread the mixture only when the air temperature (the temperature in the shade away from artificial heat) is at or above 65°F. As an exception, place the mixture at temperatures no lower than 60°F, only when approved by the Engineer based on the Contractor's demonstrated ability to achieve a satisfactory surface texture and appearance of the finished surface. The minimum ambient temperature may be further reduced to 55°F when using warm mix technology, if agreed to by both the Engineer and the Contractor.

**337-7.3.2 Temperature of the Mix:** Heat and combine the asphalt rubber binder and aggregate in a manner to produce a mix having a temperature, when discharged from the plant, meeting the requirements of 330-6.3. Meet all requirements of 330-9.1.2 at the roadway. The target mixing temperature shall be established at 320°F. The target mixing temperature may be reduced when using warm mix technology, if agreed to by the Engineer and the Contractor.

Replace subarticle 337-7.5.1 with the following:

**337-7.5.1 Air Temperature at Laydown:** Spread the mixture only when the air temperature (the temperature in the shade away from artificial heat) is at or above 45°F. The minimum ambient temperature may be reduced by 5°F when using warm mix technology, if agreed to by both the Engineer and the Contractor.

This memorandum serves as a blanket approval to process a no-cost specification change for on-going projects and should be attached to the Work Order or Supplemental Agreement accomplishing this task.

For any questions concerning this matter, please contact Greg Sholar, (352) 955-2920, or Pat Upshaw, (352) 955-2906, at the State Materials Office.

TM/DS/smw