

Part I, Sub-Part 2:

Asphalt Emulsion - 20-3 (Certifying Suppliers and Contractors)

1. REFERENCED DOCUMENTS

- 1.1 CDOT Standard Specifications:
Section 702, Bituminous Materials
Table 702-2 to Table 702-7
- 1.2 AASHTO Standards:
T 40 Method of Sampling Bituminous Materials
R 18 AASHTO Accreditation Program
- 1.3 ASTM Standards:
D 8 Definitions of Terms Relating to Materials for Roads and Pavements

2. TERMINOLOGY

- 2.1 Emulsion – A binder that is emulsified with water in a colloid mill.
- 2.2 Supplier - A Supplier shall be defined as one who produces the final product or who makes the blend or modification that alters the properties of the emulsion specified in Section 702 of the Standard Specifications and/or other appropriate CDOT specifications. A Supplier shall be a refinery, a terminal, or an emulsion producer. If no modification is made to the emulsion after its initial production at the refinery, the refinery shall be the supplier and must provide certification. If there is any modification of the emulsion at the terminal, the terminal becomes the supplier and must provide the certification. No emulsion will be produced or blended to specification at the hot mix asphalt (HMA) plant.
- 2.3 Refinery Facility - A facility that is a producer of petroleum asphalts by refining the residuum from crude petroleum. The three types of petroleum asphalts refined are; Asphalt Cements, Emulsion Asphalts, Cutback Asphalts.
- 2.4 Terminal Facility - A facility that can receive, store and distribute petroleum asphalts. May have the ability to modify petroleum asphalts.
- 2.5 Storage Facility- A facility that can receive, store and distribute petroleum asphalts. The facility does not have the ability to modify the petroleum asphalt.
- 2.6 Contractor - The Company, who places the emulsion on the project under contract with CDOT.

3. SIGNIFICANCE AND USE

- 3.1 This standard specifies requirements and procedures for a certification system that shall be applicable to all suppliers and contractors providing asphalt emulsions. The requirements and procedures shall apply to materials that meet the requirements of CDOT specifications for emulsions. These provisions initially apply to the refinery manufacturing the emulsion and or to the terminals where emulsions are modified. These provisions subsequently apply to the Contractor, after delivery of the emulsion to the Contractor, for use on CDOT projects.

- 3.2 This standard specifies procedures intended to minimize disruption of emulsion shipments. This is accomplished by a certification system that evaluates quality control and specification compliance tests performed by the Supplier and the Contractor according to their quality control plans.

4. SAMPLING

- 4.1 All test samples required by this standard shall be obtained in accordance with AASHTO T 40. A supplier may propose an alternate method of sampling that will ensure the sampling of a non-segregated product.

5. TESTING REQUIREMENTS

- 5.1 All certification testing required for this standard shall be performed by a laboratory currently covered by AMRL accreditation. Any satellite laboratory of a Supplier that performs required testing under this standard will be identified in the submitted Supplier Quality Control Plan (Section 7) and shall be approved by CDOT.

6. SUPPLIER CERTIFICATION REQUIREMENTS

- 6.1 The Supplier shall submit to CDOT for approval a complete Quality Control Plan that complies with the requirements of Section 7. If the Quality Control Plan is rejected, the Supplier may modify the plan based on the critique provided and then resubmit it to CDOT for approval.
- 6.2 Once the Supplier's Quality Control Plan is approved by CDOT, the Supplier shall submit to the CDOT Product Evaluation Coordinator a completed copy of CDOT Form 595 (Pre-Approved Product Evaluation Request & Summary) for each emulsion. The Form 595 can be located within Notice to Manufacturers at: <https://www.codot.gov/business/apl> The Form 595 is designed as a PDF Writeable form, which must be completed by the Supplier. The completed form shall be returned to CDOT's Product Evaluation Coordinator as an e-mail attachment.
- 6.2.1 The Form 595 "Product name" field shall identify the submitted emulsion and the construction year of the submittal (i.e. "CRS-2P (2018)").
- 6.2.2 The Form 595 will serve as the request to CDOT for authorization to ship emulsion as referenced within this Colorado Procedure.
- 6.3 The Supplier shall forward to CDOT the initial testing data for the emulsion identified on the Form 595 and a copy of the SDS. The Supplier shall also obtain and provide a split sample for the CDOT Central Laboratory from the first production run of the emulsion identified on the Form 595. This will be concurrent with the first shipments of the construction season when the emulsion is being made for the first time that season.
- 6.3.1 If the submitted sample required in Subsection 6.3 fails the verification testing and is rejected by CDOT, then the Supplier may submit to CDOT a new test sample with a new CDOT Form 595, updated initial test data, and an SDS. If CDOT rejects this second submittal then the Supplier may resubmit again. However, this third submittal for the same Product name (emulsion type for that calendar year) shall include, in addition to all requirements in Subsection 6.3, a test report from an independent AMRL accredited laboratory.

- 6.4 The Supplier shall allow CDOT to visit the production and/or shipping site during normal business hours to perform an audit by observing the Supplier's quality control activities, to inspect the facilities, and to obtain samples for test.
- 6.5 The Supplier shall follow the procedures described in the CDOT approved quality control plan.
- 6.6 The Supplier shall establish a continuing test record for every test required for each emulsion included in the written request as prepared to satisfy the requirements of Subsection 6.1.
- 6.7 The Supplier shall submit to CDOT all reports required by this standard in a format approved by CDOT.
- 6.8 The Supplier shall have a satisfactory record of compliance with CDOT project specifications. Decisions by CDOT concerning this requirement shall be based on the test results furnished by the supplier and satisfactory results when the splits and field tests are compared with supplier tests.

7. SUPPLIER QUALITY CONTROL PLAN (MINIMUM REQUIREMENTS)

- 7.1 The Supplier's Quality Control Plan shall identify the following:
 - 7.1.1 Facility type (refinery, terminal).
 - 7.1.2 Facility location (actual physical address).
 - 7.1.3 Name and telephone number of the person responsible for quality control at the facility.
 - 7.1.4 Quality control tests and testing frequency to be performed on each type of emulsion.
 - 7.1.5 Name and location of the laboratory performing quality control tests on the emulsion that is shipped.
- 7.2 The Supplier's Quality Control Plan shall include a declaration stating that if a test result indicates that a shipment of emulsion is not in compliance with the purchase specifications, the Supplier shall:
 - 1. Identify the material in the shipment
 - 2. Immediately cease the shipment until the material complies with the specification
 - 3. Immediately notify CDOT regarding the shipment in question
 - 4. Immediately notify the Contractors scheduled to use the material from the shipment in question
 - 5. Notify CDOT prior to resuming shipment
 - 6. Implement any mutually agreed upon procedures for the disposition of the material
- 7.3 The Supplier's quality control plan shall describe method and frequency for initial testing, specification compliance testing, and quality control testing for guiding the manufacturer.

- 7.3.1 **Initial Testing** - For each type of emulsion to be supplied, specification compliance testing shall be initially performed and the results of that testing provided to CDOT, accompanied by a sample of the material represented by the test results. Specification compliance testing shall confirm that the emulsion conforms to all requirements of Section 702 of the Standard Specifications. This will be concurrent with the first shipments of the construction season when the emulsion is being made for the first time that season.
- 7.3.2 **Specification Compliance Testing** - Specification compliance testing shall be run on a routine basis and the results submitted to CDOT at a minimum of once per month.
- 7.3.3 **Quality Control Testing for Guiding the Manufacturer** – Tests to determine conformance with Section 702 of the Standard Specifications tests shall be conducted as needed for quality control. The Quality Control Plan shall indicate the frequency of this testing. Non-Section 702 tests, of the Standard Specifications, may be used for guiding the manufacturer. The use of non-Section 702 tests does not preclude the need to meet Section 702 requirements or to run complete Section 702 tests as indicated in the Quality Control Plan.
- 7.4 The Supplier's quality control plan shall include a statement that the Supplier will prepare and maintain summary reports for all quality control and specification compliance tests performed, and will submit them to CDOT on request.
- 7.5 The Supplier's quality control plan shall provide an outline of the procedure to be followed for checking transport vehicles before loading to prevent contamination of shipments. The outline shall include a statement that the Transport Vehicle Inspection Report, signed by the designated inspector, shall be maintained in the Supplier's records and will be made available to CDOT on request.

8. CDOT EVALUATION PROCEDURE

- 8.1 CDOT will verify that the Supplier's quality control plan is adequate. CDOT may visit the shipping site when required.
- 8.2 CDOT will notify the Supplier whether or not the Supplier's application for Certified Emulsion Supplier status has been granted. The notification shall include a list of the types of emulsions covered.
- 8.3 CDOT may verify that the Supplier's specification compliance testing laboratory is currently covered by AASHTO accreditation.
- 8.4 CDOT may verify that the Supplier's specification compliance testing laboratory participates in a round robin testing program.
- 8.5 CDOT may perform split sample testing in accordance with Section 10.
- 8.6 CDOT will perform quality assurance testing.
- 8.7 CDOT may inspect the operations of the Supplier's facility including those related to the emulsion shipments if required.

- 8.8 CDOT will post the Supplier's approved emulsion type with the associated Supplier's facility name on CDOT's Approved Products List. Reference to the web site is at <https://www.codot.gov/business/apl>.

9. REQUIREMENTS FOR SHIPPING EMULSIONS BY AN APPROVED SUPPLIER

- 9.1 The Supplier's Quality Control Plan as approved by CDOT (Section 8) shall be implemented.

- 9.2 Each shipment shall be accompanied by two copies of the bill of lading, which shall include:

1. The name and location of the Supplier, as stated in the Supplier's Quality Control Plan.
2. The type of emulsion.
3. The quantity of material shipped.
4. The date of shipment
5. A certificate of compliance (COC) certifying the material meets specification requirements. The COC statement will certify the material was manufactured and tested in accordance with the CDOT approved Quality Control Plan (Section 7) and, therefore, meets state requirements (example in Chapter 400).
6. A statement certifying that the transport vehicle was inspected before loading and was found acceptable for the material shipped. The COC statement will certify the material was manufactured and tested in accordance with CDOT's approved Quality Control Plan (Section 7) and, therefore, meets state requirements.

- 9.3 If the specification compliance test results do not conform to emulsion specifications, the Supplier shall remove the non-compliant material from the shipping queue as outlined in Subsection 7.2.

10. SPLIT SAMPLE TESTING

- 10.1 CDOT may request split sample testing. The test results will be exchanged as soon as they are available.

- 10.2 If the split sample test data is not within the precision specified for that particular test a review of both sampling and testing procedures will be conducted by both the supplier and CDOT.

11. REPORT AND DATA SHEETS

- 11.1 Supplier Reports - The Supplier shall prepare the reports described in Subsections 6.1, 6.2, 6.3, 6.6, 6.7, 7.2, 7.4, 7.5, 9.2, and 9.3.

12. RECERTIFICATION

- 12.1 If a supplier has been decertified and seeks to be recertified, the supplier must fulfill the requirements for certification, as per Section 6.

13. FIELD QUALITY CONTROL OF EMULSION(S)

- 13.1 The field quality control of the emulsion shall be the responsibility of the Contractor. Prior to accepting deliveries of emulsion, the contractor shall submit a Field Quality Control (FQC) Plan for emulsion addressing all key elements as listed in Section 14. This FQC Plan will be included within the Contractor's quality control plan for asphalt concrete. The FQC Plan shall be submitted at least 10 days prior to commencing paving operations. The purpose of the FQC Plan is to describe proper handling techniques for the emulsion to maintain specification conformance of emulsion properties during transportation, storage, and production operations. The Engineer will review the FQC Plan, and the paving operations will not begin until the FQC Plan has been approved in writing.
- 13.2 The contents of the emulsion FQC Plan shall be project specific and shall be kept current to the production and mixture operations employed at any time. Prior to executing any change to emulsion handling, the FQC Plan shall be revised to incorporate the change. Engineer approval of the revised FQC Plan, in writing, will be required before the change is made to emulsion handling. Failure to keep the FQC Plan current may affect subsequent decisions by the Engineer, such as those made to address a correction of failed material.
- 13.3 The Contractor shall confirm and document that the Supplier that manufactures the emulsion and the specific emulsion is on CDOT's Approved Products List as referenced in Subsection 8.8.
- 13.4 The Contractor shall indicate, in writing, what steps will be taken to ensure that the FQC Plan is followed and what action will be taken to correct the situation if it is found that the plan is not being followed.

14. MINIMUM REQUIREMENTS FOR THE CONTRACTOR'S EMULSION FIELD QUALITY CONTROL PLAN

- 14.1 The FQC Plan shall identify all subcontractors responsible for handling the emulsion. This will include the firm hauling the emulsion unless that firm is the emulsion supplier or is employed by the emulsion supplier.
- 14.2 The responsibilities of each party having a role in executing the FQC Plan shall be identified.
- 14.3 The FQC Plan shall describe how changes in type or supplier of the emulsion, used on the paving job, will be implemented. The change must not result in mixing of different emulsions. If mixing does occur, the mixed emulsion shall not be incorporated in the project. The Contractor shall inform the Engineer in advance of any change in type or supplier of the emulsion.
- 14.4 The anticipated mode of emulsion delivery shall be described. The process of tank inspection, prior to initial filling, will be described. The tanks on the project site must be completely empty and free of contaminants to avoid contamination of the emulsion delivered to the project.
- 14.5 Any special handling or storage requirements of the emulsion shall be fully described. These shall comply with the manufacturer's recommendations for that type of emulsion. The FQC Plan shall conform to these special requirements.

- 14.6 As detailed by the emulsion supplier, based on the type of materials used to produce the specific emulsion, any potential limitations of the emulsion relative to prolonged storage, exposure to prolonged and/or elevated heating, susceptibility to stratification and/or separation, etc. shall be fully described. The Contractor's FQC Plan shall describe how these limitations of the emulsion shall be addressed.
- 14.7 If agitation is used in emulsion storage tanks, the capacity and methods of agitation within the storage tank(s) shall be described.
- 14.8 Provisions to avoid damage to emulsion during the suspension of paving operations shall be described. These provisions will detail limits to the storage times and corresponding temperature limits.
- 14.9 The emulsion rotation FQC Plan shall be described. (First-in / First-out basis, for example).
- 14.10 Any on-site sampling and testing shall be described with respect to sampling location, tests to be conducted, and control limits for test results. On-site sampling methods and facilities shall be fully described. It is a good practice for the Contractor to obtain and retain samples of emulsion when delivered to the project. These samples can be tested if emulsion problems occur. These test results can help isolate the cause of emulsion problems. Emulsion performance test requirements are contained in Section 702 of the Standard Specifications.
- 14.11 The FQC Plan shall describe methods for identifying the emulsion contained in each storage tank. Clear and consistent labeling of each tank shall be included in these methods.
- 14.12 The emulsion temperatures in the tanks shall be routinely monitored, at a minimum of once per day. Procedures and equipment for this monitoring shall be described. Results of this monitoring shall be made available to the Engineer upon request.

CP 11, Asphalt Emulsion Supplier Certification Checklist - 2020

Supplier Name: _____ Date: _____
 Supplier Lab: _____ Supplier Location: _____
 Emulsion Type: _____ Supplier Lab Location: _____

Yes/ No

Subsection

- 5.1 Does supplier's lab have current AMRL accreditation? _____
- 6.1 QC plan submitted to CDOT? _____
- 6.2 Completed CDOT Form 595 sent to CDOT as an e-mail attachment? _____
- 6.3 Initial test data supplied? _____
- 6.3 MSDS supplied? _____
- 6.3 Split sample provided to CDOT once per construction season? _____

SUPPLIER QC PLAN:

Subsection

- 7.1.1 Facility type listed? _____
- 7.1.2 Facility location listed? _____
- 7.1.3 Name of person responsible for QC at the facility is listed? _____
- 7.1.4 List of QC tests & frequency to be used on emulsion? _____
- 7.1.5 Name & location of lab performing these tests is listed? _____
- 7.2 Does Plan state that, if a shipment is not within specification, the supplier shall:
 - (1) Identify the material in the shipment? _____
 - (2) Immediately cease shipment until material complies with the specification? _____
 - (3) Immediately notify CDOT regarding the shipment in question? _____
 - (4) Immediately notify the Contractors scheduled to use the material from the shipment in question? _____
 - (5) Notify CDOT prior to resuming shipment? _____
 - (6) Implement any mutually agreed upon procedures for the disposition of the material? _____
- 7.3 Does plan describe the method and frequency for initial testing, QC testing, and specification compliance testing? _____
- 7.3.1 Results of specification compliance testing supplied to CDOT along with a sample? _____
- 7.3.1 Results confirm that the Emulsion conforms to Section 702? _____
- 7.3.2 Plan states that specification compliance testing is performed routinely and results are submitted to CDOT monthly? _____
- 7.3.3 Plan indicates frequency of testing to determine conformance with Section 702? _____
- 7.4 Plan states that supplier will maintain summary reports for all QC and Spec Compliance tests performed, and will submit to CDOT upon request? _____
- 7.5 Plan contains an outline of the procedure for checking transport vehicles before loading to prevent contamination? _____
- 7.5.1 Outline includes statement that the transport vehicle inspection report, signed by the designated inspector, shall be maintained in the supplier's records, and will be made available to CDOT upon request? _____

CP 11, Asphalt Contractor Field Quality Control Checklist - 2020

Contractor Name: _____

Date: _____

Contract ID: _____

Project Number: _____

Project Location: _____

FIELD QUALITY CONTROL OF EMULSION(S)

Yes/ No

Subsection

- 13.1 Was the Contractor's Field Quality Control (FQC) Plan submitted 10 days prior to paving? _____
- 13.2 Is the emulsion FQC plan specific to this Project? _____
- 13.2 Does the emulsion FQC plan apply to current emulsion handling?..... _____

Does the Contractor's Emulsion Field Quality Control Plan Address the Following:

Subsection

- 14.1 List of the subcontractors handling the emulsion?..... _____
- 14.2 Responsibilities of the parties executing the emulsion FQC Plan? _____
- 14.3 How emulsion type changes will be handled? _____
- 14.4 Delivery mode and tank inspection before filling? _____
- 14.5 Special handling and suppliers recommended handling? _____
- 14.6 Limitations on the type of emulsion with respect to handling?..... _____
- 14.7 Method of agitating emulsion in the tank (if any)? _____
- 14.8 Emulsion handling during paving delays?..... _____
- 14.9 Emulsion rotation plan (i.e. First-in / First-out)?..... _____
- 14.10 On-site sampling plan (if any)? _____
- 14.11 Emulsion identification plan (tank labeling)?..... _____
- 14.12 Emulsion temperature monitoring (minimum once per day)? _____

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