

**METHODS OF SAMPLING AND TESTING**  
**MT 410-04**  
**METHOD OF INSPECTION, SAMPLING, TESTING, AND**  
**ACCEPTANCE OF PAINT, EPOXY AND**  
**THERMOPLASTIC PAVEMENT MARKING MATERIAL**  
*(Montana Method)*

**1 Scope:**

- 1.1 This procedure describes the inspection, sampling, testing and acceptance of construction and maintenance traffic line paint, structural steel primers and finish coats delivered to construction and maintenance projects.

**2 Reference Documents:****2.1 *ASTM Standards, Federal Test Methods Std. 141:***

- D-711 No - Pick-up Times for Traffic Paint
- D-1640 Drying, Curing, or Film Formation of Organic Coatings at Room Temperature
- D-969 Laboratory Determination of Degree of Bleeding of Traffic Paint
- D-1210 Fineness of Dispersion of Pigment-Vehicle Systems
- D-562 Consistency of Paints Using Stormer Viscometer
- D-823 Producing Films of Uniform Thickness of Paint, Varnishes, and Related Products on Test Panels
- D-522 Mandrel Bend Test of Attached Organic Coatings
- D-1475 Density of Paint, Varnish, Lacquer and Related Products
- D-4060 Abrasion Resistance on Organic Coatings by the Tabor Abaser
- 6192 Federal Test Method Std. No. 141 Method 6192

***MT Manual:***

MT-601 Montana Test Methods-Methods of Sampling and Testing

**3 Sampling:**

- 3.1 Two samples are required for each lot or batch of paint used on a project. Suitable containers for each type of paint are listed below.
- 3.1.1 Sample Waterborne paints using a clean, one-liter (quart), lined, metal can or plastic "Nalgene" bottle. **Do not use unlined metal containers for Waterborne paint samples.**
- 3.1.2 Sample Alkyd paints using a clean, one-liter (quart), unlined, metal "Asphalt" sampling can. **Do not use plastic "Nalgene" containers for Alkyd paint samples.**
- 3.1.3 Sample Epoxy paints using a clean, one-liter (quart), lined or unlined metal can or plastic "Nalgene" container.
- 3.1.4 Sample Aluminum Mastic paints using a clean, one-liter (quart), unlined metal "Asphalt" can. **Do not use plastic "Nalgene" containers for Aluminum Mastic paint samples.**
- 3.2 Construction Projects - Project quantities of 19 liters (5 gallons) or less: No field sample required. Attach the label from the paint container to a Miscellaneous Form 46 and submit to the Materials Bureau.
- 3.3 Construction Projects - Project quantities greater than 19 liters (5 gallons) but less than 95 liters (25 gallons): No field sample is required. Sample if the type or quality is suspect, at the option of the Department. Submit Manufacturer's Certification to the Materials Bureau attached to a Miscellaneous Form 45.

**3 Sampling: (continued)**

3.4 Construction Projects - Project quantities of 95 liters (25 gallons) or more:

3.4.1 Duplicate, one-liter (quart) samples will be taken from the thoroughly mixed contents of a striping machine or container representing each lot. Both samples will be forwarded to the Materials Bureau for testing with a Miscellaneous Form 45. Acceptance will be based on the test report issued by the Materials Bureau. **CONSTRUCTION PAINT WILL NOT BE PRETESTED AT THE POINT OF MANUFACTURE.**

**4 Maintenance Traffic Paint:**

4.1 Duplicate one-liter (quart) samples of thoroughly mixed paint per lot or batch will be sampled by the Montana Department of Transportation at the point of manufacture and be forwarded to the Materials Bureau for testing. Acceptance will be based on the test report issued by the Materials Bureau.

4.2 For each paint shipment received, a Field Inspection Report - Miscellaneous Material Form No. 46 shall be prepared and mailed to the Materials Bureau. This report shall indicate the type, quantity, and condition of the paint together with source information (Manufacturer and Lot No., etc.). The label may be taken from the container and attached to the inspection report to transmit the source information.

**5 Epoxy Pavement Marking Material:**

5.1 Epoxy pigment and catalyst will be sampled separately and submitted in accordance with 3.1.3 and submit to the Materials Bureau for testing. Manufacturer's certification will be attached to a Miscellaneous Form 45 and submitted with the samples.

**6 Thermoplastic Pavement Marking Material:**

6.1 Thermoplastic will be sampled at the point of application. Approximately ½ kilo (1 pound) of the solid material will be submitted to the Materials Bureau for testing. The inspector will supply sample containers. Manufacturer's certification will be attached to a Miscellaneous Form 45 and submitted with the samples.

**7 Testing:**

7.1 Test methods used for testing paint shall conform to ASTM, Federal Test Methods Standard No. 141, latest revisions, or tests and methods described below:

7.1.1 Flexibility - Apply the paint to produce a 0.0762 mm (0.003 inch) dry film on a 0.25 mm (0.10") tin panel. Air dry at twenty-five (25) degrees centigrade plus or minus 2 degrees (25 °C ± 2°C) or 77 degrees Fahrenheit plus or minus 4 degrees (77 °F ± 4 °F) for at least four (4) hours and then bend over 6.4 mm (1/4 inch) diameter mandrel. The film shall not crack when subjected to the above prescribed flexibility test.

7.1.2 Adhesion: Prepare the panel as for the flexibility test. Place the panel on a 3.2 mm (1/8 inch) thick rubber pad. Strike a sharp blow with a ball peen hammer to cause an indentation of 1.27 mm to 2.54 mm (0.05 to 0.10 inch). There shall be no cracking, chipping or peeling when subjected to the above-prescribed test.

7.1.3 Skinning: In a 250 ml. paint container (1/2 pint), fill 1/2 full with the paint. Examine after 24 hours for skinning. There shall be no skinning.

**7 Testing: (continued)**

- 7.1.4** Settling: Fill a 100 ml. centrifuge tube with paint and revolve for 2 hrs. at a speed producing a centrifugal force of 1,112 Newton (250 pounds). A separation of not more than 12.7 mm (1/2 inch) of the pigment is acceptable. The pigment in the bottom of the tube should be soft and easily dispersed with a spatula.
- 7.1.5** Abrasion: ASTM D-4060 (Test Method for Epoxy Traffic Paint).
- 7.1.5.1** Abrasion: Federal Test Method Std. No. 141, Method 6192. Panels may be coated by dipping, spraying or by means of film applicator. Dry at 25 °C ± 2 °C (77 °F ± 4 °F) for 24 hours, cure at 49 °C (120 °F) for 72 hours, cool to room temperature and subject to Tabor Abrasion Test using CS-10 wheels, 1000 gram load per wheel and at least 500 revolutions. The dry film thickness should not be less than 0.003 inches prior to testing. The Department performs this test starting with a wet paint thickness of 0.254 mm ± 0.051 mm (0.010 ± 0.002 inch).
- 7.1.6** Hiding: Use a Standard Horest Hiding Power Chart. Apply at a rate of 16.26 square meters (175 square feet) per 3.785 liters (one gallon). Visual examination will determine acceptance.
- 7.1.7** Film Appearance: Visual examination of dry film on tin panel is performed. The paint shall dry to a flat finish.
- 7.1.8** Light Resistance: Apply a wet film of 0.381 mm (0.012 inches) to two clean 76.2 mm x 127 mm (3x5 inches) tin panels and allow to dry horizontally for twenty-four (24) hours. Expose one (1) of the panels to direct sunlight or to a carbon arc light (no water spray) for a period equivalent to seven (7) hours of direct sunlight. The other panel shall not be exposed. Finally examine both panels and compare for darkening. The yellow paint shall not darken appreciably when subjected to the above-prescribed test.