



# BUREAU OF MATERIALS MATERIALS PROCEDURES

**MP NUMBER: 43-15**

**EFFECTIVE DATE: April 1, 2015**

**APPROVAL: Eileen Sheehy**

## INFRARED (IR) SPECTROPHOTOMETRY ANALYSIS OF STRUCTURAL STEEL PAINT AND EPOXY TRAFFIC PAINT

### **PURPOSE:**

To establish standard procedures for Infrared (IR) Spectrophotometry Analysis of Structural Steel Paint and Epoxy Traffic Paint.

### **GENERAL REFERENCES:**

NJ DOT Bureau of Materials Material Approval Procedures MAP #119, MAP#120  
NJDOT Standard Specifications Sections 912.01.01, 912.03.01  
Rutgers State University of New Jersey Final Report "INFRARED SCAN OF CONCRETE ADMIXTURES AND STRUCTURAL STEEL PAINTS" FHWA-NJ-2011-007.

### **FORMS:**

Site Manager (SM) NJDOT# IRSCAN - Analysis of Infrared Spectrophotometry  
SM NJDOT# LB280 Analysis of Structural Steel Paint  
SM NJDOT# LB492 Analysis of Epoxy Traffic Paint.

### **TEST METHODS DESCRIPTION:**

- 1- Quantitatively comparing the Chemical Analysis of the Test Sample to the Initially Approved Chemical Analysis for each Material Brand Name by the Correlation Coefficient (CC) to the Correlation Threshold (CT),
- 2- Use the Quantitative Test Method for Paints (FHWA-NJ-2011-007) described in "INFRARED SCAN OF CONCRETE ADMIXTURES AND STRUCTURAL STEEL PAINTS", design by Rutgers State University of New Jersey for NJ DOT.
- 3- IR scan apparatus should be set for Quantitative Analysis.

**EQUIPMENT:**

Spectrum One FT-IR Spectrometer  
Producer: Perkin Elmer Instruments.

**SOFTWARE:**

Perkin Elmer Spectrum  
Version 10.4.2  
Copyright 2014 Perkin Elmer Inc.

**TEST SUBJECT:**

Paint Components: part A, B, S, T, Activator, Hardener.

**TEST SPECIFICATION REQUIREMENT:**

- A. Correlation Coefficient  $\geq$  Correlation Threshold.
- B. Correlation Threshold is equal to 0.98=98% for all NJ State Structural Steel and Epoxy Traffic Paints.

**INSTRUCTIONS:**

**I. Assignment Procedures**

- A. The Team Leader or Supervisor shall:
  - 1. Assure that the Team receives the following:
    - a. Copies of references and test methods pertinent to this MP.
    - b. Site Manager Sample ID Number.
    - c. Technical Data Sheet, MSDS and Production Report.
    - d. One-quart sample (for Approval: three One-quart samples each from a different production batch).
  - 2. Check the Sample Label against the paperwork.
- B. The Technician shall:
  - 1. Inspect the sample visually.
  - 2. Make the test preparation.
  - 2. Run the test.
  - 3. Put the test result in SM Form.
  - 4. Print out Crystal Report and file the hard copy.
- C. The Supervisor shall review the Crystal Report.
  - 1. Immediately notify the RE of all failing test results.
- D. The Technician shall electronically distribute the Crystal Report to Inspection Group's Leader.

## **II. IR scan Preparation**

- A. Mix the One-quart Paint manually with spatula.

## **III. IR scan Test**

### **A. Run the Test:**

1. Click on “NJDOT” icon.
2. Click on “Assure ID Analyzer” icon.
3. Highlight “Analyst”.
4. Click “OK”.
5. Select the desired method based on Manufacturer and Paint’s Brand Name.
6. Click “Analyze”.
7. Click ”Next”.
8. Ensure top plate is clean and correctly positioned.
9. Run the Background Scan by clicking “Start”.
10. Contamination Check will commence.
11. Click “Next” when completed.
12. Throughput Check will commence.
13. Click “Next” when completed.
14. Noise Check will commence.
15. Click “Next” when completed.
16. Enter Sample ID number and Select “Material Type”.
17. Click “Next”.
18. Click “Next”.
19. Mix the sample thoroughly by hand for 15 seconds.
20. Apply the sample to trough plate window using a disposable polyethylene transfer pipet with the tip cut off for a wider opening.
21. Click “Start” twice.
22. IR scan will commence.
23. When scan is completed, material will either be identified correctly or material will not be identified as specified material.
24. Click “Next”
25. Click “View Report”.
26. Print Page #1 of the “Assure ID Analysis Report”.
27. Copy/Paste Report to Microsoft Word “Paint” file.
28. Save.
29. Click “Finish”.
30. Close out screen.
31. Clean trough plate using acetone, reposition trough plate on instrument and cover.
32. Close out of “Assure ID Analyzer”.

33. Shut down computer.

**B. IR scan Retest:**

- a. If the Test failed, mix the sample mechanically using the shaker for one minute.

**C. Run IR scan Retest:**

- a. Follow Section III.A “Run the Test” procedure.

**IV. Reporting Test Results**

A. Put the test result into SM Form # IRSCAN.

B. For New Material:

- Test the sample which has the Midpoint’s parameters for the tested Viscosity, Density, % Solids, % Pigment of the three samples for Approval.
- Set the IR Scan Standard for Brand Name Paint Component.
- Report to Paint Spec Manager.

**V. Authority and Responsibility**

The Technician should bring to the attention of the Supervisor any uncertainties regarding the quality of material, equipment, methods of operation or sampling. Document the discussion and the corrective action taken.

**V. Distribution of Forms**

It shall be the Team Supervisor's responsibility to ensure forms are distributed as follows:

FORM

DISTRIBUTION

LB280

The Technician shall electronically distribute the Structural Steel Crystal Report to Inspection Group’s Leader.

LB492

The Technician shall electronically distribute the Epoxy Traffic Paint Crystal Report to Inspection Group’s Leader.