MINNESOTA DEPARTMENT OF TRANSPORTATION
PAVEMENT MARKING QUALIFICATION AND ACCEPTANCE PROGRAM

INTRODUCTION

This Pavement Marking Qualification and Acceptance Program has been developed and implemented to insure that quality pavement marking materials and glass beads are used on MnDOT highway projects.

The pavement marking materials covered by this Program include High Solids Water Based Traffic Paint, Plural Component Liquid Pavement Markings (epoxy, polyurethane, polyurea, MMA, etc.), pavement marking tapes, thermoplastics, and drop-on glass beads for all liquid pavement marking materials.

There are two major parts to this program:

1. Inclusion of a product on the Pavement Marking Qualified Products List.
2. Acceptance of a pavement marking material for use on a MnDOT project.

Scope

This Program applies to all pavement marking materials for use on MnDOT highways. Participation in this program is a requirement for participation in Minnesota's cooperative purchase contracts for pavement marking materials and glass beads.

Other political subdivisions are encouraged to review these requirements for adoption by their agency. Technical assistance by MnDOT is available on request.

PAVEMENT MARKING QUALIFIED PRODUCTS LIST

Pavement marking materials are qualified by successful completion of a new products review process by MnDOT's Office of Traffic, Safety, and Technology (OTST). This program requires:

- Submittal of a product for consideration by the manufacturer or vendor.
- Provisional status of the product on the Qualified Products List.
- Application and review of the product on highway projects.
- Addition to the Qualified Products List.

Submittal Process

Consideration of a pavement marking material or glass beads is initiated by the manufacturer or vendor by completion of a Product Evaluation Application form and submittal of the form with all required documentation. This submittal process requires the manufacturer or vendor to submit the following before consideration will be given:

- **Application Form:** Includes submittal of documentation for MnDOT's Hazard Evaluation Process (HEP)
- **Test Data**: Submit NTPEP data. Participation in a NTPEP Test deck in a Snow Belt state within the last 5 years is required for inclusion on the QPL.
- **Specification**: Submit written specifications for the proper installation of the product. Also include the website address where the specifications can be found. The QPL will link to these specifications so that contractors and project inspectors can easily locate them.
- **Report**: The manufacturer shall submit, in writing, a report containing all of the information below and a statement agreeing to the provisions of this Pavement Marking Qualification and Acceptance Program.
  - Technical Assistance: Submit the name(s), telephone number(s), and e-mail addresses for these representatives. The manufacturer or vendor shall have at least one technical representative available to instruct in the application of the pavement marking material. The technician shall be familiar with the application equipment process and materials, and shall have successful experience in application of pavement marking materials. The manufacturer or vendor shall also have at least one technical representative available to provide assistance to MnDOT Materials Laboratory personnel engaged in quality assurance operations.
  - Manufacturer Quality Control Program: Submit a written quality control program that monitors a manufacturer's production for MnDOT approval. This written program shall detail the frequency and types of tests performed on each lot produced for MnDOT projects as well as raw materials where appropriate. The written program must also demonstrate the manufacturer maintains a laboratory to scientifically control the product to assure accuracy and quality of the product.
  - Manufacturing Capability: Submit in writing, that the manufacturer has in operation a plant adequate for, and devoted to manufacturer of the specific pavement marking material. This statement must include assurance that the manufacturer is capable of producing batch or lot sizes consistent with the quantities to be delivered for pavement marking projects. This statement must also contain information that it has produced similar material over the past two (2) years with a successful record.
- Product Sample: Acceptance of pavement marking materials under this program is based on the manufacturer's certification and quality control testing verified by MnDOT Laboratory testing of verification samples and spot checks on samples obtained from contractor stock or from project sites. Therefore, the manufacturer or vendor needs to:
  - Sample: Submit a one pint sample of the product for MnDOT verification.
  - Quality Control Test Results: The manufacturer shall supply copies of all internal quality control test results to the MnDOT Laboratory.
  - Certification: Each shipment shall be accompanied by manufacturer's written certification listing batch or lot number, quantity and certifying that the product meets the appropriate MnDOT specifications. A copy of the certification shall be submitted to the MnDOT Laboratory.

- Send the sample and supporting documents to:

  Allen Gallistel
  Office of Materials and Road Research
  1400 Gervais Avenue
  Maplewood, MN 55109
  Phone: 651-366-5545

Provisional Approval

Upon receipt of the product submittal, the pavement marking section of the OTST will review the documentation and determine if the product should be included in operational field evaluations. The manufacturer or vendor will be informed in writing of the results of this review. If the result is to proceed with field evaluation the product will be given provisional approval and placed on the Pavement Marking Qualified Product List. The provisions of this limited approval will be included in the provisional approval letter.

Field Testing

After receipt of provisional approval, the pavement marking material is eligible for evaluation on actual construction and maintenance projects. MnDOT reserves the right to determine the duration and type of the evaluation needed for each product.

It is the manufacturer or vendors responsibility to:

- Find a test location.
- Obtain the approval of both the Project Engineer and the OTST Pavement Marking Engineer for the substitution of material on test location project.
- Notify the OTST Pavement Marking Engineer of the test location at least 5 days prior to installation.
- Ensure that a verification sample of the test material being placed is sent to the MnDOT materials lab. These samples shall be submitted to the MnDOT Materials Laboratory along with a certification stating the sample is representative of the batch manufactured and copies of all quality control reports.
- The manufacturer and/or contractor will complete the attached Contractor Striping Report Form and submit this information within 5 working days of installation to OTST Pavement Marking Engineer, at fax 651-234-7370.

During the field testing period, MnDOT representatives will evaluate the material's initial retroreflectivity, and perform periodic inspections.

Final Qualification

Upon completion of the product evaluation, the pavement marking section of OTST will review the results and determine if the product should be included in on the Pavement Marking Qualified Products list. The manufacturer or vendor will be informed in writing of the results of this review.

Once on the qualified product list, it is the manufacturer's responsibility to notify MnDOT of any and all changes to the chemical and/or physical makeup of the approved product.

Non-compliance to the provisions of this program may result in the removal of a product from the qualified products list.

Failure of the product at any time may result in the removal of a product from the qualified products list.

PAVEMENT MARKING MATERIAL ACCEPTANCE PROGRAM

The Minnesota Department of Transportation (MnDOT) will accept only qualified pavement marking materials for final acceptance on projects. Once a pavement marking material is placed on the qualified products list it is eligible to be used on MnDOT projects. To ensure that the materials used will provide the same service as those tested during the initial qualification, the following acceptance program has been established.

Acceptance of pavement marking materials and glass beads under this program is based on the manufacturer's certification and quality control testing verified by MnDOT Laboratory testing of verification samples and spot checks on samples obtained from contractor stock or from project sites. This sampling and testing is not intended as a MnDOT preapproval process. MnDOT testing is for verification of the manufacturer's quality control testing. Discrepancies in test results between manufacturer's lab and the MnDOT lab that indicate significant deviation from MnDOT specifications, which cannot be resolved, may result in removal of a material from the qualified product list.

This acceptance program requires the manufacturer to:

- Provide samples for MnDOT verification.
- Provide manufacturer's quality control test results.
- Supply shipping information.
- Certify that the material meets the requirements of MnDOT specifications.

Verification Samples

The manufacturer shall submit verification samples, of quantities as required in the specifications, of each batch or lot manufactured. These samples shall be submitted to the MnDOT Materials Laboratory along with a certification stating the sample is representative of the batch manufactured and copies of all quality control reports.

Tests will be performed on these verification samples according to ASTM Standards, Federal Test Methods, or MnDOT Methods as detailed in the MnDOT specifications. Other test methods may be used upon approval by MnDOT.

Quality Control Test Results

The manufacturer shall supply copies of all internal quality control test results to the MnDOT Laboratory for all batches or lots to be used on MnDOT projects. These reports shall include the name and address of the purchaser and state project number as appropriate.

Shipping Information
The manufacturer shall provide shipping information for all batches and lots shipped for use on MnDOT projects to the MnDOT Laboratory. This information shall include the name and address of the purchaser and state project number as appropriate.

Certification
Each shipment shall be accompanied by manufacturer's written certification listing batch or lot number, quantity and certifying that the product meets the appropriate MnDOT specifications. A copy of the certification shall be submitted to the MnDOT Laboratory.

MnDOT Contact Information

Samples, test data, certifications and shipping information shall be sent to:

Minnesota Department of Transportation
Materials Laboratory
1400 East Gervais St
Maplewood MN 55109
Phone: 651-366-5592
Fax: 651-366-5461

Inquiries on the qualification and acceptance program can be sent to:

Minnesota Department of Transportation
Pavement Marking Engineer
Mail Stop 725
1500 West County Road B2
Roseville, Minnesota 55113
Phone: 651-234-7380
Fax: 651-234-7370

Mn/DOT Office of Environmental Services
Hazardous Evaluation Process

The Mn/DOT Office of Environmental Services developed the Hazard Evaluation Process (HEP) as a tool to determine potential environmental impacts that could result from use of a product and consequently, if the product is acceptable for use on Mn/DOT infrastructure. The following information must be submitted by the vendor in order for Mn/DOT to complete the HEP:

1. Vendor information
   a. Name of Company
   b. Address
   c. Technical Contact Name and Telephone Number
   d. Application Date
   e. Product Trade Name
   f. Product Chemical Name
   g. Product Data Sheet

2. Provide Material Safety Data Sheets for all chemicals in the product/waste material.

3. Regulatory Approvals & Status:
   a. Licenses
   b. Approval
   c. Permits
   d. TSCA Listing

4. Chemical Status:
   a. Provide Individual Chemical & Physical Properties (OECD[1] Methods 102, 103, 104, 105, 111, 112, 113, 117, 121);
   b. Identify chemicals with molecular weights greater than 1000 Daltons (OECD Methods 118, 120 or equivalent;
   c. Certification that final product would not be considered a hazardous waste under Minnesota Rules Chapter 7045 if disposed of unused;
   d. Names and Chemical Abstract Numbers (CAS numbers) of the reportable substances in the product (40 CFR 302);

The following product-specific information must be submitted if known. If information for a representative test is unknown it must be stated as such.

EPA SW-846 test method information can be found at:
http://www.epa.gov/epaoswer/hazwaste/test/main.htm
OECD product test method information can be found at:
http://www.oecd-ilibrary.org/
U.S. EPA Office of Prevention, Pesticides and Toxic Substances Harmonized Test Guidelines can be found at: http://www.epa.gov/ocspp/pubs/frs/home/guidelin.htm

   a. Leach test results (EPA Method 1311 and OECD Method 312 with subsequent analysis for test substance or equivalent method);
   b. Biodegradation (OECD Method 301C, 301D, 302C, 304A, 307, 309 or equivalent method);
   c. Ecotoxicity to include three trophic levels (OECD Method 201, 207, 208, 210, 211 or equivalent method, OPPTS Method 850.5400, 850.1300, 850.6200, 850.4100, 850.4150, 850.1400 or equivalent method);
   d. Other available test data that provide individual chemical fate, exposure and pathway information.

[1] Organization for Economic Co-operation and Development methodology for product testing is preferred but equivalent methods may be acceptable.

Questions regarding the Mn/DOT Hazard Evaluation Process can be sent to:

Robert.D.Edstrom@state.mn.us