

## **DMS-8600, Delineators and Object Markers**

### **Overview**

Effective Dates: August 2004 – August 2007.

This Specification governs for the materials, composition, quality, sampling, and testing of delineators and object markers, and describes the approval procedures and the Material Producer List (MPL).

### **Material Producer List**

The Materials and Pavements Section of the Construction Division (CST/M&P) maintains the MPL of all materials conforming to the requirements of this Specification. Materials appearing on the list of [pre-approved Type C delineators units](#) may require sampling and testing before use. "Tex-725-I, Sampling Delineator and Object Marker Reflector Units," describes the sampling procedure.

### **Pre-approval Requests**

Prospective producers interested in submitting their product for evaluation must submit a written request to the Texas Department of Transportation, Construction Division, Materials and Pavements Section (CP51), 125 East 11<sup>th</sup> Street, Austin, Texas 78701-2483.

Include the following information in the request:

- ◆ company name
- ◆ physical and mailing addresses
- ◆ type of material and
- ◆ contact person and telephone number.

### **Bidders' and Suppliers' Requirements**

Before any material is considered, it must be of manufacture and product code or designation shown on the MPL maintained by the Department.

### **Pre-approval**

Pre-approval of the Type C bracket consists of a visual examination of the bracket by CST/M&P to insure there are no obvious deficiencies in size, materials, fasteners, or adhesives. When an adhesive is used, it must be the adhesive recommended by the manufacturer of the unit.

CST/M&P maintains the list of approved materials.

Notify CST/M&P of any changes in materials and submit additional samples for pre-approval.

## **Payment**

### ***Procurement by the State***

Payment for all materials governed by this Specification will be in conformance with provisions of the purchase order awarded by the State.

### ***Contracts***

All materials governed by this Specification utilized by the manufacturer in Contract projects will be paid for in accordance with the Department's *Standard Specifications for Construction of Highways, Streets, and Bridges* "Item 658, Delineators and Object Marker Assemblies."

## **Sampling and Testing**

The Department will sample in accordance with "Tex-725-I, Sampling Delineator and Object Marker Reflector Units," and will test in accordance with the methods listed in the 'Material Requirements.'

Costs of sampling and testing are normally borne by the Department; however, the costs to sample and test materials failing to conform to the requirements of this Specification must be borne by the manufacturer. The cost will be assessed at the rate established by the Director of CST/M&P and in effect at the time of testing.

Amounts due the Department for conducting such tests will be deducted from monthly or final estimates on contracts or from partial or final payments on direct purchases by the State.

## **Material Requirements**

This Specification covers the general and specific requirements for 3 types of delineator and object marker reflector units.

### ***Reflector Types***

1. Type A must consist of Class 1 or Class 2 flat surface, reflective sheeting. Class 1 and Class 2 reflective sheeting must meet the requirements of ASTM "D 4956, Standard Specification for Retroreflective Sheeting for Traffic Control," Type III, IV, or V.
2. Type B must consist of center-mount acrylic, plastic-prismatic reflector units.

3. Type C must consist of Type A or Type B reflector units attached to a bracket to facilitate the mounting of the delineator on concrete traffic barriers, railings, or other locations as shown on the plans. These units must be pre-approved.

### ***Construction***

Construct delineators as follows:

◆ General

- Delineators must consist of 1 or 2 individual reflectorized panels of reflective sheeting or reflector units of Type A, Class 1 or 2 reflector units or Type B reflector units of the color, shape, and size specified.

◆ For Flexible Posts

- Delineators for flexible posts must consist of reflective panels or individual reflector units of Type A, Class 1 or 2 reflective sheeting of the color, shape, and size specified for the various types applied directly to the post in the specified position.

◆ For Nonflexible Posts

- Delineators for nonflexible posts must consist of: panels of Type A, Class 1 or 2 sheeting; individual reflector units of Type A, Class 1 or 2 sheeting; or Type B reflector units of the color, shape, and size specified for the various types.
- Panels or individual reflector units utilizing sheeting must be constructed by applying the sheeting to 1.6 mm (0.063 in.) aluminum blanks or fiberglass reinforced plastic or other approved blank material of approved thickness of the specified size.

Construct object markers as follows:

- ◆ Types 1 and 4 must be of the color and size specified utilizing Type B reflector units only.
- ◆ Type 2 must be of the color, size, and type of sheeting as specified.
- ◆ Type 3 must be of the color and size specified utilizing Type A reflective sheeting only.

*Note:* See the Department's Standard Plans sheet for Delineators and Object Markers.

### ***Type A Reflective Materials***

Type A reflective materials must meet the requirements of ASTM "D 4956, Standard Specification for Retroreflective Sheeting for Traffic Control," Type III, IV, or V, except where specific differences are shown.

◆ Specific Intensity (SI)

- Type A reflective materials must meet the minimum brightness values for each class when tested in accordance with "Tex-842-B, Measuring Retroreflectivity."

- ◆ Durability
  - Weather-Ometer exposure will be in an Atlas Weather-Ometer. Weather-ometer exposure will be in accordance with ASTM "G 153, Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials," using Exposure Cycle 1 (18 min. for water spray in every 120 min. of light exposure).
  - Color must show no appreciable change and SI must be a minimum of 80% of the beginning value after 2,000 hr. weather-ometer exposure.
  - The sheeting, when applied to aluminum panels, must show no cracking, crazing, blistering, chalking, or dimensional change after weather-ometer exposure.
- ◆ Adhesion
  - The adhesive must be a pressure-sensitive type.
  - The adhesive must adhere so that the sheeting cannot be peeled or pulled from the surface in pieces greater than 1,290 mm<sup>2</sup> (2 sq. in.) when applied to clean aluminum at temperatures from 10° to 38°C (50° to 100°F), aged for 36 hrs at 60°C (140°F), and allowed to cool to room temperature for 12 hrs.

### ***Type B Reflector Units***

Type B reflector units must consist of center-mount acrylic, plastic-prismatic reflector units meeting the following requirements:

- ◆ Construction
  - The reflector unit must consist of a clear and transparent plastic face, referred to as the lens, and back material attached to the lens to permanently seal it against water, dust, and air.
  - The lens must consist of a smooth front surface, free from projections or indentations other than for identification.
  - Mold the manufacturer's name or trademark legibly on the lens.
- ◆ Design and Fabrication
  - The reflector unit must have a mounting hole in its center.
  - There must be a 4.8 mm (3/16 in.) inside diameter noncorrosive grommet within the mounting hole, such that the normal tightening of the mounting fastener will not fracture the seal of the reflector unit.
  - The face of the reflector unit must not be less than 4516 mm<sup>2</sup> (7 in.<sup>2</sup>) in area.

- ◆ Specific Intensity
  - Ninety-six percent or more of the reflector units must equal or exceed the following minimum values of specific intensity, when tested in accordance with "Tex-842-B, Measuring Retroreflectivity."

Specific Intensity (SI) Minimum Values				
Observation Angle	Entrance Angle	SI		cd/lux/unit or CP/FTC/Unit Red
		White	Yellow	
0.1	0	60	30	10
0.1	20	30	15	4
1/3	0	30	15	4
1/3	20	15	8	2

- ◆ Seal Test
  - Ninety-six percent or more of the reflector units must pass the seal test when tested in accordance with "Tex-845-B, Testing the Seal of Reflector Units."
- ◆ Heat Test
  - The reflector units must pass the heat test when tested in accordance with "Tex-846-B, Testing the Heat Resistance of Reflector Units."

**Archived Versions**

The following archived versions of "DMS-8600, Delineators and Object Markers" are available:

- ◆ [8600-0898](#) for the Specification effective August 1998 through May 2003.
- ◆ [8600-0603](#) for the Specification effective June 2003 through July 2004.