

DMS-8311, Internally Illuminated Street Sign Panels

Overview

(Formerly D-9-8311, Internally Illuminated Street Sign Panels).

Effective Date: August 1998 – April 2003.

This specification shall govern for the material, composition, quality, sampling, and testing of internally illuminated street sign panels.

Bidders' and/or Suppliers' Requirements

All prospective bidders and/or suppliers are notified that, before any material is considered, it shall be of manufacture and product code or designation shown on the list of approved manufacturers of materials covered by this specification and maintained by the General Services Division (GSD) of TxDOT.

Payment

Procurement by the State

Payment for all materials under this specification shall be in accordance with the conditions prescribed in the contract awarded by the State.

Contracts

All materials under this specification utilized by the Contractor shall not be paid for directly, but will be considered subsidiary to the various bid items of the contract.

Prequalification and Performance History

Establishment of Performance History

Prospective bidders and/or suppliers who desire to prequalify and establish a performance history for their product governed by this specification, should contact the Texas Department of Transportation, General Services Division, 125 East 11th Street, Austin, TX 78701-2483.

They shall then submit a complete unit and two (2) panels for prequalification tests. The complete unit and panels shall be randomly selected from production and represent the product which will be supplied for TxDOT use. The complete unit will be returned upon completion of testing.

Prospective bidders and/or suppliers will be notified, after their material has been evaluated, as to conformance with the requirements of this specification.

TxDOT reserves the right to perform any or all of the tests required by this specification as a check on the tests reported by the manufacturer. In the case of any variance, TxDOT tests will govern.

All materials for prequalification tests shall be submitted at no cost to TxDOT.

Performance History

Some of the tests required by this specification extend over a prolonged period of time. Therefore, testing for acceptance of materials supplied on any contract or state purchase order will only be considered on those materials which are determined by the Director of CST/M&P, to be identifiable as a material having an established performance history of compliance with the criteria established by this specification.

Re-evaluation

When, in the opinion of the Director of CST/M&P, changes have been made in the composition and/or manufacturing process of a prequalified material, a re-evaluation of the performance may be required.

TxDOT may conduct additional tests to identify changes in the material. Changes that are detected in composition and/or manufacturing process, which have not been reported by the manufacturer, may be cause for removal of that material from the list of prequalified materials.

Periodic Evaluation

TxDOT reserves the right to periodically evaluate the performance of materials.

Samples for periodic evaluation of performance will be selected at random from materials submitted to TxDOT on contracts or direct state purchase orders.

Failure of materials to comply with the requirements of this specification as a result of periodic evaluation, may be cause for removal of those materials from the list of prequalified materials.

Sampling and Testing

Costs of sampling and testing are normally borne by TxDOT; however, the costs of sampling and testing of materials failing to conform to the requirements of this specification shall be borne by the contractor or supplier.

Costs of sampling and testing failing material shall be assessed at the rate established by the Director of CST/M&P and in effect at the time of testing.

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

Sampling

Samples shall be in accordance with Test Method "Tex-1110-T, Sampling Lighting Assemblies," except the minimum sample quantity shall be one.

Testing

Testing shall be in accordance with the methods listed in the 'Material and Construction Requirements' section of this specification.

Material and Construction Requirements

Sign Panel Material

Sign panels shall be constructed of polycarbonate or a glass-fiber reinforced polyester fluoride.

The sign panel shall consist of a translucent white lens, which presents the legend and symbols as a white format on a green background.

The lens shall be ultraviolet resistant to prevent color fading and excessive yellowing.

Break Resistance

The panel shall be break resistant and shall not crack or shatter when subjected to 0.17 kilograms-meters (1.25 foot-pounds) by a steel ball, approximately 38 millimeters (1-1/2 inches) in diameter, dropped onto any part of the panel while panel is supported within the unit or on a rigid 0.09 meter square (one [1] foot square) frame.

Infrared Spectra

The infrared spectra of sign panel materials shall match the spectra of the prequalification samples on file with the TxDOT.

Specific Gravity

The specific gravity of the sign panel material shall match within ± 0.1 the specific gravity of the prequalification samples. Specific gravity is determined using ASTM D 792.

Exposure

The sign panel material shall show no significant change in color, flexibility, or integrity when subjected to 2000 hours exposure in an Atlas Carbon Arc Weather-Ometer fitted with an 18 - 102 cycle gear and tested in accordance with ASTM G 23, Method 1 Type EH.

Color

The color of the legend, symbols and background shall fall within the CIE color coordinates and reflectance values listed below, both before and after exposure testing.

Color shall be determined in accordance with Test Method "Tex-839-B, Determining Color in Reflective Materials."

CIE Chromaticity Coordinates and Reflectance Values					
White			Green		
x	y	Reflectance	X	y	Reflectance
0.300	0.290	40 minimum	0.255	0.330	3.5 – 10
0.280	0.310		0.255	0.520	
0.360	0.360		0.020	0.540	
0.340	0.380		0.030	0.370	

Illumination

The entire surface of the sign panel shall be evenly illuminated with a minimum average brightness reading at the letters of 1615 lumens per square meter (150 lumens per square foot) and a variation of no more than 20 percent for any reading from the average (minimum of 10 readings).

The light transmission factor of the sign panel shall provide a letter to background ratio of between 10:1 and 25:1.

Each background reading measured shall not vary by more than 40 percent (minimum of 10 readings) from the average of the background brightness readings.

Background readings shall be taken within 89 millimeters (3-1/2 inches) of the letters.

All readings shall be taken with a Tektronix J16 Photometer and Tektronix 6511 probe and shall be taken by placing the probe directly on the exterior face of the panel as it sits in the fixture.

The light transmission factor is defined as the average letter reading divided by the average background reading.

Percent Glass-Fiber

Glass-fiber reinforced panels shall have a percent glass-fiber equivalent to the percent glass-fiber of the prequalification samples within ± 5 percent.

Percent glass-fiber will be determined by loss on ignition in accordance with ASTM D 2584.

Hardness

The hardness of the panels shall match the hardness of the prequalification panels within ± 6 when determined in accordance with ASTM D 2240, Type D.

Tensile Strength

The tensile strength of the panels shall be a minimum of 62,055 kilopascals (9,000 psi) when tested in accordance with ASTM D 638.

Shear Strength

The shear strength of the panels shall be a minimum of 62,055 kilopascals (9,000 psi) when tested in accordance with ASTM D 732.

Thickness

The glass-fiber-reinforced panels shall have a minimum thickness of 1.4 millimeters (0.055 inch) and the polycarbonate panels shall have a minimum thickness of 2.3 millimeters (0.090 inch).

Workmanship

The panels shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect appearance or serviceability.