

2204 - CENTER MOUNT REFLECTORS

SECTION 2204

CENTER MOUNT REFLECTORS

2204.1 DESCRIPTION

This specification covers plastic center mount reflectors.

2204.2 REQUIREMENTS

a. General. Provide reflectors that are plastic reflector discs with a mounting hole in the center, and a nominal diameter of 3 inches. Provide the reflectors in 3 colors; white, amber and red. Provide amber and red reflectors that comply with the limits set by the Highway Yellow and Red Color Tolerance Charts of the U. S. Department of Transportation.

b. Construction and Materials.

(1) Plastic Reflector Unit. Provide reflectors that consist of 2 circular pieces of plastic, hermetically sealed together at the edges and at the center mounting hole. Provide units with an air space between the two sealed pieces and permanently sealed against dust, water and vapor.

(a) Front (Lens). Provide reflectors whose front piece of plastic consists of a clear and transparent acrylic plastic of the color shown in the Contract Documents. Provide reflectors whose outer surface of the front piece is smooth and highly polished, free from cracks, checks, projections or indentations. This surface may contain a mounting hole and trademark identification. Legibly mold the manufacturer's name and identification into the face near the edge. Form the inner surface into numerous small reflector elements to affect "cubecorner" retroreflection.

(b) Back. Provide a plastic back that is either transparent or opaque, but sealed to the front to form an airtight seal in order to protect the reflector elements.

(2) Housing and Mounting. Provide reflectors with a center mounting hole with a grommet that uses either of two designs. A Type I grommet is formed as part of the backing and projects through the reflector and beyond the lens by about 1/32 in. The backing, including the grommet, is hermetically sealed to the lens. A Type II grommet is formed from nonferrous metal and applied after the reflector is assembled and sealed. Provide either type of grommet with an inside diameter of 0.19 – 0.24 inches, inclusive.

c. Performance. Provide reflectors with the following minimum Reflective Intensity per reflector at a divergence angle of 0.2°:

TABLE 2204-1: MINIMUM REFLECTIVE INTENSITY			
Angle of Incidence	Reflective Intensity (cd/ft-c)		
	White	Amber	Red
-4°	90	54	25
20°	45	27	12

2204.3 TEST METHODS

Center mount reflectors will be sampled by a representative of KDOT and submitted to the Engineer of Tests. A sample consists of 18 reflectors per each 5000 reflectors for each color. For each additional 5000, or fraction thereof, add 4 reflectors to the sample size. Lightly wash the reflectors with a mild detergent and dry with a clean cloth before testing as follows:

a. Coefficient of Luminous Intensity per Reflector. Determine the reflective intensity of center mount reflectors according to ASTM E 809. Measure each reflector individually at a divergence angle of 0.2° and incidence angles of -4° and 20°. Average readings taken at every 45° rotation.

b. Heat Test. After measuring the reflective intensity per reflector, place a minimum of 9 reflectors face up in a horizontal position on the central rack of a forced draft oven maintained between 148° and 150°F for 4 hours.

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Remove the reflectors from the oven and place them face up on a table to cool. Allow the reflectors to return to room temperature, wipe the reflectors with a clean chamois and measure the reflective intensity of each reflector as described in **subsection 2204.3a**. The reflective intensity of each reflector must not be less than the minimum values shown in **subsection 2204.2c**.

c. Leakage Test. After measuring the reflective intensity per reflector, immerse a minimum of 9 reflectors face down in water in a vacuum desiccator under a coarse bronze or stainless steel screen to keep them beneath the water. Cover the desiccator and slowly reduce the air pressure in the desiccator until a vacuum of 20 inches of mercury is obtained. Hold this reduced pressure for 5 minutes and then allow air to slowly enter the desiccator until the pressure is equal to atmospheric pressure. Allow the reflectors to remain under water for an additional 5 minutes. Remove the reflectors from the water and wipe off the excess water with a clean cloth. Measure the reflective intensity of each reflector as described in **subsection 2204.3a**. Any reflectors that have filled with any water will be marked as failures and the reflective intensity will not be measured. The reflective intensity of each reflector must not be less than the minimum values shown in **subsection 2204.2c**.

d. Resampling. When only 1 reflector per sample fails **subsection 2204.3a**, **b**, or **c**, the entire sample will be accepted for use on KDOT projects. A failure of 2 reflectors per sample will require resampling and testing. A failure of 3 or more will cause the entire sample to be rejected without resampling.

2204.4 PREQUALIFICATION

None required.

2204.5 BASIS OF ACCEPTANCE

Each lot or batch will be sampled by a representative of KDOT and tested as necessary to verify compliance with the specification.

Satisfactory performance in the field.