

**SUPPLEMENTAL SPECIFICATION****SECTION 718 – RETROREFLECTIVE SHEETING**

*The intent of this Supplemental Specification is to accommodate new ASTM specifications.*

**718.01** Description. Retroreflective sheeting shall consist of a retroreflective microprismatic system having a smooth outer surface. When adhesive backing is used, the sheeting shall have a pre-coated adhesive on the back side protected by an easily removable liner.

**718.02** Detail Requirements. Reflective sheeting and overlay film shall be selected from the Department's Qualified Products List (QPL). Reflective sheeting and overlay film products will be included on the QPL after the Department determines conformance to the specifications and the manufacturer has supplied written information indicating conformance to the warranty requirements as noted under the acceptance criteria of the QPL. Determination of conformance will include, but will not be limited to, the evaluation of test data from AASHTO's National Transportation Product Evaluation Program (NTPEP) or other Department approved facilities except when otherwise indicated.

Retroreflective sheeting shall conform to the requirements of ASTM D 4956 including supplementary requirement and any exceptions and/or additions included herein.

**718.021** Retroreflective sheeting used on all Type A, AA, B, BB, C and CC signs, shall conform to the requirements of Type IV material except those specifically indicated otherwise herein.

**718.0211** Retroreflective sheeting for the copy, border, and shields on overhead structures including bridge mounts shall conform to Type IV, VIII, IX, or XI material unless otherwise noted in the plans.

**718.022** Blank.

**718.023** Blank.

**718.024** Fluorescent Retroreflective sheeting for the following signs shall conform to Type VIII, IX, or XI material.

- Fluorescent yellow sheeting shall be used for all Horizontal Alignment Warning signs as defined by the MUTCD.
- Fluorescent orange sheeting shall be used on permanent orange construction and maintenance activity signs as prescribed under Section 619.

**718.025** Overlay films shall consist of highly durable, transparent, acrylic colored films coated with a transparent pressure sensitive adhesive protected by a removable translucent, synthetic, release liner.

**718.0251** Test Methods: Testing conditions and panels for the following test shall follow ASTM D 4956.

**718.02511** Color Requirements. When electronic cuttable film is applied to retroreflective sheeting, the resulting color of the composite sheeting will conform to Federal Specification FP-92, Section 718.01 and ASTM D 4956.

**718.02512** Coefficient of Retroreflection,  $R_A$ . When transparent colored electronic cuttable film is applied per the manufacturer’s recommendations over white retroreflective sheeting, the colored composite will conform to the percentage specified in Table 1. The coefficient of retroreflection shall be determined in accordance with ASTM E-810.

<b>Table 1</b>		
Coefficient of Retroreflection $R_A$ * for applied Overlay Films (expressed as % of white retroreflective sheeting background )		
<b>Transparent Color</b>	<b>Minimum</b>	<b>Maximum</b>
Green	13.0	20
Blue	6.5	20
Red	14	24
Yellow	60.0	80
Orange	30	-
Brown	5.0	-

$R_A$  (cd/lux/m<sup>2</sup>) measurements shall be made at 0.2° observation angle, -4° entrance angle, and 0° rotation, per ASTM E-810. The ratio of the  $R_A$  (color) to  $R_A$  (white) shall be calculated and converted to a percentage to determine the film transmission values.

**718.02513** The following ASTM D 4956 requirements shall meet the specific color of overlay film:  
Daytime Color

- Accelerated Outdoor Weathering
- Color Fastness
- Shrinkage
- Flexibility
- Liner Removal
- Adhesion
- Impact Resistance
- Specular Gloss

**718.0252** Blank.

**718.0253** Adhesive Liner. The protective lay flat liner shall be a synthetic film liner resistant to moisture absorption and curl. The liner shall be printed with an indelible mark indicating the name of the film manufacturer.