



**INSPECTION & ACCEPTANCE
REFLECTIVE SHEETING**

GENERAL

Reflective sheeting for signs, barricades, reboundable drums and other traffic control devices shall meet the requirements of Section 4186.03. Reflective sheeting is classified according to the performance characteristics given in ASTM D-4956 and this IM. The following is a guide for identifying the various types of sheeting. Actual classification is based on performance characteristics and not on sheeting construction.

ASTM Type I - A medium intensity retroreflective sheeting referred to as "engineering grade" and typically enclosed lens glass bead sheeting.

ASTM Type II - A medium high intensity retroreflective sheeting sometimes referred to as "super engineering grade" and typically enclosed lens glass bead sheeting.

ASTM Type III - A high intensity retroreflective sheeting, that is typically encapsulated glass bead retroreflective material.

ASTM Type IV - A high intensity retroreflective sheeting. This sheeting is typically an unmetalized microprismatic retroreflective element material.

ASTM Type V - A super high intensity retroreflective sheeting. This sheeting is typically a metalized microprismatic retroreflective element material.

Type VI (Iowa) - An elastomeric high intensity retroreflective sheeting without adhesive. This sheeting is typically a vinyl microprismatic retroreflective material.

Type VII (Iowa) - A prismatic very high intensity retroreflective sheeting. The sheeting is typically a microprismatic material.

Type VI (Iowa) and Type VII (Iowa) sheeting shall meet the following initial material requirements:

Orange: Fluorescent orange sheeting shall have a minimum total luminance factor (Y) of 20% and non-fluorescent orange sheeting shall have a minimum (Y) of 12%. The sheeting shall meet the chromaticity coordinates shown in the following Table.

White: White sheeting shall have a minimum total luminance factor (Y) of 37% for Type VII (Iowa). The sheeting shall meet the chromaticity coordinates shown in the following Table.

Type VI (Iowa) & Type VII (Iowa) Chromaticity Coordinates

Color Point	Fluorescent Orange		White	
	X	Y	X	Y
1	0.583	0.416	0.303	0.300
2	0.535	0.400	0.368	0.366
3	0.595	0.351	0.340	0.393
4	0.645	0.355	0.274	0.329

Type VI (Iowa) and Type VII (Iowa) sheeting shall have an initial Coefficient of Retroreflection according to the following table:

Type VI (Iowa) & Type VII (Iowa) Coefficient of Retroreflection

Observation Angle (Degree)	Entrance Angle (Degree)	Fluorescent Orange (Candela/lux/m ²)	White (Candela/lux/m ²)
0.2	-4.0	170	430
0.2	+30.0	60	220
0.5	-4.0	50	200
0.5	+30.0	34	100

ACCEPTANCE

Acceptance of reflective sheeting for use on Department of Transportation projects or for contract purchases will be on the basis of manufacturer and brand name approval and the results of tests on monitor samples.

Approved manufacturers and brand names are listed in Appendix A.

MANUFACTURER & BRAND NAME APPROVAL

Manufacturer and brand name approval will be based on test results from the National Transportation Product Evaluation Program (NTPEP) and on testing done by the Iowa Department of Transportation.

The weathered sheeting shall meet the requirements Iowa's Standard Specification Article 4186.03.

Samples shall be submitted to the NTPEP test deck in Minnesota. In the event the Minnesota deck is discontinued, the samples shall be submitted to the NTPEP deck, which has weather conditions most similar to Iowa's. Sheeting materials for use on rigid construction work zone signs shall be weathered for one year and roll up signs for six months. Sheeting materials for permanent signs shall be weathered for three years. The sheeting shall be evaluated with the manufacturer's recommended ink, overlay films, and (if necessary) clear coat.

In addition, the manufacturer shall submit to the Iowa DOT, two sheets for each color with the dimensions of 36 by 36 inches (0.9 by 0.9 meters). These pieces will be fabricated into signs with the dimensions of 30 by 30 inches (0.8 by 0.8 meters). These signs will be evaluated for thermal cracks and other distress that may not be evident on the smaller panels tested by NTPEP. The evaluation period for the 30 by 30 inch panels shall be one year for construction zone materials and three years for permanent signs.

In the event that a manufacturer alters a material that is either approved or in the approval process, and the same product designation is maintained, the manufacturer shall notify the Manufactured Materials Engineer for the Iowa DOT. A determination will be made on a case-by-case basis to continue with the approval or approval process. Substantial changes will require the sheeting to start a new approval process.

An approval will remain in effect unless withdrawn because of deficient test results on monitor samples.

MONITOR SAMPLING AND TESTING

Monitor samples will be secured according to IM 486.