

Retroreflective Sheeting Identification Guide

General

The following information and color table is being provided to inform road authority officials of the various types of retroreflective sheeting, typical applications, and brand names and manufacturers. The information is accurate as of the date of printing and subject to change as new materials are developed.

It is hoped that this information will assist the proper officials in making informed decisions regarding the materials they select for the traffic control devices on their roadways.

This information was obtained from the Standard Specification for Retroreflective Sheeting for Traffic Control, ASTM Designation: D 4956-01, dated January 10, 2001. It has been summarized to provide the basic information regarding retroreflective sheeting types and adhesive backing classes. Technical information regarding the testing procedures that shall be followed to ensure conformance with ASTM specifications are available in the full version of the afore mentioned specification.

Definition

reboundable sheeting, n--retroreflective material intended to be attached to flexible impact resistant plastic devices, such as traffic drumlike channelizing devices

Requirements

Retroreflective sheeting shall consist of a white or colored sheeting having a smooth outer surface and that essentially has the property of a retroreflector over its entire surface. There are nine types and five classes of retroreflective sheeting. Types are determined by conformance to the retroreflectance, color, and durability requirements listed in section 6.1 of ASTM 4956-01 and may be of any construction providing that those requirements are met. Type designation is provided as a means for differentiating functional performance. Typical examples of applications are provided for descriptive information only and are not intended to be limitations or recommendations.

Typical Applications

The typical applications for the retroreflective sheeting addressed in this specification are:

Type	Typical Application
I	Highway Signing, construction-zone devices, and delineators
II	Highway Signing, construction-zone devices, and delineators
III	Highway Signing, construction-zone devices, and delineators
IV	Highway Signing, construction-zone devices, and delineators
V	Delineators
VI	Temporary roll-up signs, warning signs, traffic cone collars, and post bands
VII	Highway Signing, construction-zone devices, and delineators
VIII	Highway Signing, construction-zone devices, and delineators
IX	Highway Signing, construction-zone devices, and delineators

Retroreflective Sheeting Types

Retroreflective sheeting shall be classified as follows:

- Type I* -- A medium-intensity retroreflective sheeting referred to as "engineering grade" and typically enclosed lens glass-bead sheeting. Typical applications for this material are permanent highway signing, construction zone devices, and delineators.
- Type II* -- A medium-high-intensity retroreflective sheeting sometimes referred to as "super engineer grade" and typically enclosed lens glass-bead sheeting. Typical applications for this material are permanent highway signing, construction zone devices, and delineators.
- Type III* -- A high-intensity retroreflective sheeting, that is typically encapsulated glass-bead retroreflective material. Typical applications for this material are permanent highway signing, construction zone devices, and delineators,
- Type IV* -- A high-intensity retroreflective sheeting. This sheeting is typically an unmetallized microprismatic retroreflective element material. Typical applications for this material are permanent highway signing, construction zone devices, and delineators.
- Type V* -- A super-high-intensity retroreflective sheeting. This sheeting is typically a metallized microprismatic retroreflective element material. This sheeting is typically used for delineators.
- Type VI* -- An elastomeric high-intensity retroreflective sheeting without adhesive. This sheeting is typically a vinyl microprismatic retroreflective material. This sheeting is typically used for orange temporary roll-up warning signs, traffic cone collars, and post bands.
- Type VII* -- A super-high-intensity retroreflective sheeting having highest retroreflectivity characteristics at long and medium road distances. This sheeting is typically an unmetallized microprismatic retroreflective element material. Typical applications for this material are permanent highway signing, construction zone devices, and delineators.
- Type VIII* -- A super-high-intensity retroreflective sheeting having highest retroreflectivity characteristics at long and medium road distances. This sheeting is typically an unmetallized microprismatic retroreflective element material. Typical applications for this material are permanent highway signing, construction zone devices, and delineators.
- Type IX* -- A very-high-intensity retroreflective sheeting having highest retroreflectivity characteristics at short road distances. This sheeting is typically an unmetallized microprismatic retroreflective element material. Typical applications for this material are permanent highway signing, construction zone devices, and delineators.

Note 1 -- All retroreflective sheetings, but especially microprismatic sheetings, may have unique performance characteristics outside of the range of the standard geometries presented in the tables that define the types. Certain applications may require the use of a particular product within a particular type in order to achieve a desired level of retroreflectivity in a given situation. In these cases, information concerning additional performance characteristics must be obtained.

Adhesive Backing Classes

The backing required for retroreflective sheeting Types I through IX shall be classified as follows;

- Class 1* -- The adhesive backing shall be pressure-sensitive, require no heat, solvent, or other preparation for adhesion to smooth, clean surfaces.
- Class 2* -- The adhesive backing shall have an adhesive that shall be activated by applying heat and pressure to the material. The Class 2 material shall be repositionable under normal shop conditions and at substrate temperatures up to 100°F (38°C) and without damage to the material. The Class 2 material may be perforated to facilitate removal of air in heat-vacuum laminators, but the perforations must be of a size and frequency such that they do not cause objectionable blemishes when the sheeting is printed.
- Class 3* -- The adhesive backing shall have a positionable low-tack pressure-sensitive adhesive that requires no heat, solvent, or other preparation for adhesion to smooth, clean surfaces. It shall be repositionable up to a temperature of 100°F (38°C) without damage to the material.
- Class 4* -- The adhesive backing shall have a low-temperature pressure-sensitive adhesive that permits sheeting applications at temperatures down to +20°F (-7°C) without the aid of heat, solvent, or other preparation for adhesion to smooth, dry, clean surfaces.
- Class 5* -- This shall be a nonadhesive backing made of material commercially used for self-supporting products such as traffic cones, temporary roll-up warning signs, and post bands.

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Notes: ASTM Types are shown as stated by the manufacturers using ASTM D4956-04 “type” designations. Agencies should verify that the sheeting they use complies with their specifications or ASTM D4956. FHWA does not endorse or approve any material nor does it determine type category(s) for materials. This side of the Sheeting ID Guide is for rigid surfaces only. The other side is for flexible surfaces and non-signing applications.

Retroreflective Sheeting Materials for Rigid Sign Surfaces Made with Glass Beads

Example of Sheeting (Shown to scale)									
ASTM Type	I	II	III	III	III	III	III	III	
Manufacturer	See note A	Avery Dennison®	Nippon Carbide	3M™	ATSM, Inc.	Avery Dennison®	Kiwalite®	LG Lite	Nippon Carbide
Brand Name	Engineer Grade	Super Engineer Grade	Super Engineer Grade	High Intensity	High Intensity	High Intensity	High Intensity	High Intensity	High Intensity
Series Number	Several	T-2000	15000 17000 18000	2800 3800	ASTM HI	T-5500	22000	LH8000 LH8100	N500 N800
NOTES:	A								

Retroreflective Sheeting Materials for Rigid Sign Surfaces Made with Prisms

Example of Sheeting (Shown to scale)									
ASTM Type	III, IV	III, IV, X	VII, VIII, X	VIII	IV, VIII	IX	IX	X	Unassigned
Manufacturer	Avery Dennison®	3M™	3M™	Avery Dennison®	Nippon Carbide	Avery Dennison®	Avery Dennison®	Nippon Carbide	3M™
Brand Name	High Intensity Prismatic	High Intensity Prismatic	Diamond Grade™ LDP	MVP Prismatic	Crystal Grade	Diamond Grade™ VIP	Omni-View™	Crystal Grade	Diamond Grade™ DG3
Series Number	T-6500	3930	3970	T-7500	94000 (IV) 92000 (VIII)	3990	T-9500	93000	4000
NOTES:	B	B	B,D		B,C			C	

A – All the manufacturers listed on the other side of this guide (except Reflexite) provide Engineer Grade sheeting. Engineer Grade sheeting is uniform without any patterns or identifying marks. Visually, it is indistinguishable from lower quality grades (i.e., utility and commercial grades).
 B – These materials can be classified as different ASTM Types.
 C – These materials are visually indistinguishable from one another.
 D – The arrow or “water mark” on this product is no longer included with new productions.

