

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.






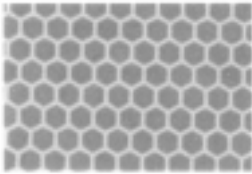
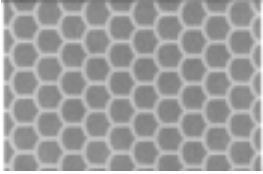
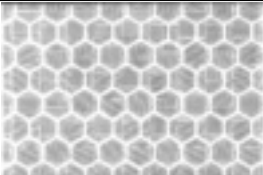
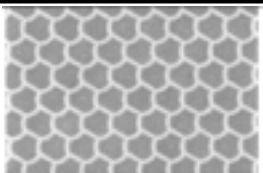
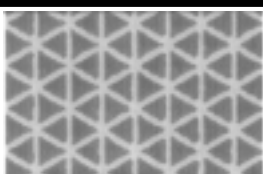
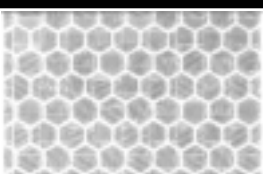

Adhesive Backing Classes


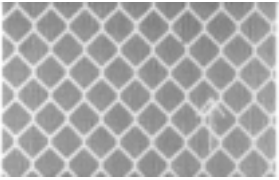

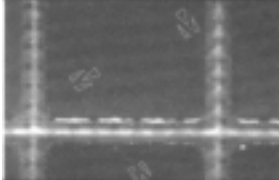
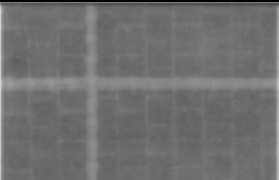
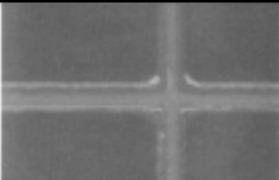
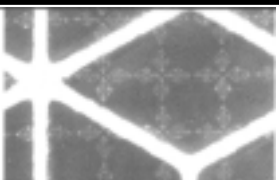

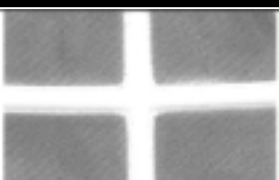

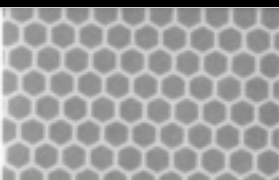

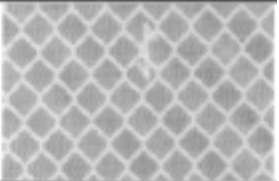

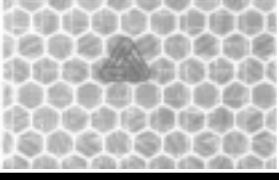

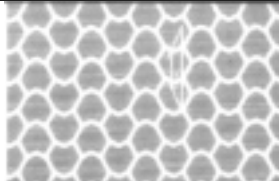
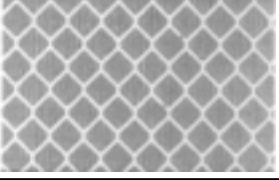

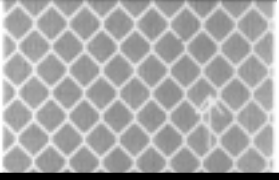
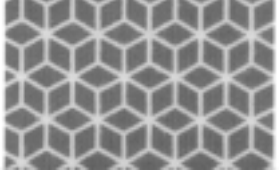
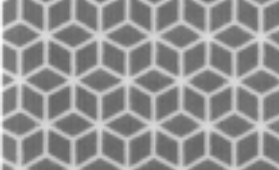
The backing required for retroreflective sheeting Types I through IX shall be classified as follows;

- 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.

Retroreflective Sheeting Identification Guide

Current as of 11/16/2001

ASTM Type	<p>NOTES: Photographs show the sheeting pattern at actual size. Symbols depict watermark visible on sheeting when viewed up close (not shown at actual size). The "Type" designations used in this guide are ASTM D4956-01 classifications <u>as stated by manufacturers</u>. FHWA does not endorse or approve any material nor does it determine what type category(s) may be. Fluorescent colors are not currently defined by ASTM D4956-01.</p>		
I	Commonly referred to as Engineer Grade. Enclosed lens glass bead materials have a uniform appearance without any pattern or identifying marks. It is indistinguishable from grades lower in reflectivity and durability such as "utility" and "commercial" grade.		
II	Super Engineer Grade - Identical in appearance to Type I except for addition of identifying marks as pictured. Avery Dennison®		Super Engineer Grade - Identical in appearance to Type I except for addition of identifying marks as pictured. Nippon Carbide
III	Symbols used for special applications:		
	High Intensity 3M™	 Cones	 Drums  Tubes
		 Signs (Temporary)	
	High Intensity ATSM Rigid Surface		Series 5000 Avery Dennison® Rigid Surface
	Series 6000 Avery Dennison® Rigid Surface		High Intensity LG Lite Rigid Surface
	High Performance Ultra Lite Grade II (ULG II) Nippon Carbide Rigid Surface		WR - 6100 Avery Dennison® Reboundable Devices
	High Impact Channelizer Tape Reflexite Reboundable Devices		22000 Series Kiwalite® Rigid Surface
IV	Series 6000 Avery Dennison® Rigid Surface		
V	AR 1000 Reflexite Barrier Delineators		AP 1000 Reflexite Railroad Sign Backs and Supports, End of Road Barricade

VI	<p>Series RS20 3M™ Roll-Up Signs</p>  	<p>Series RS30 3M™ Roll-Up Signs</p>  
	<p>WU-6014 Avery Dennison® Roll-Up Signs</p> 	<p>Flagging Material Reflexite Nighttime Flagging</p> 
	<p>High Performance (Marathon Fluorescent) Reflexite Roll-Up Signs</p> 	<p>Super Bright Fluorescent Reflexite Roll-Up Signs</p> 
	<p>Preformed Cone Collar Reflexite Cones</p> 	<p>3840 Cone Sleeves 3M™ Cones</p>  
VII	<p>Diamond Grade™ LDP 3M™ Rigid Surface</p>  	
VIII	<p>Series 7000 Avery Dennison® Rigid Surface</p>  	<p>Crystal Grade Nippon Carbide Rigid Surface</p>  
	<p>Diamond Grade™ NAP 3M™ Rigid Surface</p> 	
IX	<p>Diamond Grade™ VIP 3M™ Rigid Surface</p>  	
*Unassigned/ Proposed	<p>Resilience™ Channelized Tape Reflexite Reboundable Devices</p> 	<p>Endurance™ Sign System Reflexite Temporary Rigid Signs</p> 

* The materials in “Unassigned/Proposed” box have yet to be classified.

Contact information: www.3M.com/tcm - www.reflectives.averydennison.com - www.nikkalite.com - www.reflexite.com
www.atsminc.com - www.kiwa.com - www.lgchem.com

Developed by the Federal Highway Administration - <http://safety.fhwa.dot.gov/programs/retroref.htm>