

# Avery Dennison® 4500 Series Reflective Film

Permanent

Revision: 4 Dated: 11/18/13

## Uses:

Avery Dennison® 4500 series is a metalized prismatic, retroreflective film designed to provide an extra high level of visibility for emergency vehicles, fleet graphics, traffic delineators, photoelectric controls, decals and general markings at wider entrance angles.

Colors (with polyester interleaf):

White – 45110

Red – 45118

Blue – 45105

Colors (without polyester interleaf):

White – 45200

Yellow – 45201

Red - 45202



**Face:** 9.0 mil (228 microns) high gloss acrylic



**Adhesive:** Permanent Acrylic (clear)



**Liner:** Polymeric film



**Durability:** Up to 5 years

## Application Surfaces:

Flat or simple curves (Not recommended for unpainted stainless steel.

Note: Wet method of application should not be used on Avery Dennison® metalized reflective films. Use of wet method invalidates standard warranty on this product.

## Features:

- High gloss face
- Complies with ASTM D-4956 test method
- Durable up to 5 years outdoors

## Conversion:

- Flat Bed Sign-Cut
- Steel Rule Die-Cutting
- Guillotine Cutting
- Screen Printing

## Common Applications:

- Fleet
- Emergency Vehicle
- Traffic Delineators
- Photoelectric Controls
- Decals
- General Markings

## Product Data Sheet

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#### Physical Characteristics:

Property	Value
Caliper, face	9.0 mil (228 µm)
Caliper, adhesive	3.0 mil (76 µm)
Dimensional stability	Complies with ASTM D-4956 test method
Tensile at Yield	
Elongation	
Gloss	Hunter Gloss @ 60
Adhesion: 15 min.	
Flammability	Self Extinguishing
Shelf-Life	<i>2 years from date on label (up to 2 years unprocessed, OR process within one year and apply within 1 year of processing)</i>
Durability	Vertical Exposure Up to 5 years
Min. Application Temperature	55° F (13° C)
Service Temperature	-10°-140°F (-12°-60° C) (Reasonable range of temperatures which would be expected under normal environmental conditions).
Chemical resistance	Resistant to most mild acids, alkalis, and salt solutions.

#### Typical Optical Properties:

Entrance Angle	Observation Angle	White	Yellow	Red	Blue
-4°	0.1°	2000	1500	350	160
-4°	0.2°	900	675	670	72
-4°	0.5°	230	170	40	18.4
30°	0.1°	1100	800	180	88
30°	0.2°	600	425	100	48
30°	0.5°	120	85	20	9.6

Tested according to ASTM E810

#### Important:

Information on physical and chemical characteristics are based on tests believed to be reliable. The values are intended only as a source of information. This information is given without guaranty and do not constitute a warranty. The purchaser should independently determine, prior to use, the suitability of any material for their specific purpose. (Data represents average values where applicable, and is not intended for specification purposes)

#### Warranty:

All statements, technical information and recommendations about Avery Dennison products are based upon tests believed to be reliable but do not constitute a guarantee or warranty. All Avery Dennison products are sold with the understanding that Purchaser has independently determined the suitability of such products for its purposes. Avery Dennison products are warranted to be free from defects in material and workmanship for either one year (or the period stated on the specific product information literature in effect at time of delivery, if longer) from date of shipment if said product is properly stored and applied. It is expressly agreed and understood that Avery Dennison's sole obligation and Purchaser's exclusive remedy under this warranty, under any other warranty, express or implied, or otherwise, shall be limited to repair or replacement of defective product without charge at Avery Dennison's plant or at the location of product (at Avery Dennison's election), or in the event replacement or repairs is not commercially practical, to Avery Dennison's issuing Purchaser a credit reasonable in light of the defect in the product.

Avery Dennison's liability for defective products shall not exceed the purchase price paid therefore by Purchaser and in no event shall Avery Dennison be responsible for any incidental or consequential damages whether foreseeable or not, caused by defects in such product, whether such damage occurs or is discovered before or after replacement or credit, and whether or not such damage is caused by Avery Dennison's negligence.

NO EXPRESS WARRANTIES AND NO IMPLIED WARRANTIES, WHETHER OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE, OR OTHERWISE (EXCEPT AS TO TITLE), OTHER THAN THOSE EXPRESSLY SET FORTH ABOVE WHICH ARE MADE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, SHALL APPLY TO PRODUCTS SOLD BY AVERY DENNISON. AVERY DENNISON SPECIFICALLY DISCLAIMS AND EXCLUDES ALL OTHER SUCH WARRANTIES. NO WAIVER, ALTERATION, ADDITION OR MODIFICATION OF THE FOREGOING CONDITIONS SHALL BE VALID UNLESS MADE IN WRITING AND MANUALLY SIGNED BY AN OFFICER OF AVERY DENNISON.

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#### **Dimensional stability:**

Is measured on a 6" x 6" (150 x 150 mm) aluminum panel to which a specimen has been applied; 72 hours after application the panel is scored in a cross pattern, exposed for 48 hours to 150°F (65°C), after which the shrinkage is measured.

#### **Adhesion:**

(FTM-1, FINAT) is measured by peeling a specimen at a 180° angle from a stainless steel panel, 24 hours after the specimen has been applied under standardized conditions. Initial adhesion is measured 15 minutes after application of the specimen.

#### **Flammability:**

A specimen applied to aluminum is subjected to the flame of a gas burner for 15 seconds. The film should stop burning within 15 seconds after removal from the flame.

#### **Temperature range:**

A specimen applied to stainless steel is exposed at high and low temperatures and brought back to room temperature. 1 hour after exposure the specimen is examined for any deterioration. Note: Prolonged exposure to high and low temperatures in the presence of chemicals such as solvents, acids, dyes, etc. may eventually cause deterioration.

#### **Chemical Resistance:**

All chemical tests are conducted with test panels to which a specimen has been applied. 72 hours after application the panels are immersed in the test fluid for the given test period. 1 hour after removing the panel from the fluid, the specimen is examined for any deterioration.

#### **Related Documents:**

The following Avery Dennison literature will provide complete information to the user for proper application, storage, and other requirements and is available upon request from your Avery Dennison representative or from the Avery Dennison website ([www.na.averygraphics.com](http://www.na.averygraphics.com)).

Document Title	Reference Number
Substrate Cleaning and Preparation	Instructional Bulletin #1.10
Converting Tips for Sign Films	Instructional Bulletin #2.10
Ink Recommendations for Cast, Reflective, Calendered, and Specialty Products	Instructional Bulletin #3.00
Cutting Methods for Avery Dennison Reflective Traffic Sign Sheeting	Instructional Bulletin #8.20
Computer Sign Cutting Avery Dennison Traffic Sign Products	Instructional Bulletin #8.25

*Revisions are italicized*

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