

Avery Dennison® V4000 Premium Reflective

Permanent StaFlat or Easy Apply RS

Revision: 0 Dated: 06/26/18



Uses:

Avery Dennison® V4000 Premium Reflective is a conformable enclosed lens retro-reflective sheeting which meets or exceeds the requirements of Federal specification ASTM D4956-13. V4000 Premium Reflective film offers exceptional value for architectural, transportation, and general signage applications requiring conformability and extended durability.



Face: PERM - 5.7 mil (143 micron)
LTR - 7.9 mil (210 micron)



Adhesive: PERM - Permanent Clear Acrylic
LTR - Long Term Removable Acrylic (clear with gray opacifying layer)



Liner: 90# Staflat or
90# Easy Apply™ RS

Application Surfaces:

Flat, Flat with Rivets, Rivets and Corrugations, Moderate Curves

Notes:

- V4000 w/PERM adhesive not recommended for unpainted stainless steel applications.
- V4000 w/LTR is approved for use on stainless steel
- Wet method of application is not recommended on V4000 reflective film. Use of wet method of application invalidates standard warranty on this product.

Features:

- Reflectivity of film allows night time visibility of image
- High gloss finish
- Conforms well over rivets for fleet applications
- Outstanding durability and outdoor performance
- Dimensionally stable liner for easy converting
- Excellent dimensional stability
- The V4000 Perm and LTR meet ASTM D4956-13 specification
- White V4000 is digitally printable
- Available with LTR Easy Apply RS or Permanent adhesive

Conversion:

- Flatbed Sign-Cut
- Drum Roller Sign-Cut
- Steel Rule Die-Cutting
- UV inkjet*
- Mild/Eco Solvent inkjet
- Latex Inkjet
- Solvent based inkjet

* For flat surfaces only, except for qualified flexible UV inks.

Common Applications:

- Fleet
- Vehicle
- Indoor Graphics
- POP/ Trade Show
- Outdoor Signage
- Striping
- Bus Graphics
- Railroad Decals

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Physical Characteristics:

Property	Measurement	Typical Value
Caliper, face		PERM - 5.7 mil (143 µm) LTR - 7.9 mils (201 µm)
Caliper, adhesive		1.4 mil (36 µm)
Dimensional stability		<0.03" (0.4mm) Note: Ink loads in excess of 250% may cause increased shrinkage and/or increased initial adhesion of the printed film
Tensile at Yield		PERM 7-9 lbf/in (1.25-1.60 kgf/cm) LTR 9-11 lbf/in (1.60 -2.15 kgf/cm)
Elongation		70% minimum
Gloss	Hunter Gloss @ 60 degrees	90 GU
Adhesion SS:	Perm 90# StaFlat 15 min 24 hr 1 week LTR 90# StaFlat EZ RS 15 min 24 hr 1 week	3.5 lbs/in (604 N/m) 3.8 lbs/in (665 N/m) 4.6 lbs/in (802 N/m) 1.5 lbs/in (270 N/m) 1.9 lbs/in (333 N/m) 2.1 lbs/in (361 N/m)
Flammability	FMVSS302	Self Extinguishing
Shelf-Life		2 years from the date of manufacture (when stored at the following temperatures and humidity conditions 68°-77° F (20° - 25° C) and 50±5% R. H.)
Durability	Vertical Exposure	Unprinted – Up to 7 years Printed – Up to 5 years
Min. Application Temperature		50° F (10° C) Flat & Flat w/Rivets
Service Temperature		-50° to 180°F (-45° to 82° C) (Reasonable range of temperatures which would be expected under normal environmental conditions).
Chemical resistance		Resistant to most mild acids, alkalis, and salt solutions
Optical Properties	Reflective Intensity	The V4000 meets the ASTM D4956-13 specification Type 1 (EG) for Permanent adhesive Class 3 for Easy Apply RS adhesive (70 cpl minimum reflectivity for white).

Data represents average values where applicable, and is not intended for specification purposes.

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Warranty:

This Warranty applies to the Product listed in this Data Sheet. All statements, technical information (including physical and chemical characteristics) 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 subject to the Purchaser's assent and agreement that Purchaser is responsible for, and has independently determined, the suitability of such products for its purposes or its customer's purposes. Avery Dennison products are warranted to be free from defects in material and workmanship (i) for two years from the date of manufacture, or (ii) from the date of manufacture until the expiration of the period stated on the specific Product Data Sheet in effect at the time of delivery. Such time periods are subject in either case to the proper storing and application of said product, and the failure to properly store or apply the product, including without limitation the failure to follow any applicable Instructional Bulletin, negates any warranty. 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 exclusively to: (a) repair or replacement of defective product without charge at Avery Dennison's plant or at the location of the product (at Avery Dennison's election), or (b) in the event repair or replacement are not commercially practical, a credit amount up to the price of the product taking into account the defect in the product in Avery Dennison's sole discretion.

THE WARRANTY EXPRESSLY SET FORTH ABOVE IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR USE AND/OR NON-INFRINGEMENT. SELLER 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.

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.

All sales and contracts for sale of Products are subject to Purchaser's assent and agreement to this Warranty. Avery Dennison hereby objects to any terms or conditions contained in any purchase order or other communication of any kind from the Purchaser that is conflicting, inconsistent or additional to this Agreement.

▲WARNING

Failure to install the film in full compliance with Avery Dennison's installation instructions may result in personal injury or property damage. Read and follow all instructions when installing the film.

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Colors & Expected Durability

Vertical Durability for Zone 1 vertical applications is noted in the chart below. Color samples are available from samples.graphics@averydennison.com, or through your sales or customer service contact. Reference Instructional Bulletin 1.30 for zones by geographic location.

NOTE: Some color fade may occur in severe environmental areas. Reference IB 1.30 for durability guidelines.

V-4000 Series Name	Vertical Durability Zone 1 Years	V-4000 Series Name	Vertical Durability Zone 1 Years
V4000-101-R White Perm SF	7	V4000-101-R White LTR EZ RS	7
V4000-190-R Black Perm SF Δ	7	V4000-190-R Black LTR E ZRS	7
V4000-250-R Yellow Perm SF	7	V4000-250-R Yellow Perm LTR E ZRS	7
V4000-650-R Blue Perm SF	7	V4000-650-R Blue Perm LTR E ZRS	7
V4000-450-R Red Perm SF	7	V4000-450-R Red Perm LTR E ZRS	7
V4000-350-R Orange Perm SF	7	V4000-350-R Orange Perm LTR E ZRS	7

Δ - colors not used by government institutions, do not have ASTM® reflectivity minimums.

Typical Coefficient of Retro-Reflectivity:

Color	Coefficient of Retro-Reflectivity	Color	Coefficient of Retro-Reflectivity
White	100	Black	16
Orange	25	Blue	6
Red	15	Yellow	70

COMMENTS: (based on averages of production runs, NOT for specification purposes)

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.graphics.averydennison.com).

Document Title	Reference Number
Substrate Cleaning and Preparation	Instructional Bulletin #1.10
Storage, Maintenance, and Cleaning of PVC Films	Instructional Bulletin #1.20
Warranty of Avery Dennison Films	Instructional Bulletin #1.30
Cleaning and Maintenance of Vehicle Wraps	Instructional Bulletin #1.50
Converting Tips for Sign Films	Instructional Bulletin #2.10
Ink recommendations for Cast, Reflective, Calendered, and Specialty Products	Instructional Bulletin #3.00
Sericol TMI II Screen Inks: Metallics	Instructional Bulletin #3.20
Sericol TMI II Screen Inks: Four Color Process	Instructional Bulletin #3.21
Sericol TMI Screen Inks: Opaques, Transluents, and Transparents	Instructional Bulletin #3.22
Sericol UTMI II Overprint Clear Coat	Instructional Bulletin #3.23
Sericol TMI II 1000 Overprint Clear Coat	Instructional Bulletin #3.24
Nazdar 3500 UV Fleet	Instructional Bulletin #3.30
Application of Avery Dennison SuperCast Films on Irregular Substrates	Instructional Bulletin #4.07
Removal Instructions	Instructional Bulletin #4.10
Thermal Transfer Printing, Converting, Operating, and Product Instructions	Instructional Bulletin #5.10
Tips for Overlaminating, Premasking & Packaging Graphics IB 5.50	Instructional Bulletin #5.50

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Multi Purpose Inkjet OEM Qualification Matrix, Durability Reference, & Troubleshooting Guide	Instructional Bulletin #5.80
Reflective Films on Stainless Steel IB 6.11	Instructional Bulletin #6.11

Application:

Avery Dennison V4000 Series is designed for application onto solid surfaces such as passenger vehicles, buses, trains, and railcar. To ensure color consistency when wrapping a vehicle, ensure the material used is from one production lot # of material.

Important Note: Never use a wet application method to apply this film.

- Some slight color shift may occur between rolls or lots, therefore, minimizing the mixing of rolls/lots on a specific vehicle is encouraged. If multiple rolls are needed be sure to use only rolls from the same production lot.
- Firm pressure should be used during the application to prevent the formation of post application bubbling.
- All vehicle substrates must be cleaned according to Avery Dennison recommended cleaning practices as outlined in IB # 1.10 "Substrate Cleaning and Preparation".
- For cleaning and care recommendations see IB 1.30.

Cleaning and maintenance products should conform to the following:

- Free from abrasive components
- Ideally pH balanced, thus not highly acidic or alkaline (pH level between 5 and 9)
- Free from alcohols (including isopropyl), acids, ammonia, chlorine, glycol ethers, harmful detergents, petroleum distillates, and phosphates

Unsuitable Uses:

This Avery Dennison product is not designed or recommended for the following uses. Unsuitable applications or exposure conditions include:

- Graphics exposed to oil, harsh chemicals, or gasoline vapors or spills
- Paint that is not thoroughly cured or dried
- Low surface energy substrates (i.e. Tedlar® coatings)
- Substrate surfaces that are not properly cleaned
- Painted substrates with poor paint-to-substrate, or paint-to-paint bond
- Film applied to non-Avery Dennison Films
- Non-OEM painted vehicles
- Graphic removal from paint with poor adhesion or existing graphics
- Graphics where application tape must adhere to EZ liner
- Plotter cut text where the minimum size of the text or dimension of the object is less than 2 in (51 mm)

Removability:

The removability of LTR listed in the features section "Clean removability" means removable with less than 20% adhesive residue when using appropriate heat and chemical removal methods. See Instructional Bulletin 4.10 for removal instructions.

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Avery Dennison does not warrant removability from the following substrates:

- Surfaces with poor paint-to-substrate adhesion
- Wallboard (painted or unpainted)
- Pre-existing graphics that must remain intact; damage to existing graphic when film is removed
- Improperly cured paint
- Oxidized or chalked substrates
- Horizontally exposed outdoor applications (as defined in Instructional Bulletin 1.30).
- Stainless Steel

Avery Dennison makes no warranty for:

- **Paint Staining:** Avery Dennison does not warrant vehicle paint staining that may be visible after removing material which has cracked or discolored. To reduce the risk of this problem, always remove the graphic at the first sign of a change in the surface of the material.
- Ease or speed of removal of any graphic
- Removal from automotive paint that is greater than 5 years old.
- Removal from paint that is improperly cured
- Removal from aged paint or metals, surface oxidation or chalking; user must test, approve, and accept liability for such applications.
- Removal from horizontally-exposed outdoor applications.

Revisions are italicized

Patent Registration:

US6,630,049, US7,060,351, US7,344,618, EP1276605, EP1282472

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