

Avery Dennison® V-4000 E Premium Reflective

Permanent StaFlat or Easy Apply RS

ISSUED: NOV 2020

Overview

Avery Dennison® V-4000 E Retro-Reflective film is a flexible cast reflective vinyl with high dimensional stability. It is designed for truck and trailer applications in Europe. Ideal solution where day and night time visibility is required. V-4000 E Series comes with LTR Easy Apply™ RS or Permanent Adhesive.

V-4000 E comes with a watermark certifying its ECE104 - Class E approval. (Approval Number 104R – 000005). This series also meets the ASTM D4956®, Type 1 reflectivity levels.

Availability

Series/Color	Durability* (years)
V-4000-101-R White	7
V-4000-190-R Black	7
V-4000-250-R Yellow	7
V-4000-650-R Blue	7
V-4000-450-R Red	7
V-4000-350-R Orange	7

*Vertical Exposure Only Unprinted.
Printed - up to 5 years

Features

• Reflectivity of film allows night time visibility of image
• High gloss finish
• Conforms well over rivets for fleet applications
• Dimensionally stable liner for easy converting
• Digitally Printable (white only)

Performance

Australia	ECE 104 Class D/E	Italy	ECE 104 Class D/E
Belgium	ECE 104 Class D/E	Netherlands	ECE 104 Class D/E
Europe	ECE 104 Class D/E	North America	NFPA 1901
Germany	ECE 104 Class D/E	Spain	ECE 104 Class D/E
France	ECE 104 Class D/E	South Africa	ECE 104 Class D/E

Avery Dennison recommends the user obtain the current requirements from their local governing agency to ensure product conformance.

Characteristics

Construction	Vinyl Retroreflective Film with beads with a permanent clear acrylic or Long Term Removable Acrylic adhesive protected with 90# Staflat or 90# Easy Apply™ RS.
Typical Film Caliper (Face + Adhesive)	PERM: 7.1 mils (179 μm) LTR: 9.3 mils (237 μm)
Shelf-life	1 year from the date of purchase when stored at 73.4°F (23°C) 50% ± 5% R.H.
Min. Application Temperature	50° F (10° C) Flat & Flat w/Rivets
Service Temperature	-0° to 176°F (-40° to 80° C) (Reasonable range of temperatures which would be expected under normal environmental conditions).

Table A - Retroreflectivity

Typical values for the coefficients of retroreflection (RA) for V-4000 are shown in Table A. The values are shown at 0° orientation.

Minimum Coefficient of Retroreflection (R _A) cd/lx/m ²							
Observation Angle	Entrance Angle	White	Yellow	Red	Blue	Orange	Black
0.2°	5°	49.4	36.5	8.9	3.8	15.7	9.2



Table B - Other Testing

Test	Requirement	V-4000 E Permanent	V-4000 E EZRS/LTR
Dimensional Stability	1000 hrs AtlasTwin Arc Weatherometer, EH	max. 0,8 mm	max. 0,8 mm
Chemical Resistance LS300C section 3.6.2 Immersion in kerosine and turpentine for 10 minutes Toluene, Xylene, and Methyl alcohol for 1 minute	No deterioration.	Pass	Pass
Adhesion ASTM D3330, PSTC 101	Aluminum	680 N/m	376 N/m
	Stainless Steel	600 N/m	270 N/m
	Painted Aluminum	495 N/m	179 N/m

Application Surfaces

- Flat
- Flat with Rivets
- Rivets and Corrugations
- Moderate Curves
- V4000 E w/PERM adhesive not recommended for unpainted stainless steel applications.
- V4000 E w/LTR is approved for use on stainless steel

Application

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

Conversion

- Thermal Die - Cut*
- Flatbed Sign - Cut*
- Steel Rule Die- Cut*
- Drum Roller Sign - cut*
- V-4000 E with Easy Apply™ RS converted material to be transported flat.
- V-4000 E White can be inlet printed (latex, Mild/Eco Solvent or UV).

*Good on PERM version, possible on LTR- Version

Substrates

The application of Avery Dennison V-4000 E is limited to flat surfaces and moderate curves with or without rivets. Not recommended for unpainted stainless steel. Wet method application is not recommended. The use of wet application invalidates the standard warranty.

Instructional Bulletins

Please refer to Instructional Bulletins which detail proper handling, storage, and converting of Avery Dennison retroreflective films, overlays, inks, and application tapes. Instructional Bulletins may be found in the Customer Tools section of our [website](#).

Warranty

WARRANTY

Avery Dennison ® branded materials are manufactured under careful quality control and are warranted to be free from defect in material and workmanship. Any material shown to our satisfaction to be defective at the time of sale will be replaced without charge. Our aggregate liability to the purchaser shall in no circumstances exceed the cost of the defective materials supplied. No salesman, representative or agent is authorised to give any guarantee, warranty, or make any representation contrary to the foregoing. All Avery Dennison ® branded materials are sold subject to the above conditions, being part of our standard conditions of sale, a copy of which is available on request.

CONDITIONS

This warranty shall be effective only if all of the following conditions are met: Fabrication and/or installation must occur within one (1) year from the date of purchase. The failure must have resulted solely from a manufacturing defect or deterioration of the Product due to natural causes under the Performance Warranty. Without limiting the generality of the foregoing, there is no warranty for the failure of the sheeting due to improper sign fabrication, improper storage, handling, installation, maintenance, failure of the sign substrate, vandalism or mischief. Slight color fading, cracking, chalking, edge lifting, or slight reduction in gloss or reflectivity will not materially detract from appearance and does not constitute a breach of warranty. Avery Dennison has published instructional bulletins pertaining to the storage, handling, and cleaning of Product, approved substrates, and application procedures (collectively, the "Procedures"). The Product must



have been processed and applied to blank, clean material in accordance with the Procedures, as such may be amended from time to time. Avery Dennison reserves the right to reject any warranty claim where the fabricator or installer cannot satisfactorily prove or demonstrate that the Avery Dennison Procedures were utilized. The date of installation, warranty registration, and claim procedures established by Avery Dennison must be followed, and failure to follow such procedures shall void this warranty. Replacement Product carries only the unexpired warranty portion of the Product it replaces. The Product must be properly stored and applied within the shelf-life as stated in the applicable Avery Dennison Product Data Sheet including adhesive and other material product data sheets.

ADDITIONAL LIMITATIONS

Unintended Use: This warranty only applies to Product that is used by professional converters and installers for the defined end uses and in the combinations described in the applicable Avery Dennison Product Data Sheets and Instructional Bulletins. For any other use, the user is responsible for determining the suitability of the Product, and for any and all risk or liability associated with that use or application, and the user agrees to indemnify, defend and hold harmless Avery Dennison for any claims, losses, damages, judgments, expenses and/or expenses, including attorneys fees, resulting from such use or application. This warranty is expressly conditioned on the Product being processed by professional converters or installers in accordance with the Avery Dennison recommended written processing instructions, and being applied to properly prepared surfaces and cleaned and maintained in accordance with recommended Avery Dennison procedures. It is the converters, installers or other users responsibility to perform incoming raw material quality inspections, to assure proper surface preparation and that approved application procedures are followed, to retain converted samples, and to immediately cease using and notify Avery Dennison and/or its authorized agent or distributor of any Product, Materials and/or finished Product discovered to be (or reasonably capable of being discovered to be) defective.

Misuse and Force Majeure: Avery Dennison has no obligations or liability under this warranty with respect to Product that has been altered, modified, damaged, misused, abused, subject to accident, neglected or otherwise mishandled or improperly processed or installed. Product is not warranted against premature failure caused by chemical, environmental or mechanical means such as, but not limited to, vandalism, cleaning solutions, paints, solvents, moisture, temperature, mechanical washing equipment, engine fuel spills, engine exhaust, steam, organic solvents or other spilled chemicals pollutants, including industrial and volcanic ash. Damage from fire, structural failure, lightning, accidents, and other force majeure events are not covered by this warranty.

Third Party Product: Avery Dennison assumes no responsibility for any injury, loss or damage arising out of the use of a product that is not of our manufacture. Where installer or converter uses or reference is made to a commercially available product, made by another manufacturer, it shall be the responsibility of the user, installer or converter to ascertain the precautionary measures for its use outlined by the manufacturer.

The remedies provided under this warranty are exclusive. In no event shall Avery Dennison be responsible for any direct, indirect, incidental or consequential damages or specific relief 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. In no event shall Avery Dennison's liability hereunder exceed the remedies specifically set forth in this warranty. Avery Dennison's liability shall be limited, at Avery Dennison's option, to the purchase price, replacement of the defective Product and in some cases when authorized by Avery Dennison the repair and replacement of the defective Product. **THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHERS. ANY AND ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED. 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.**

DEFINITIONS

Durability: means that the Product in a finished graphic, panel or sign situated outdoors, subject to the limitations herein and Avery Dennison Product Data Sheets and Instructional Bulletins, and applied to recommended surfaces, will not deteriorate excessively such that the finished sign, panel or graphic is ineffective for its identification when viewed under normal conditions from the intended viewing distance.

Outdoor Durability: is based on normal middle European and central North American outdoor exposure conditions and application to recommended surfaces. Actual performance life will depend on a variety of factors, including but not limited to substrate preparation, exposure conditions and maintenance of the Product and finished graphic, panel or sign. In case the finished graphics, panel or sign is in areas of high temperatures or humidity, in industrially polluted areas or other areas with air laden particulate matter, and/or in high altitudes, Outdoor Durability may be reduced. Please see your local Avery Dennison representative for changes to warranties based on such localized conditions.

Vertical Exposure: means that the face of the finished graphic is $\pm 10^\circ$ from vertical.

Non-Vertical Exposure: means that the face of the finished graphic is greater than 10° from vertical and greater than 5° from horizontal. Retroreflective films are not warranted for this exposure. Flat surfaces: means a two dimensional flat surface without protruding objects.

Weathering Effects: Some degradation of Product performance over time is considered normal wear. Slight color fading, chalking, edge lifting, or slight reduction in gloss or reflectivity due to normal wear exposure and other natural weathering, environmental or other conditions or damage caused by tornadoes, hurricanes, wind, excessive ice buildup or extraordinary frozen particulate conditions, large hailstones or other acts of God, do not constitute a breach of warranty or give rise to any liability by Avery Dennison.

Adhesion to Application Surfaces: This warranty does not cover the Product if the application surface is not properly prepared; nor does the warranty cover the Product or damage to the substrate because the layers of the substrate separate due to a lower bond between those layers than the bond between the Product and the top layer of the substrate, or surfaces which subsequently crack, peel, outgas, or become damaged beneath the Product

INDEPENDENT TESTING REQUIRED All statements, technical information and recommendations about Avery Dennison products are based upon tests and information believed to be reliable but do not constitute a guarantee or warranty of any kind. All Avery Dennison products are sold with the understanding that Purchaser has independently determined the suitability of such products for its intended and other purposes.

