

PRODUCT DATA SHEET

Avery Dennison® V-4000 Retro-Reflective Films

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Introduction

Avery Dennison® V-4000 is a high-quality beaded retro-reflective cast film, tailored for long-term commercial and emergency fleet applications. It has excellent cutting and weeding performances as well as printing on screen presses. Digital printability is possible with the white version. A high level of reflectivity makes this a very versatile product that offers exceptional value for vehicle, architectural, and general signage applications requiring conformability and extended durability.

Description

Facefilm: High gloss, cast retro-reflective vinyl film with enclosed lens
Adhesive: Permanent, pressure sensitive, Clear Acrylic (Perm-version)
or Long Term Removable Acrylic (LTR-version)
Backing paper: 90# StaFlat
or 90# StaFlat, Poly-Coated with Easy Apply™ RS technology

Features

- Outstanding digital printability across all platforms (V-4000 White only)
- Excellent printing results on screen presses
- Meets ASTM® D4956, Type 1 reflectivity levels
- Flexible cast vinyl
- High dimensional stability
- Extensive colour range
- Colour matching option
- Possible to sign-cut
- Unique patented Easy Apply™ RS adhesive technology helps prevent wrinkles and bubbles during application, also providing repositionability and slideability
- Excellent long term removability (LTR-version)

Colours

Avery Dennison® V-4000 retro-reflective is available in White, Yellow, Red, Orange, Blue and Black as standard colours plus the option to customize colour matching.

Typical Reflectivity Values

Colour	White	Yellow	Red	Blue	Orange	Black
Coeff of Retro-Reflection*	94.4	65.7	14	4	24.5	9.8
Reference	V-4000-101	V-4000-235	V 4000-440	V-4000-688	V-4000-360	V-4000-190

* Cd/Lx/m² at an entrance angle of 5° and observation angle of 0.2°.

Conversion

Avery Dennison® V-4000 Reflective films can be screen printed and converted using a wide variety of conversion techniques including steel rule die-cutting, thermal die-cutting, flatbed Sign-cut or Drum Roller sign-cut. Good signcutting properties shown on the Perm-version; sign cutting possible on LTR-version. For V-4000 with Easy Apply™ RS we recommend flat transport of converted material. V-4000 white can be inkjet printed (Latex, Mild/Eco solvent or UV) as well. Always test suitability of V-4000 prior to use. The digitally printed films are recommended to be protected using an overlamine (see Technical Bulletin 5.3).

Application

Application on 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.

Physical and Chemical Properties

Avery Dennison® V-4000 Retro Reflective Films

Physical properties

Features	Test method ¹	Results	
		V-4000 Permanent	V-4000 EARS/LTR
Caliper, facefilm + adhesive		179 µm	237 µm
Dimensional stability	1000 hrs AtlasTwin Arc Weatherometer, EH	max. 0,8 mm	max. 0,8 mm
Shelf life	Stored at 23°C/50% RH	1 year from date of purchase	1 year from date of purchase
Outdoor Durability ^{2z}	Vertical exposure only	7 years	7 years
Adhesion 15 min.	ASTM D3330, PSTC 101 Aluminum	680 N/m	376 N/m
	Stainless Steel	600 N/m	270 N/m
	Painted Aluminium	495 N/m	179 N/m

Temperature range

Application temperature	Squeeze roll application	Minimum +10° C	Minimum +10° C
Service temperature		-40° C to + 80° C	-40° C to + 80° C

Chemical Properties

Solvent resistance

When properly processed and applied the film is resistant to most common solvents. When tested according to LS-300C, Section 3.6.2, after immersion in the following solvents for the specified length of time, the film shows no deterioration. Kerosene and Turpentine: 10 minutes, Toluene, Xylene and Methyl alcohol: 1 minute.

Colour consistency

Due to the nature of retro-reflective material, graphics comprised of multiple pieces of film may give the perception of a colour shift depending on the viewing angle and light source. This is not considered a defect in the material. To minimise this effect, cut letters from one continuous piece of material or use materials from adjacent portions of the roll. Also, a small overlap (5 mm) or no overlap of the retro-reflective film is recommended to maintain a consistent viewing angle.

NOTE: Materials have to be properly dried before further processing, for example laminating, varnishing or application. The residual solvents could change the products' specific features.

For good print and converting result we recommend to let the rolls acclimatize in the print/lamination room at least 24h. Before printing or converting. Too much temperature or humidity deviation between material and room climate can cause layflatness and/or printability issues.

Generally, constant material storage conditions of ideally 20°C (+/-2°C) /50% RH (+/- 5%), without too big climate deviations, will support a more robust and stable printing/converting process. For further details, please refer to TB 1.01.

Important

Information on physical and chemical characteristics is based upon tests we believe to be reliable. The values listed herein are typical values and are not for use in specifications. They are intended only as a source of information and are given without guarantee and do not constitute a warranty. Purchasers should independently determine, prior to use, the suitability of this material to their specific use.

All technical data are subject to change. In case of any ambiguities or differences between the English and foreign versions of these Conditions, the English version shall be controlling.

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.

1) Test methods

More information about our test methods can be found on our website.

2) Durability

The durability is based on middle European exposure conditions. Actual performance life will depend on substrate preparation, exposure conditions and maintenance of the marking. For instance, in the case of signs facing south; in areas of long high temperature exposure such as southern European countries; in industrially polluted areas or high altitudes, exterior performance will be decreased.