

# Avery Dennison® VisiFlex™ V-8000 Easy Apply™ Series High Visibility Reflective Film

## Introduction

Avery Dennison® VisiFlex™ V-8000 Easy Apply™ Series High Visibility Reflective Film is engineered to improve the day and night time visibility of emergency response, utility, and construction fleets. Highly reflective vehicle markings can improve detection and recognition, giving drivers more time to react safely and avoid a collision. Collision avoidance may help fleet managers contain costs through lower repair, maintenance, and insurance fees. VisiFlex™ V-8000 Easy Apply™ Series offers durable, vibrant daytime colors. At night, its bold, high-quality microprismatic retroreflective elements efficiently return light at a wide range of angles. The single layer construction simplifies application and eliminates the requirement for edge sealing. Designed to be flexible, VisiFlex™ is purposely engineered for vehicle application and offers excellent cutting and conformability for converters and installers.



### Face Film

Vinyl Retroreflective Film with microprisms (533-660 µm)



### Backing

Easy Apply™ liner



### Adhesive

Permanent pressure-sensitive



### Outdoor life\*\*

Up to 7 years

## Features

- Single layer construction that does not require edge sealing
- Unique omnidirectional prisms not available in other products create high uniform brightness at night
- Easy to handle and apply, conforms to simple curves
- Withstands normal vehicle maintenance
- Digitally Printable (white only)
- Easy Apply™ liner for ease of application

## Common Applications

- Emergency Vehicles
- Utility Vehicles
- Fleet

## Conversion

- Flatbed cutters
- Friction fed cutters
- Die cutting
- Thermal transfer
- Screen printing
- Offset printing
- Cold overlaminating
- Electrostatic printing
- Latex inkjet\*
- Eco solvent inkjet\*
- Solvent inkjet\*
- UV curable inkjet\*

\*V-8000 Easy Apply™ White only

## Performance

Europe	HOSDB
Germany	DIN30710
North America	NFPA 1901
Avery Dennison recommends the user obtain the current requirements from their local governing agency to ensure product conformance.	

## Characteristics

Construction	Vinyl Retroreflective Film with microprisms with a permanent pressure-sensitive adhesive protected with Easy Apply™ liner
Typical Film Caliper	21-26 mils (533-660 µm)
Application Surface	Metal & Painted Metal; Flat, Simple Curves (not for use on stainless steel or rivets)
Min. Application Temperature	16° C
Service Temperature	-23°C to + 65°C
Shelf-life	1 year from the date of purchase when stored at (18°–24°C) 50% ± 5% R.H.

## Table A - Retroreflectivity

V-8000 Series meets the coefficients of retroreflection (RA) based on HOSDB specs shown below:

Minimum Coefficient of Retroreflection (R <sub>A</sub> ) cd/lx/m <sup>2</sup>							
Observation Angle	Entrance Angle	White	Blue	Green	Red	FL Yellow-Green	FL Orange
0.2°	5°	350	25	-	60	300	160
	30°	150	12	-	25	150	80
	45°	40	3	-	7	33	18
0.33°	5°	150	10	-	25	80	80
	30°	60	4	-	10	60	50
	45°	30	2	-	5	16	20
0.5°	5°	110	7	-	20	50	45
	30°	60	3	-	10	20	20
	45°	20	1.3	-	3.6	9	8
1.0°	5°	9	1	-	2.5	8	8
	30°	6	.75	-	1	6	4
	45°	3	-	-	-	2	2

**Table B** meets the color and minimum luminance requirements for ASTM D4956 and CAST (HOSDB) Publication # 14/04

Colors	Daytime color specification limits								Luminance ( Y%)	
	1		2		3		4			
	x	y	x	y	x	y	x	y	min	max
White (HOSDB)	0.355	0.355	0.305	0.305	0.285	0.325	0.335	0.375	17	--
White (ASTM)	0.303	0.3	0.368	0.366	0.34	0.393	0.274	0.329	27	--
Yellow (ASTM)	0.498	0.412	0.557	0.442	0.479	0.52	0.438	0.472	15	--
Red (HOSDB)	0.55	0.358	0.64	0.365	0.735	0.265	0.66	0.233	0.5	--
Red (ASTM)	0.648	0.351	0.735	0.265	0.629	0.281	0.565	0.346	2.5	--
Green (HOSDB)	0.026	0.399	0.166	0.346	0.286	0.446	0.207	0.771	3	12
Blue (HOSDB)	0.065	0.216	0.19	0.225	0.245	0.21	0.144	0.03	0.7	--
Blue (ASTM)	0.14	0.035	0.244	0.21	0.19	0.255	0.065	0.216	1	10
FL Yellow - Green (HOSDB)	0.375	0.62	0.46	0.532	0.398	0.45	0.35	0.508	30	--
FL Yellow - Green (ASTM)	0.387	0.61	0.369	0.546	0.428	0.496	0.46	0.54	50	--
FL Orange (HOSDB)	0.506	0.404	0.57	0.429	0.655	0.345	0.56	0.34	15	--
FL Orange (ASTM)	0.583	0.416	0.535	0.4	0.595	0.351	0.645	0.355	20	--

**Table C - Other Testing**

Test	Requirement	V-8000 Typical Values
Dimensional Stability	Less than 1/8" change on 9x9 panel	Pass
Flexibility Wrap around 0.125" mandrel @ 32°F (0°C)	No Cracking	Pass
High Pressure Wash Test 45° angle, 1200 psi, 8 inch distance	No delamination, edge lift, cracking, or water penetration	Pass
Adhesion 0.79kg 90° hanging weight	Less than 2" movement	Pass
Chemical Resistance LS300C Immersion in diesel fuel, xylene/mineral spirits mixture	No softening, dulling, color change, or adhesion loss	Pass
Corrosion Resistance .1 NaOH solution immersed for 1 hour	No white corrosion, red rust, discoloration, delamination, flaking, checking, cracking, or blistering	Pass
Impact Resistance Room Temp ASTM D4956 Impact with 10 in-lb force and 3/4 inch tip at room temperature	No damage outside impact area	Pass
Peel Adhesion PSTC-2	Prepainted Panel Substrate	2.7 lb/in (0.47 N/mm)
12in/min, 90° peel angle	Stainless Steel Substrate	5.5 lb/in (0.96 N/mm)

#### Substrates

The application of Avery Dennison V-8000 is limited to properly prepared metal and painted metal substrates. Users are urged to carefully evaluate, under actual use conditions, any film application to other substrates. For painted surfaces follow manufacturer's recommendations for drying and curing. Failure of film caused by other substrates, materials, contamination, or improper surface preparation is not the responsibility of Avery Dennison.

#### 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.

#### Recommendations

- Use a high tack application tape
- To facilitate positioning Avery Dennison Frosted Glass Film can be wet applied using 2 drops of baby shampoo per 1 litre of water
- Water should be removed with a squeegee and firm hand pressure.
- Before removing application tape allow the adhesive to build to a sufficient adhesion level (15-45 minutes)
- Refer to IB 1.2 Wet Application Method for more details

#### 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 reflective products are warranted to be free from defects in material and workmanship for one (1) year from the date of manufacture, unless stated otherwise in the applicable product data sheet. 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.

#### Conditions

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## 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.

HIS 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  $10^\circ$  from vertical and greater than  $5^\circ$  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



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