

# Avery® HV1100 High Visibility Prismatic-Series

Removable Clear Synthetic

(formerly: A3911)

Revision: 1 Dated: 08/11/2009

## Uses:

Avery Graphics™ HV1100 Reflective is a conformable micro-prismatic, retroreflective film designed for use as a high visibility graphics media for emergency vehicles, such as police cars, ambulances, or other safety vehicles.



**Face:** 13 mil (330 microns) high gloss cast film



**Adhesive:** Removable Clear Acrylic



**Liner:** Clear Synthetic



**Durability:** Up to 3 years

**Application Surfaces:**

Flat, Simple Curves.

## Features:

- Conformable product structure capable of being applied to contours and curves of automobile body panels
- Smooth, flexible vinyl outer face
- Permanent or removable adhesives available
- Friction-coated, polyester release liner for smooth tracking on friction-fed plotters
- Screen Printable with many UV and solvent inks
- Prismatic grade reflectivity levels to provide the brightest vehicle graphics
- Good dimensional stability
- Metalized micro-prisms to ensure total internal reflection and the highest levels of reflectivity
- Minimal tooling lines so as to not detract from the graphics' aesthetic qualities

## Conversion:

- Thermal Die-Cutting
- Flat Bed Sign-Cut
- Drum Roller Sign-Cut
- Steel Rule Die-Cutting

- Thermal Transfer
- Screen Printing
- Cold Overlaminating
- Water based inkjet

- Solvent based inkjet
- Mild/Eco Solvent inkjet
- UV inkjet

## Common Applications:

- Fleet
- Vehicle
- Marine/ Watercraft
- Backlit Signs

- Wall Murals
- POP/ Tradeshow
- Window Graphics
- Outdoor Signage

- Floor Graphics

## Product Data Sheet

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### Limitation of End Uses:

Certain applications are not recommended or warranted by Avery Graphics. Unsuitable applications include:

- Stainless Steel
- Wood (painted or unpainted)
- Urethane substrates
- Walls
- Compound curves
- Flexible substrates
- Low surface energy substrates (i.e. Tedlar coatings)
- Unclean or textured surfaces
- Wet method of application not recommended on HV Reflective Series reflective films. Use of wet method of application invalidates standard warranty on this product
- Long term exposure to temperatures over 140°F
- Non-Vertical applications (durability is for vertical exposure ONLY, defined as  $\pm 10^\circ$  from vertical)

### Physical Characteristics:

Property	Value
Caliper, face	13 mil (330 microns)
Caliper, adhesive	1.0mil (25 $\mu$ m)
Dimensional stability	Less than 0.03 in. (0.76 mm) shrinkage. (1000 hours Atlas Twin Arc Weatherometer, EH)
Tensile at Yield	NA
Elongation	NA
Gloss	90
Adhesion: 15 min.	
24 hr.	4 lbs/in (700 N/m)
Flammability	Self Extinguishing
Shelf-Life	1 year
Durability	Vertical Exposure Only Up to 3 years (Some color fade may occur in severe environmental areas. Reference IB #1.30 for durability guidelines.)
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.

### 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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## Aesthetic Consistency

Unlike other micro-prismatic retroreflective materials, HV 1100 Series has no subsurface gridlines or cellular patterns that may detract from either the daytime or nighttime appearance of the graphic. Similarly, the tooling lines within the HV 1100 Series sheeting are less than 0.00065" in thickness.

## Retroreflectivity

The retroreflective elements of HV 1100 Series are metalized micro-prismatic elements. To minimize the rotational sensitivity of the product, arrays of the micro-prismatic elements are rotated in 30-degree increments throughout the sheeting. This ensures that the product remains bright regardless of the rotation of the material. However, when cutting words or letters it is still recommended to align all letters in the same direction to maximize the uniformity of their appearance.

HV 1100 Series, unprinted, has the following typical and minimum coefficients of retroreflection ( $R_A$ ) (cd/lux/m<sup>2</sup>) at a -4° entrance angle and a 0.2° observation angle:

Color	Typical Coefficient of Retroreflection ( $R_A$ )	Minimum Coefficient of Retroreflection ( $R_A$ )
White	650	400

## Screen Printing:

HV 1100 Series can be screen printed with a variety of UV and Solvent-based screen inks. With respect to solvent-based inks, vinyl-based screen inks will typically yield the best results. During oven drying, prolonged exposure to temperatures above 120°F should be avoided or curl of the material may result. HV 1100 Series is designed to be screen printable as received. However, in some instances, due to specific shop or environmental conditions, it may be useful to wipe the face of the sheeting with a mild alcohol wipe.

The following is a partial list of recommended ink systems which have been successfully used on HV 1100 Series. This list does not constitute a warranty and should not be used as such. The user is encouraged to pre-test each specific application to determine the suitability of the ink. For more information, please reference Instruction Bulletin #3.00.

- Coates J. Series
- Ink Dezyne VP Series
- Nazdar 9700 All Purpose Ink
- Nazdar Plastic Plus
- Nazdar System 2
- Sericol TMI II / TMI 1000 Clearcoat
- Sericol Duracal UV Series
- Sericol Plactical (PC)
- Sericol UVRP
- Sericol UV2

## Application Method:

Use a dry method. Do not use a detergent and water or a commercial application liquid to position the graphic. Avery Graphics™ only warrants this material when applied to a factory-approved paint finish.

## Cutting:

Reference Instructional Bulletins 2.10, 8.20, 8.25 and 8.50 for more recommended instructions and details.

## Application Tape

The type of application tape depends upon the type of graphic produced and the ink or overlamine used. Please reference Instruction Bulletin 2.10 or 8.25 for more details.

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Graphics & Reflective Products Division  
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### Product Data and Specifications

These are typical values for the Avery Dennison® HV 1100 Series and are not intended to be used in specifications. Please contact your sales representative for a product specification.

### Defects Coverage:

- **Manufacturing & Workmanship Defects.** A failure of the Product to materially conform to the written specifications for the Product as described in the applicable Avery Graphics Product Data Sheet.
- **Printing and Ink Defects.** Artifacts or misprints that occur when printing on specified Avery Graphics Product using ICS Qualified Processing Materials, due solely to a defect in the Product in manufacturing or workmanship.
- **Cutting Defects.** A failure of clean cutting and weeding characteristics when cut as recommended in the applicable Avery Graphics Product Data Sheet and Instructional Bulletins, due solely to a defect in the Product in manufacturing or workmanship.
- **Finished Graphic Appearance Defects.** Defects, not including those attributed to the ink, such as excessive fading, discoloration, cracking, crazing, blistering, gloss changes, excessive dimensional change or loss of adhesion or reflectivity (for retro-reflective films) that makes the graphic visually unsuitable for its intended purpose when viewed with the intended lighting, angle and distance for such a graphic, as determined by customary industry standards.

### Warranty Limitations:

This product is covered under the Avery Standard Material Warranty. The Product must be properly stored and applied within the shelf-life as stated in the applicable Avery Graphics Product Data Sheet. All Recommended Processing Materials must be properly stored and applied in accordance with OEM instructions.

- **Unintended Use.** This warranty only applies to Product that is used by professional converters for the defined end uses and in the combinations described in the applicable Avery Graphics Product Data Sheets, 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 Graphics 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 using only Qualified Processing Materials in accordance with the OEM and Avery Graphics recommended written processing instructions, and being applied to properly prepared surfaces and cleaned and maintained in accordance with recommended OEM and Avery Graphics procedures. It is the converters 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 Graphics and/or its authorized agent or distributor of any Product, Qualified Processing Materials and/or finished graphic discovered to be (or reasonably capable of being discovered to be) defective.
- **Misuse and Force Majeure.** Avery Graphics 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. 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. Damage from fire, structural failure, lightning, and other force majeure events are not covered by this warranty.
- **Weathering Effects.** Some degradation of materials and graphics over time is considered normal wear. Slight color fading, chalking, edge lifting, "tenting" around rivets, or slight or gradual reduction in gloss (for cast and calendered films) or reflectivity (for retro-reflective films), and other natural weathering, environmental or other conditions or damage caused by tornadoes, hurricanes, wind or other acts of God, do not constitute a breach of warranty.
- **Printing, Curing and Ink Defects.** Ink contaminations, failures or other defects, or other failures due to improper printing conditions or settings including, but not limited to, unsuitable color calibration, incorrect ICC color profile or incompatible printing, do not constitute a breach of warranty. Product failure caused by ink over-saturation, excessive or under curing, or other treatment or processing errors are not warranted.

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- **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.
- **Glass Breakage.** This warranty does not cover glass breakage. Glass is prone to break under the stresses caused by temperature changes across the surface, which could be amplified by the application of vinyl film.

### Definitions:

- **“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.
- **“Outdoor Durability”** means that the Product in a finished graphic situated outdoors, subject to the limitations herein and Avery Graphics Product Data Sheets and Instructional Bulletins, and applied to recommended surfaces, will not deteriorate excessively such that the finished graphic is ineffective for its advertising or identification purpose(s) when viewed under normal conditions from the intended viewing distance, due solely to a defect in the Product in manufacturing or workmanship. 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. In case of finished graphics 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 will be reduced and the warranty period will be decreased accordingly. Avery Graphics [Instructional Bulletin #1.30](#) Durability of Avery® Dennison Films sets forth the durability period in the regional service area of your graphics.
- **“Indoor Durability”** means that the Product in a finished graphic situated within the interior of a building without direct exposure to sunlight and applied to recommended surfaces, will not deteriorate excessively such that the finished graphic is ineffective for its advertising or identification purpose(s) when viewed under normal conditions from the intended viewing distance, due solely to a defect in the Product in manufacturing or workmanship. The warranty does not extend to the use of the Product or finished graphic as wood or fabric replacement films or safety and security window films.
- **“Vehicle Graphics”** means finished graphics applied to new OEM finished recommended surfaces road and rail vehicles, both commercial and personal, including straight trucks and trailers, and passenger vehicles.
- **“Marine Graphics”** means finished graphics applied to water going vessels, both commercial and recreational, above the static waterline. All edges and seams (overlaps) must be sealed. The warranty does not extend to Product or finished graphic that may routinely be submerged in water.
- **“Vertical Exposure”** means that the face of the finished graphic is  $\pm 10^\circ$  from vertical. Please consult the Avery Graphics [Instructional Bulletin #1.30](#) Durability of Avery® Graphics Films for full details.
- **“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. Please consult the Avery Graphics [Instructional Bulletin #1.30](#) Durability of Avery® Graphics Films for full details. **This product will degrade quicker, and expected durability is only 1 year in these application conditions.**
- **“Horizontal Exposure”** means the face of the finished graphic is  $85^\circ$  to  $90^\circ$  from vertical. Please consult the Avery Graphics [Instructional Bulletin #1.30](#) Durability of Avery® Dennison Films for full details. **This product is NOT recommended for horizontal applications.**
- **“Removable Adhesive”** means an Avery Graphics adhesive that can be removed without heat or chemicals within the period stated on the respective Product Data Sheet and might leave twenty percent (20%) or less adhesive residue.

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- **“Flat surfaces”** means a two dimensional flat surface without protruding objects.
- **“Simple curves”** means surfaces that include a third dimension which does not require stretching of the film (for example, a cylinder).
- **“Rivets”** mean surfaces with protruding rivet heads. Slight “tenting” or film lifting around rivets does not constitute a breach of warranty.
- **“Compound Curves”** a surface that includes both, or either, concave or convex curves. It does not include surfaces with hard angles or corrugations that would require extensive stretching of the Product or finished graphic.
- **“Corrugations”** means corrugated or recessed areas that require stretching of the Product or finished graphic (for example, a false window recess on a commercial van).

*Revisions are italicized*

Avery Dennison is a registered trademark of Avery Dennison Corp.

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