PRODUCT DATA BULLETIN

Avery Dennison â Integrated Digital Printing Materials Package: LP-3050 & LP-0500
For License Plate Applications
Dated: 7/03/03

Description:

Avery Dennison® L-Series integrated materials package consists of a premium quality enclosed lens retroreflective material and a UV stabilized cast vinyl overlay. This integrated material package is designed specifically for the production of convertor printed embossed license plates.

The reflective portion of the materials package is suitable for various printing technologies including flexographic, gravure and digital thermal transfer printing.**

The overlay provides UV and abrasion resistance and has a pressure sensitive adhesive for lamination to the printed reflective sheeting.

** requires the use of an Avery certified overlaminate product and qualified thermal transfer ribbons

Construction:

BASE MATERIAL	LP-3050
Face Film:	High gloss retroreflective polymer
Adhesive	Permanent acrylic pressure sensitive
Liner:	Two side polyethylene coated paper
PROTECTIVE OVERLAY	LP-0500
Face Film:	High gloss optically clear cast vinyl
Adhesive:	Permanent acrylic pressure sensitive
Liner:	Two side polyethylene coated paper

Physical Properties:

The following information on physical and chemical characteristics is based upon tests believed to be reliable. The values are intended only as a source of information. They are given without guarantee and do not constitute a warranty. The purchaser should independently determine, prior to use, the suitability of this material for his/her specific purpose. (Data represents averages and is not intended for use as a specification).

Outdoor Durability	5 years when properly processed and applied (vertical exposure, unprinted or Avery supplied preprinted sheeting).
Minimum Surface/Ambient Air Application Temperature	50°F (5°C) when applied with a squeeze roll applicator
Application Surface	Flat, aluminum
Service Temperature Range	-40°F to 180°F (-40°C to 82°C)
Custom Converting	Avery Dennison does not warranty any printing or converting operations applied to the sheeting without a prior written agreement from Avery Dennison. Always check with your Sales representative

Optical Properties	Meets LS-300C Table IV, Ref. 3 (Class 1)
Minimum Adhesion Values	**180° Peel** **Substrate** — **15 min** **Anodized Aluminum** — 2.5 lb./in (438 N/m) NOTE: Tested per ASTM D1000. Always pre-test your specific substrate prior to actual application.
Shelf Life	One year when stored at the following temperatures and humidity conditions 68°-77° F (20° - 25° C) and 50±5% R. H.
Dimensional Stability	Less than 0.03 inches (0.8 mm) shrinkage after 1000 hours Atlas Twin Carbon Arc Weatherometer

Photometric Performance:

Color	Minimum Reflectivity Level*
White	50

*CPL at 0.2° observation angle and -4° entrance angle

Colors & Specification Limits (Daytime):

	1		2		3		4		Luminance (Y%)	
Color	x	y	x	y	x	y	x	y	Min	Max
White	0.305	0.315	0.335	0.345	0.325	0.355	0.295	0.325	35	--

The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 Standard Colorimetric System measured with Standard Illuminant D65 (geometry 45/0°).

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, immersion in the following solvents for the specified length of time the film shows no deterioration:

Solvent	Time	Solvent	Time
Kerosene	10 minutes	Xylene	1 minute
Turpentine	10 minutes	Methyl Alcohol	1 minute
Toluene	1 minute		

Approved Screen Printing Inks:

Ink Supplier*	Ink Series	Ink System
Nazdar	System II	Solvent Based
Nazdar	Gloss Vinyl (GV)	Solvent Based
Sericol	TMI II	Solvent Based

*Ink available in custom colors

Approved Thermal Transfer Ribbon:

Ink Supplier*	Ink Series	Ink System
Iimak	DC305	Thermal transfer

Approved Inking Systems:

Ink Supplier*	Ink Series	Ink System
Nazdar	CD-381	Solvent Based

Coates	J	Solvent Based
ITW	Foil Stamping	Thermal Transfer
Kurz	Foil Stamping	Thermal Transfer

*Ink available in custom colors

Converting Information:

1. The face of LP-3050 is designed for printing of graphics prior to lamination with LP-0500.
2. Laminating configurations differ. Always pre-test Avery LP-3050 Series with your specific system prior to application, or contact your Sales representative for assistance.
3. Remove liner from LP-0500 and laminate to printed LP-3050. Tension & pressure during lamination should be adequate to produce a solid bond with LP-0500.
4. After lamination, construction should be stored for a minimum of 48 hours (minimum temperature 60°F/ 16°C) to ensure a proper bond build-up, prior to embossing.

Additional Information:

Watermark/Security Mark:	L-Series license plate sheeting can be manufactured with with Avery SecureMark™ for security purposes.
Converting Information:	• For best results, aluminum substrate should be heated prior to lamination to 70-90ºF (21-32º C) • Tension on the sheeting during the lamination process needs to be kept at a minimum to avoid overstretching the material. The sheeting will not perform properly when the stretch exceeds 3%. • After lamination, allow a minimum of a 24 hour dwell at 50ºF (10ºC) before embossing. • Embossing configurations differ, Pre-test Avery L-Series with your specific system prior to full production. • Maximum embossing depth of L-Series is 0.085” (2.1mm) • Temperature exposure for curing inks should be in accordance with the instructional bulletin and in accordance with the oven profile established with your technical representative, but should never exceed a temperature of 220°F.

- *Allow license plates to cool to room temperature prior to stacking and packaging the plates*