

Avery Dennison® UVTS-Sericol Ultraviolet Curable Printing Inks

Instructional Bulletin # 8.33
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General Processing Guidelines

Substrate/Ink Compatibility

Avery Dennison UVTS-Sericol Ink is a one-component, UV curable ink system. Only Avery Dennison Reflective Sheeting, manufactured by Avery Dennison Corporation and approved for use in the traffic signage market is warranted for use with Avery Dennison UVTS-Sericol inks. UVTS-Sericol ink and clearcoat or Avery Dennison OL-1000 Premium Anti-Graffiti Overlaminant is warranted for 7 years on T-1500, 10 years on T-2500 sheeting. UVTS-Sericol is not recommended or warranted on T-5500A sheeting.

Substrate Conditioning

For best results, sheet stock should be allowed to stabilize under shop humidity and temperature conditions for 24 hours before a run is started. Refer to IB # 8.00 for more information.

Ink Preparation

All inks arrive press ready-to-use. All ink must be mixed with a high-speed mixer for 10 minutes before use.

Since Avery Dennison UVTS-Sericol ink contains no solvents, there will be no evaporation during the course of the day or premature drying in the screen. The use of thinner / retarder is not required in the UVTS-Sericol ink system.

Use only dark polyethylene plastic containers for mixing and storing. Keep containers tightly closed when not in use. Allow at least 10% airspace between the surface of the ink and the container lid. This air pocket extends the shelf life of the ink.

The UVTS-Sericol warranty provides for five (5) years of outdoor durability when creating custom blends using standard traffic colors and mixing colors. Custom color matches made with additional components (other than standard traffic or mixing colors) are not warranted.

Mesh Recommendations

Avery Dennison UVTS-Sericol Inks offer a full range of traffic colors. Each pigment has been carefully selected to provide brilliantly clean transparent traffic colors with outstanding reflectivity when printed on Avery Dennison Reflective Sheeting. UVTS-Sericol Ink formulations have been matched to meet ASTM D 4956 color and reflectivity requirements when printed through a 390 twill mesh screen (34 μ thread diameter) with 18-24 N/cm mesh tension.

Squeegee Selection

A medium/hard/medium (70/90/70) durometer 'Serilor 3' squeegee blade is recommended. A sharp squeegee with the proper amount of pressure is required for optimum print resolution on all applications. Slight imperfections in the squeegee will be readily visible in the quality of the print. Thus, the condition of the squeegee and proper squeegee maintenance are a must. The squeegee blade must also be positioned at the correct angle to assure proper ink transfer.

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Press Selection

To ensure consistent, reproducible color and reflectivity throughout the entire printing run, a fully or semi-automatic press is recommended. Care must be taken to ensure other printing variables, such as screen tension, mesh selection, etc., are consistent with the recommendations presented in this process guide.

Squeegee Technique

Most squeegee related problems are created by applying too much squeegee pressure. Any time the squeegee has enough pressure applied to bend the blade or severely change the angle, the proper “cutting edge” of the blade will be lost.

The lower the durometer of the squeegee, the more prone it will be to distortion from excess pressure. To mitigate this issue, a 70/90/70 durometer squeegee is recommended. The 70/90/70 durometer surface will contact the ink and screen to allow proper ink deposition and reduce screen wear from excessive abrasion.

Caution should also be exercised to ensure the screen frame is sufficiently larger than the print area. If the squeegee edge is too close to the frame, the screen will not stretch properly and uniformly during printing. This will cause the outside edges of the squeegee to bend with the pressure required to maintain substrate contact. The end result will be poor print quality.

Use of a Flood Stroke

Most screen printing mechanics require the use of a flood coat prior to the print (squeegee) stroke to assure consistency in color development and print resolution. At the proper printing viscosity, Avery Dennison UVTS-Sericol inks will have excellent flow characteristics; therefore, a heavy flood will significantly add to the amount of ink deposited resulting in poor reflectivity and color. **To prevent excess ink deposit a tight or minimal ink flood is recommended with little or no time between flood and print strokes. For an automatic or semi-automatic press, the flood / print mode is recommended.** Too much flood will smear small printed copy. A heavy flood coat will result in printing up to 50% more ink through the mesh, which will adversely affect color and reflectivity.

Curing

Assuming proper printed ink film thickness, Avery Dennison UVTS-Sericol Inks require 250-260 mJ/cm² of UV energy transmitted from a curing unit to the ink surface for effective cure. Typically, 250-260 mJ/cm² can be obtained using 300-watt mercury vapor bulbs at line speeds of 40 to 50 fpm. If the required level of energy output is not attainable at the stated conditions, it is recommended that the unit is inspected and the UV bulbs are cleaned to maximize energy output. If problems persist, please contact the equipment manufacturer. **NOTE: Clearcoat requires 325 to 350 mJ/cm² for complete cure.**

It is important to keep the surface temperature of the sheeting under 110°F when curing UV inks. The routine use of some type of temperature indicator placed directly on the surface of the sheeting will allow you to properly check actual temperatures reached in the curing cycle.

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Ink/Clear Coat Adhesion Test

After all adjustments to the printing press have been made, print a sample on the production sheeting. Place the printed sign onto the belt and pass through the UV curing unit. The curing unit should be adjusted and set to the initial energy setting recommended in this bulletin, under the section Curing.

Test the ink adhesion on the printed sign every 4" across the bulb width by scratching the surface with a dime and conducting a cross-cut test (as outlined in ASTM D3559 Method B). It is recommended that Scotch #610 tape be used for this test. The tape should remain on the sign for 60 seconds and then be removed with a quick pull at a 90 degree angle to the sign.

If the ink can't be scratched off with a coin or removed with the tape then proceed with the production run. However, if the ink can be scratched or removed from the sign then the ink is not properly cured. In this case, the UV cure unit settings need to be adjusted and the above test repeated.

Adhesion testing also needs to be evaluated for the required clear coat print over the ink color. The above guidelines need to be repeated for proper testing of the clear coat printed over the top of the properly cured color print. If poor adhesion continues please contact an Avery Dennison representative for assistance.

Clear Coating

For 7 year and 10 year outdoor durability of the ink, clear coating is required.

Additionally, OL-1000, when laminated over standard UVTS-Sericol traffic colors, will extend the outdoor durability to 7 and 10 years.

Ink Clean-up

Screens and other printing equipment should be cleaned immediately with Avery Dennison UVTS-Sericol Screen Wash or as soon as possible after use. Though UV inks will not cure in the screen like solvent inks, they are susceptible to premature cure if exposed to ambient UV light, such as direct sunlight. Exposure to less UV intensive light sources, such as interior lighting, should not be a problem provided the screen is not left unattended for a prolonged period. The ink can be left in the screen for short periods of time, such as a lunch break, without causing cleaning problems, provided the screen is not exposed to direct sunlight.

Screens used to print Avery Dennison UVTS-Sericol inks are cleaned like screens used for standard solvent inks. The ink should be removed from the print screen using UVTS-Sericol Screen Wash and clean-up rags. Do not re-use ink that is removed from the screen.

Caution: Wearing gloves, safety glasses, and other safety equipment is required when working with solvent inks and cleaning solvents.

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Warranty:

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