

Avery Dennison 7TS Series Inks One Component Solvent Ink System For Traffic Sign Products

Instructional Bulletin # 8.37

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General Processing Recommendations

Avery Dennison 7TS Inks

7TS Series Inks are formulated to render 7 year exterior performance when the process guidelines outlined in this document are implemented. 10 Year performance can be achieved when printed on Avery Dennison Super Engineer Grade Sheeting and the 7TS clear coat or Avery Dennison OL-1000 Premium Anti-Graffiti Overlaminates is used.

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 Instructional Bulletin #8.00 for more information.

Ink Preparation

Before adding ink into the screen, mix thoroughly. Thinner should not be added to the ink prior to printing. 7TS S30 Thinner/Retarder may be added as the ink loses solvent during the course of the day. However, the maximum amount of thinner/retarder to add is 10%.

7TS Series Inks are color formulated to render 7 year exterior performance. Alteration of the base colors to obtain other shades will degrade the durability and affect the reflectivity of the color. Mixing colors and custom color formulations are not warranted for durability.

Mesh Recommendations

7TS inks offer a full range of traffic colors. 7TS ink formulations have been carefully selected to provide brilliantly clean transparent traffic colors to meet ASTM D 9456-95 color requirements when printed through a 157 mesh screen (48 μ thread diameter) with 14-20 N/cm mesh tension and implementing the process guidelines outlined in this document. Other mesh sizes can be used as long as the cured ink yields the color and the reflectivity that meets your internal specifications.

Squeegee Selection

A medium/hard (70) durometer 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. If a manual press is used, care must be taken to ensure other printing variables, such as screen tension, mesh selection, etc., are consistent with the recommendations presented in this instructional bulletin.

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. A 70 durometer squeegee is recommended. The 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 print area 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's, 7TS series ink 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 can adversely affect color and reflectivity.

Drying

Drying occurs with 7TS series inks by solvent evaporation. This ink system can be air or oven dried. As always, sufficient air flow will greatly enhance drying characteristics. However, the use of additional thinner, poor air movement, high humidity, etc. can slow the drying process. Exhaust ventilation should be utilized to remove solvent vapors.

Drying time required varies and depends on temperature, humidity, air flow, and thickness of the ink layer. Excessive amounts of environmental humidity will extend the curing time of the 7TS ink system. As the humidity increases to 70% and beyond, the cure time will be increased proportionally. Thus, the cure time at 90%RH will be significantly longer than the cure time at 60%RH.

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Air Drying

When air drying, good air flow is important. Prints should be racked with a minimum of 1.5 inches between each other in the rack. Allow 1.5 - 4 hours before applying a second coat. Under optimal drying conditions of 70°F and 50% RH, these inks are dry to touch after 20 minutes but must be allowed to 4 hours before final stacking.

Oven drying, with good ventilation, at 180°-200°F for 4-5 minutes is recommended to assure the best ink anchorage. Prints must be thoroughly dried and cooled to room temperature before stacking to prevent blocking due to post heating.

Do not exceed oven temperatures above 248° F or loss of gloss and reduced reflectivity may occur.

After 2.5 hours of air drying cross hatch testing can be performed.

Clear Coating

Due to the 7 year durability of the ink, clear coating is not required to enhance the durability of Avery Dennison sheeting printed with 7TS inks.

Avery Dennison 7TS inks are compatible with Avery Dennison Engineer Grade and Super Engineer Grade Traffic sheeting. When applied to Avery Dennison Super Engineer Grade Sheeting they will have a 10 year durability when 7TS Overprint Clear is applied using a 157 mesh screen. The clear coat may be applied over inks that were oven dried for 4-5 minutes at 180°-200° F or air dried 3 hours.

Additionally, Avery Dennison OL-1000 Premium Anti-Graffiti Overlamine Film will extend the outdoor durability to 10 years when used over 7TS inks on Avery Dennison 10 year durability Traffic sheeting.

Ink Clean-up

7TS inks dry in a screen like other solvent inks. Solvent inks, screens and other printing equipment should be cleaned immediately or as soon as possible after use. Screens used to print 7TS inks can be cleaned using Avery Dennison Traffic Screen Wash.

Always make sure to keep cans of ink covered between use. NOTE: Do not re-use ink that is removed from the screen.

If the screen is to be completely reclaimed such that a different image can be exposed on the screen, an additional step is required. After removing the ink from the screen, place the screen in a wash sink, spray the emulsion remover solution over the entire surface of the screen and work the solution into the mesh with a brush. Allow the screen to sit for at least 5 minutes. Rinse the screen thoroughly with a water spray. Repeat this process as necessary. If problematic areas persist, a de-staining solution may be required.

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

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