Rutland Plastic Technologies, Inc.

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Technical Bulletin #99

Printing On Polyester Performance Fabrics

Problem

- Dye migration or bleeding occurs on polyester garments when the Disperse dye in polyester fiber is heated to temperatures in excess of 265°F causing it to sublimate. (The dye actually changes from a solid to a gas.) When plastisol inks are heated at temperatures higher than 265°F, (Note: Most plastisol ink is cured at 320°F) these dyes are released into the ink causing a discoloration of the plastisol ink. Higher temperatures cause more severe migration and fabric shrink, so avoid curing temperatures above 320°F or 160°C.

Example: A red 100% polyester shirt is printed and cured at 320°F with a MH (non low bleed/high opacity) White ink. The white ink begins to turn pink. Note that the migration may not become noticeable for 24 to 48 hours depending on the ink deposit or the quality of the dye used in the garment.

Solution

- Print with a quality low bleed (ML Series) ink as an under base when printing on 100% polyester or polyester performance textiles. Rutland's ML9749 Jersey White and ML9051 Dyno White are very effective options when printing on polyester. The type and color of the dyes in the garment can allow one product to work better than the other so testing new fabrics, new colors, and new lots is highly recommended. The very best option on any color polyester fabric is to print with ML0266 Dyno Grey underlay to completely block the migration.

Test Procedure

- Test for migration by printing the fabric with enough white to insure complete coverage. This is normally printed through at least a 110 mc. in. or 43 mc. cm. Print—Flash—Print may be necessary to insure enough ink for 100% coverage.
- Cure the white ink in a dryer that is calibrated to insure that a temperature of 320°F or 160°C is achieved on the garment. Note: This should not be confused with a dryer setting of 320°F or 160°C, but a measured temperature on the garment.
- Cut the print in 1/2. Place 1/2 of the print in a convection oven or a warm place to achieve 125°F or 52°C for 15 hours. This accelerated heat aging test will simulate several weeks of normal aging.
- Place the heat aged sample beside the non-heat aged sample to compare the differences in bleed.