



DUPONT™ ARTISTRI® BRITE PIGMENT INK

DIRECT TO GARMENT INKS

Application of DuPont™ Artistri® Brite P5010 Pre-treatment Solution

APPLICATION

Direct to Garment Printing/Cotton & Polyester Garments

INK TYPE

DuPont™ Artistri® Brite P7000/P6000/P5000/P3500
Pigment Ink

AIM

DuPont™ Artistri® Brite P5010 is a fabric pre-treatment solution for use with white cotton and polyester t-shirts enabling clean and consistent printing with DuPont™ Artistri® Brite P7000, P6000, P5000 and P3500 direct to garment inks. The advantages of using DuPont pre-treatment with DuPont™ Artistri® ink are:

- Outstanding color gamut and image sharpness
- Excellent wash fastness
- Heat tunnel drying and curing of pre-treatment and final garments
- Compatibility with cotton and cotton/polyester blends
- Compatibility with white polyester fabrics
- Faster curing times in heat press workflows

DuPont™ Artistri® Brite P5010 pre-treatment solution was developed for white and light-colored cotton, cotton blended fabrics and white polyester garments and is intended for use with DuPont™ Artistri® Brite P7000, P6000 and P5000 direct to garment inks.

This guide is intended to provide best practices for using DuPont™ Artistri® Brite P5010 pre-treatment solution with DuPont™ Artistri® Brite P7000/P6000/P5000/P3500 inks. The pre-treatment and final shirt curing can be accomplished in either a belt conveyer heat tunnel or in a heat-press only process. Preferred temperatures are provided for drying and curing; however, it is not uncommon that there can be temperature variability from one heat press or heat tunnel to another. It is recommended that temperatures be measured and adjusted accordingly if out of calibration. In order to achieve best results, proper application of the pre-treatment solution must be practiced. Proper application of the pre-treatment solution is key to obtaining optimum image quality and ink adhesion to the fabric.

SAFETY

Please refer to the supplied SDS sheet prior to use of this product.

APPLICATION OF PRE-TREATMENT

DuPont™ Artistri® Brite P5010 pre-treatment solution can be applied manually using a hand sprayer or mechanically by the use of an automatic pre-treatment unit. Automatic pre-treatment applicators are available from a number of printer and silk screen suppliers. An automatic pre-treatment unit offers a number of advantages, not the least of which is a consistent and repeatable application of pre-treatment to the garment. However, DuPont™ Artistri® Brite P5010 can be easily applied through a manual hand sprayer without loss in quality. Instructions for application with a manual hand sprayer are provided below. If an automatic pre-treatment machine is used, please refer to the vendor's usage instructions for proper safety and use.

PRE-TREATMENT APPLICATION

Regardless of whether an automatic unit or a hand sprayer is used, the preferred quantity of pre-treatment is 0.068 g/in² (0.0105 g/cm²) or 20 g sprayed over a 19" x 15.5" (48.3 cm x 39.4 cm) area. Some automatic pre-treat machines allow specifying a spray volume - if one of these machines is used, please refer to the manufacturer's instructions to dial in the correct amount of pre-treatment. In other cases, use the procedure below to determine the correct amount of pre-treatment to apply.

1. Using a scale that is accurate to at least 1 gram, weigh an un-treated shirt.
2. If the employed scale has a "Zero" option, zero the scale on the shirt weight. If not, note the shirt weight.
3. Pre-treat the shirt (manual or automatic). An automatic unit should have a setting that is normal—use that as a starting point.
4. Immediately weigh the pre-treated shirt. Weigh the shirt wet, DO NOT PRESS THE SHIRT OR DRY BEFORE WEIGHING. If the un-treated shirt was zeroed, the weight should be close to 20g. If the weight of the un-treated shirt was noted, the wet shirt should be 20g heavier than the un-treated shirt.
5. If the weight was either heavier or lighter than desired, adjust the pre-treatment application and re-run the test.
6. Lighter, higher quality fabrics typically require lower quantities. Heavier, poorer quality fabrics typically require more. Ideally, this pre-treatment quantity should be optimized for different fabric types and colors. This is fabric dependent and tests must be performed to determine the appropriate quantity.

This procedure is not needed every time a shirt is prepared; it is a set up procedure. Once the right amount of pre-treatment is determined, continue to pre-treat consistently and correctly apply pre-treatment whether an automatic unit or hand sprayer is used. In the rare cases where shirts are not printing or washing correctly, refer to the troubleshooting section below.

DRYING THE PRE-TREATMENT

The objective of drying after pre-treatment application is to remove water and hold down vertical fibers, providing a flat surface which is easily covered by ink. If vertical fibers remain vertical, then these will either be visible (not completely coated by ink) or typically require more ink to coat them. The user should look for an ideal condition where the pre-treatment is dried at the lowest temperatures, shortest times possible and lowest pressure possible to obtain good print quality. Avoid over-drying the pre-treatment in this step, which can lead to poor wash fastness. Because of differences in the efficacy of heat presses and belt conveyor drying tunnels, the user should test their own system to determine optimum drying procedures.

The pre-treatment can be dried in a heat press or a heat tunnel after application. A thin, disposable parchment paper, non-stick papers, or non-stick polymer sheets are the preferred material for this step. This type of paper gives best uniformity in drying, and enables better evaporation of the volatiles. These sheets should only be used once per garment and then disposed. If unavailable, alternative non-stick paper may be used.

Preferred method for drying white or light cotton shirts with a heat press

- Dry the pre-treated garment with the heat press (using the parchment paper or non-stick polymer sheet as a barrier from the press) for 30 seconds at 165°C (~330°F) at 120-130 psi (if it is not possible to measure the pressure, 120-130 psi is likely a “high pressure” setting).

Preferred method for drying white or light cotton shirts with a belt conveyor heat tunnel

- Dry the pre-treated garment in the heat tunnel for approximately 30 seconds at 330-345°F (166-174 °C). The shirt should be slightly damp as it exits the heating box.
- Immediately press the shirt in a heat press for 10-15 seconds at 165°C (~330°F) at 120-130 psi. This step is necessary to control printing defects due to fibrillation (random fibers sticking up from the shirt which can cause an uneven ink layer). If using high quality, smooth surface shirts and believe such defects will not be encountered, skip this step.

NOTE: Because of the differences in heat tunnel efficiency from manufacturer to manufacturer, it may be necessary to dial in an optimum curing heat and speed.

Preferred method for drying white polyester shirts with a heat press

- Dry the pre-treated garment with the heat press (using the parchment paper or non-stick polymer sheet as a barrier from the press) for 20 seconds at 165°C (~330°F) at a very light pressure.

Preferred method for drying white polyester shirts with a belt conveyor heat tunnel

- Dry the pre-treated garment in the heat tunnel for approximately 30-45 seconds at 330-345°F (166-174°C).

NOTE: Because of the differences in heat tunnel efficiency from manufacturer to manufacturer, it may be necessary to dial in an optimum curing heat and speed

PRINTING

Attaining the Best Quality Print

Ink quantities should be optimized for image quality.

CURING

Post print curing binds the ink onto the shirt and insures proper wash and usage characteristics. The time and temperature of the heat press or drying tunnel are critical to attaining the best possible print quality. It is recommended that the specific curing system be tested for temperature control. Infrared thermometer guns or adhesive temperature gauge strips are inexpensive methods of checking the given curing device.

Care should be taken to transfer the printed garment, with wet ink, to the heat press so that the image isn't compromised from handling. If there are any signs of overly wet ink, these should be left to hover under the heat press for some short period of time to allow for drying. When applying paper onto the wet printed image, take care to place the paper onto the image without any lateral manipulation of the paper thereafter. Discard any paper which may have folds, creases or wrinkles, as these may transfer to the printed image. Parchment paper, non-stick papers, or non-stick polymer sheets may be used. It is known that these can give rise to different levels of gloss or sheen to the printed image.

Preferred conditions which have been optimized are described below. Shorter times or lower temperatures can give rise to poorer wash fastness. (This may be acceptable however. For example, in some cases 60 second cures may be only slightly better than 45 second cures.)

Preferred method for curing white cotton and cotton/poly blend shirts with a heat press

- Press, using a non-stick sheet as a barrier from the press for 60 seconds at 340-345°F (171-174°C) and high pressure (120-130 psi). Shirts from different manufacturers/mills will sometimes behave differently and need higher or lower curing temperature. Test shirts of choice in equipment of choice to determine optimum curing conditions.

Preferred method for curing white cotton and cotton/poly blend shirts with belt conveyor heat tunnel

Gas and electric conveyor dryers have a wide variance of efficiency. The recommendations below represent a useful starting point. A user should test to determine the best drying time and temperature with their particular drying tunnel.

- Use 2.5-4 minutes at 340-345°F (171-174°C) as a starting point.
- If the wash fastness is insufficient, changing temperature or dwell time can have positive effects on wash fastness.
- If the shirt yellows or stains, reduce the temperature and/or the dwell time.

NOTE: DuPont also offers pre-treatment for dark garments named DuPont™ Artistri® Brite P5003 pre-treatment solution. This is a product to increase the opacity and consistency of white ink, wash fastness and image sharpness for prints that use a white ink layer. More information on DuPont™ Artistri® Brite P5003 pre-treatment solution is available from your authorized DuPont™ Artistri® reseller.

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