



» TIPS & TECHNIQUES

UNION INK™ U

**PLASTICHARGE™
ADDITIVE**

WHAT IS DISCHARGE PRINTING?

Discharge printing is a procedure used to screen print ink onto a dark T-shirt that will either effectively remove the dark color of the garment and replace it with a color in one step or remove the dark color with a clear discharge and print colors in later steps.

WHAT IS THE UNION INK PLASTICHARGE ADDITIVE?

The Union Ink™ Plasticharge™ additive DSPCH-9070 is a unique water-based clear additive that is combined with a plastisol-colored ink and DSPP-9ZFS Discharge Agent to form a hybrid (water-base/plastisol) ink that will discharge the original color from the underlying fabric while simultaneously printing the desired new color in a single operation.

PREPARATION



Selecting the substrate - Not all garments are designed to discharge. They must be “reactive dyed” and made of natural fiber (100% cotton). Currently, most name-brand 100% cotton shirts will discharge. Kelly green and royal blue substrates have historically been difficult to discharge; however, recent testing indicates more positive discharge reaction.

Selecting a plastisol color - Technically, any plastisol can be used to provide the color. However, it is essential to remember that the 50% Plasticharge additive component will dilute the intensity of the color. Therefore, using a high-opacity color will result in a more accurate replication of the original plastisol color. Union Ink recommends either Maxopake™ or Mixopake™ for the plastisol component. Test results with these inks have, in most instances, resulted in precise color matches.

Blending - Plasticharge additive is a hybrid product that combines an aqueous discharge base component with color provided by plastisol inks. The two components should be blended at the recommended ratio of 50:50 by weight. This ratio will approach maximum color accuracy and coverage. However, printers can alter this ratio to achieve the desired finish, with a higher ratio resulting in a softer finish.

This step can be completed before production as pot life begins to diminish 6–8 hours after the addition of the activator powder. The amount of discharge agent powder should be determined by the weight of the amount of Plasticharge additive rather than the combined weight of the additive and the ink.

Activating the Plasticharge additive - To activate the Plasticharge, add 5–6% discharge agent immediately before adding ink onto the screen. Some garments will discharge fully when as little as 4% of this activator is introduced, so use the lowest possible percentage to achieve the desired effect.

At this point, the pot life of the ink is approximately eight hours. However, to achieve optimal performance, apply in 1–2-hour increments and only activate the ink needed for the time interval allotted. For longer runs, repeatedly adding fresh Plasticharge additive to the screen will help keep the process working at peak efficiency.





SCREENPRINTING



Printing - The squeegee angle should be between 5–10 degrees. Pressure should be enough to clear the screen and achieve the desired print, short of discharging through the shirt. Excess Plasticharge printing through the garment allowed to build up on the platen will transfer to other garments and can show up in areas outside of the intended art area.

The Plasticharge inks are opaque and cannot be printed directly over another ink without flashing. We recommend printing discharge and Plasticharge ink directly on the fabric without using an underbase. However, if the job typically has a second flash later in the print sequence, this flash can still be utilized to maintain image clarity.

Curing - Discharge is a steaming/extraction process. It is very important that the print is not cured using extreme temperatures. Remember: longer dwell time is more important than higher heat. See “Testing the Curing Process” below.

Testing the curing process - When the project begins, first run two prints down the dryer, then immediately run one of the prints through the dryer again. Then, compare the two prints; if the prints look the same, the dryer is ready for production. If the twice-cured print looks better, slow the dryer and repeat the test until they match.

In the curing process, there is a plastisol component that still must cure between 300°F–320°F (150°C–160°C). Therefore, in addition to steaming the water out to enable the discharge function, it is also necessary for the ink film to reach cure temperature. As the water evaporates, the plastisol ink will not reach cure temperature until the discharge process is complete. Thus, testing for complete cure is highly recommended.

Preparing the screen - It is important to use a high-quality water-resistant emulsion¹ and possibly a screen hardener² on all screens to be used on a Plasticharge additive run, even if only printing a Plasticharge underbase. All screens will come into contact with the Plasticharge underlayment during printing, and breakdown will occur if the proper screen preparation, coating techniques, and emulsions are not used.



Selecting a mesh—Recommended screen meshes for this product are approximately 110–180 t/in (43–71 t/cm).

¹ To further protect your screen, liberally apply tape on the print face in areas where the image is not exposed to protect from pinholes that will not be detectable until the image has developed. You cannot shoot Plasticharge additive or discharge pinholes with a spot cleaning gun.

² When hardening a screen, avoid hardening both sides, as it will be difficult, if not impossible to re-claim. If you harden only one side, apply the hardener to the print-well side. This will not ensure that your stencil will not break down, and you will be able to re-claim the screen.





POST-PRODUCTION



Aftercare - Printers must not allow residual discharge ink to come into contact with finished garments when they are loading or unloading them, as it will still discharge where touched.

TROUBLESHOOTING



Print has dark and light areas - The discharge process has not been completed, and moisture is still present; slow dryer belt speed.

Print looks weak; color intensity low - If the print initially looks faint, the mesh count is too high and insufficient discharge ink is on the fabric. If the print initially appears as intended and later fades, then either the screen is starting to “dry in” (clog up), or the discharge ink is old and is starting to lose effectiveness.

Ink has color streaks in the screen - If the streaks are the same color as the emulsion, then the non-water-resistant is the most common cause because the water in the Plasticharge additive will break down the emulsion. For full production, use a quality water-resistant emulsion that has been properly exposed and hardened.

Color fades after washing - This typically indicates that the garment did not have sufficient dwell time and water was still in the print because it did not completely evaporate.

Green or similarly colored garments fail to discharge completely - Request a rating chart from the garment supplier that provides a score for each of their garment colors. Green-dyed garment offerings often will not discharge well.

Plasticharge additive mixed with red shows white areas or fading - Discharge agent is attracted to, and subsequently deteriorates, red pigments. To reduce the resulting white areas or fading, reduce the agent by 1-2%. Red discharge colors should achieve image development with as little discharge powder as possible.

Plasticharge additive alone creates a pink or blue image on dark garments - If you apply an un-tinted Plasticharge additive to a black or dark garment and the “gray goods” exposed appear pink or blue, this would indicate that the batch of shirts may have been over-dyed black. To ensure the discharge process is successful, specify “dischargeable garments” from the blanks supplier. Applying Plasticharge additive alone to a black 100% cotton shirt should develop into an off-white, natural cotton color.

Plasticharge additive foams - This is acceptable. Simply stir the product to eliminate foam.





To learn more about Union Ink Plasticharge Additives, please call 1.844.4AVIENT, email askspecialtyinks@avient.com or visit www.avientspecialtyinks.com.



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