



IMAGESTAR SILICONE INK

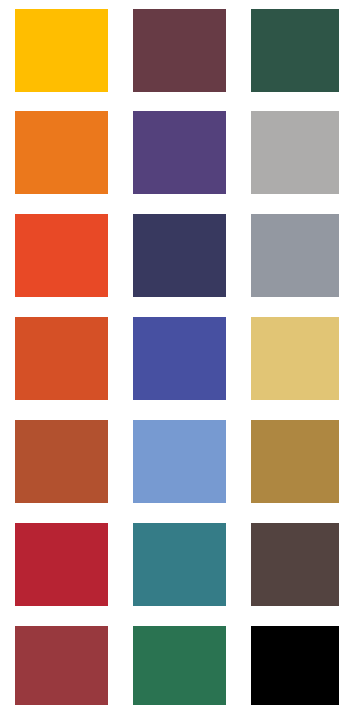
3500 Series RFU Textile Inks

1500 Series Pigment Concentrate Textile Inks

ImageStar 3500 Series RFU Silicone Ink

Ready-For-Use Colors

Color	Item Number	Color	Item Number
Gold	IMS35610	Aqua	IMS35682
Light Orange	IMS35600	Kelly Green	IMS35692
Bright Orange	IMS35602	Dark Green	IMS35694
Burnt Orange	IMS35606	Silver Gray	IMS35262
Texas Orange	IMS35604	Dark Gray	IMS35264
National Red	IMS35620	Vegas Gold	IMS35612
Crimson	IMS35630	Old Gold	IMS35614
Light Maroon	IMS35840	Dark Brown	IMS35842
Purple	IMS35662	Opaque Black	IMS35240
Navy Blue	IMS35684	Opaque White	IMS35750
Royal Blue	IMS35220	Underbase Gray*	IMS35260
Columbia Blue	IMS35680		



ImageStar 1500 Series Pigment Concentrate Silicone Ink

Bases

Description	Item Number	Description	Item Number
Clear – used for mixing fluorescents or HD printing	IMS2100	Opaque – used for mixing PMS colors (contains retarder)	IMS3102

Colorants

Color	Item Number	Color	Item Number
Blue 1	IMS1522	Maroon	IMS1584
White Tint	IMS1558	Fluorescent Pink	IMS1590
Black Tint	IMS1559	Fluorescent Green	IMS1592
Orange	IMS1560	Fluorescent Yellow	IMS1594
Yellow	IMS1561	Fluorescent Red	IMS1595
Violet	IMS1566	Fluorescent Purple	IMS1598
Blue 2	IMS1568	Fluorescent Blue	IMS1599
Green	IMS1569	Strong Black**	IMS1524
Magenta	IMS1583	Strong White**	IMS1575

Additives

ImageStar additives are compatible with both 1500 Series Color Concentrate Inks and 3500 Series RFU Inks.

Description	Item Number
Catalyst	IMS2200
Retarder	IMS2201

Refer to the mixing recommendations on page 4 for information about incorporating catalyst or retarder with ImageStar Silicone Inks.

3500 Series colors not visually represented above: Underbase Gray (IMS35260 RFU), Opaque White (IMS35750 RFU) and custom colors. Printed results of colors may vary based on production. Ink film thickness, opacity, pigment selection and substrate can all affect results.

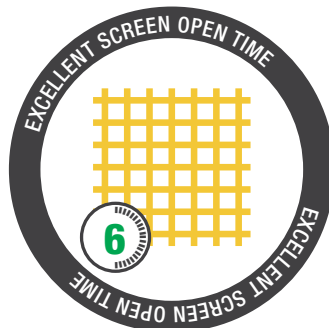
*Only needed as underbase for extremely problematic dye-migrating fabrics.

**Only needed to make printing black and white. Not needed if using 3500 Series RFU black and white.

The ImageStar Silicone 3500 RFU and 1500 Color System Textile Ink Series are developed for printing on performance wear and smooth polyester fabrics. The ImageStar Silicone PVC free inks exhibit superior elasticity and durability when printed on these demanding fabric types. Manufactured with a retarder addition, the inks maximize screen open time of the catalyzed product. This results in a very production-friendly printing ink that can run up to 6 hours with minimal screen drying issues. The 3500 Series is a ready-for-use ink consisting of 23 standard colors. The 1500 Series is a base-plus-concentrate system allowing for color customization. Both the 3500 and 1500 Series are catalyzed using the 2200 Silicone Catalyst and feature low curing temperature which greatly reduces the potential for dye migration.



These inks feature a very low curing temperature which greatly reduces the potential for dye migration. Also the perfect choice for printing on digital dye-sublimated camouflage performance wear.



Manufactured with a retarder addition to maximize the screen open time of the catalyzed product resulting in a very production-friendly printing ink that can run up to 6 hours with minimal screen drying issues.



Colors are stocked in quart and gallon containers.



Contains no PVC, phthalates, solvents, organotins, azo-dyes, or formaldehyde.



Prints through a wide range of mesh. 110-156 mesh is recommended for stretch and athletic apparel. 156-305 mesh can be used for fine detail.



The printed image can be ironed and will not melt.



Features a soft, matte finish with very low to non-tack feel. Extreme elongation properties for elastic fabrics.

Recommended Mixing Ratios for 1500 Series

The ImageStar 1500 Series Pigment Concentrates can be added to the base material up to a maximum of 30% by weight. A 20% addition is recommended in most formulations. Always pre-test for cure and adhesion prior to production run.

- Add the catalyst just prior to production to maximize the pot life of the ImageStar silicone ink. See recommendations for adding catalyst below.
- If catalyst is added during the color blending process, and the print production is delayed, seal the container air-tight and store in a cool, dry environment until use.

Recommendations for Adding Catalyst

The catalyst is the key component for curing the ImageStar Silicone Inks. The reaction of the catalyst to the base material results in the cross linking of the silicone components; this cross linking will continue until a completely cured ink film is achieved.

- 3% to 5% by weight of the IMS2200 Silicone Catalyst must be mixed into the 3500 Series RFU or 1500 Series Color Concentrate ink colors prior to printing. The catalyst can be manually weighed and mixed by hand or by using a mechanical mixer.
- The catalyst should be added and mixed with the RFU silicone right before the printing process.
- Only catalyze the quantity of ink you will use during an 8-hour shift of printing.
- The catalyzed ink pot life is primarily determined by ambient room temperature. Higher temperatures result in shorter pot life. On press, humidity has little effect on pot life of the catalyzed printing ink.
- Extended pot life of catalyzed inks that are not in screen can be achieved by covering the ink container and keeping in a cool location. Do not place containers near flash units.

Recommendations for Adding Retarder

The 1500 Series Opaque Base (item number IMS3102) and all of the 3500 Series RFU silicone ink colors already contain an addition of retarder. The retarder slows the curing process during printing; additional retarder may be needed when printing production occurs in hot environmental conditions or long printing times (>8 hours) are required.

- In most environments, additional retarder will not be required.
- The normal cross linking could begin to occur after about 45 minutes of printing; retarder allows the ink to remain screen stable and printable through an 8-hour shift.
- Use an additional 1% - 3% of IMS2201 Silicone Retarder by weight as needed.

Printing Recommendations

Printing the ImageStar Silicone Ink is not different from most other textile printing inks. When printing on dark substrates, the silicone ink can be flash cured, and colors can be printed on top of the flash plate (similar to plastisol ink processes). Depending on the artwork, wet-on-wet printing can be achieved using finer mesh counts and less ink deposit.

- **Screen Mesh** – To achieve a smooth print surface, 110-156 mesh is recommended for stretch and athletic apparel. 156-305 mesh can be used for fine detail.
- **Stencil** – A good EOM (emulsion over mesh) ratio with an even shirt side coating surface helps to ensure a consistent and smooth ink deposit.
 - Utilize a quality high solids emulsion and incorporate a 2/2 coating procedure, finishing on the squeegee side of the screen.
 - Capillary films (100-200 micron) can be used to increase the thickness of the printed ink film if desired.
- **Squeegee** – 70 durometer or 60/90/60 triple durometer. Lower durometer squeegee, increased angle, and slower print speed will result in increased ink deposit for optimal opacity.
- **Pallets** – Preheat the pallets to 140°F (60°C) prior to production.
- **Flash** – The ImageStar Silicone ink will typically flash dry at temperatures of 180-200°F (82-93°C). Flash times are normally achieved in 4-6 seconds. For fabrics containing high levels of elastic fibers (15%-20%) or fabrics with poor sublimation fastness, the ink surface temperature should be kept below 212°F (100°C) to prevent fabric damage or contamination from migrated dyestuff.
- **Adding Ink to Screen** – Add only enough ink to be able to print for 2-3 hours. Add additional ink in small increments throughout the print run to allow for a continuous printing operation.
- **Extreme Climates** – When the ambient air temperature is extremely hot, use fans on screens to keep ink cooler and add a cool down station after flash as needed.
- **Machine Stop** – When the machine stops for a break, the image area must be flooded with a thick layer of silicone ink to protect the ink from curing in the mesh openings. For longer breaks:
 - Best practice is to remove the ink from the screens and store in covered container. Wipe down the screens with solvent.
 - Optionally, clean the image area with solvent and cover the screen with a plastic bag.
- **End of Print Run** – It is recommended to use as much of the ink in the screen as possible as the production run winds down to reduce waste.
 - Do not remove the catalyzed ink from the screen and add it back to un-catalyzed product.
 - It is also not recommended to remove the ink from the screen and reuse it. The excess ink will continue to cross link until hardened.
- **Screen Cleaning/Clean Up** – Clean the screen right after the printing operation is complete, as the ink will continue to cross link and cure with time. Uncured catalyzed ImageStar Silicone inks can generally be removed from the screens and equipment with the same cleaning agents used to remove plastisol inks. In addition, hydrocarbon-based solvents such as mineral spirits can be used.

Curing Recommendations

- After printing, the printed image should be oven cured at 248-284°F (120-140°C) for one to two minutes to ensure full cure and wash fastness.
- For heat sensitive fabrics or for energy saving purposes, lower temperatures can be used for longer dwell times.
- Materials such as tin complexes, sulfur and amines are known to interfere with curing so contamination by these must be avoided.
 - Pre-treatment of printed fabric with an amino-silicone softener will result in an incomplete cure.
 - Dark garment colors such as blacks, browns, and dark blues may contain sulfur dyes and can inhibit the silicone ink from curing thus resulting in insufficient adhesion.
- Avoid any potential for cross-contamination with PVC containing products. It is recommended that ImageStar Silicone inks are printed and cured on a production line that is dedicated strictly to the use of silicone inks.
- Screen printing pallets must be free of any non-silicone ink residue. Even a slight PVC plastisol ink deposit on the pallet can release plasticizer under heat that will inhibit the curing of the silicone ink.



It is extremely important to test all fabrics for adequate adhesion before beginning a production run.

Storage Recommendations

- Store original unopened containers at or below 86°F (30°C).
- Ink taken from the press should not be returned to the original container to avoid contamination and curing of fresh ink.
- Store unused catalyzed inks in closed containers at cool temperatures (~77°F or 25°C). The ink can be kept for extended periods (up to several days) and reused when necessary. Cooler temperatures (~45°F or 7°C) can result in longer useable life of product. Do not place ink from screen back into the container containing unused catalyzed inks or risk affecting pot life of unused inks.
- Relative humidity has little effect on pot life of the catalyzed printing ink, however, if un-catalyzed IMS Silicone Inks are exposed to humid air during storage, the pot life of the subsequently catalyzed ink will be shortened, even when no significant changes in viscosity are noticed.
 - To avoid shortening of pot life, the containers of ImageStar Silicone Inks must be sealed well. Once the containers are opened, a PE, PP, or PVDC film should be placed over and in contact with the un-catalyzed printing ink to prevent moisture absorption and then sealed appropriately. This helps prevent moisture from coming into contact with the silicone ink.
 - ImageStar Silicone inks have a usable life of 12 months from the date of manufacture when stored at or below the recommended temperature of 86°F (30°C).

Special Considerations for Printing on Cotton and Blends

As a general rule, silicone inks do not exhibit good fiber mat down properties. Therefore, printing on “hairy” fabrics such as some 100% cotton or brushed polyesters garments is not recommended. The standard “smoothing” screen process as utilized in plastisol printing on the flashed underbased ink is not effective as the silicone ink is not thermoplastic and will not re-melt.

A smooth print surface on these fabrics can be achieved by utilizing a multi-step printing process:

- Print the underbase, apply a Teflon sheet to the wet ink film.
- Print the smoothing screen and flash cure.
- Finally remove the Teflon sheet. The resultant print will be significantly glossier than standard.

If you have in-line heat press capabilities, or if you are manually printing, the following method can be used:

- Apply a Teflon coating to a heat press/hot plate and set the temperature to 250-300°F (120-150°C).
- Print the underbase, apply the heat press for ~10 seconds.
- Print the additional colors on top of the pressed underbase. The resultant print will be significantly glossier than standard.

An effective process for less severe fabrics is simpler:

- Print a thin neutral ink film layer (160-180 mesh) as an underbase. The IMS3102 Base can be used. A fast squeegee stroke will lay minimal material down to “seal” the air space between the garment fibers.
- Flash
- Print ImageStar Silicone white/color on top of neutral flash plate through coarser (110-140) mesh.

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