Textile Screen Printing Inks and Supplies

"The Right Tools for the Job"

Table of Contents

Plastisol Inks

Plastisol Inks (cont.)

Water Based Textile Inks

Screen Printing Supplies and Services

For more information about Union Ink Company products, or for technical information on printing applications call 1-800-526-0455, or visit us on the world wide web at www.unionink.com.

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Ink Selector for Plastisol Inks

General Purpose Inks
General purpose inks are used on a wide variety of garment types and colors, for direct prints and transfers, and on manual and automatic presses. Ultrasoft (PLUS/PLUE) is a general purpose inks.

High-Opacity Inks
To print on medium and dark-colored fabrics, you must use high-opacity inks. Mixopake (MIXO/MIXE) inks and Maxopake (PADM/PADE) inks maintain their colors even when printed on black.

Low-Bleed Inks
Dye migration, which occurs when dyes in polyester fibers dissolve into and change the color of plastisol ink is one of the most severe technical challenges in textile screen printing. Union Ink has added bleed-resistant low-bleed whites and yellows to their Mixopake (MIXO/MIXE) and Maxopake (PADM/PADE) inks. A series of inks called Polyester (POLY/ATHP) was formulated in 14 colors to help fight dye migration on 100% polyester athletic uniforms or other fabrics prone to severe dye migration.

Soft-Hand Inks
Unimatch (MACH/PTHF) and Tru-Tone (PRPL/PRPE) produce extremely soft-hand prints (prints where the ink is scarcely detectable to the touch). When printed through a fine mesh, Ultrasoft (PLUS/PLUE) can also provide a very soft-hand print.

Color Matching Inks
Automatch (AUTO) Mixopake (MIXO/MIXE) and Unimatch (MACH/PTHF) are designed for simulating PANTONE® olors on dark, medium and light-colored garments.

Process Inks
Union Ink has pioneered the development of inks for process-color printing. Our Tru-Tone (PRPL/PRPE) is the industry standard for consistent process-colors. Tru-Tone's unique chemistry causes each individual dot to return to its resting viscosity faster than competitive process inks thus minimizing dot gain and improving image sharpness.

Heat Transfer Inks
Union Ink Company has developed five plastisol inks that provide superior performance for printing heat transfers. Mixotrans (MITR/MITE) is a color mixing system for the highest opacity hot-split and cold peel transfers. A standard range of colors for printers not wanting to mix colors is also available in Mixotrans. Also available is Ultrasoft (PLUS/PLUE) for producing general purpose transfers, You should use Soft-Split Transfer Clear (PLUS/PLUE-9031) for producing process color transfers.

Athletic Inks
For printing on nylon athletic uniforms Athletic Gloss (PATH/PATE) is an opaque ink with a durable, high-gloss finish that will adhere to the widest variety of fabrics. For 100% polyester athletic uniforms Union manufactures the Polyester Series (POLY/ATHP), a set of 14 athletic colors that have shown great resistance to dye migration. For Lycra/Spandex or other extremely stretchy fabrics, Unistretch White or the addition of Unistretch Clear to the Athletic Gloss Series helps prevent cracking in designs that are stretched beyond normal proportions.

Special Effect Inks
Plastisol inks are available in an amazing array of special effect formulations. Puff inks are the most popular special effect ink. Plastipuff (PLPF/PLPE) provides a high loft and an extremely opaque, durable print. Union Ink also manufactures other popular novelty inks such as Glitter (PAGL/PAGE J or S), Shimmer (PAGL/PAGE-M), Suede (PLSE/NPSU), Flash-Back (REFL/REFE), Photochromic (PHOT/PHOE) and Hi Square (3DSQ/3DSE). Flash-Trans (FLTR), is a system where printers can produce customized light-reflective designs that are safety rated for use by fire departments and other public safety workers. Union's newest addition to their special effects inks, Holographic Glitter (HALO/HALE), is a series of 10 sparkling, glitter colors formulated to produce not only a glitter effect but also emits a pearlescent or holographic look when viewed in direct sunlight or under any point light source.

For More Information
For more information about specific Union Ink product lines, consult the appropriate section in this catalog or call Union Ink and request Technical Data Sheets and Material Safety Data sheets for the products in which you are interested. Technical Data sheets, Material Safety Data Sheets, and online technical support for all Union Ink Company products are also available via the internet at www.unionink.com.

General Information About Plastisol Inks

Plastisol inks are widely used in garment printing because they are easy to print, do not dry in the screen, can be opaque on dark garments, and can adhere to most textiles. They are composed primarily of PVC resin (a white powder) and plasticizer (a thick, clear liquid). Plastisol must be heated to 300°-340° F (143°-166° C) to dry (cure).

Plastisol inks can be printed on virtually any surface that can withstand the heat required to cure the ink and is porous enough to permit good ink penetration. Plastisol inks do not dye the fibers. Instead, the ink wraps around the fibers and makes a mechanical bond with the fabric. For this reason, they will not adhere to non-porous substrates such as plastic, metal, and glass. They will also not adhere well to woven, water-proofed nylon without adding a bonding agent.

For More Information About Union Ink Products:
Technical Data Sheets and Material Safety Data Sheets for all Union Ink products are available by fax or mail from Union Ink. They are also posted on the internet at www.unionink.com.

Health, Safety, and Environmental Concerns:
Plastisol inks are innocuous when used with reasonable care. A true plastisol ink contains no air-polluting solvents or volatile organic compounds. The manufacture, transportation, storage, use, and disposal of plastisol inks do not cause injury, illness, or environmental contamination as long as the appropriate safety and environmental protection procedures are followed.

Mesh Selection: With over 400 different meshes to choose from, selecting the correct mesh can be a frustrating process. The chart at the bottom of this page provides general guidelines for mesh selection.

Emulsion Selection: For plastisol inks use solvent-resistant dual-care or diazo direct emulsion stencils specifically designed for plastisols such as Union's Inmarcol-R or Inmarcol-F. Stencils created with capillary films are also a good choice, particularly when printing halftones and transfers.

Plastisol Ink Additives: A word of caution about ink additives: It's easy to upset the chemical balance of plastisol inks by adding too much or by using the wrong additives. The result can be a print that never cures properly, a problem that may not be discovered until your customer washes a shirt and the design falls off. To avoid this, use only those additives recommended by Union Ink, read the technical Data Sheets for each ink and additive, and carefully follow their instructions.

Never add mineral spirits to plastisol ink. Although mineral spirits will make it easier to print at first, later the ink will thicken up on standing. Also, it is possible that mineral spirits will prevent the ink from curing properly.

Ink Storage: Store plastisol inks at room temperature. Prolonged exposure to temperatures above 90 F (32 C) can cause the ink to start to cure while still in the container.

Screen Wash-up: Clean plastisol ink off your screens with either mineral spirits or any of the various brand name screen washes available from your screen printing supplier.

Print Washability: The washability of properly cured direct and transfer prints is excellent. Do not dry clean. Do not iron the printed part of the garment.

Controlling Dye Migration: Dye migration is the problem caused by dyes in polyester fibers transferring to and changing the color of plastisol inks. The colors most likely to migrate are red, maroon, kelly green, and some of the darker blues. Dye migration may appear immediately after the ink is cured, or hours, days, or up to two weeks later.

Mesh Selection Guide

Threads/in	Threads/cm	Printing Type
30—40	12—16	Glitter Inks
60—95	24—38	Athletic printing, opaque ink deposits, thick puff ink, shimmer inks.
86—110	34—43	Heavy coverage on dark shirts, solid underbase, puff, metallic, shimmer inks and transfers.
125—150	49—59	General printing on light shirts and light nylon jackets.
180—230	71—90	Multi-color printing on light shirts and light nylon jackets.
230—305	90—120	Detailed multi-color printing on light shirts, light nylon jackets, overprinting on dark shirts.
305—355	120—140	Process color on light shirts and overprinting on dark shirts.

When printing on fleece goods use 20 threads lower. When printing on an automatic press use 30 threads higher. This chart was developed by Scott Fresener of the US Screen Printing Institute..

General Information About Plastisol Inks (cont.)

To control dye migration use the following procedures:

- Print with high-opacity, low-bleed inks.
- Use no more heat than necessary to cure the ink. Excessive heat can trigger dye migration.
- Print and flash-cure a low-bleed white underbase, then print the desired color over that.
- Avoid the problem entirely by printing on 100% cotton fabrics

PREVENTING BUILD-UP WITH PLASTISOL INKS

Build-up is exactly what the name implies, the build-up of ink on the backs of screens. This can interfere with the print, throw off-registration, and slow print speeds. Build-up would not be a problem except for the luxury that plastisol printers have to be able to print most of their work wet-on-wet. If each color were cured before the next color was printed, there would be no build-up.

Build-up is more common with automatic printing and opaque inks. Build-up never shows on the first screen in the sequence, it's always on the subsequent screens in a design. Some colors have a stronger tendency to build-up than others do.

One of the main causes of build-up is that more ink is printed than the fabric can hold. If the fabric cannot hold it, then the ink readily transfers back to the subsequent screens. In other words, the excess ink has greater adhesion to the screen than it does to the substrate. The following steps will help you control build-up and improve overall print quality.

Use Inks Designed to Reduce Buildup: Union Ink's Automatch, Mixopake, and Tru-Tone ink lines are much less liable to cause build-up problems.

Reduce Inks With Extender Bases and Flow Additives: MIXO/MIXE-9070 and PLUS/PLUE-9090 are great for reducing build-up. For Mixopake inks Flow Additive (MIXO/MIXE-9020) is also recommended.

Use Higher Mesh Counts: Use the highest recommended mesh count for a particular ink series. This practice will not only decrease the amount of ink used; it will improve the hand of print.

Use Well Tensioned Screens: Screen tensions should be greater than 20 Newton's/cm and all screens on a particular job should be the same tension.

Reduce Off-Contact: Low off-contact distances (no more than 0.080" or 2.0 mm) reduce the amount of squeegee required to print the ink. Low squeegee pressure reduces the amount of ink printed.

Use the Correct Squeegee Angle: Set the squeegee angle at no more than 15 degrees from vertical.

Use A Medium-Hard Squeegee: Use 70/90/70 or 75 durometer squeegees.

Increase Squeegee and Floodbar Speed: Increase the speed until the laydown suffers then back off just enough to print correctly. Union Ink's newer plastisol formulations are designed to reduce build-up. However, poor printing practices can result in build-up. By following the suggestions outlined above you can minimize build-up and improve your print quality and production speeds at the same time.

Curing Plastisol Inks: For complete information on curing plastisol inks call 1-800-526-0455 and request a copy of the Union technical paper titled "How to Evaluate the Cure of Union Ink Plastisols".

Transfer Printing: Most plastisol heat transfers fall into one of three categories, hot-split, cold-peel, or puff. When hot-split transfers are applied, the paper is stripped off the garment immediately after the heat transfer press is opened. The ink layer splits, leaving part of the ink on the garment and part on the transfer paper. Hot-split transfers are nearly indistinguishable from a soft-hand direct print. When cold-peel transfers are applied, the transfer is allowed to cool before the paper is removed. All of the ink transfers from the paper to the garment. Cold-peel transfers have a glossy surface and are preferred for glitter and athletic transfers. Some transfers can be either hot-split or cold-peel. Puff transfers are printed with special puff transfer inks and produce a puff design. Transfers that have been properly printed and applied are as durable as a direct print.

Curing Transfer Prints: When printing heat transfers, the ink is gelled or brought to a semi-cure between 180°-250° degrees F (82°-121° degrees C) just past the wet state. If they are over-cured, the ink will not transfer well. Transfers that have been semi-cured become fully cured when they are applied to the garment.

Testing For Cure: To determine the correct dryer settings for transfers, increase the conveyor speed, or decrease the temperature of the curing unit until the stacked prints begin to stick together or show a slight amount of set off on the back of the upper sheet, then decrease the conveyor speed enough to eliminate the sticking. Another test for gel (though not always accurate) is to peel the ink off the release paper and roll it into a ball. If the ball unrolls when laid down, the transfer is uncured. A third test is the stretch test. The ink layer should be gelled just enough that you can peel it off the paper, but if you stretch it, it should break with very little stretch.

General Information About Plastisol Inks (cont.)

Hot-Split Transfer Tips: For medium-opacity transfers use Ultrasoft ink. For high-opacity transfers use Mixotrans. Print through an 86 threads/inch (34 metric) mesh. Cure to 250° degrees F (121° C). See below for curing procedures. Use Super-Trans, Trans-Lith, or Trans 60 paper, available from Union Ink. Transfer to the garment at 350° degrees F (177° C) for 10-15 seconds at 25-30 ldb/in² (1.75-2.1 kgf/cm²). Peel the paper off the garment immediately after the press is opened.

Cold-Peel Transfer Tips: Use the same inks, mesh, and curing procedures as for hot-split transfers. Use TransFrench T-75, Super-Trans, or TransLith paper, available from Union Ink. Transfer to the garment at 350° degrees F (177° degrees C) for 10-20 seconds at 25-30 lbf/in² (1.75-2.1 kgf/cm²). Allow the transfer to cool completely before stripping off the paper.

Glitter Transfer Tips: For glitter transfers, use Super Glitter printed through a 30 thread/inch (12 thread/cm) mesh. Cure as for hot-split transfers. Use TransFrench T-75 or TransLith papers. Glitter transfers are generally applied using the cold-peel procedures.

Testing for Transferability: It is essential that you test your heat transfers at the start of each production run. This is particularly important when using a new paper or ink. You should also do accelerated aging tests which will indicate how well the transfer will release after 6-12 months on the shelf. Accelerated aging tests can be done by will simulate approximately one year of shelf storage. While this test does not exactly duplicate the effects of aging, it will definitely help you determine whether a particular transfer will release well after aging. Accelerated aging tests can be done by placing the printed transfer in an environment of 120° degrees F (49° degrees C) for 100 hours. This will simulate approximately one year of shelf storage. While this test does not exactly duplicate the effects of aging, it will definitely help you determine whether a particular transfer will release well after aging.

Always Test Inks Prior To Production Runs

Always test inks to determine their fitness for your particular applications, especially new types of inks or when printing on new products. Before printing a production run, print a sample for testing for adhesion, crocking, opacity, washability and specific job requirements.

Warranty Disclaimer

Union Ink Company believes that the information contained in this catalog is accurate and opinions expressed are those of qualified experts. However, the information is not to be taken as a warranty or representation for which Union Ink Company assumes legal responsibility. It is offered solely for your consideration, investigation, and verification.

Union Ink Company will replace or refund any defective product returned to us within 1 year of the purchase date. This warranty is in lieu of any implied warranty of merchantability or fitness, and no other warranty shall apply. The user is responsible to determine whether the product is suitable for each particular substrate and application. The user must test thoroughly (including wash and storage tests) before using in production. In no event will Union Ink be responsible for indirect or consequential damages such as damaged substrates or printing labor.

A Guide to Union Ink's Standard & Non-PhthalateTextile Ink Lines

liberty™ Series inks are a Non-Phthalate plastisol line specially formulated to meet with today's environmental regulations. The **liberty™** series passes all the requirements of **CPSC HR-4040, California Assembly Bill 1108 and Oeko-Tex 100**. When you require a Non-Phthalate ink please be sure to order using the correct product identification.

Athletic Gloss Plastisol (PATH), liberty™ Series (PATE) - An opaque ink which provides outstanding adhesion and durability, as well as, a high gloss finish. Designed for athletic uniforms, nylon mesh, Supplex™, Spandex/Lycra™.

Flash-Back Plastisol (REFL), liberty™ Series (REFE) - A light reflecting plastisol ink available in eight colors.

Flash Trans (FLTR), liberty™ Series (FLTE) - A reflective transfer system that provides maximum brightness for safety rated applications. Meets public safety department requirements for reflectivity on safety clothing. This is a 3M Scotchlite™ material to be used in conjunction with Union's FLTR-9180 adhesive.

Glitter Plastisol (PAGL-J, PAGL-S), liberty™ Series (PAGE) A glitter ink for both direct printing and transfer printing.

Hi-Square Plastisol (3DSQ), liberty™ Series (3DSE) - When printed using capillary films this product will provide 3D effect prints which retain sharp edges and crisp, highly detailed graphics.

Holographic Glitter (HALO), liberty™ Series (HALE) - Provides the ultimate in glitter effects. Adds sparkle and dimension to almost any design, particularly when viewed in bright sunlight.

Maxopake Plastisol (PADM), liberty™ Series (PADE) - Our highest opaque ink. A variety colors are available in bleed-resistant formulations for printing on cotton/polyester blends.

Mixopake Plastisol (MIXO), liberty™ Series (MIXE) - A versatile, easy-to-print, high-opacity ink intended for simulating PANTONE® colors on colored garments.

Mixotrans (MITR), liberty™ Series (MITE) - A high-opacity transfer ink which simulates PANTONE® colors for hot split or cold peel transfers.

Photochromic (PHOT), liberty™ Series (PHOE)- A plastisol ink available in 3 colors which change color when exposed to sunlight or other UV light sources.

Plasticharge White and Additive (DSPCH), liberty™ Series (DSPCH-E)- Plasticharge White is an under base white which will provide a bright and soft hand. When Plasticharge Additive is blended with recommended plastisols the results are bright, soft handed graphics.

Plastipuff Plastisol (PLPF), liberty™ Series (PLPE) - An extremely opaque ink which provides a 3 Dimensional puff effect.

Pre-Print Discharge (DSPP) - A water based discharge ink which provides the ultimate soft-hand under base for plastisol or water based prints on dischargeable dark garments.

Polyester (POLY), liberty™ Series (ATHP) - A series of colors formulated for the ultimate opacity and bleed resistance even on the worst bleeding 100% polyester athletic uniforms.

Shimmer Plastisol (PAGL-M), liberty™ Series (PAGE-M)- A finer particle size than Glitter, the colors are bright, non-tarnishing, and wash fast.

Suede Plastisol (PLSE), liberty™ Series (NPSU)- A special effect ink which simulates the soft feel and texture of suede.

Tru-Tone Plastisol (PRPL), liberty™ Series (PRPE) - The most accurate inks available for printing four-color process graphics. They feature accurate color values, minimal dot gain, and extremely soft hand.

Ultrasoft Plastisol (PLUS), liberty™ Series (PLUE) - A versatile medium-opacity ink, available in over 50 colors, excellent for both direct printing and transfer printing.

Unimatch (MACH), liberty™ Series (PTHF) - A state-of-the-art PANTONE® approved, medium opacity, color mixing system for printing on under based dark garments or direct on light colored garments.

** Other Non-Phthalate ink series may be currently available which were not at the time of this publication. Please call 1-800-526-0455 or Outside US 201-945-5766 to varify any additional needs you may have.

If you require a Non-Phthalate type plastisol, please be sure to order as such by using the proper acronym and number for the specific series being ordered as indicated above. If you do not specify by using the proper name and number a standard Phthalate containing plastisol could very well delivered.
If you have any questions please call 1-800-526-0455 or outside the US 201-945-5766.
E-mail sales@unionink.com or visit our web site www.unionink.com

White Plastisols

Mixopake Super White (MIXO/MIXE-1000)
For printers using the Mixopake Color Matching System who do not want to purchase an additional white for 100% cotton garments, Mixopake Super White provides excellent printing, matte-down, flash and opacity characteristics for underbase, stand-alone or highlight white printing. See page 16 for more information on the Mixopake Series.

Basic Cotton White (PADM/PADE-1001)
A low-cost, general-purpose white which provides good opacity and printability rivaling many competitive whites that sell at a higher price. See page 9 for more information on Basic Cotton White.

Bright Cotton White (PADM/PADE-1027)
Bright Cotton White is Union's newest white ink for 100% cotton garments. Its versatility makes it a natural choice for use as an underbase, stand-alone or highlight white. Bright Cotton White provides excellent opacity, a pure white appearance and a smooth surface to print over. Its easy printing viscosity ensures that it will print through meshes ranging in size from 86-305 (32-120 metric). It flash cures quickly with no after-flash tack when used as an underbase on dark garments. See page 9 for more information on Bright Cotton White.

Premium Bright Cotton White (PADM/PADE-1030)
For printers who require the very best in a white ink. Premium Bright Cotton white has all the attributes of Bright Cotton White as well as improved opacity and brightness while maintaining excellent printability. See page 9 for more information on Premium Bright Cotton White.

EZ Print White (PADM/PADE-1062)
Designs printed with EZ Print White will have an extremely bright and purer white appearance as well as exhibiting a smooth surface. EZ Print White's low-viscosity, fast-flashing and no-after-flash-tack-characteristics make it a perfect choice for high production printing when printing simulated process designs on dark garments. Even though EZ Print White exhibits good bleed resistance when compared with competitive brands that are billed as low-bleed inks, it is recommended that you use Union's PLHT/PLHE-1075 Premium Low Bleed White or PLHT/PLHE-1070 Diamond White on polyester blended fabrics that are known to cause dye migration.

Diamond White (PLHT/ PLHE-1070)
Premium LB White (PLHT/PLHE-1075)
Diamond White plastisol is Union's high-opacity low-bleed white. Diamond White is formulated to be an extremely bright white exhibiting high opacity, easy printability through fine meshes up to 196 (76 metric) and excellent bleed resistance on polyester blended fabrics. Diamond White retains a creamy viscosity during storage, is ready to use straight from the container and is designed for both manual and automatic printing. Our Premium LB White PLHT/PLHE-1075 exhibits all the qualities mentioned above however, this Premium product also maintains and provides a smoother finish and a tolerance for higher temperatures which make it an excellent choice for underbasing or when a smoother finish is required. See page 10 for more information on Diamond White.

Athletic Gloss White (PATH/PATE-1000)
When athletic uniform printers need a high opacity white for 100% nylon athletic uniforms they use Athletic Gloss White. Athletic Gloss White's easy printing formulation provides excellent coverage and the durability necessary to keep your uniforms looking new season after season. See page 11 for more information on the Athletic Gloss Series.

Premium Polyester White
(POLY/ATHP-1070)
Polyester White is Union's ultimate high-opacity, low-bleed white formulated to help fight dye migration on the 100% polyester athletic uniforms or other synthetic substrates prone to dye migration. It provides excellent printing characteristics for both manual and automatic printing. Premium Low-Bleed White POLY/ATHP-1070 offers printers a low-bleed white ink with easier printablility once the initial viscosity is broken down by stirring, increased whiteness and better post-bleed properties after the ink film is fully cured. See page 12 for more information on the Polyester Series.

Unistretch White (UNST/UNSE-1000)
Designs printed with Unistretch White exhibit high elongation and resist cracking when the design is stretched beyond normal proportions. Ideal for use on fabrics such as Spandex and other Elastane blends. See page 13 for more information on the Unistretch Series.

Basic Cotton White (PADM/PADE-1001)
Bright Cotton White (PADM/PADE-1027)
Premium Bright Cotton White (PADM/PADE-1030)

High-opacity, direct-print white plastisols for 100% cotton.

Applications

- For direct printing as underbase, stand-alone or highlight white on 100% cotton garments.

Features

- High opacity.
- Easy to print, creamy consistency.
- Can be used through fine meshes for extra soft-hand prints.

Good

Basic Cotton White: A low-cost, general-purpose white which provides good opacity and printability rivaling many competitive whites that sell at a higher price.

Better

Bright Cotton White: Union's most successful cotton white, Bright Cotton White is fast-flashing, has no after-flash tack, high-opacity and is extremely bright with excellent printability.

Best

Premium Bright Cotton White: For printers who require the very best in a white ink. Premium Bright Cotton white has all the attributes of Bright Cotton White as well as improved opacity and brightness while maintaining excellent printability.

Opacity: Refer to individual product for opacity.

Mesh: Underbasing—123-255 (48-100 metric) monofilament polyester. Finer meshes for the underbase application will produce softer feeling prints.

Direct printing without underbase—83-230 (32-92 metric) monofilament polyester.

Highlight White—156-305 (61-120 metric) monofilament polyester produces excellent results.

Screens stretched to higher tensions (30 newtons and above) allow inks to pass through easier yielding better opacity, coverage and smoother finishes even when using finer mesh counts.

Stencils: Any stencil compatible with plastisol inks.

Additives: These inks are supplied ready to print. Since plastisol inks "body up" as they sit in the container, you should always stir the ink well to determine the actual printing viscosity before adding any reducer. If necessary reduce with small amounts of Reducer/Detackifier (PLRE-9000). Reducing the ink usually reduces the opacity. Do not add mineral spirits.

Printing Instructions: These whites may be printed on both manual and automatic presses using normal printing techniques. For increased ink deposits multiple strokes may be necessary on manual presses. A soft pad on the printing pallet and minimal squeegee pressure will minimize penetration into the garment and enhance the final print.

Flash-Curing: Inks will gel when surface of ink film reaches approximately 240° F/115°C. Flash times will vary depending on type of flash-cure unit, dwell time and distance from flash panel to substrate.

Curing: Entire ink film must reach 310°F/154°C to achieve full cure and subsequent washfastness. Thicker ink deposits typically require higher temperatures and longer dwell times in oven.

Wash-Up: Mineral Spirits or any screen wash designed for plastisol inks.

Washability: Excellent. Do not dry clean. Do not iron printed areas.

Storage: Store plastisols at room temperature. Prolonged exposure to high temperature can make the ink start to gel.

Caution: Test this product for curing, adhesion, crocking, opacity, washability and other specific requirements before using in production.

Standard Colors

PADM/PADE-1001 Basic Cotton White
PADM/PADE-1027 Bright Cotton White
PADM/PADE-1030 Premium Bright Cotton White

Diamond White (PLHT/PLHE-1070)
Premium LB White (PLHT/PLHE-1075)

A high-opacity, low-bleed, white plastisol for polyester blended fabrics. Excellent for use as an underbase or highlight white.

Applications

- Direct print low-bleed white for controlling dye migration on polyester blended garments.
- Bleed-resistant underbase for polyester blended garments.

Features

- Smooth, bright white appearance.
- Superior bleed resistance.
- High opacity.
- Extremely fast flashing with low tack.
- Improved viscosity stability.

General Information:
Diamond White (PLHT/ PLHE-1070)
Premium LB White (PLHT/PLHE-1075)
Diamond White plastisol is Union's high-opacity low-bleed white. Diamond White is formulated to be an extremely bright white exhibiting high opacity, easy printability through fine meshes up to 196 (76 metric) and excellent bleed resistance on polyester blended fabrics. Diamond White retains a creamy viscosity during storage, is ready to use straight from the container and is designed for both manual and automatic printing. Our Premium LB White PLHT/ PLHE-1075 exhibits all the qualities mentioned above however, this Premium product also maintains and provides a smoother finish and a tolerance for higher temperatures which make it an excellent choice for un-derbasing or when a smoother finish is required.

Opacity: Diamond White is a high-opacity, low-bleed ink.

Mesh: Print through 125-230 (48-92 metric) monofilament polyester. Because of the excellent printing characteristics of Diamond White it may be printed as an underbase through a mesh count of 230 (92 metric) leaving an ultra smooth, opaque printing surface for the overprint colors. Caution: Thinner deposits of ink will reduce the effectiveness of the bleed resistance properties. On some polyester blends thinner deposits may not be possible.

Stencils: Any direct emulsion or capillary film compatible with plastisol inks.

Additives: Diamond White is supplied ready to print. The viscosity of Diamond White has been carefully formulated to sit on top of the fabric when printed. Reducing the ink is not recommended unless absolutely necessary as over-reduction could cause a loss of bleed resistance and opacity. Measure carefully by weight and add no more than 5% PLRE-9000 Viscosity Reducer or 2% of the PLRE-9100 Concentrated Viscosity reducer. When printing through finer meshes (180-230T/72-92T metric) and/or at higher screen tensions (40 N/cm and above), the ink's ability to flow through the screen can be enhanced with very small amounts (less than 2%) of Union Ink's Flow Additive (MIXO/ MIXE-9020). Additions above the recommended level will reduce the ink's viscosity dramatically and will have a negative effect on opacity and bleed resistance.

Printing Instructions: For the best coverage, bleed resistance and brightest print, adjust the off-contact distance and squeegee pressure to print the ink layer on top of the printed fabric rather than penetrating through it.

Curing Instructions: Diamond White will fully cure and withstand repeated washings when the entire ink deposit reaches 300°F (149°C). Diamond White is a superior quality low-bleed ink. To enhance its ability to prevent dye migration, flashing should be the minimum time and temperature necessary to surface cure the ink.

Caution: Always test this product for curing, adhesion, bleed-resistance, crocking, opacity, washability and other specific requirements before using in production.

Athletic Gloss (PATH/PATE)

Our most durable plastisol for nylon athletic uniforms.

Applications

- Athletic uniforms.
- Nylon mesh jerseys.
- Lycra/Spandex and Supplex nylon.

Features

- Extremely durable ink film.
- High opacity.
- Glossy finish.

General Information: Athletic Gloss plastisol inks provide glossy, opaque prints with outstanding durability. Athletic Gloss inks are recommended for printing large numbers, letters and designs with thick ink deposits on cotton, as well as, nylon mesh garments. When printing Lycra/Spandex or knit ribbed materials where great elasticity is required, the addition of Unistretch Additive (UNST/UNSE-9160 see page 13) is recommended. When printing water-resistant materials such as nylon jackets or nylon garment bags adhesion is greatly improved by adding Nylobond Additive (NYBE-9120 see pg.31)

Opacity: Athletic Gloss is a high-opacity ink.

Mesh: Coarse meshes such as 86 to 110 threads per inch (34 - 43 metric) monofilament polyester are recommended.

Stencils: Use any direct emulsion or capillary film compatible with plastisol inks.

Printing Instructions: Athletic Gloss inks should be printed through a coarse mesh screen in order to produce a thick deposit of ink. Placing a soft surface such as a silicone rubber pad on the platen will help print a thicker layer of ink. Two or three strokes may be necessary to drive the ink into the garment and still leave a thick film on top. For maximum deposit use soft or medium durometer squeegees with rounded or beveled edges.

Additives: Athletic Gloss plastisol inks are supplied ready to print. If necessary, reduce with (up to 5% by weight) Reducer/Detackifier (PLRE-9000).

Curing Instructions: Athletic Gloss inks will cure when the entire ink deposit reaches 300°F (149°C). Because of the thicker layer of ink usually printed on athletic uniforms as well as the thicker fabrics of athletic garments, longer dwell times and higher oven temperatures may be required to ensure that the entire ink film is fully cured.

Caution: Always test this product for curing, adhesion, crocking, opacity, washability and other specific requirements before using in production. Athletic Gloss Metallics should be washed in cool water with mild detergent to preserve brilliance of finish. Even after taking these precautions, some detergents and ph factors of the wash water can adversely affect the longevity of the print. Many Athletic Gloss colors are available in non-migrating formulations. This indicates colors when printed over other numbers or graphics will not run into each other unless excessive heat (350°F/177°C and above) is applied during the curing process. This concept should not be confused with bleed resistance.

Standard Colors
PATH/PATE-1000 White*
PATH/PATE-1500 Gray*
PATH/PATE-1508 S.G. Blue Gray*
PATH/PATE-2010 Lemon Yellow*
PATH/PATE-2015 Michigan Yellow*
PATH/PATE-2040 Golden Yellow*
PATH/PATE-2042 S.G. Gold*
PATH/PATE-2045 Blazer Gold*
PATH/PATE-2046 Rebel Gold*
PATH/PATE-2050 Orange*
PATH/PATE-2052 S.G. Bt. Orange*
PATH/PATE-2054 S.G. Light Orange*
PATH/PATE-2056 S.G. TX Orange*
PATH/PATE-3000 Vermillion Red*
PATH/PATE-3010 Scarlet Red*

Standard Colors Cont.
PATH/PATE-3014 S.G. Scarlet Red*
PATH/PATE-3015 Cardinal Red*
PATH/PATE-3030 Maroon*
PATH/PATE-4010 Magenta*
PATH/PATE-4020 Deep Purple*
PATH/PATE-5002 S.G. Aqua*
PATH/PATE-5012 S.G. Col. Blue*
PATH/PATE-5032 S.G. Royal Blue*
PATH/PATE-5036 Royal Blue*
PATH/PATE-5044 S.G. Navy Blue*
PATH/PATE-6020 Chrome Green*
PATH/PATE-6090 S.G. Kelly Green*
PATH/PATE-7000 Dark Brown*
PATH/PATE-7004 S.G. Army Tan*
PATH/PATE-8000 Black*

Fluorescents
PATH/PATE-F211 Orbit Yellow
PATH/PATE-F212 Golden Yellow
PATH/PATE-F213 Inferno Orange
PATH/PATE-F214 Flame Orange
PATH/PATE-F311 Missile Red
PATH/PATE-F312 Aurora Pink
PATH/PATE-F511 Solar Blue
PATH/PATE-F611 Traffic Green

Metallics
PATH/PATE-M120 Silver
PATH/PATE-M128 Washable Silver
PATH/PATE-M220 Pale Gold
PATH/PATE-M222 Rich Gold
PATH/PATE-M224 Mirror Gold

Additives
PATH/PATE-9030 Clear For Gold & Silver
PATH/PATE-9090 Extender Base
UNST/UNSE- 9160

S. G. Indicates Sporting Goods Association colors

* Non-Migrating colors

Polyester Low-Bleed Plastisol (POLY/ATHP)

A high-opacity, low-bleed plastisol ink series for 100% polyester athletic uniforms.

Applications

- Direct print low-bleed series for controlling dye migration on 100% polyester fabrics.
- Athletic uniforms or any other nasty bleeding fabrics.

Features

- All inks are made with non-migrating pigments.
- Excellent opacity.
- Superior bleed resistance.
- Excellent durability.

General Information: Polyester low-bleed plastisols (POLY/ATHP) are Union's ultimate high-opacity, low-bleed plastisols formulated to fight dye migration on the nastiest, bleeding 100% polyester athletic uniforms or other synthetic substrates prone to dye migration. It's formulated to provide excellent printing characteristics and is designed for both manual and automatic printing. Premium Low-Bleed White POLY/ATHP-1070 offers printers a low-bleed white ink with easier printability, increased whiteness and better post-bleed properties. All standard colors contain non-migrating pigments.

Opacity: Polyester low-bleed plastisols are high-opacity, low-bleed inks.

Mesh: Print through 74T-110T (29-34 metric) monofilament polyester. For maximum opacity use 62T (24 metric).

Stencils: Any direct emulsion or capillary film compatible with plastisol inks.

Additives: Polyester low-bleed plastisols are supplied ready to print. Since plastisol inks "body up" as they sit in the container you should always stir the ink well to determine the actual printing viscosity before adding any reducer. The viscosity of Polyester low-bleed plastisol has been carefully formulated to sit on top of the fabric when printed.

Reducing may cause the ink to penetrate into the fabric affecting coverage. Never add mineral spirits to any plastisol ink

Printing Instructions: For the best coverage, bleed resistance and brightest prints, adjust the off-contact distance and squeegee pressure to print the ink layer on top of the printed fabric rather than pushing the ink through it.

Curing Instructions: Plastisol inks will not air dry and must be heat cured. Polyester low-bleed plastisols will fully cure and withstand repeated washings when the entire ink deposit reaches 300°F (149°C). Be careful ink film temperatures do not exceed 330°F (166°C) as this temperature may facilitate dye migration.

Caution: Always test this product for curing, adhesion, crocking, opacity, washability and other specific requirements before using in production. Because of the thick ink deposits required by athletic printers, Polyester Low-Bleed plastisols may require higher dryer temperatures or slower belt speeds for the ink deposit to reach the recommended curing temperature. For 100% polyester fabrics prone to extreme dye migration consider using Union's Barrier Clear PLHT/PLHE-9040 (page 22) as an underbase.

Standard Colors

POLY/ATHP-1070 Polyester Premium Low-Bleed White
POLY/ATHP-1500 Polyester Low-Bleed Grey
POLY/ATHP-2040 Polyester Low-Bleed Gold
POLY/ATHP-2015 Polyester Low-Bleed Michigan Yellow
POLY/ATHP-2045 Polyester Low-Bleed Blazer Gold
POLY/ATHP-2046 Polyester Low-Bleed Rebel Gold
POLY/ATHP-2050 Polyester Low-Bleed Burnt Orange

Standard Colors Cont.

POLY/ATHP-3010 Polyester Low-Bleed Tru-Red
POLY/ATHP-3030 Polyester Low Bleed Cardinal
POLY/ATHP-5015 Polyester Low-Bleed Collegiate Blue
POLY/ATHP-5035 Polyester Low-Bleed Royal Blue
POLY/ATHP-5040 Polyester Low-Bleed Navy Blue
POLY/ATHP-6020 Polyester Low-Bleed Kelly Green

Unistretch (UNST/UNSE-1000)
Unistretch (UNST/UNSE-9160)

Plastisols and plastisol additive with high elongation.

Applications

- Extremely stretchy fabrics such as Lycra/Spandex or any fabric where an improvement in elasticity is necessary.

Features

- Increases elasticity of print.
- Extremely durable and crack resistant.
- Clear can be used effectively when added to any Union plastisol ink series.

General Information: Designs printed with Unistretch White and Unistretch Clear exhibit high elongation and resist cracking when the design is stretched beyond normal proportions. Unistretch is available pre-mixed in white or in a clear (UNST/UNSE-9160) that can be added to any Union plastisol color or overprinted on top of flashed colors to achieve these same results. Even though Unistretch Clear can be added to any color, best results are achieved when it is added to the Athletic Gloss, Maxopake or Mixopake series of inks. Unistretch plastisols are especially effective when printed upon extremely stretchy fabrics like Lycra or Spandex.

Opacity & Bleed Resistance: Unistretch White high opacity ink. The addition of Unistretch Clear to opaque, light colored inks such as white, gold or light blue will reduce the opacity to a medium level. Adding Unistretch to any low-bleed ink will lower the bleed resistance of the mixed color possibly resulting in dye migration on polyester fabrics.

Mesh: For best results use same mesh sizes recommended for the particular ink series in which you have added Unistretch Clear. Unistretch White may be printed through meshes ranging from 110-230 (43-92 metric). Coarser mesh counts will give prints a higher ink film strength resulting in better stretch.

Stencils: Avoid using water-resistant emulsions as they can react with the components used to manufacture Unistretch and cause the ink to lock-up and clog the mesh openings. Any other solvent resistant direct emulsions or capillary films will be acceptable.

Mixing Instructions Unistretch Clear: Up to 35% Unistretch Clear may be added to any Union plastisol to achieve desired elongation in print.

Printing Instructions:

For white or light colored fabrics with Unistretch Clear:

- Print using the specifications outlined on the Union Technical Data sheet for the particular ink series in which you have added Unistretch Clear.

For white or light colored fabrics with Unistretch White:

- Even though Unistretch White prints well through mesh counts as fine as 230 (92 metric), for best results it is recommended that printers use coarser meshes ranging from 110-140 (43-56 metric) to give prints a higher ink film strength which results in the maximum elasticity of the print.

For printing on dark colored fabrics several options are available:

- Print a conventional fast flashing white, flash, and overprint with conventional inks containing the percentage of Unistretch Clear for the desired opacity and stretch.
- Print a conventional fast flash white, flash, overprint with conventional inks, flash and overprint with Unistretch Clear.
- Add up to 35% by weight of Unistretch Clear or Unistretch White to a fast flashing white, print as an underbase and then overprint with colors mixed with Unistretch Clear.

Curing Instructions: Check Technical Data Sheet for curing guidelines for the ink series in which Unistretch Clear has been added. Unistretch Clear and Unistretch White will cure when the entire ink film reaches 300° F (149° C). Laboratory and field testing has shown that ink film temperatures of 330°F (167°C) greatly increases stretchability of print.

Wash-Up: Immediately clean the screens and squeegees with mineral spirits or any screen wash designed for plastisol inks.

Caution: Always test this product for curing, adhesion, washability, elongation, opacity as well as any other specific requirement before using in production.

UNST/UNSE-1000 Unistretch White
UNST/UNSE-9160 Unistretch Clear

Ultrasoft Plastisol (PLUS/PLUE)

A versatile, easy-printing, direct-print and transfer ink.

Applications

- Light and medium-colored shirts.
- Hot-split and cold-peel transfers.

Features

- A versatile, easy printing ink.
- Over 50 standard colors.
- Soft hand prints.

General Information: Ultrasoft inks are versatile, lead-free, plastisol inks formulated for direct printing and heat transfer manufacturing. They have good coverage on light and medium-colored garments. When printing on dark fabrics, a white underbase is recommended. Ultrasoft's new formulation helps eliminate press stoppages due to build-up on the backs of screens.

Opacity: Ultrasoft is a medium-opacity ink.

Mesh: For direct printing, monofiliment polyester meshes from 86 to 305 threads per inch (34-120 threads per centimeter). Meshes over 180 (71 metric) will produce very soft-hand prints but will reduce opacity. For best results with neon colors do not use meshes over 160 (62 metric). For hot-split transfers use 83 to 110 mesh (34-43 metric). For overprint colors use 140-230 mesh (55-91).

Stencils: Use direct emulsion or capillary film.

Additives: If reducing the ink is necessary, add 3-5% Viscosity Reducer (PLRE-9000) by weight. Do not add any additives when using Ultrasoft for plastisol transfer production.

Curing Direct Prints: Ultrasoft inks will fully cure when the entire ink deposit reaches 300° F (149° C). Do not use metallic colors for heat transfer production.

Curing Heat Transfers: Ultrasoft ink will semi-cure or gel when it reaches 250º F (121º C). For more information on transfers, see the general information section of this catalog beginning on page 4. For more information on the additives listed below, see the Plastisol Ink Additives Section in this catalog beginning on page 31.

Caution: Always test this product for curing, adhesion, crocking, opacity, washability and other specific requirements before using in production.

Standard Colors
PLUS/PLUE-1020 Opaque White
PLUS/PLUE-1035 Backup White
PLUS/PLUE-1500 Gray
PLUS/PLUE-2001 Primrose Yellow
PLUS/PLUE-2011 Lemon Yellow
PLUS/PLUE-2021 Chrome Yellow
PLUS/PLUE-2041 Golden Yellow
PLUS/PLUE-2051 Orange
PLUS/PLUE-3001 Vermillion Red
PLUS/PLUE-3006 Bright Red
PLUS/PLUE-3011 Scarlet Red
PLUS/PLUE-3015 Cardinal Red
PLUS/PLUE-3030 Maroon
PLUS/PLUE-4010 Magenta
PLUS/PLUE-4025 Deep Purple
PLUS/PLUE-5005 Bright Blue
PLUS/PLUE-5015 Columbia Blue
PLUS/PLUE-5020 Mono Blue

Standard Colors Cont.
PLUS/PLUE-5030 Ultramarine Blue
PLUS/PLUE-5035 Royal Blue
PLUS/PLUE-5040 Navy Blue
PLUS/PLUE-6001 Tahiti Green
PLUS/PLUE-6006 Bright Green
PLUS/PLUE-6021 Dark Chrome Green
PLUS/PLUE-6091 Kelly Green
PLUS/PLUE-7001 Dark Brown
PLUS/PLUE-7031 Sienna Brown
PLUS/PLUE-8000 Black

Fashion Colors
PLUS/PLUE-1504 Flesh
PLUS/PLUE-2102 Khaki
PLUS/PLUE-3106 Fuschia
PLUS/PLUE-3113 Cool Pink
PLUS/PLUE-4101 Lilac
PLUS/PLUE-4103 Rose Magenta

Fashion Colors Cont.
PLUS/PLUE-4104 Violet
PLUS/PLUE-5105 Turquoise
PLUS/PLUE-5107 Powder Blue
PLUS/PLUE-5108 Peacock Blue

Fluorescents
PLUS/PLUE-F211 Orbit Yellow
PLUS/PLUE-F212 Golden Yellow
PLUS/PLUE-F213 Inferno Orange
PLUS/PLUE-F214 Flame Orange
PLUS/PLUE-F311 Missile Red
PLUS/PLUE-F312 Aurora Pink
PLUS/PLUE-F511 Solar Blue
PLUS/PLUE-F611 Traffic Green
PLUS/PLUE-F666 Phosphorescent Green

Metallics
PLUS/PLUE-M100 Copper
PLUS/PLUE-M120 Silver
PLUS/PLUE-M128 Washable Silver
PLUS/PLUE-M220 Pale Gold
PLUS/PLUE-M222 Rich Gold
PLUS/PLUE-M224 Mirror Gold

Additives
PLRE-9000 Reducer/Detackifier
PLUS/PLUE-9020 Build-Up Buster
PLUS/PLUE-9030 Clear For Metallics
PLUS/PLUE-9034 Easy Split Transfer Clear
PLUS/PLUE-9040 Hot-Split Additive
PLUS/PLUE-9090 Extender Base
PLUS/PLUE-9100 Conc. Viscosity Reducer
PLUS/PLUE-9114 Thickener
NYBE-9120 Nylon Bonding Agent
PLPF/PLPE-9111 Plastipuff Additive
TOPL/PFTR-Concentrated Toners

Maxopake Plastisol (PADM/PADE)

High-opacity, direct print plastisol

Applications

- Dark garments.
- Direct printing.
- 100% cotton or cotton/polyester.*

Features

- Very high opacity.
- Easy to print.
- Low-bleed formulations.

General Information: Maxopake inks are the most opaque plastisol colors available. Even the neon colors are bright and highly opaque. Maxopake inks are recommended for direct manual or machine printing on black and dark colored garments. When printing on whites and and light–colored fabrics we recommend adding the appropriate extender base for economy.

Opacity: Maxopake inks are highly opaque.

Mesh: 74-125 (29-49 metric) monofilament polyester. Maxopake inks can be printed through higher mesh counts on light-colored fabrics with the addition of Reducer/ Detackifier (PLRE-9000) or Extender Base (PLUS/PLUE-9090).

Stencils: Use any direct emulsion or capillary film.

Additives: Maxopake inks are supplied ready to print. If necessary reduce with small amounts of Reducer/Detackifier (PLRE-9000). For printing transfers, mix Maxopake with with 5-10% Hot Split Additive (PLUS/PLUE-9040).

Printing Instructions: Multiple strokes may be required when printing by hand. When printing with automatic presses use a rounded squeegee to print a thicker ink layer. A soft pad on the printing pallet will minimize penetration into the garment and improve opacity.

Curing Instructions: These inks will fully cure when the entire ink deposit reaches 300°F (149°C).

Using Low-Bleed Inks: The Maxopake series includes two low-bleed colors: Low-Bleed Medium Yellow (PADM/ PADE-2060), and Low-Bleed Golden Yellow (PADM/PADE-2048). The low-bleed inks are recommended for printing on cotton/polyester garments to control the problem of dyes in the polyester fibers migrating or “bleeding” into the plastisol ink. Low-bleed inks are not recommended for printing on light-colored fabrics. On rare occasions ghost images can appear on the back of light blue, green, gray or lavender colored garments. As garment colors most apt to ghost are not colors that tend to bleed, the use of low-bleed plastisols on these fabrics is not recommended. If low-bleed colors are used, cure to at least 325º F (163º C) for at least 2 minutes to minimize the possibility of ghost images. Avoid stacking garments printed with low-bleed inks while they are still hot. Always check to see if you are getting ghost images. If in doubt, slip-sheet between garments with newsprint or butcher paper.

Caution: High opacity inks may crock. Red pigmented inks are especially subject to this problem. To control or reduce crocking, add Extender Base (PLUS/PLUE-9090). Always test this product for curing, adhesion, crocking, opacity, washability and other specific requirements before using in production.

*The Maxopake Series contains two colors, PADM/PADE-2048, and PADM/PADE-2060 that are formulated for printing on cotton/polyesters. All other Maxopake colors should be printed on light color cotton/poly blends with the appropriate extender base or on 100% cotton garments only.

Standard Colors
PADM/PADE-1027 Bright Cotton White
PADM/PADE-2010 Lemon Yellow
PADM/PADE-2020 Chrome Yellow
PADM/PADE-2044 Golden Yellow
PADM/PADE-2064 Orange
PADM/PADE-3006 Bright Red
PADM/PADE-3010 Scarlet Red
PADM/PADE-3020 Flag Red

Standard Colors Cont.
PADM/PADE-4014 Magenta
PADM/PADE-5008 Bright Blue
PADM/PADE-5036 Royal Blue
PADM/PADE-5060 Aqua Marine
PADM/PADE-5085 Process Blue
PADM/PADE-6008 Bright Green
PADM/PADE-6016 Lime Green
PADM/PADE-6090 Kelly Green

Neon Colors
PADM/PADE-F211 Orbit Yellow
PADM/PADE-F212 Golden Yellow
PADM/PADE-F213 Inferno Orange
PADM/PADE-F214 Flame Orange
PADM/PADE-F311 Missile Red
PADM/PADE-F312 Aurora Pink
PADM/PADE-F402 Neon Purple
PADM/PADE-F511 Solar Blue
PADM/PADE-F611 Traffic Green

Low-Bleed Colors
PADM/PADE-2048 LB Golden Yellow
PADM/PADE-2060 LB Medium Yellow

Additives
PLRE-9000 Reducer\Detackifier
PLUS/PLUE-9090 Extender Base

Mixopake Plastisol (MIXO/MIXE)

A versatile, high-opacity ink for color matching or all-around printing.

Applications

- For black, colored, or white fabric.
- For accurate color matching.

Features

- Extremely opaque prints.
- PANTONE® approved.

General Information: Union's Ink's Mixopake inks will enable you to create any color in the PANTONE® Matching System and all Union Ink standard colors when printed on black, colored, or light fabrics. Mixopake inks are also an excellent choice for standard colors when color matching is not required. Mixopake inks are balanced, ready-for-use plastisols—not concentrated pigments.

Mixopake prints easily by hand and also prints well on the fastest automatic presses. The MIXO/MIXE-1000 Super White is extremely opaque, easy to mix with other MIXO/MIXE Series colors, and performs well as a fast flashing underbase white on 100% cotton fabric.

Opacity: Mixopake Inks are high-opacity inks.

Stencils: Use any direct emulsion or capillary film.

Mesh: Mixopake inks will print through meshes from 60 to 230 (24-90 metric) with excellent opacity. Inks mixed according to Mixopake System formulas are designed to reproduce specific colors when printed through a 60 (24 metric) monofilament mesh on to black 100% cotton fabric.

Additives: We do not recommend reducing Mixopake inks when printing on dark fabrics as this will reduce the opacity of the finished print. If necessary, reduce with 5-10% of Reducer (PLRE-9000). When printing on light colored fabrics you may add Extender Base or Soft-hand Base in a ratio of up to three parts base to one part ink. This will reduce the opacity of the ink. If build-up on the back of the screen is a problem, add 1-2% Flow Control Additive (MIXO/MIXE-9020).

Color Mixing Instructions: The formulas and instructions for simulating the standard PANTONE® "C" colors and the Union Ink standard colors are available free from Union Ink both in booklet form (the Mixopake Formulation Guide) and in Unimix, a Windows-based computer program

Printing on Polyester: For excellent results on polyester fabrics, substitute MIXO/MIXE Low Bleed colors for the standard Mixopake colors. Alternately, the regular colors can be printed over a low-bleed underbase white such as MIXO/MIXE-1055 or PLHT/PLHE-1070-1075 Diamond White. Overprint Mixopake through 140-305 (55-120 metric) monofilament mesh.

Curing Instructions: These inks will fully cure when the entire ink layer reaches 300°F (149°C).

Caution: Always test this product for curing, adhesion, crocking, opacity, washability and other specific requirements prior to using in production.

Standard Colors
MIXO/MIXE-1000 Super White
MIXO/MIXE-2002 Yellow G/S
MIXO/MIXE-2042 Yellow R/S
MIXO/MIXE-3002 Red Y/S
MIXO/MIXE-3007 Red B/S
MIXO/MIXE-4001 Magenta
MIXO/MIXE-4002 Violet
MIXO/MIXE-4003 Cerise
MIXO/MIXE-5001 Blue G/S
MIXO/MIXE-5003 Blue R/S
MIXO/MIXE-6002 Green
MIXO/MIXE-8000 Black

Neon Colors
MIXO/MIXE-F211 Neon Orbit Yellow
MIXO/MIXE-F212 Neon Golden Yellow
MIXO/MIXE-F214 Neon Flame Orange
MIXO/MIXE-F312 Neon Aurora Pink
MIXO/MIXE-F411 Neon Magenta
MIXO/MIXE-F511 Neon Solar Blue
MIXO/MIXE-F611 Neon Traffic Green

Low-Bleed Colors
MIXO/MIXE-1055 Low-Bleed White
MIXO/MIXE-2005 Low-Bleed Yellow G/S
MIXO/MIXE-2045 Low-Bleed Yellow R/S
MIXO/MIXE-4005 Low-Bleed Magenta

Additives
MIXO/MIXE-9070 Soft-Hand Base
MIXO/MIXE-9090 Extender Base

G/S indicates Green Shade
R/S indicates Red Shade
Y/S indicates Yellow Shade
B/S indicates Blue Shade

Unimatch Color Matching System (MACH/PTHF)

Medium opacity mixing system for printing on underbases and white garments.

Applications

- For mixing accurate and intense colors.
- For wet-on-wet direct printing on white, light colored shirts or underbase whites.

Features

- Pantone®-licensed matches for white garments.
- Low build-up formulations.
- Satin finish and soft hand.
- Excellent color intensity when printed through fine mesh counts.

General Information: Unimatch is a state of the art, Pantone® licensed opaque mixing system. Containing 15 components, all formulated to create intense, bright colors with low build up. Unimatch's unique low buildup and superior wet on wet printing characteristics make flash curing (underbase excluded) virtually unnecessary and make it a perfect choice for both manual and automatic presses. Printers have reported extremely successful results printing 10 colors wet on wet on top of a flashed underbase when proper off-contact, retensionable frames, medium to hard squeegees and fine mesh counts are utilized. The system features opaque formulas allowing printers the choice of printing through fine mesh counts in order to increase print sharpness and reduce print costs, excellent matte down characteristics to help fight fibrillation on light colored garments, and a pleasing satin finish and soft hand.

Opacity: Unimatch inks are medium-opacity.

Mesh: Unimatch inks are formulated to print through finer mesh counts thus increasing ink mileage and reducing ink costs. Inks mixed according to Unimatch formulas are designed to reproduce PANTONE® colors accurately when printed through a 230 (92 metric) monofilament mesh. See "Printing Instructions" on Unimatch Technical Data Sheet for greater detail concerning mesh counts.

Stencils: Use any direct emulsion or capillary film.

Additives: Unimatch inks are supplied ready to mix. Since plastisol inks "body up" as they sit in the container you should always stir them well to determine the actual viscosity before adding any reducer. Reducing the ink usually reduces the opacity. If you wish to reduce the ink viscosity use Viscosity Reducer (PLRE-9000). To extend the ink or to soften the hand further use only Unimatch Soft Hand Extender Base (MACH/PTHF-9070).

Color Mixing Instructions: The formulas and instructions for simulating the standard PANTONE® "C" colors are available from Union Ink both in booklet form (The Unimatch Formulation Guide) and Unimix, a Windows based software program.

Curing Instructions: Unimatch inks will fully cure and withstand repeated washings when the entire ink deposit reaches 300° F (149° C).

Wash-Up: Mineral spirits or any screen wash designed for plastisol inks.

Caution: Always test this product for curing, adhesion, crocking, opacity, washability and other specific requirements before using in production.

Standard Colors	Standard Colors Cont.	Standard Colors Cont.	Additives
MACH/PTHF-1000 White	MACH/PTHF-4008 Cerise	MACH/PTHF-F310 Neon Red	PLRE-9000 Reducer/Detackifier
MACH/PTHF-2000 Yellow	MACH/PTHF-5000 Blue G/S	MACH/PTHF-F410 Neon Magenta	MACH/PTHF-9070 S.H. Extender
MACH/PTHF-2050 Orange	MACH/PTHF-5004 Blue R/S	MACH/PTHF-F410 Neon Magenta	
MACH/PTHF-3000 Red B/S	MACH/PTHF-6000 Green	MACH/PTHF-F510 Neon Blue	
MACH/PTHF-3005 Red Y/S	MACH/PTHF-8000 Black		
MACH/PTHF-4006 Violet	MACH/PTHF-F210 Neon Yellow		

Tru-Tone Plastisol (PRPL/PRPE)

For extremely accurate and consistent process color printing.

Applications

- Four-color process printing.
- Wet-on-wet direct printing.
- White garments.

Features

- Ready-to-print accurate colors.
- Minimal dot gain and build-up.
- Extremely soft hand.

General Information: Union Ink's Tru-Tone (PRPL/PRPE) plastisol inks are the premier inks for process color printing on textiles. Tru-Tone inks have extremely accurate, consistent colors, very low dot gain, and are ready to print right out of the can.

Opacity: Tru-Tone inks are transparent.

Mesh: For best results use 305-355 (120-140 threads/cm) plain weave monofilament polyester. Using coarser meshes will result in increased ink deposits and stronger color shades. If you are using retensionable frames, adjust the mesh tension to at least 25 Newtons/cm. Be sure that all screens are at the same tension.

Stencils: For optimum results use solvent resistant dual-cure emulsions. Do not use water-resistant or one-part photopolymer emulsions. Underexposed stencils may break down during printing or cause a chemical reaction between the ink and emulsion resulting in a clogged screen mesh that will be difficult and sometimes impossible to reclaim.

Additives: Tru-Tone plastisol inks are supplied ready to print. Any modification to these inks can have an adverse effect on their performance.. If necessary, reduce with small amounts of Reducer/Detackifier (PLRE-9000). Tru-Tone Clear Base (PRPL/PRPE-9080) can be used when necessary to reduce color concentrations.

Printing: For best results Tru-Tone inks should be printed on white fabrics. The color values will be altered if printed on colored fabrics.

Curing Instructions: Tru-Tone inks will fully cure when the entire ink deposit reaches 300°F (149°C).

Technical Tips: If you use Adobe Photoshop for making color separations, the most accurate process color separations can be achieved by using the TruTone Ink Photoshop Setup Values Plug In available for free download on our web site www.unionink.com.

The Tru-Tone ink set also includes a Fine White Printer (PRPL/PRPE-1080), a transparent white halftone ink that is printed through a fifth screen to provide brighter highlight colors, minimize dot gain and enhance detail in pastel colors.

Five highly-pigmented Triple Strength process color inks are available for printing with an underbase white or a discharge underbase to obtain true four-color process prints on black shirts. They can also be used with Process Halftone Base (PRPL/PRPE-9080) to create process colors with color values unavailable with the standard Tru-Tone process colors.

We also offer a variation on our standard Process Magenta. Process Hot Magenta (PRPL/PRPE-3085) can be used when you want to accentuate reds, oranges, and flesh tones in your design.

Caution: Always test this product for curing, adhesion, crocking, opacity, washability and other specific requirements before using in production. The use of commercial screen openers with PRPL/PRPE is not recommended.

Standard Colors
PRPL/PRPE-1080 Fine White
PRPL/PRPE-2080 Process Yellow
PRPL/PRPE-3082 Process Magenta
PRPL/PRPE-5080 Process Cyan
PRPL/PRPE-8080 Process Black

Triple Strength Process Colors
PRPL/PRPE-1089 Triple Strength Fine White
PRPL/PRPE-2089 Triple Strength Process Yellow
PRPL/PRPE-3089 Triple Strength Process Magenta
PRPL/PRPE-5089 Triple Strength Process Cyan
PRPL/PRPE-8089 Triple Strength Process Black

Specialty Process Colors
PRPL/PRPE-3085 Process Hot Magenta

Additives
PRPL/PRPE-9080 Process Halftone Base

Mixotrans Plastisol (MITR/MITE)

A high-opacity color matching ink for printing hot-split transfers.

Applications

- For black, colored, or white fabric.
- Simulates Mixopake formulas on dark or light fabrics.

Features

- Extremely opaque printed transfers.
- Fast, easy printing on all types of presses.

General Information: Mixotrans plastisol ink is designed with the most advanced technology and formulated with the finest raw materials to provide the best opaque, hot-split transfers in the industry. Union Ink's Mixotrans will enable you to match any color in the Mixopake Color Matching System when printed on black, colored, or light fabrics. Mixotrans inks are also an excellent choice for standard colors when color matching is not required. Mixotrans inks print easily by hand and also print well on the fastest automatic presses. Mixotrans inks contain balanced, ready-for-use plastisols--not concentrated pigments. A broad range of popular colors are available in addition to the mixing shades. Mixotrans can also be direct printed if printing short runs. For longer runs, or higher press speeds, the Mixopake series is recommended.

Opacity: Mixotrans inks are high-opacity inks.

Additives: Mixotrans plastisol inks are supplied ready to print. If necessary, reduce with 1% (by weight) of Viscosity Reducer (PLRE-9100). For white or light colored fabrics you may add MITR/MITE-9090 Extender Base in a ratio of up to three parts base to one part ink.

Mesh: 60-86 (24-43 Metric) monofilament mesh.

Stencil: Any direct emulsion or capillary film.

Color Mixing Instructions: In order to match colors for transfers you can use the Mixopake Color Formulation Guide and substitute Mixotrans components.

Printing Instructions: Mixotrans is especially formulated to be applied using the hot-split method (where the transfer paper is peeled off immediately after the transfer is applied). Heat transfers made with Mixotrans can also be applied as a cold-peel (where the transfer paper is allowed to cool down after application).

Curing Instructions: Mixotrans will semi-cure when the entire ink film reaches 250º F (121º C).

Transferring To Garment
Hot Peel method: 6-10 seconds at 375º F at 40 PSI.
Cold Peel method: 15 seconds at 370º F at 40 PSI.

Caution: Always test this product for curing, adhesion, crocking, opacity, washability, shelf life of printed transfer and other specific requirements before using in production.

Standard Mixing Colors
MITR/MITE-1000 Super White
MITR/MITE-2002 Yellow G/S
MITR/MITE-2042 Yellow R/S
MITR/MITE-3002 Red Y/S
MITR/MITE-3007 Red B/S
MITR/MITE-4001 Magenta
MITR/MITE-4002 Violet
MITR/MITE-4003 Cerise
MITR/MITE-5001 Blue G/S
MITR/MITE-5003 Blue R/S
MITR/MITE-6002 Green
MITR/MITE-8000 Black

Neon Mixing Colors
MITR/MITE-F211 Neon Orbit Yellow
MITR/MITE-F212 Neon Golden Yellow
MITR/MITE-F214 Neon Flame Orange
MITR/MITE-F312 Neon Aurora Pink
MITR/MITE-F411 Neon Magenta
MITR/MITE-F511 Neon Solar Blue
MITR/MITE-F611 Neon Traffic Green

Standard Colors
MITR/MITE-2020 Chrome Yellow
MITR/MITE-2040 Golden Yellow
MITR/MITE-2050 Orange
MITR/MITE-3010 Scarlet Red
MITR/MITE-5002 Turquoise
MITR/MITE-5006 Brite Blue
MITR/MITE-5036 Royal Blue
MITR/MITE-6006 Brite Green
MITR/MITE-6016 Lime Green
MITR/MITE-F213 Neon Inferno Orange
MITR/MITE-F311 Neon Missile Red

Additives
MITR/MITE-9090 Extender Base
PLRE-9100 Concentrated Viscosity Reducer

G/S Indicates Green Shade
R/S Indicates Red Shade
Y/S Indicates Yellow Shade
B/S Indicates Blue Shade

Retro (PLFX)

Used to create a cracked or worn, distressed effect.

Applications

- Cotton/poly-cotton blends and denims.

Features

- Extremely durable.
- Base can be tinted with toners.
- Prints continue to crack with washing.

Printing Tips: Crackle inks are a two-part mixture. When printed in thick deposits the graphic can be easily stretched and cracked after curing. The image will continue to crack during the wash cycle intensifying the distressed look.

Opacity: Crackle inks are a high opacity product and cover dark fabrics very well.

Mesh: An 86–110 mesh (34–43 metric). A heavier deposit will result in a more prominent cracked effect.

Stencils: A direct emulsion built up to a minimum of 100 microns or the use of capillary films of 100-250 microns is necessary.

Additives: Always add the recommended amount of catalyst (PLFX-RT912) and stir the ink well to determine the actual viscosity before adding any reducer. If necessary a small amount of plastisol reducer (PLRE-9000) may be used at a level of 5-10% by weight.

Mixing Instructions: Mix only enough catalyst to be used within an 8 hour period.

- PLFX-RT100 White add 2.0% of the PLFX-RT912 Catalyst.
- PLFX-RT909 Base add 0.5% of the PLFX-RT912 Catalyst.
- Up to 10% TOPL (Plastisol Toner) can be added to the PLFX-RT909 base to create a wide variety of colors.

Printing Instructions: For the best results, use high tension screens with sufficient off-contact. A medium durometer squeegee using a moderate print speed is also recommended. Once fully cured the print should be allowed to cool, then stretched to produce the desired cracked effect.

Curing Instructions: Proper cure will be achieved when the entire ink film reaches 300°F– 325 °F (148°C–162°C).

Wash-Up: Mineral spirits or any screen wash designed for plastisol inks immediately after finishing.

Caution: Always test this product for curing, adhesion, wash ability, as well as, any other specific requirement before using in production.

Standard Colors

PLFX-RT100 White	PLFX-RT909 Base	PLFX-RT912 Catalyst

Flash-Back (REFL/REFE)

A one-part light-reflective ink for enhanced visibility or novelty designs.

Applications

- Smooth, absorbent, jersey-knit fabrics such as t-shirts and fleece goods.

Features

- Brightly reflects light from headlights.
- Easy-to-use one part plastisol ink.

General Information: Flash-Back ink is an easy to use, one-part, plastisol ink that contains millions of light-reflecting microspheres. In daylight the ink appears to be a normal print, but, in low-light conditions reflects light back toward the light source. Stir well prior to use.

Opacity: Flash-Back is transparent and colors will not be visible on colored or dark garments. However, reflectivity will not be affected.

Mesh: Print through a 110 thread/inch mesh (43 metric) monofilament. Coarser meshes may reduce reflectivity.

Stencils: Use any direct emulsion or capillary film. Capillary films should be 50 microns or less in thickness for best results.

Printing Instructions: Do not print Flash-Back on top of a plastisol underbase. If underbasing is necessary and fabric is dischargeable, use any Union dischargeable white or discharge additive.

Additives: Flash-Back is supplied ready to print.

Curing Instructions: These inks will cure at 340° F (171° C). Because of the reflective nature of the ink, it requires a longer curing time and more heat to reach the required temperature. Flash-Back must be fully cured on first pass through conveyor oven as re-curing is rarely successful.

Washability: Flash-Back ink has limited washability. While results may vary, a Flash-Back print will lose some reflectivity with each wash cycle.

Caution: Always test this product for curing, adhesion, reflectivity, crocking, opacity, washability and other specific requirements before using in production. Flash-Back does not meet the requirements of the National Fire Protective Association (NFPA) for Fire Department Safety or "Turnout Gear". Only Union's Flash-Trans Reflective Transfer System or approved reflective tapes and fabrics should be used for this application.

Standard Colors

REFL/REFE-1500 Neutral Gray	REFL/REFE-4000 Purple
REFL/REFE-1504 Dark Gray	REFL/REFE-5000 Blue
REFL/REFE-2000 Yellow	REFL/REFE-6000 Green
REFL/REFE-3000 Red	REFL/REFE-8000 Black

Flash-Trans (FLTR)

A reflective transfer system utilizing 3M™ Scotchlite™ reflective material.

Applications

- Safety applications requiring night-time visibility.

Features

- Meets all safety standards.
- Excellent reflectivity, even after washing.

General Information: The Flash-Trans Reflective Transfer System is a user friendly system consisting of 3M™ Scotchlite™ Reflective Transfer Film, Flash-Trans Transfer Adhesive and Flash-Trans Coupling Agent. Following the mixing instructions for catalyzing the Flash-Trans Adhesive, print a reversed image onto the dull side of the transfer film, gel, and transfer to the garment.

Opacity: Transfers made with this system are opaque.

Mesh: For best results use 110-156 (43-62 metric) monofilament polyester.

Stencils: Use any direct emulsion or capillary film compatible with plastisol inks.

Mixing Instructions: Add 4-6% by weight of FLTR-9120 Flash-Trans Coupling Agent to the Flash-Trans Adhesive.

Curing Instructions: The Flash-Trans Transfer Adhesive solution will not air dry and must be gelled or semi-cured prior to application to garment. A starting guideline is for the ink temperature to be 200°-250°F at belt level with a dwell time of 30-45 seconds. Do not stack semi-cured transfers until they have cooled to room temperature. .

Transferring Instructions: Use a transfer machine with a flat surface where uniform heat and pressure may be applied. Transfer to garment at temperatures of 375°F for 15-20 seconds applying firm, 20-40 psi pressure. Allow transfer to cool to room temperature before removing the backing.

Wash-Up: Clean screens and squeegees with mineral spirits or any screen wash designed for plastisol inks.

Storage: All components should be stored at temperatures between 40°-90°F (4°-32°C.) in a cool, dry area. Store reflective sheets flat and reflective rolls suspended by the core of the roll.

Caution: This is a synopsis of the full Technical Data Sheet on Flash-Trans. Refer to full Technical Data Sheet prior to production. Full customer testing is required prior to production.

For a complete listing of all components and materials included in the Flash-Trans Reflective Transfer System please call 1-800-526-0455.

Black Light Clear (PAGL/PAGE-F620)

Special effects ink that emits a blue glow when exposed to black light.

Applications

- White fabrics.
- Colored underbases.

Features

- Pale and transparent under normal light, emits blue glow under black light conditions.

General Information: Union's Black Light Clear when printed remains almost colorless in normal indoor or outdoor lighting conditions but emits a blue glow when exposed to black UV light. Black Light Clear is normally used in highlight areas of designs and is sometimes combined with Crystalina Flakes for an even more dramatic special effect.

Mesh: from 85- 156 (34-62 metric) polyester monofilament meshe. If Crystalina flakes have been added to Blacklight Clear mesh size must be 24-40 (9.5-15 metric) monofilament polyester in order for the flakes to pass through the mesh.

Stencils: Use any direct emulsion or capillary film compatible with plastisol inks

Additives: Blacklight Clear is supplied ready for use. If absolutely necessary, reduce with 2-5% PLRE-9000 Reducer/ Detackifier.

Curing Instructions: The inks will cure and withstand repeated washings when the entire ink film reaches 300 F (149 C). See curing instructions for Crystalina if flakes have been added to Blacklight Clear.

Wash-Up: Clean the screens and squeegees with mineral spirits or any screen wash designed for plastisol inks.

Durability of the Black Light Effect: There are no known effects to the durability of prints made with Black Light Clear because of exposure to sunlight or regular laundering of garments.

Caution: Always test this product for glow, curing, adhesion, washability and other specific requirements before using in production.

PAGL/PAGE-F620 Blacklight Clear

Barrier Clear (PLHT/PLHE-9040)

Underbase for direct printing or overprint for transfers.

Applications

- Direct print, low-bleed underbase for polyester-blended or 100% polyester garments or as a last-down clear on transfers.
- Print as last-down clear over transfers.

Features

- Helps control dye migration on troublesome polyester fabrics.
- Easy printing.
- Provides excellent adhesion to fabrics.

General Information: Barrier Clear (PLHT/PLHE-9040) is a specially formulated low-bleed clear to be used as a direct-print underbase on polyester fabrics prone to extreme dye migration This product may also be printed last as a low-bleed mask on heat transfers. Depending upon the transfer paper used, it may be peeled from the platen immediately after transferring prior to cooling. In laboratory and field testing Barrier Clear has shown to greatly increase the chances of success when printing troublesome polyester fabrics. For best results Barrier Clear must be printed through mesh counts of 74-86 (29-34 metric), flash-cured at 240˚F/115˚C and overprinted with another low-bleed ink. Screens should be tensioned to mesh manufacturer's tensioning recommendations and emulsion applied to screen building up the print side to increase ink deposit and edge sharpness of print. Off-contact should be set so that screen immediately peels from substrate as squeegee passes through the print stroke.

Additives and Modifiers: None recommended, Barrier Clear should be used straight from the container to achieve ultimate bleed resistance.

Flash-Curing and Curing: Barrier Clear will gel when surface of ink film reaches 240°F/115°C. Entire ink film must reach 300°F/150°C to achieve full cure. Thicker ink deposits will require higher temperatures and longer time in oven.

Caution: Stir well before use and always test for curing, adhesion, washability, and desired performance before commencing a production run.

Brilliant Metallic (PLFX/PLFE)

Extra Bright Metallic Inks.

Applications

- Direct printing.

Features

- Extra bright silver and rich gold.
- True metallic look.
- Easy-to-print viscosity.

Printing Tips: PLFX/PLFE metallics are state-of-the-art metallic inks with a much improved metallic finish. For optimum performance it is imperative the PLFX/PLFE metallics are printed over smooth underbases such as Union's PADM/PADE-1027 Bright Cotton White for garments made of 100% cotton and PLHT/PLHE-1075 for garments made of poly/cotton blends.

Additives and Modifiers: If absolutely necessary additions of up to 15% by weight of PLRE-9000 Curable Reducer may be added to increase ink flow and provide a smoother finish.

Flash-curing and Curing: The entire ink film must reach 310˚-325˚F (154˚-163˚C) to achieve full cure and subsequent washfastness and durability. Because metallic inks reflect heat it may be necessary to increase dryer temperature and dwell time.

Caution: PLFX/PLFE-M222 has a limited shelf life and will tarnish in the container, therefore it should be ordered as needed and used accordingly.

Even though PLFX/PLFE-M121 will not tarnish in the container, wash resistance is limited. For best results garments should be washed inside out in cold water with low-phosphate detergents.

Always stir well before use and test print for curing, adhesion, washability, and desired performance prior to production run.

Standard Colors
PLFX/PLFE-M121 Extra Bright Silver,
PLFX/PLFE-M222 Extra Bright Rich Gold.

Crystalina (PAGL/PAGE-J100)

A special effects ink that will add sparkle to any design.

Applications

- Direct printing on light colored garments.
- Transfer applications.

Features

- Multi-color pearlescent effect.
- Washable and non-tarnishing.
- Ready for use.

General Information: Crystalina Plastisol is a special effects plastisol ink designed to give prints a multi-color pearlescent appearance. Crystalina Plastisol may also be used as a cold peel transfer. Consult your transfer paper supplier for proper paper recommendations.

Mesh: 24-40 (9.5-15 metric) monofilament polyester meshes stretched to manufacturer's tensioning recommendations.

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Stencils: Any stencil compatible with plastisol inks.

Additives: Crystalina Plastisol is supplied ready for use. If absolutely necessary, reduce with 2-5% PLRE-9000 Reducer/Detackifier.

Wash-Up: Clean the screens and squeegees with mineral spirits or any screen wash designed for plastisol inks.

Curing Instructions: The inks will cure and withstand repeated washings when the entire ink film reaches 300° F (149° C). Because of the reflective nature of this ink it may be necessary to slow down the belt speed or increase the temperature to reach a full cure.

Caution: Always test this product for curing, adhesion, washability and other specific requirements before using in production.

PAGL/PAGE-J100 Crystalina Plastisol

Glitter Plastisol (PAGL/PAGE)

For sparkling, bright transfer and direct prints.

Applications

- Direct printing or transfer applications

Features

- Two formulations.
- Six sparkling colors.
- Excellent opacity.

General Information: Glitter Plastisols will provide a glittering textured metallic finish when printed directly on textiles or used in transfers. Glitter Inks are extremely flexible. They are available in two formulations. Regular Glitter Plastisols (PAGL/PAGE-J) are recommended for direct printing and Super Glitter Plastisols (PAGL/PAGE-S) are recommended for heat transfer printing.

Opacity: Glitter Plastisol ink is highly opaque.

Mesh: For direct printing use 24-40 (10-15 metric) monofilament. For transfer printing use 25-33 (10-12 metric) monofilament.

Stencils: Use any direct emulsion or capillary film.

Additives: Glitter Plastisol inks are supplied ready to print. Reducer/Detackifier (PLRE-9000) may be added if a thinner consistency is required.

Curing Instructions: These inks will cure at 300° F (149° C). Because of the reflective nature of this ink, it requires a longer curing time and more heat to reach the required temperature than standard plastisols.

Caution: Always test this product for curing, adhesion, crocking, opacity, washability and other specific requirements before using in production.

Standard Colors
PAGL/PAGE-J120 Silver
PAGL/PAGE-J220 Pale Gold
PAGL/PAGE-J221 Dark Gold
PAGL/PAGE-J321 Brilliant Red
PAGL/PAGE-J522 Mono Blue
PAGL/PAGE-J624 Emerald Green

Specialty Colors
PAGL/PAGE-S120 Super Silver
PAGL/PAGE-S220 Super Pale Gold

Additives
PAGL/PAGE-9030 Glitter Clear Base
PAGL/PAGE-9032 Premium Glitter Clear

Shimmer Plastisol (PAGL/PAGE)

A special effects ink that will add sparkle to any design.

Applications

- Direct printing on light or dark garments.

Features

- Six bright metallic colors.
- Washable and non-tarnishing.
- Excellent opacity.

General Information: Shimmer Metallic inks will heat cure to a glittering, shimmering, metallic finish. They are much brighter than regular metallics, and unlike most metallic inks, will not tarnish with age or washing. The finished prints have excellent flexibility. When properly cured the ink layer will stretch and recover well.

Opacity: Shimmer Metallic ink is highly opaque.

Mesh: For direct printing use 60-86 (24-36 metric) monofilament, except for the black which should be printed through a 110 mesh (43 metric).

Stencils: Use any direct emulsion or capillary film.

Additives: Shimmer Metallic inks are supplied ready to print. Reducer/Detackifier (PLRE-9000) may be added if a thinner consistency is required.

Curing Instructions: These inks will cure at 300° F (149° C). Because of the reflective nature of this ink, it requires a longer curing time and more heat to reach the required temperature than standard plastisols.

Caution: Always test this product for curing, adhesion, crocking, opacity, washability and other specific requirements before using in production.

Standard Colors
PAGL/PAGE-M128 Bright Silver
PAGL/PAGE-M210 Bright Gold
PAGL/PAGE-M300 Brilliant Red
PAGL/PAGE-M500 Metallic Blue
PAGL/PAGE-M600 Emerald Green
PAGL/PAGE-M800 Sparkling Black

Hi-Gloss Gel Clear (PLFX-9040/9013) (PLFX-E9040/E9013)

Gel clear that creates deep, glossy, crystal clear prints.

Applications

- Creating a 3D wet-look
- Overprint exisiting colors.

Features

- Produces high gloss, crystal clear prints.
- Retains viscosity, less prone to shearing.

General Information: Hi-Gloss Gel Clear (PLFX/PLFX-E9040) is an improved, specially formulated clear for creating thick and glossy, wet-look prints. It can be applied directly on garments or over underbase, flashed colors. Finished prints made using Union's Hi-Gloss Gel Clear (PLFX/PLFX-E9040) has more gloss and better clarity compared to competitive products or Union's own PLFX/PLFX-E9013 (which is slightly less expensive). Hi-Gloss Gel Clear is crystal clear and does not shear down during the print run, but will maintain a constant viscosity from start to finish.

Mesh: 83S (32 metric) tensioned to your mesh manufacturer's tensioning guidelines.

Stencils: For best results use capillary films in the 250-400 micron range. The same techniques used in making stencils for high-density printing apply to Hi-Gloss Gel Clear. Avoid using water-resistant capillary films or emulsions, as they can react with the components used to manufacture Hi-Gloss Gel Clear and cause the ink to lock-up and clog the mesh openings.

Additives: None recommended, use Hi Gloss Gel Clear directly from the container.

Curing Instructions: Hi Gloss Gel Clear will fully cure and withstand repeated washings when the entire ink deposit reaches 320° F (160° C). Because ink is tacky when hot, do not allow garments to fall into a box unattended at the end of the dryer.

Wash-Up: Clean the screens and squeegees with mineral spirits or any screen wash designed for plastisol inks.

Caution: Always test this product for curing, adhesion, washability and other specific requirements before using in production.

PLFX/PLFX-E9040 Premium Hi-Gloss Gel Clear
PLFX/PLFX-E9013 High Gloss Gel Clear

Holographic Glitter (HALO/HALE)

A special effects ink that will add sparkle to any design.

Applications

- Direct printing or transfer applications on light or dark garments.

Features

- 14 sparkling colors.
- Gives a dry-dusted appearance.

General Information: Holographic Glitter Plastisol (HALO/HALE) is a series of 14 intense sparkling, glitter colors. Designs will have the appearance of a multi-colored glitter when direct sunlight or a point light source is reflected off the holographic particles.

Mesh: 24-40 (10-15 metric) monofilament polyester meshes stretched to manufacturer's tensioning recommendations.

Stencils: Use any direct emulsion compatible with plastisol inks that will give you the necessary stencil thickness and edge sharpness for screen meshes as coarse as those required for printing Holographic Glitter Plastisol.

Additives: Holographic Glitter is supplied ready for use.

Wash-Up: Any screen wash designed for plastisol inks.

Heat Transfer Paper: For maximum sparkle, a high gloss transfer paper such as Midland Glitcote is recommended for best results.

Curing Instructions: This ink will cure and withstand repeated washings when the entire ink film reaches 320° F (160° C). Because of the reflective nature of this ink and thickness of the ink film it may be necessary to slow down the belt speed or increase the temperature to reach a full cure. For transfers, semi-cure or gel for 60-90 seconds at 250° F (121° C) is suggested as a starting point.

Transfer Machine Settings: Transfer to garment using heat transfer machine set at 375° F (191° C) for 15-20 seconds with pressure set at 40 p.s.i. Allow print to cool prior to removing transfer paper.

Caution: Always test this product for curing, adhesion, washability and other specific requirements before using in production.

Standard Colors	Standard Colors Cont.
HALO/HALE-G120 Solar Silver	HALO/HALE-G400 Zenith Purple
HALO/HALE-G200 Luna Yellow	HALO/HALE-G500 Celestial Blue
HALO/HALE-G220 Quasar Gold	HALO/HALE-G530 Nova Blue
HALO/HALE-G250 Galaxy Gold	HALO/HALE-G550 Comet Blue
HALO/HALE-G270 Cosmic Copper	HALO/HALE-G600 Satellite Green
HALO/HALE-G300 Radiant Red	HALO/HALE-G630 Gamma Green
HALO/HALE-G330 Asteroid Red	HALO/HALE-G800 Eclipse Black

Hi-Square Plastisol (3DSQ/3DSE)

For three-dimensional, high-density prints.

Applications

- Print on t-shirts or fleece goods of any color.

Features

- Produces extremely thick, sharp-edged, three-dimensional prints.

General Information: Hi-Square ink, when printed correctly, will produce a print with an extraordinarily thick ink layer that retains sharp edges and crisp, highly detailed definition even after curing. Hi-Square colors are based on the standard Mixopake color range so they will produce very close color matches when used with the formulas in the Mixopake Formulation Guide. For satisfactory results this ink must be used in combination with a correctly prepared screen and carefully adjusted printing techniques.

Opacity: Hi-Square ink is opaque.

Mesh: Use 70-86 S thread per inch monofiliment polyester mesh. A mesh with a thin thread diameter will result in a smoother finish with no mesh marks. For best results the mesh should be tensioned to at least 24 newtons per centimeter.

Stencils: To achieve the desired three-dimensional effect this ink must be printed through stencils that are at least 200-700 microns thick. Thicker stencils will produce thicker ink layers. Dramatic results may be obtained with stencils of 700 microns.

Additives: The use of additives or reducers is not generally recommended with this ink. Occasionally, in order to obtain a sharper print, a very small amount (1-2%) of Viscosity Reducer (PLRE-9000) may be added.

Printing Instructions: Use a sharp 75-80 durometer squeegee. The squeegee angle and pressure must be adjusted so the ink prints a clean, sharp image but is not pushed into the fabric being printed on. Use a slow speed both on the flood and print strokes. The off-contact distance should be as small as possible. Adjust the speed and angle of screen lift so that the screen peels away from the print immediately behind the squeegee on the print stroke. Correct adjustment of this variable is crucial for producing a crisp sharp print with a minimum of ink retained on the mesh. We recommend that these inks be printed last in the color sequence. If this is not possible they should be flash-cured before the next color is printed to maintain the three-dimensional effect.

Curing Instructions: These inks will fully cure and withstand repeated washings when the entire ink deposit reaches 320° F (160° C). Due to the extreme thickness of the ink layer, higher dryer temperatures and slower belt speeds may be required for complete curing.

Wash-Up: Clean the screens and squeegees with mineral spirits or any screen wash designed for plastisol inks.

Washability: Excellent. Do not dry clean. Do not iron printed areas.

Storage: Store plastisols at room temperature. Prolonged exposure to high temperature can make the ink start to gel.

Caution: Always test this product for curing, adhesion, crocking, opacity, washability and other specific requirements before using in production.

Standard Colors	Standard Colors Cont.	Standard Colors Cont.
3DSQ/3DSE-1000 White	3DSQ/3DSE-3007 Red B/S	3DSQ/3DSE-5001 Blue G/S
3DSQ/3DSE-2002 Yellow G/S	3DSQ/3DSE-4001 Magenta	3DSQ/3DSE-5003 Blue R/S
3DSQ/3DSE-2042 Yellow R/S	3DSQ/3DSE-4002 Violet	3DSQ/3DSE-6002 Green
3DSQ/3DSE-3002 Red Y/S	3DSQ/3DSE-4003 Cerise	3DSQ/3DSE-8000 Black

G/S Indicates Green Shade
R/S Indicates Red Shade
Y/S Indicates Yellow Shade
B/S Indicates Blue Shade

Suede Plastisol (PLSE/NPSU)

A special effect ink with a unique, suede like texture.

Applications

- For direct printing on T-shirts or fleece.

Features

- Realistic suede texture.
- High opacity.

General Information: Suede Plastisol Ink combines an extremely matte finish with a fuzzy texture and raised effect. The resulting print is almost indistinguishable from suede leather in texture and appearance.

Opacity: Suede Plastisol has good opacity.

Mesh: Print through a 110 thread/inch mesh (43 metric) monofilament.

Stencils: Use any direct emulsion or capillary film.

Additives: While standard Suede Plastisol inks are supplied ready to print, PLSE/NPSU-9101 Suede Additive can be added in increments up to 15% to Mixopake, Maxopake or Unimatch to achieve a suede effect. Pre-test prior to running production to ensure the desired effect is reached. PLSE/NPSU -9090 Suede Base can be pigmented with 5%-12% by weight of Plastisol Toners (TOPL/PFTR) to create custom colors.

Curing Instructions: These inks will cure at 300° F (149° C).

Washability: Excellent. Do not dry clean or iron printed areas.

Caution: Always test this product for curing, adhesion, crocking, opacity, washability and other specific requirements before using in production.

Standard Colors
PLSE/NPSU-1000 White
PLSE/NPSU-1500 Gray
PLSE/NPSU-2040 Golden Yellow
PLSE/NPSU-3010 Scarlet Red
PLSE/NPSU-5040 Navy
PLSE/NPSU-6021 Dk Chrome Green
PLSE/NPSU-7000 Dk Brown
PLSE/NPSU-7004 Tan
PLSE/NPSU-8000 Black

Additives
PLSE/NPSU-9101 Suede Additive
PLSE/NPSU-9090 Suede Base

Phosphorescent (PLUS/PLUE)

A glow-in-the-dark ink

Applications

- For direct printing on white fabrics.

Features

- Available ready-for-use or as components.
- Glows bright green in the dark.

General Information: Phosphorescent plastisol is a glow-in-the-dark ink which is supplied ready to use or in a component (powder and base form). This ink is formulated for application to cotton and cotton/polyester garments and novelty items. Best results are obtained printed directly onto a white garment or when printed over a white underbase.

In daylight or artificial light conditions, this ink will have a pale green hue but will glow an eerie green color in darkness. Colors can be obtained by adding small amounts (up to 10%) of Union Ink's Ultrasoft (PLUS/PLUE) Fluorescent Inks.

Printers can mix their own phosphorescent plastisol with Union's Phosphorescent green powder (ADDI-1524) and Ultrasoft Clear for Metallics (PLUS/PLUE-9030). Add six pounds of phosphorescent powder to each gallon of clear (1½ lbs. powder to each quart). For more information consult the Technical Data Sheet for this product.

Opacity: Phosphorescent plastisol is medium opacity ink.

Mesh: For best results use 86-110 (34-43 metric) monofilament.

Stencils: Use any direct emulsion or capillary film.

Curing Instructions: These inks will cure when the entire ink film reaches 300° F (149° C).

Caution: Always test this product for curing, adhesion, crocking, opacity, washability and other specific requirements before using in production.

PLUS/PLUE-F666 Phosphorescent Green
ADDI-1524 Phosphorescent Powder

Photochromic (PHOT/PHOE)

Inks that change color when exposed to sunlight or artificial UV light.

Applications

- White fabrics or plastisol underbases

Features

- Fast color change when exposed to sunlight or artificial UV light.

General Information: Photochromic plastisol inks (PHOT/PHOE) are almost colorless when viewed indoors but when viewed outside or under a source of intense UV light they quickly change from transparent to a color. This enables you to provide your customers with prints that display one design indoors and a dramatically changed design when exposed to sunlight or artificial UV light.

Opacity: Photochromic Plastisol is transparent and should be printed on white fabrics or plastisol underbases.

Mesh: Use polyester monofilament mesh between 83-230 (33-92 metric). Thicker ink layers will provide more dramatic effects and better durability.

Stencils: Use any direct emulsion or capillary film.

Additives: Photochromic Plastisol is supplied ready to print.

Curing Instructions: These inks will cure at 300° F (149° C).

Wash-up: Clean the screens and squeegees with mineral spirits or any screen wash designed for plastisol inks.

Washability: This product has been wash tested to 20 wash cycles with no loss of color intensity. Do not use chlorine bleaches when laundering garments.

Caution: Always test this product for curing, adhesion, crocking, washability, color change and other specific requirements before using in production.

Standard Colors	Outdoor Color
PHOT/PHOE-2000 Photochromic Yellow	PANTONE® 135 or 136
PHOT/PHOE-4025 Photochromic Purple	PANTONE® 260
PHOT/PHOE-5000 Photochromic Blue	PANTONE® 647 or 653

Unilon Powder (ULON)

Hot melt adhesive powder in different grades and melting ranges.

Applications

- Sprinkled onto un-gelled transfers or added to ink prior to printing transfers.

Features

- Improves transfer adhesion.

General Information: Unilon Powder is a hot-melt adhesive in powder form used to improve the adhesion of plastisol heat transfers to nylon, polyester and other synthetic garments. including some with water-proof coatings.

ULON-2027 for nylon and cap transfers: Fill a rectangular tray with approximately ¼" of ULON-2027 and pass the transfers through the tray, print side up. The powder will adhere to wet or semi-cured transfers. Shake the transfer or lightly brush the transfer to get rid of the excess powder. Semi-cure or gel the ink and transfer to the garment at normal transfer temperatures.

ULON-2159 for foil transfers: Mix 10-15% ULON-2159 into a compatible plastisol such as the Ultrasoft Series (PLUS). Print and gel the transfer at normal temperatures. Apply the transfer to the garment and wait for it to completely cool before peeling. Place the foil sheet (color side up) over the print and transfer at 325°-350° F. (163°-177° C.) for 2-4 seconds. Let the transfer cool completely, and then gently pull the foil from the garment.

ULON-2170 for puff transfers: Identical to ULON-2159 except for coarser particle size. Follow procedures outlined for ULON-2027 when manufacturing puff transfers.

Caution: Always test for adhesion, washabillity and other specific requirements before using in production. Due to the great variation in foils and other conditions it is mandatory that tests be carried out to determine if the recommended procedures and materials produce the intended results before each and every production run.

Standard Powders	Particle Size	Melting Temperature
ULON-2027	Fine	248°-260°F
ULON-2159	Fine	176°-185°F
ULON-2170	Coarse	176°-185°F

Unifoil (FOIL-9200/9208P)
Unifoil (FOIL-E9211)

Foil adhesive and metallic transfer foils.

Applications

- T-shirts.
- Baseball caps.
- Most other garments.

Features

- Brilliant metallic effects.
- Wide variety of colors.
- Easy to use.

General Information: Unifoils are a set of brilliant metallic foils especially selected for application to t-shirts and other garments. Using a heat transfer press, the foil is transferred to the fabric over the FOIL-9200/9208P or FOIL-E9211 Foil Adhesive that has been previously direct printed and cured, or, applied to the garment by the transfer method. FOIL-9208P Foil Adhesive is a premium adhesive with increased viscosity and adhesive properties that helps the adhesive to lay on top of the fabric providing a greater surface area as well as providing better adhesion of the foil sheet to the print. The FOIL-9200 is a more economical product whit a slightly thinner viscosity best suited for tightly woven fabrics. The FOIL-E9211 is a Non-Phthalate formulation which complies with regulations regarding printing onto children's wear. This product is also processed with a smoother consistency which allows it to be printed through slightly finer meshes with less clogging in the mesh.

Ink Requirements: Even though Unifoil will adhere to many plastisol inks and some urethane and water-based inks, optimum results are obtained when Foil Adhesive (FOIL-9200/9208P or E-9211) is used as the adhesive in which to apply the foil.

Mesh: For either the direct printing or transfer method of applying FOIL-9200 / 9208P or E-9211 Foil Adhesive use 83-110 (33-44 metric) monofilament polyester mesh stretched to the manufacturer's tensioning recommendations.

Transfer Method: Print the design on the non-color side of the foil sheet and semi-cure or gel the transfer print at 240° F.

Direct Print Method: Print the design using FOIL-9200P/9208P or E9211 Foil Adhesive directly on the garment and cure the entire ink film at 300° F (149° C).

Foil Application: Apply the plastisol heat transfer or direct print to the garment. If you have directly printed the FOIL-9200P/9208P or E9211 Foil Adhesive to the garment cut the Unifoil sheet to the desired shape and place it color side up over the area where you want the foil effect. If Unifoil is not placed over the entire design, cover the exposed plastisol ink areas with release paper to shield them from the hot platen surface. The transfer press temperature should be set at 375° F (163°-177° C) with medium to high pressure for 6-8 seconds over a direct print. If using the transfer method of applying the FOIL-9208P/ E9211 Foil Adhesive to the foil sheet, transfer the design to the garment for 1-2 seconds at a temperature of 325°-350° F (163°-177° C.) using medium to high pressure. Allow the fabric and foil to cool completely before peeling.

Washing Instructions: Prints decorated with foil are not as durable as unfoiled prints. Some dulling of the foil over time is to be expected with laundering and normal wear. To minimize this during laundering the garment should be hand washed inside out, using cool or lukewarm water and dried either by hanging or laying flat. Do not dry clean.

Caution: Always test this product for curing, adhesion, crocking, opacity, washability and other specific requirements before using in production.

Standard Foil Colors	Standard Foil Colors Cont.	Foil Adhesive
FOIL-M100 Copper	FOIL-3000 Red	FOIL-9200P Foil Adhesive
FOIL-M120 Silver	FOIL-3111 Pink	FOIL-9208P Foil Adhesive
FOIL-M220 Gold	FOIL-4025 Purple	FOIL-E9211 Foil Adhesive
FOIL-M400 Rainbow	FOIL-5035 Royal Blue	
FOIL-M500 Oil Slick	FOIL-6000 Green	

Special Purpose Inks

Union Ink manufactures a variety of inks with unique properties for unusual applications. This page provides brief descriptions of some of these inks. For Technical Data Sheets on any product listed on this page please contact Union Ink Company at 1-800-526-0455 or visit our website at www.unionink.com to obtain the information.

Chalkboard Plastisol (PLFX-CK)
Chalkboard Plastisol is used to provide a smooth, dry surface on a garment which can be written upon with normal limestone chalk. The ink can be printed either as a direct print or a cold peel transfer.

Crayon Clear (PLFX-CR90)
Crayon Clear is formulated for screen printing heat transfers. After gelling, the printed surface provides a base for drawing designs with crayons or felt-tipped pens. The decorated transfer is then applied to garments with a heat transfer press or hand iron. Crayon Clear can also be used for backing the Lithotrans Series (LTHO)

Easy Split Clear (PLUS/PLUE-9034)
Easy Split Transfer Clear is a soft-hand plastisol designed to be used as a first down clear for transfer applications. Once the Easy Split Transfer Clear has been printed and properly gelled it can be overprinted with a four color process or fine line print. A correctly applied transfer will produce vibrant, detailed prints with a very soft hand.

Lithotrans Back-Up White – (PLUS-1035)
This plastisol has been specifically formulated to give excellent “grab” of the lithotrans ink, good opacity, a soft hand and excellent washfastness.

Metallic Inks (PLUS/PLUE-M)
A range of six ink colors are available to give designs a bright, metallic looking effect. See catalog page 14 under Ultrasoft for more information.

Barrier Clear (PLHT/PLHE-9040)
Is a specially formulated low-bleed clear to be used as a direct-print underbase on plyester fabrics prone to extreme dye migration. This product may also be printed last as a low-bleed mask on heat transfers.

Black Light Clear (PAGL/PAGE-F620)
When printed remains almost colorless in normal indoor or outdoor lighting conditions but emits a blue glow when exposed to black UV light.

Hi-Gloss Gel Clear (PLFX/PLFX-E9040)
Is an improved, specially formulated clear for creating thick and glossy, wet-look prints. It can be applied directly on garments or over underbase, flashed colors. Finished prints made using Union’s Hi-GLoss Gel Clear (PLFX/PLFX-E9040) has more gloss and better clarity compared to most competitive products.

Plastisol Flock Adhesive (PLAD-9180)
Plastisol Flock Adhesive is an easy printing flock adhesive that offers unmatched durability. This product may be tinted with plastisol toners. After the adhesive is flocked and cured, it will remain soft and pliable.

Printable Adhesive (PLAD-9080)
A plastisol based adhesive printed over the entire design as the last color down to improve the adhesion of cold peel transfers to a wide range of fabrics including difficult synthetics.

Foil Adhesive (FOIL-9200/9208P) (FOIL-E9211)
Is a premium adhesive with increased viscosity and adhesive properties that helps the adhesive to lay on top of the fabric providing a greater surface area as well as providing better adhesion of the foil sheet to the print.

Holographic Glitter (HALO/HALE)
Holographic Glitter Plastisol (HALO/HALE) is a series of 14 intense sparkling, glitter colors. Designs will have the appearance of a multi-colored glitter when direct sunlight or a point light source is reflected off the holographic particles.

Aerotex Shimmer (ATEX-M)
New to the Aerotex water-based product line is the addition of eight Shimmer colors. Combining the sparkling brilliance of plastisol and the soft hand of water-based inks, Aerotex Shimmers are a natural for white, white fashion garments.

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Additives for Plastisol Inks

Extender Base
PLUS/PLUE-9090, PATH/PATE-9090, AUTO-9090, PLPF/PLPE-9090, MIXO/MIXE-9090, TRPF-9090
Extender Base is used to extend the ink. When added to pigmented ink it increases the volume and lessens the cost per gallon. It will also minimize ink penetration into the garment. Because it is a balanced additive, you can add any amount to plastisol ink without negatively affecting ink cure. Extender Base will reduce the ink's opacity, though not as much as Soft-Hand Base. Generally, Extender Base is not used to reduce the viscosity of the ink, although it will make the ink easier to print.

Soft-Hand Transparent Base
PADS/PADS-E 9095, MIXO/MIXE-9070
Soft-Hand Base is a transparent base that reduces the ink viscosity, allows the ink to penetrate the garment more than extender base, and gives the finished print a softer hand, particularly when the ink is printed through a fine mesh. The recommended amount of Soft-Hand Base to add is 20-25% by weight, although up to 50% can be added when printing on white or light colored garment. When printing Mixopake inks, up to three parts base to one part ink can be used. When used with toners, it makes bright, transparent inks. It is a balanced additive so you can add any amount to a plastisol ink without affecting the cure. Since it reduces the opacity of the ink it is added to, it is not recommended that you use it in applications where opacity is important, or with low-bleed inks when they will be printed on polyester or cotton/polyester fabrics.

Half-Tone Base
PRPL/PRPE-9080, PLUM-9080A,
Half-Tone base is a transparent base used in process color printing. It gives the ink a short body that prints very well wet-on-wet and helps prevent dot smearing and dot gain by allowing the ink to penetrate further into the fabric. It is not designed to reduce the viscosity of the ink. It is a balanced additive and will not affect the cure of the ink. It will greatly reduce the opacity of any ink it is added to.

Metallic Clear Bases
PLUS/PLUE-9030, PAGL/PAGE-9032, PATH/PATE-9030, PAGL/PAGE-9030
Metallic Clear Base is a transparent base with a heavier body than other bases. It's used with glitter flakes and metallic powders where its heavier body helps keep the coloring agents in suspension. It is a balanced additive so you can add any amount to a plastisol ink without affecting the cure. Metallic Clear Base (PAGL/PAGE-9030) can also be used as a backup clear for litho transfers. Premium Glitter Clear (PAGL/PAGE-9032) is a lower viscosity version of a clear base to produce simulated "dry dusted glitter" designs. Premium Glitter Clear produces a more shimmering, brilliant effect than normal metallic clear bases.

Reducer/Detackifier (Viscosity Reducer)
PLRE-9000, TRPF-9100
Every textile screen printer should have ample viscosity reducer on hand. Union Ink's viscosity reducer can be used in any plastisol ink and contains a special detackifing agent that helps reduce the amount of ink that sticks to the bottom of the screens when printing wet-on-wet. Generally, no more than 10-15% by weight should be needed in the ink. Reducer/ Detackifier will reduce the opacity of the ink and should be added no more than 1-3% by weight to high opacity ink.

Nylobond
NYBE-9120
Plastisol inks do not adhere well to tightly woven, waterproofed nylon fabrics, such as are commonly used in manufacturing nylon jackets. Union Ink's Nylobond is the essential ingredient for printing on nylon jackets and other products made of woven nylon. Add 10-15% Nylobond by weight to any Union Ink plastisol and it will adhere to nylon. Within that percentage range, add slightly more for printing on heavily waterproofed garments or with high-opacity inks. For mixing by volume, add 1 part Nylobond to 5 parts ink: in high-opacity inks, add 1 part Nylobond to 4 parts ink.

Nylobond will reduce ink viscosity. If the viscosity is too low, allow the mixture to sit for a few hours and it will thicken or add Thickening Additive (PLUS-9114). Print and cure the ink using the normal curing temperatures for the particular ink series in which you have added Nylobond. The printed image will reach full adhesion about 72 hours after curing.

Once the Nylobond is added to the plastisol, the ink has a pot life of 8-16 hours. After that time do not use the ink for printing. Do not return plastisol ink containing Nylobond to the original container, as it will contaminate the remaining ink. Plastisol ink containing Nylobond is extremely difficult to remove once it has set in the screen so clean screens thoroughly immediately after printing. For complete instructions for using Nylobond additive call Union Ink and ask for a copy of the Nylobond Technical Data Sheet.

Additives for Plastisol Inks (cont.)

TONERS (TOPL/PFTR)

Toners are pure pigments mixed in a plastisol-compatible medium. They are used for color matching and to brighten or intensify colors. You should not add more than 20% of toner by weight to any plastisol ink. They are heavy pastes and can be quite difficult to disperse in a gallon of plastisol. The suggested procedure is to mix the desired amount of Toner with a small amount of plastisol on a mixing slab or in a small cup until the toner reaches a viscosity where it can be mixed easily with the rest of the ink.

FLATTENING AGENT
PLSE/NPSU-9101 Suede Additive

Suede Additive (PLSE/NPSU-9101) can be used to reduce the charismatic high-gloss finish of plastisol inks. This product (PLSE/NPSU-9101) can be easily mixed by hand with plastisol inks. Adding 2%-4% by weight is recommended depending upon the degree of flatness desired for the job.

THICKENER PASTE
PLRE-9114

In some cases you may want to increase the viscosity of a plastisol ink. Perhaps you added too much reducer, or Nylobond has temporarily reduced the viscosity of the ink and you don't want to wait for the viscosity to return. Union Ink's Plastisol Thickener (PLRE-9114) can be added at the rate of 1-2% by weight to increase viscosity.

FLOW CONTROL ADDITIVE
MIXO/MIXE-9020, PLUS/PLUE-9020

When printing wet-on-wet, ink buildup on the back of the screens can reduce printing speeds and degrade the sharpness of the printed image. Flow Control Additive will reduce or eliminate this problem. This product lowers ink viscosity and dramatically reduces or eliminates the amount of ink that adheres to the back of the screen when printing wet-on-wet. Use no more than 1-2% by weight.

ANTI-STAT ADDITIVE
PLUS-9116

Direct printing on synthetic fabrics or transfer paper can cause static electricity buildup. This static makes loading and printing difficult and in extreme cases can even affect the quality of the print. Add 0.5-3% Anti-Stat Additive (PLUS-9116) to any plastisol ink to immediately reduce or eliminate static electricity on the screen.

HOT-SPLIT TRANSFER ADDITIVE
PLUS/PLUE-9040, MIXO/MIXE-TRANS

Although many plastisol inks can be used for printing transfers, some inks, particularly high-opacity inks, require an additive before they will work well in this application. For transfer printing with Union's high-opacity Maxopake and Athletic Gloss, add 5-10% Hot-Split Transfer Additive (PLUS/PLUE-9040) by weight. For producing transfers with Mixopake inks, add 15% MIXO/MIXE-TRANS.

PUFF ADDITIVES
PLPF/PLPE-9111, PUFS-9111

It is often more convenient and less expensive for screen printers to stock a puff additive so any plastisol ink in their inventory can be quickly converted into a puff ink. Union Ink has developed two puff additives, Plastipuff (PLPF/PLPE-9111) and Superpuff (PUFS-9111). Plastipuff Additive works best with our Ultrasoft (PLUS/PLUE) however,it can be used with any regular plastisol. To colored inks, add Plastipuff in the ratio of 1 part additive to 6 parts ink by volume. When adding to white ink add 1 part Plastipuff to 4 parts ink. Superpuff Additive creates a higher tougher, more elastic puff than the Plastipuff but requires a higher cure temperature and significantly longer curing times. It should be used with Union's Athletic Gloss (PATH/PATE) plastisol. Add 15% by weight.

PHOSPHORESCENT GREEN POWDER
ADDI-1524

Phosphorescent Green Powder is used for making a phosphorescent (glow-in-the-dark) ink. Add six pounds of Phosphorescent Green Powder to one gallon of Metallic Clear (PLUS/PLUE-9030) and print through a very coarse mesh on white fabrics or white underbase for best results.

FLAME RETARDANT ADDITIVE
PLFR-9111

Flame Retardant Additive (PLFR-9111) is a paste that can be added to all Union Ink plastisols to decrease ink flammability. Add 12-15% Flame Retardant Additive to ink by weight. Customers must test the resulting ink and additive mixture to insure it meets their requirements. Customers are solely responsible for determining if the ink meets their flammability specifications.

Soft-Hand Discharge (DSPP)

Water-based discharge underbase for plastisol prints.

Applications

- Underbase for plastisol prints on dischargeable fabrics.
- Discharges color from dischargeable 100% cotton fabric.
- White can be used as underbase or stand-alone white.

Features

- Soft-hand underbase.
- Enables overprinting of soft-hand plastisols.
- Plastisols can be overprinted with or without flash curing the preprint underbase.

General Information: Discharge printing is a process where water-based inks are applied to certain "dischargeable" dark colored garments to produce very bright, soft prints. As the discharge inks are printed and heat cured, the original dyes in the garment are being reduced, or "discharged" from the image area. Soft-Hand Discharge inks are an underbase for plastisol inks when printing on dischargeable fabrics. Regular opacity and soft hand plastisols such as Union's Ultrasoft (PLUS/PLUE), Tru-Tone (PRPL/PRPE), and (MACH/PTHF) inks can be printed over Soft-Hand Discharge inks, producing bright, soft-hand prints, even on dark fabrics. Printers who prefer not to use an underbase can create custom dischargeable colors by using the DSPP-9070 Discharge Base combined with Pavonine Pigments. After the custom color has been created, mix the DSPP-9ZFS agent using the same percentages as described under Mixing Instructions. The increased brightness of newly reformulated DSPP-1003 Soft-Hand White now works well as either an underbase or stand-alone white.

Mesh: Use 156-186 thread per inch (62-73 threads per cm) mesh.

Stencil: Use only water-resistant emulsion or capillary films.

Mixing Instructions for DSPP-9ZFS Agent: The discharge system consists of two parts: the ink and the Discharge Agent. The DSPP-9ZFS Discharge Agent is furnished as a powder in a separate container. Add 6-8% DSPP-9ZFS Discharge Agent by weight to the Soft Hand Clear, Soft-Hand White or the custom color created with the DSPP-9070 Discharge Base and Pavonine Pigments). Mix until totally dissolved. Minimize the unused portion by only mixing enough of the ink system as will be used in a 6-8 hour period.

Printing Instructions: Print the Soft-Hand Discharge inks first, forcing the ink well into the substrate with heavy squeegee pressure, then without flash curing, print the other plastisol inks, wet-on-wet, directly on the discharge print. The color values of the plastisol inks printed over the Soft-Hand White or Soft-Hand Clear will appear after curing. You may mist the screen occasionally with water to maintain the ink viscosity during long printing runs. Print custom dischargeable in the same manner.

Additives: All are water-reducible.

Curing Instructions: Cure for a minimum of 90 seconds at 320º F (160º C) to activate the discharge reaction and produce a washable print. Evaporating the water too quickly will stop the discharge reaction and result in dull colors.

Wash-Up: All may be cleaned up with water. A mild detergent may be necessary if ink the ink was allowed to dry in the mesh.

Caution: Not all garments are dyed with dischargeable dyes. The printer must test Soft-Hand Discharge inks on the garment before using in production to determine if the dyes in that garment will discharge.

Available Standard Colors
DSPP-1003 Soft-Hand White
DSPP-9070 Discharge Base
DSPP-9050 Soft-Hand Clear

Additives
DSPP-9ZFS Discharge Agent

Plasticharge White (DSPCH-1000) (DSPCH-E100)

The first dischargeable plastisol ink.

Applications

- Discharge-dyed cotton garments.
- Underbase prints.

Features

- Extremely soft hand.

General Information: Plasticharge White (DSPCH-1000/ DSPCH-E100) is a plastisol ink with discharge properties until now only found in water-based discharge inks. With Plasticharge White you can print bright, colorful, soft-hand prints on discharge-dyed garments. Plasticharge White will provide you with the ultimate soft-hand underbase print.

Mesh: For underbase printing use mesh counts from 156-178 (62-71 metric) monofilament polyester stretched to mesh manufacturer's tensioning recommendations.

Stencils: Use only water-resistant emulsions.

Additives: Add 4;6% ZFS Discharge Agent (DSPP)-9ZFS) prior to printing. Mix until completely dissolved. After mixing, the ink must be used for discharging within 24 hours. If necessary, Plasticharge White may be reduced with water.

Curing Instructions: Cure for at least 90 seconds at 320° F (160° C). Evaporating the water too quickly will stop the discharge reaction and result in dull colors.

Caution: The printer should test Plasticharge White on the garment prior to production to determine if the dyes in that garment will discharge. It is the printer's responsibility to test Plasticharge White to determine its fitness for use with the garments and printing in their plant.

DSPCH-1000 Plasticharge White DSPCH-E100 Plasticharge White	**Additives** DSPP-9ZFS Discharge Agent

Plasticharge Additive (DSPCH-9070)

Additive to discharge plastisol inks.

Applications

- Discharge-dyed cotton garments.
- Terry-cloth towels.

Features

- Works with almost any plastisol.

General Information: With Plasticharge Additive (DSPCH-9070) you can print bright, colorful, soft-hand prints on discharge-dyed garments by transforming selected Union plastisols into discharge inks.

Mesh: 156-178 (62-71 metric) monofilament polyester stretched to manufacturer's tensioning recommendations.

Stencils: Use only water-resistant emulsion.

Mixing Instuctions: Combine equal parts Plasticharge Additive and a suitable Union plastisol. Stir slowly until completely mixed. Mix only enough for a few days production. Add 4-6% ZFS Discharge Agent (DSPP-9ZFS) just before printing and mix until completely dissolved. After adding the ZFS the ink must be used for discharging within 24 hours.

Curing Instructions: Cure for at least 90 seconds at 320° F (160° C). Evaporating the water too quickly will stop the discharge reaction and result in dull colors.

Caution: The printer must test any color mixed with Plasticharge Additive on the garment prior to production to determine if the dyes in that garment will discharge. It is recommended that Plasticharge Additive not be mixed with ink colors made from non-permanent type red pigments as oxidation may result in extreme color shifts.

DSPCH-9070 Plasticharge Additive	**Additives** DSPP-9ZFS Discharge Agent

Aerotex Water-Based Ink (ATEX)

Air-cure water-based ink.

Applications

- Light and medium-colored garments.

Features

- Soft hand, bright colors.
- Cures with or without a dryer.

General Information: Aerotex is a water-based textile ink formulated for printing on cotton, cotton/polyester blends and many synthetic fabrics. When used with Catalyst (ATEX-9120) it will air-cure at room temperature to optimum wash resistance 24 hours after printing. Aerotex Inks are not recommended for nylon or fabrics which are treated with water-repellent coatings.

Opacity: Aerotex is a medium-opacity ink. White (ATEX-1000) may be printed as a separate color or added to Aerotex colors to increase opacity. Super Opaque white (ATEX-1020) will cover dark fabrics and diminish bleeding but has less stretchability than other ATEX colors and is not recommended for printing on t-shirts or other garments that stretch.

Mesh: Use monofilament polyester meshes ranging from 110-143 (43-55 metric).

Stencils: Use any water-resistant direct emulsion.

Additives: Aerotex is supplied ready-for-use. If necessary, up to 10% SOLV-1679 or 2-5% Stay Open (ATEX-9600) can be added to control screen clogging. Additives will reduce opacity.

Curing Direct Prints: Catalyzed prints will set enough for stacking within minutes after printing and continue to cure at room temperature. Wash tests should not be done for 24 hours after printing. To speed up production, dry prints at approximately 250° F (121° C) for 2 minutes.

Catalyst: Aerotex Catalyst (ATEX-9120) must be added in a ratio of ½ oz. Catalyst to 1 quart of ink (1 to 64 by volume) for washfastness. Inks are supplied with the correct amount of catalyst. The ink/catalyst mixture has an average pot life of approximately 8 hours. Do not use the mixture after that period. The mixture may show signs of deterioration sooner, in which case it should be discarded.

Wash-up: Clean up with water immediately after printing. Detergent (ATEX-9400), or a commercial detergent containing at least five percent ammonia is recommended where ink may have dried in the screen. Follow by rinsing with lukewarm water.

Caution: Always test this product for curing, adhesion, crocking, opacity, washability and other specific requirements before using in production. Aerotex inks must be kept from freezing. Aerotex catalyst contains minute amounts of hazardous material and may cause an allergic reaction in sensitive people. Use plastic gloves when handling.

Standard Colors
ATEX-1000 White
ATEX-1020 Super Opaque White
ATEX-2011 Lemon Yellow
ATEX-2021 Chrome Yellow
ATEX-2051 Orange
ATEX-3004 Hot Pink
ATEX-3006 Brite Red
ATEX-3030 Maroon
ATEX-4020 Royal Purple
ATEX-3011 Scarlet Red
ATEX-5000 Peacock Blue

Standard Colors Cont.
ATEX-5004 Turquoise
ATEX-5020 Mono Blue
ATEX-5035 Royal Blue
ATEX-5040 Navy Blue
ATEX-6030 Spring Green
ATEX-6081 Paris Green
ATEX-7002 Khaki
ATEX-7021 Yellow Ochre
ATEX-7031 Sienna Brown
ATEX-8000 Black

Fluorescents
ATEX-F211 Orbit Yellow
ATEX-F212 Golden Yellow
ATEX-F213 Inferno Orange
ATEX-F214 Flame Orange
ATEX-F311 Missile Red
ATEX-F312 Aurora Pink
ATEX-F511 Solar Blue
ATEX-F611 Traffic Green

Additives
SOLV-1679 Retarder
ATEX-9030 Clear For Metallics
ATEX-9090 Extender Base
ATEX-9120 Catalyst
ATEX-9400 Detergent
ATEX-9600 Aqueous Stay Open

Aerotex Shimmers (ATEX-M)

For producing sparkling, soft-hand prints.

Applications

- White T-shirts
- Fashion garments.

Features

- Soft-hand feel.
- Bright, sparkling colors.

Printing Tips: New to the Aerotex water-based product line is the addition of eight Shimmer colors. Combining the sparkling brilliance of plastisol and the soft hand of water-based inks Aerotex Shimmers are a natural for white, fashion garments. For printing on dark colors with Aerotex Shimmer inks use a dark garment that is dischargeable and underbase prints with DSPP-9050 Pre-Print Discharge Clear. Mixing Silver (ATEX-M125) is also available where custom colors can be created by adding up to 10% by weight of Pavonine pigments.

Stencils: Any waterproof direct emulsion or capillary film.

Additives and Modifiers: For Aerotex Shimmer inks 2% by weight of ATEX-9120 catalyst is required for wash fastness. The ink/catalyst mixture has an approximate pot life of 8 hours.

Extender: ATEX-9090 Extender Base can be used to extend colors but may diminish opacity.

Curing: Cure temperature for Aerotex Shimmer inks is 320°F (160°C) for 90 seconds.

Wash-Up: Water if screen is cleaned immediately after printing. ATEX-9400 or any commercial detergent containing at least 5% ammonia if ink has hardened in the screen.

Caution: Stir well before use and always test for crocking, curing, adhesion, washability, and desired performance before commencing a production run. Do not expose to freezing temperatures. Wash tests should not be conducted until 24 hours after printing.

Standard Colors	Standard Colors Cont.
ATEX-M120 Silver	ATEX-M420 Purple
ATEX-M125 Mixing Silver	ATEX-M520 Powder Blue
ATEX-M220 Gold	ATEX-M630 Mint Green
ATEX-M311 Red	ATEX-M700 Walnut
ATEX-M320 Pink	ATEX-M800 Black

Unidye Water-Base (UNDY)

Outstanding ink for the softest hand on towels.

Applications

- Terry cloth.
- Light colored fabrics.

Features

- Soft hand prints with excellent washability.
- Air dries or cures with low temperatures.

General Information: Unidye is a water/oil emulsion ink that is an outstanding choice for printing on towels. Unidye is recommended for printing on cotton, cotton/synthetic blends and most synthetic fabrics where soft hand and excellent washability are required. All colors are lead-free.

Opacity: Unidye Inks are formulated for printing on light colored fabrics. Unidye White UNDY-1000 has good opacity and when added to Unidye colors will greatly increase their opacity but may alter the shade.

Curing: Unidye will set enough for stacking within minutes after printing. Curing for good washability can be accomplished by any one of the following methods: Add catalyst (UNDY-9120 2% by volume or as indicated on the catalyst container). Catalyzed inks will air-cure to optimum washfastness within 24 hours. Pot life of ink/catalyst mixture is 48 hours after mixing. Washability of uncatalysed ink will be fair after seven days, good after 14 days and excellent after 28 days. Excellent washability can be obtained immediately without the addition of catalyst by curing at 250°-325° F (121°-162° C) for 3-5 minutes. Excellent washability can be achieved in 24 hours by adding catalyst (UNDY-9120) and curing at 100°-123° F (38°-52° C.)

Reducer/Retarders: Reduce viscosity with mineral spirits or Union's SOLV-1225. Water may be used but care should be taken to prevent drying in the screen. Retarder (SOLV-1679) or 2-5% Aqueous Stay Open (ATEX-9600) can be used for an all water-phased system. Addition of these additives will diminish opacity.

Washability: Excellent. Test for dry cleanability.

Mesh: 110-140T (43-45 metric) monofilament polyester meshes are recommended.

Stencils: If you reduce and wash-up with water, a water-resistant direct emulsion is recommended. If you use mineral spirits for reduction or wash-up, standard direct emulsion may be used for short runs. For longer runs, permanent water-proof screens are recommended.

Wash-Up: Use either water, detergent (ATEX-9400), or mineral spirits (SOLV-0225). Wash up immediately after completion of print run.

Caution: Unidye must be kept from freezing. Test before production for adhesion, wash-resistance and other requirement. Wear plastic gloves when handling the catalyst as it could possibly cause an allergic reaction.

Standard Colors
UNDY-1000 White
UNDY-2011 Lemon Yellow
UNDY-2021 Chrome Yellow
UNDY-2051 Orange
UNDY-3004 Hot Pink
UNDY-3006 Bright Red
UNDY-3011 Scarlet Red
UNDY-3030 Maroon
UNDY-4020 Royal Purple
UNDY-5000 Peacock Blue

Standard Colors Cont.
UNDY-5004 Turquoise
UNDY-5020 Mono Blue
UNDY-5035 Royal Blue
UNDY-5040 Navy Blue
UNDY-6030 Spring Green
UNDY-6081 Paris Green
UNDY-7002 Khaki
UNDY-7021 Yellow Ochre
UNDY-7031 Sienna Brown
UNDY-8000 Black

Process Colors
UNDY-2080 Process Yellow
UNDY-3080 Process Red
UNDY-5080 Process Blue
UNDY-8080 Process Black

Fluorescents
UNDY-F211 Orbit Yellow
UNDY-F212 Golden Yellow
UNDY-F213 Inferno Orange
UNDY-F214 Flame Orange

Fluorescents Cont.
UNDY-F311 Missile Red
UNDY-F312 Aurora Pink
UNDY-F511 Solar Blue
UNDY-F611 Traffic Green

Additives
SOLV-1679 Retarder
UNDY-9030 Clear For Metallics
UNDY-9090 Extender Base
UNDY-9120 Catalyst
UNDY-9240 Lo Crock Additive
ATEX-9600 Aqueous Stay Open

Unisoft Sub-Dye (SBDY)

Sublimation transfer dye.

Applications

- Polyester fabrics.
- Other synthetic fabrics.

Features

- Breathable transfer prints.
- Dry cleanable prints
- Soft Hand

General Information: Unisoft is a water-based screen printing sublimation ink for printing Sub-dye transfers to be applied to polyester and other synthetic textiles. (For a Cotton Sub-Dye system see the Union Ink Technical Information on Unisoft Topcoat Clear). Transferred prints are porous or "breathable" with a very soft finish. They may be ironed, washed and dry cleaned. Unisoft colors are not opaque and should only be used for transfers to be applied to light-colored garments. All colors are made from Lead-Free materials.

Transfer Paper: 70-80 lbs. offset stock, preferably matte or dull-coated, is recommended.

Drying: Unisoft will air-dry within 5-10 minutes or may be conveyor dried at very low temperatures. Avoid too much heat (indicated by color development).

Reducers: Unisoft colors are supplied ready-for-use. If required, use small amounts (up to 10%) of SOLV-1679 Retarder.

Mesh: Monofilament meshes up to 230T (90T metric) are recommended. Coarser meshes give heavier deposits and thus increase the color strength. This is desirable when making transfers which are to be used for highnap fabrics or terry cloth towels.

Stencils: Water-resistant direct emulsions such as INMARCOL-W should be used. Knife-cut lacquer films are suitable.

Wash-Up: Immediately after printing, wash screens with water. If screens are kept for longer periods before washing and water will not remove the inks, use Union Ink Detergent ATEX-9400. Follow by rinsing with luke-warm water.

Transfer Method: 400F (204C) for 15-20 seconds is recommended. Lower temperature and dwell times will diminish color intensity. Upon raising the transfer platen, the release paper may come off by itself. It should be removed quickly to prevent it from transferring again ("ghosting").

Storage: Keep from freezing. Do not store over 90° F. (32° C). Storing at temperatures that are too hot or too cold will affect transfer properties.

Caution: Always test this product for curing, transferability, opacity, washability and other specific requirements before using in production.

Standard Colors	Standard Colors Cont.	Additives
SBDY-2080 Process Yellow	SBDY-5035 Royal Blue	SBDY-9090 Extender Base
SBDY-3001 Fire Red	SBDY-5040 Navy Blue	FADY-9117 Topcoat Clear
SBDY-3011 Scarlet Red	SBDY-5080 Process Blue	ATEX-9400 Screen Wash Detergent
SBDY-3080 Process Red	SBDY-6006 Kelly Green	
SBDY-3090 Rubine Red	SBDY-8080 Process Black	
SBDY-4010 Magenta	SBDY-8100 Jet Black	

Pavonine Products Water-Based Inks

Pavonine Pigments—Dispersions of super fine ground pigments that can simply be stirred into any water based base. Available in white, black, fluorescents and many standard colors

PavoClear—An extremely soft hand Ready-for-Use transparent clear that can be pigmented with Pavonine Pigments and used on almost any type fabric. (Reduce with water if printing terry cloth towels). Good open time and excellent washfastness

PavoStretch Clear—A highly elastic, abrasion-resistant ink that can be used as a flock transfer or special effect adhesive. Can add metallic or standard Pavonine Pigments for printing fabrics ranging from t-shirts to denim. Prints well on water repellent nylon with proper additive. Available as an opaque white or colors on special (CCC) orders

NyloClear—Designed for use on hard-woven (denim, twill, mouse pads) fabrics where a very low deposit print is desired, this transparent base is for use with standard, metallic or pearlescent Pavonine Pigments. Can be used on water-repellent nylon.

Nylo-Opaque—Available as an opaque white, colors on special (CCC) orders and a base that can be pigmented with Pavonine Pigments. Nylo-Opaque is an excellent choice for t-shirts, fleece, woven fabrics mouse pads and water-repellant nylons.

Pavopaque—For use as an opaque ink that works well on dark colors. Available as an opaque white, an opaque base that can be pigmented with Pavonine Pigments and colors on special (CCC) orders. Pavopaque is for soft, knitted garments like t-shirts and fleece.

PavoReflect—A two-part system available in 16 standard and 7 fluorescent colors. PavoReflect can be used on any absorbent fabric including Lycra®. Excellent reflectivity and wash fastness for a direct print ink.

NyloReflect—Also a two-part system, this ink provides excellent results when printed on most water-repellent nylon. Available in 16 standard and 8 fluorescent colors.

Discharge Base DSPP-9070—Transparent discharge base that can be pigmented with Pavonine pigments to product a wide range of dischargeable colors. Will not discharge without the addition of ZFS discharge agent. Call and ask for Understanding Discharge Book.

Discharge Preprint Clear—A clear discharge underbase for use in overprinting plastisols wet on wet. Will not discharge without the addition of ZFS discharge agent. Call and ask for Understanding Discharge Book.

Discharge Preprint White—A white discharge underbase designed for use under suitable process plastisols. Will not discharge without the addition of ZFS discharge agent. Call and ask for Understanding Discharge Book.

Pavassist Plastacharge—An additive that converts suitable plastisol colors into discharge inks. Will not discharge without the addition of ZFS discharge agent. Call and ask for Understanding Discharge Book.

Shelf Life—Shelf life of Pavonine Products inks is approximately 2 years if kept in a closed container in cool conditions.

For more information—For complete Technical Data Sheets on any Pavonine Products ink call 1-800-526-0455.

Water-Based Additives

Reducer/Retarder (SOLV-1679)
White water-based inks can be reduced with small amounts of water, the Reducer/Retarder (SOLV-1679) givers better viscosity control. Do not add more than 5-10% of SOLV-1679. Since water-based inks are prone to drying the screen is left unattended, a retarder is helpful to slow the drying process.

Extender Base (ATEX-9090/UNDY-9090)
Extender base is the base ink without pigment. It can be added to an ink to increase the volume of the ink or to make it more transparent. Its general purpose is to reduce ink cost. This is accomplished by adding the appropriate extender base to inks that are more opaque than necessary for the job being printed. An example of this is printing scarlet red on a white shirt. Extender Base could be added to the scarlet in a one-to-one ratio without significantly reducing the color of the final print. Even though extender base can be added in any quantity, it will make inks more pastel on light garments and much less opaque on dark garments.

Catalysts
Some water-based inks require the use of special catalysts to enhance the washability of the print, or to allow for a full cure with excellent washability if no dryer is available or if the fabric will shrink with high heat. Consult the Technical Data Sheet for the specific ink series you are printing to determine if a catalyst is necessary.

Rub Resistance Additives (UNDY-9240)
Low Crock (UNDY-9240) can be added to Unidye Ink to improve the crock (rub-off) resistance. Only small amounts (2-5%) should be added and only if necessary. UNDY-9240 will make the ink feel stiffer.

Detergent Wash-Up (ATEX-9400)
Although water should be used to wash-up screens, ATEX-9400 can be blotted on where ink is starting to dry in the screen. Follow this with a water rinse. ATEX-9400 reduces the effort necessary for washing up, and prolongs the screen life, especially where the water-based inks are beginning to dry in the screen.

Aerotex Stay Open (ATEX-9600)
When added to either Union's Aerotex (ATEX) or Unidye (UNDY) Series water-based inks, Stay Open will postpone screen clogging for as much as 2-5 hours depending on environment conditions.

Pavonine Additives

Pavassist Slow (PARM-9005)
A clear, thin liquid that slows evaporation of ink and extends open time. Lab tests indicate that the open time of fine line areas tripled with the addition of 6% SLOW and quadrupled with the addition of 8% to an ink containing no retarder.

Pavassist Penetrant (PARM-9003)
A penetrant that comes in the form of a clear liquid that helps the ink penetrate into the garment with little or no effect on image sharpness. Pavassist Penetrant also reduces pickup on the backs of screens. Requires 1% or less by weight added to press-ready inks.

Pavassist Lo Crock Softener (PARM-9008)
Lo Crock Softener when added in increments up to 2% to any press-ready Pavonine ink reduces crock, softens the hand and assists in keeping the screen open. Has no effect on the shelf life of the ink in which it is added.

Pavassist PR 1733 (PARM-9007)
An anti-wicking agent that helps prevents wicking of color from edges of print onto unprinted fabric and also helps control wicking of color into any adjacent colors. Reduces absorption of high opacity prints on dark fabrics for brighter, more uniform colors.

Pavifix A (PPPA-FIXA)
A highly reactive cross linker/bonding agent that works over a period of 24-48 hours at room temperature in a dry ink film. Recommended for use with inks that are to be printed upon cotton, cotton blends and synthetic fabrics.

Pavafix C (PPPA-FIXC)
A cross linker/bonding agent for use with inks printed on stretchy fabrics or water repellent nylon. Works over a period of 24-48 hours at room temperature in a dry ink film.

Pavafix H (PPPA-FIXH)
A highly effective hot-cure cross-linking and bonding agent. Recommended for use in the PavoStretch Series or Nylo Series to improve adhesion to difficult fabrics such as water repellent nylon .

Pavafix RF (PPPA-FIXRF)
Fix RF is a bonding agent that improves adhesion of reflective glass beads to water based ink systems.

Supplies

Direct Emulsions

Inmarcol-R (ACEM-INMR)
An excellent choice for a general purpose emulsion for use with a wide range of inks. This blue-green solvent-resistant diazo emulsion has excellent image reproduction that will enable you to print high quality detail on long print runs. Available in one gallon containers.

Inmarcol-W (ACEM-INMW)
Mainly used in textile printing, this diazo emulsion is an excellent choice when using any Union water-based or plastisol ink. Available in one gallon containers.

Inmarcol-Fast (ACEM-INMF)
An excellent choice for shops using fluorescent or blacklight tubes to expose screens. The fast exposing diazo emulsion is recommended for use with plastisol or solvent based inks. Available in one gallon containers

Hand Cleaner

Ink-Off Hand Cleaner (ACHC)
Ink-Off is a waterless hand cleaner that is specially formulated to remove inks of every type from the hands of printers. Ink-Off does not contain any solvents and will not dry the oils out of the hands leaving hands soft with a fresh, natural citrus scent. To use Ink-Off simply take a small amount into your hands and rub vigorously and either rinse your hands off under running water or wipe them off with a towel. The pumice container in Ink-Off goes into the crevices of your hands to clean them thoroughly. Available in 4 ½ lb cans (6 cans per case).

Heat Transfer Release Papers and Transfer Supplies

Midland Glitcote 107
Glitcote 107 is a newly designed heat transfer paper for high gloss screen printed and litho transfers. Glossy side has special release coating that stabilizes the paper and keeps it flat during the printing and curing process. Available in 500 sheet cartons: 25”x38” sheets (PAPR-GL25)

Trans French
Trans French is a non-parchment, white paper that is one of the most stable papers available for the production of multi-color cold-peel and litho transfers. Either side of the paper may be used for the production of cold-peel plastisol heat transfers. The top side of the paper must be used when producing litho transfers. Available in 1000 sheet cartons: 25”x38” (PAPR-TF25) 12 ½”x12 ½” (PAPR-TF12).

Super Trans
Super Trans is a versatile heat transfer paper that can be used for the production of regular, high-opacity, hot-split, cold-peel, puff, glitter and metallic transfers. Super-Trans has excellent stability for producing multi-color transfers. Both sides of paper can be used for cold peel transfers. Not recommended for plastisol backed lithographic transfers. Available in 1000 sheet cartons: 25”x38” (PAPR-SU25) 12 ½”x12 ½” (PAPR-SU11).

Soft Trans HS 90
Soft Trans HS 90 hot split transfer paper for plastisol puff and sublimation transfers offers printers a smooth surface that results in a consistent even split of ink close to the surface when using hot split plastisol inks. HS 90 has excellent dimensional stability and consistent shrinkage from sheet to sheet. Transfers may be printed on either side of the paper. Available in 1000 sheet cartons: 25”x38” (PAPR-ST60) 12½”x12½” (PAPR-ST12).

Trans Lith
Trans Lith is a parchment type transfer paper that is an excellent choice for producing single color hot-split and cold peel transfers. Trans-Lith’s translucent quality allows for easy see-through and alignment for transferring alphabet sheets and lettering. Available in 1000 sheet cartons: 25”x38” (PAPR-TL25) 12 ½”x12 ½” (PAPR-TL12).

Supplies (cont.)

Heat Transfer Release Papers and Transfer Supplies (cont.)

Unilon Powder
A hot-melt adhesive powder used to improve the adhesion of plastisol heat transfers on nylon, polyester and other synthetic garments including those with water-proof coatings. Available in three different particle sizes and melting temperatures depending upon your application. See page 28 for specific information.

Scales For Ink Mixing

Acculab VIC1501 (ACCX-SCALE15)
The VIC1501 weighs quantities up to 1200 grams and is an excellent choice for the small shop or larger shops who need a separate scale to measure sample quantities of inks. The VI1501 has an accuracy of 0.10 grams.

Acculab VI6KG (ACCX-SCALE4)
A larger capacity version of the VI1200, this scale has a capacity of 6000 grams (13 lbs.) and is accurate to 1 gram.

Ohaus ES30R (ACCX-SCALE3)
For shops mixing larger quantities of ink, this scale has a capacity of 44 lbs. (20 kilos) and will be accurate to 10 grams.

Screen Opener

Unispray (SOLV-1556)
This screen opening spray is the most effective method for removing dried-in ink from the image areas of the screen. Unispray may be used with all conventional screen printing inks except catalytic and UV inks. Simply fill a pressurized container with Unispray and spray the clogged image area of the screen and continue printing. The screen should unclog within 1-3 squeegee passes. Because Unispray is sold in bulk form where you refill your own pressurized container, it is a fraction of the cost when compared to pre-packaged aerosol containers.

Spray Adhesive

Unitac Spray Adhesive (ACCH-UTAC)
A mist aerosol spray that is extremely resistant to the heat generated on the platen by flash curing. Unitac dries quickly and holds most textile products made from jersey knit fabrics, fleece wear, nylon uniforms and some plastic films and cardboards. Unitac is an excellent choice to hold garments when flash-curing. Contains no methylene chloride or ozone depleting chemicals and is available in a 12.05 oz. net weight (17.5 fluid oz.) can.

Stencil Remover

U-Strip Stencil Remover (ACCH-USTR)
U-Strip is a liquid stencil remover formulated for the fastest removal of diazo, dual-cure, and one part photopolymer emulsions. It is safe for all screen fabrics, works quickly, is biodegradable and is practically odorless. Available in one gallon quantities.

Temperature Measuring

Temperature Strips (ACCX)
These strips provide approximate temperature readings of inks during the curing process or can be used to check the temperature of transfer presses. Simply peel off the backing sheet and apply to the surface being tested. When heated, the strip will change color from white to black at the highest temperature the strip reached. Temperature Strips are packed 50 strips per pack in single temperatures of 270° F (132° C), 300° F (149° C), 330° F (166° C), 360° F (182° C) or in variety packs of 16 strips per pack divided into four temperature ranges. Range A—240°-280° F (116°-138° C), Range B—290°-330° F (143°-166° C), Range C—340°-380° F (171°-193° C), and Range D—190°-230° F (88°-110° C.) Four strips of each range are included in the variety pack.

Mini-Temp Infra-Red Thermometer
This economically priced non-contact thermometer measures a temperature range between 0-500° F (-18°-275° C). A convenient switch located just above the battery inside the handle makes it easy to switch from Fahrenheit to Celsius readings when needed. The Mini-Temp is easy to use. As the garment exits from the last heat panel in the dryer, aim the thermometer at the print and pull the trigger. A laser point will be activated to show you the exact spot where the temperature that is displayed on the large, easy to read display is reading. The closer the thermometer is used near the garment the more accurate the reading. The Mini-Temp is designed to give you a general reading of the temperature the ink film is reaching and is not sold to give you a definitive answer on cure.

Atkins Temperature Probe (ACCX-PROB)
The Atkins Digital Thermometer and Dryer Probe enables printers to electronically monitor dryer performance and accurately measure actual ink film temperature. The probe is connected to the thermometer by 15 feet of heat resistant cord. After the shirt has been placed on the dryer conveyor belt, place the probe wire side down into the ink film. As the shirt passes through the dryer the probe will send the temperature readings to the thermometer and show the exact temperature the ink film is reaching at that point inside the dryer. All temperatures below 200° F (93° C) are shown in 0.1° resolution. Temperatures greater than 200° F (93° C) are shown in 1.0° resolution. The Atkins Temperature Probe is an invaluable tool to help diagnose heat panels that may not be working properly.

Direct Printing Standard Plastisol Inks

Ultrasoft, Maxopake, Athletic Gloss, Polyester, Unimatch, Mixopake

Union Ink

Ink Application Chart

	Direct Printing Standard Color		Athletic Plastisols		Matching Systems	
Name	Ultrasoft	Maxopake	Athletic Gloss	Polyester	Unimatch	z
Product Codes [1]	**PLUS, PLUE**	**PADM, PADE**	**PATH, PATE**	**POLY, ATHP**	**MACH,PTHF**	**MIXO, MIXE**
General Information	Medium Opacity, wet-on-wet	Very High Opacity	High Opacity, Gloss	High Opacity, very low bleed for 100% Polyester	Pantone Approved Medium Opacity Color Matching System	Pantone Approved Very High Opacity Color Matching System
Colors	16 Standard + 9 Fluorescents 6 Metallics*	17 Standard Colors + Three Low Bleed Colors + 9 Fluorescents	30 Standard Colors + 8 Fluorescents + 5 Metallics*	2 Whites + 12 colors	15 RFU Colors	12 Standard RFU Colors + 7 Neon RFU Colors + 4 Low Bleed Compatible Colors
Substrates						
Cotton	Excellent (Light Colors, or Med Colors)	Excellent (Dark Colors or Light colors extended)	Not Recommended	Not Recommended	Excellent (Light Colors, or dark colors w/underbase)	Excellent (Dark Colors or Light colors extended)
Cotton/Polyester	Not Recommended	Not recommended unless printed on low-bleed underbase	Not Recommended	Not Recommended	Not recommended unless printed on low-bleed underbase	Not recommended unless printed on low-bleed underbase
100% Polyester	Not Recommended	Not recommended unless printed on polyester low-bleed underbase	Not recommended unless printed on polyester low-bleed underbase	Excellent	Not recommended unless printed on polyester low-bleed underbase	Not recommended unless printed on polyester low-bleed underbase
Athletic Nylon Mesh	Not Recommended	Good	Excellent	Not Recommended	Not Recommended	Good
Athletic Polyester	Not Recommended	Not recommended unless printed on polyester low-bleed underbase	Not recommended unless printed on polyester low-bleed underbase	Excellent	Not Recommended	Not Recommended
Waterproof Fabric	Not Recommended	Excellent w/Nylobond	Excellent w/Nylobond	Not Recommended	Not Recommended	Excellent w/Nylobond
Tight Woven denier cloths	Not Recommended	Excellent w/Nylobond	Excellent w/Nylobond	Not Recommended	Not Recommended	Excellent w/Nylobond
Properties						
Opacity	Moderate	Excellent	Very Good	Very Good	Moderate	Excellent
Bleed Resistance	None	None, except LB Colors	None	Excellent	None	None
Soft Hand	Excellent	Only w/softhand additive	No	No	Excellent	Only w/softhand additive
Wet on wet	Good	Only w/softhand additive	Fair, not recommended	No	Excellent	Only w/softhand additive
Flash Cure	Fair	Fair	Fair	Good	Excellent	Fair
Dry Cleaning/Ironing	No	No	No	No	No	No
Application						
Mesh	125-305 (48-120cm)	74-230 (29-92cm)	60-110 (24-43cm)	60-110 (24-43cm)	125-305 (48-120cm)	74-230 (29-92cm)
Stencil	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary
Cure Temp	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C
Wash Up	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash
Additives						
Viscosity Reducer	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000	0-2% PLUS or PLUE-9100	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000
Soft Hand Extender	0-99% MIXO or MIXE -9070	0-99% MIXO or MIXE -9070	0-99% MIXO or MIXE -9070	Not Recommended	0-99% MACH or PHTF-9070	0-99% MIXO or MIXE -9070
Opaque Extender	Not Recommended	MIXO or MIXE-9090	PATH or PATE 9090	Not Recommended	MACH or PHTF-9090 only as required in formulas	MIXO or MIXE-9090 only as required in formulas
Nylobond	Not Recommended	Excellent	Excellent	Not Recommended	Good	Excellent

[1] First Code is standard ink series, second code is Liberty EF Non-phthalate series

Always test inks prior to production to test their fitness for your particular application. Customer is responsible for proper application, suitability, and cure of all inks.

* Metallics have different application requirements. See Page 2.

Revised: 04/10

Direct Printing Metallics, Shimmers, Glitters, Process Plastisols

Ultrasoft Metallics, Athletic Metallics, Shimmers, Glitters, Halo Glitters

Ink Application Chart

Union Ink

	Plastisol Metallics					
Name	Ultrasoft	Brilliant and Athletic Gloss Metallics	Shimmers	Glitters	Halo Glitters	Tru-Tone Process
Product Codes [1]	**PLUS, PLUE/PLFX,PLFE**	**PATH, PATE**	**PAGL, PAGE**	**PAGL, PAGE**	**HALO, HALE**	**PRPL, PRPE**
General Information	Highly opaque true metallic ink	Highly Opaque true metallic, gloss finish	Non-tarnishing medium sized flake	Non-tarnishing large sized flake	Dry Dusted Look Large Non-Tarnishing Flake	True color transparent process inks
Colors	Copper, Silver, Washable Silver, Pale Gold, Rich Gold, Mirror Gold	Silver, Gold, Rich Gold, Mirror Gold	6 Standard Colors	8 Standard Colors	14 Standard Colors	Regular Strength, Triple Strength, Highlight White
		Extra Bright Silver, Extra Bright Gold				
Substrates						
Cotton	For Best Results, Use Underbase	For Best Results, Use Underbase	Excellent	Excellent	Excellent	White Fabric, All Other Colors w/Discharge Underbase
Cotton/Polyester	With Low-Bleed Underbase	With Low-Bleed Underbase	Excellent	Excellent	Excellent	White Only
100% Polyester	With Polyester LB Underbase	With Polyester LB Underbase	Only on Very Light Colors	Only on Very Light Colors	Light colors	White Only
Athletic Nylon Mesh	Not Recommended	Best Choice	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Athletic Polyester	Not Recommended	With Polester Underbase	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Waterproof Fabric	With Nylobond Additive	With Nylobond Additive	With Nylobond Additive	With Nylobond Additive	With Nylobond Additive	Not Recommended
Tight Woven denier cloths	With Nylobond Additive	With Nylobond Additive	With Nylobond Additive	With Nylobond Additive	With Nylobond Additive	Not Recommended
Properties						
Opacity	High	Excellent	Good	Good	Good	Transparent
Bleed Resistance	None	None	None	None	None	None
Soft Hand	No	No	No	No	No	Excellent
Wet on wet	No	No	No	No	No	Excellent
Flash Cure	N/A, Print Last	N/A, Print Last	N/A, Print Last	N/A, Print Last	N/A, Print Last	Not recommended, but flashes well
Dry Cleaning/Ironing	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Application						
Mesh	60-125 (24-49cm)	60-110 (24-43cm)	60-110 (24-43cm)	24-33 (10-12cm)	24-33 (10-12cm)	305-355(120-140cm)
Stencil	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary
Cure Temp	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C
Wash Up	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash
Additives						
Viscosity Reducer	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000
Soft Hand Extender	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	PRPL,PRPE-9080 only
Opaque Extender	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Nylobond	Excellent	Excellent	Excellent	Very Good	Very Good	Not Recommended

[1] First Code is standard ink series, second code is Liberty EF Non-phthalate series

Always test inks prior to production to test their fitness for your particular application. Customer is responsible for proper application, suitability, and cure of all inks.

Revised: 04/10

Direct Printing Special Effects Inks, Transfer Mixing System Plastisols

Hi Gloss Gel, Hi Density, Suede, Phosphorescent, Photochromatic, Mixotrans

Ink Application Chart

Union Ink

Name	Hi Gloss Gel Clear	3DSQ High Density	Suede	Phosphorescent	Photochromatic	Mixotrans
Product Codes [1]	**PLFX, PLFE**	**3DSQ, 3DSE**	**PLSE, NPSU**	**PLUS, PLUE**	**PHOT**	**MITR, MITE**
General Information	High Gloss Gel Clear	Three Dimensional High Density Ink	Special Effect Suede Finish, Do not underbase	Glow in the Dark Ink	UV Sensitive Color Change Ink	High Opacity Color Matching System for Hot Split and Cold Peel Transfers
Colors	PLFX, PLFE - 9013,9040	12 Standard RFU Colors + 7 Neon RFU Colors	10 Standard Colors, Plus Base and Additive	Greenish White	Blue, Yellow, Purple	12 Standard RFU Colors + 7 Neon RFU Colors + 11
						Standard Colors
Substrates						
Cotton	Excellent, best when printed on flashed underlayer	Excellent	Excellent	Best when printed on white or cotton white underbase	Best when printed on white or cotton white underbase	Excellent
Cotton/Polyester	Not Recommended	Only when printed on low-bleed underbase	Not Recommended	Only When Printed on Low-Bleed White Underbase, TEST	Only When Printed on Low-Bleed White Underbase, TEST	When Printed with Low Bleed Underbase and/or Barrier Clear
100% Polyester	Not Recommended	Not recommended unless printed on poly low-bleed underbase	Not Recommended	Not Recommended Unless Printed on Poly Low-Bleed Underbase, TEST	Not Recommended Unless Printed on Poly Low-Bleed Underbase, TEST	When Printed with Polyester Low Bleed Underbase and/or Barrier Clear, TEST
Athletic Nylon Mesh	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Athletic Polyester	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Waterproof Fabric	Not Recommended	Not Recommended	Not Recommended	With Nylobond Additive	Not Recommended	Not Recommended
Tight Woven denier cloths	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	TEST
Properties						
Opacity	Transparent	Excellent	Very Good	Transparent	Transparent	Excellent
Bleed Resistance	None	None	None	None	none	Only with Low Bleed Underbase
Soft Hand	No	No	N/A, Print Last	No	Very Good	Good
Wet on wet	No	No	N/A, Print Last	No	No	No
Flash Cure	Not Recommended	Fair	Good	Not Recommended	Not Recommended	Yes
Dry Cleaning/Ironing	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Application						
Mesh	70-86 (28-33cm) Thin Thread	70-86 (28-33cm) Thin Thread	110-160 (43-60 cm)	83-110 (32-43cm)	83-125 (32-49cm)	83-230 (32-92cm)
Stencil	200 Micron Thick Film or Capillary	200 - 400 Micron Thick Film or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary
Cure Temp	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	Gel @ 240-250°F/115-121C°
Wash Up	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash
Additives						
Viscosity Reducer	0-2% PLUS or PLUE-9100	0-15% PLUS or PLRE-9000	0-2% PLUS or PLUE-9100	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000
Soft Hand Extender	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Opaque Extender	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	As Needed
Nylobond	Not Recommended	Not Recommended	Not Recommended	Good	Not Recommended	Not Recommended

[1] First Code is standard ink series, second code is Liberty EF Non-phthalate series

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Revised: 04/10

Direct Print Special Effects, Transfer Inks, Key Additives - Plastisols

Unistretch, Plasticharge, Reflectives, Transfer systems

Ink Application Chart

Discharge Inks

Name	Barrier Clear	Unistretch	Plasticharge	W/B Discharge	Flashback	Flashtrans
Product Codes [1]	**PLHE**	**UNST, UNSE**	**DSPCH, DSPCH-E**	**DSPP**	**REFL**	**FLTR**
General Information	Supplemental Dye Blocking Underbase for difficult fabrics	Stretch additive and direct print ink	Hybrid Ink system that allows for Plastisol Discharge	Extremely Soft Hand Discharge	Retro Reflective Ink	Retro Reflective Transfer System for Safety Apparel
Colors	PLHE-9040	Clear Additive (9160) and RFU White (1000)	Clear Additive (9070) and Premixed White (1000)	Preprint Clear + Tintable Base + Extra Bright White	8 Standard Colors	Silver Gray
Substrates						
Cotton	Not Recommended	Excellent	On Reactive Dyed Fabric	Excellent	Best on Light Fabrics But OK on Dark Fabric	Excellent
Cotton/Polyester	As Needed	Only on colors over an Underbase	Not Recommended	Not Recommended	Best on Light Fabrics But OK on Dark Fabric	Excellent
100% Polyester	Excellent for Migration prone Fabric	Only on colors over a Poly Low-Bleed Underbase	Not Recommended	Not Recommended	Best on Light Fabrics But OK on Dark Fabric	Excellent
Athletic Nylon Mesh	Not Recommended	Excellent	Not Recommended	Not Recommended	Not Recommended	Excellent
Athletic Polyester	Excellent for Migration prone Fabric	Only on colors over an Underbase	Not Recommended	Not Recommended	Not Recommended	Excellent
Waterproof Fabric	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Tight Woven denier cloths	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	TEST
Properties						
Opacity	None, Transparent	Additive None, White Good	Transparent but replaces fabric color	N/A	Fair	Excellent
Bleed Resistance	Excellent	None	N/A	N/A	N/A	Excellent
Soft Hand	N/A	Good	Excellent	Very Soft	Fair	Fair
Wet on wet	No	Test	Good	Colors and Clear, Not White	No	N/A
Flash Cure	Good	Good	Very Good	Good	No	N/A
Dry Cleaning/Ironing	Not Recommended	Not Recommended	Not Recommended	OK	Not Recommended	Not Recommended
Application						
Mesh	60-86 (24-33cm)	83-125(32-49cm)	156-180 (61-71cm)	156-180 (61-71cm)	83-110 (32-43cm)	110 (43cm)
Stencil	Direct or Capillary	Direct or Capillary	Direct Water Resistant	Direct Water Resistant	Direct or Capillary	Direct or Capillary
Cure Temp	300-320°F /149-160°C	310-330°F /154-166°C	320-330°F /160-166°C	320-330°F /160-166°C	330-340°F /166-171°C	Gel at 240°F /116°C, TEST
Wash Up	Plastisol Screen Wash	Plastisol Screen Wash	Water or Water soluble screen wash	Water or Water soluble screen wash	Plastisol Screen Wash	Plastisol Screen Wash
Additives						
Viscosity Reducer	0-2% PLUS or PLUE-9100	Not Recommended	Not Recommended	N/A	Not Recommended	Not Recommended
Soft Hand Extender	Not Recommended	Not Recommended	0 to 50% for Natural Discharge Look	N/A	Not Recommended	Not Recommended
Opaque Extender	Not Recommended	Not Recommended	Not Recommended	N/A	Not Recommended	Not Recommended
Nylobond	Not Recommended	Not Recommended	N/A	N/A	OK for Jackets	Not Recommended

[1] First Code is standard ink series, second code is Liberty EF Non-phthalate series

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White Inks - Plastisols

Cotton Whites, Low bleed Whites, Poly Whites, Athletic Whites

Ink Application Chart

Union Ink

Name	Bright Cotton White	Basic White	Diamond White	EZ Print White	Polyester White	Athletic White
Product Codes [1]	**PADM, PADE**	**PADM, PADE**	**PLHT, PLHE**	**PADM, PADE**	**POLY, ATHP**	**PATH, PATE**
General Information	Very High Opacity Underbase and Highlight White	High Opacity Underbase White	Premium High Opacity Low Bleed White for Poly Cotton Blends	Economy Low Bleed White for Cotton and Poly Cotton Blends	High Opacity very low bleed for 100% Polyester	High Opacity Gloss for Athletic Jerseys
Colors	Standard -1027 Premium - 1030	PADM, PADE - 1001	PLHT, PLHE - 1070, 1075	PADM, PADE - 1062	POLY, ATHP - 1050,1070	PATH, PATE - 1000
Substrates						
Cotton	Excellent (Dark Colors or Light colors extended)	Good (Dark Colors or Light colors extended)	Not Recommended	Good	Not Recommended	Not Recommended
Cotton/Polyester	Not Recommended	Not Recommended	Excellent	Good	Good	Not Recommended
100% Polyester	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Excellent	Not Recommended
Athletic Nylon Mesh	Good	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Excellent
Athletic Polyester	Not recommended unless printed on polyester low-bleed underbase	Not Recommended	Not Recommended	Not Recommended	Excellent	Not Recommended
Waterproof Fabric	Excellent w/Nylobond	Excellent w/Nylobond	Not Recommended	Not Recommended	Not Recommended	Excellent w/Nylobond
Tight Woven denier cloths	Excellent w/Nylobond	Excellent w/Nylobond	Not Recommended	Not Recommended	Not Recommended	Excellent w/Nylobond
Properties						
Opacity	Excellent	Very Good	Excellent	Very Good	Excellent	Excellent
Bleed Resistance	None	None	Excellent	Good	Excellent	None
Soft Hand	Only w/softhand additive	Only w/softhand additive	Fair	Fair	No	No
Wet on wet	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Flash Cure	Excellent	Good	Excellent	Good	Fair	Fair
Dry Cleaning/Ironing	No	No	No	No	No	No
Application						
Mesh	83-230 (32-92cm)	83-230 (32-92cm)	83-156 (32-61cm)	83-230 (32-92cm)	60-110 (24-43cm)	60-110 (24-43cm)
Stencil	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary
Cure Temp	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C
Wash Up	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash
Additives						
Viscosity Reducer	0-2% PLUS or PLUE-9100	0-2% PLUS or PLUE-9100	0-2% PLUS or PLUE-9100	0-2% PLUS or PLUE-9100	0-2% PLUS or PLUE-9100	0-2% PLUS or PLUE-9100
Soft Hand Extender	As Needed	As Needed	Not Recommended	Not Recommended	Not Recommended	PATH,PATE - 9090
Opaque Extender	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Nylobond	Excellent	Excellent	Not Recommended	Not Recommended	Not Recommended	Excellent

[1] First Code is standard ink series, second code is Liberty EF Non-phthalate series

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Waterbase Ink Systems

Aerotex, Unidye, Pavonine Systems, Discharge

Ink Application Chart

Name	Aerotex	Unidye	Pavoclear	Pavoopaque	Pavostretch	Pavoreflect, Nyloreflect
Product Codes [1]	**ATEX**	**UNDY**	**PPPC**	**PPPO**	**PPPS**	**PORF,NYRF**
General Information	Soft Hand Waterbase Ink	Water/Oil Emulsion Ink	Soft Hand Waterbase Ink	Opaque Waterbaase Ink	Very Elastic Standard and Opaque Waterbase Ink	Durable High Opacity Reflective Ink
Colors	21 Standard + 8 Fluorescent Colors + 9 Shimmers	20 Standard + 4 Process + 8 Fluorescent colors	24 Standard + 7 fluorescents + 4 process colors	24 Standard Colors	24 Standard + 4 fluorescents	15 Standard Colors + 7 fluorescent colors + Tintable Base
		Excellent Towel Ink				
Substrates						
Cotton	Excellent on White,test on lights	Excellent on White,test on lights	Excellent on White,test on lights	Good	Excellent on white, test on lights	Excellent
Cotton/Polyester	Excellent on White,test on lights	Excellent on White,test on lights	Excellent on White,test on lights	Good	Excellent on white, test on lights	Excellent
100% Polyester	Excellent on White,test on lights	Excellent on White,test on lights	Excellent on White,test on lights	Good	White Fabrics Only	Excellent
Athletic Nylon Mesh	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Athletic Polyester	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Waterproof Fabric	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	NyloReflect
Tight Woven denier cloths	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	NyloReflect
Properties						
Opacity	Low	Low	Low	Good	Good	Fair
Bleed Resistance	N/A	N/A	N/A	N/A	N/A	N/A
Soft Hand	Excellent	Excellent	Excellent	Fair	N/A	N/A
Wet on wet	Yes	Yes	Yes	Yes	No	No
Flash Cure	Fair	Fair	Fair	Fair	Fair	No
Dry Cleaning/Ironing	OK	OK	OK	OK	OK	OK
Application						
Mesh	110-160 (43-60cm)	110-160 (43-60cm)	110-160 (43-60cm)	83-160 (32-60cm)	83-160 (32-60cm)	74-110 (29 -43cm)
Stencil	Direct Water Resistant	Direct Water Resistant	Direct Water Resistant	Direct Water Resistant	Direct Water Resistant	Direct Water Resistant
Cure Temp	320-330°F /160-166°C or Air dry w/ Catalyst	320-330°F /160-166°C or Air dry w/ Catalyst	320-330°F /160-166°C or Air dry w/ Catalyst	320-330°F /160-166°C w/ Catalyst	320-330°F /160-166°C w/ Catalyst	320-330°F /160-166°C w/ Catalyst
Wash Up	Water or Water soluble screen wash	Water with Mild Detergent	Water or Water soluble screen wash	Water or Water soluble screen wash	Water or Water soluble screen wash	Water or Water soluble screen wash
Additives						
Extender Base	yes	yes	yes	yes	yes	yes
Retarder	yes	yes	yes	yes	yes	yes
Air Dry Catalyst	yes	yes	yes	yes	yes	yes
Other Catalyst	no	no	yes	yes	yes	yes

[1]All Union Waterbase Inks are Non-phthalate

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