1300 Series UV Screen Ink

Code Ref: 473

technical information and application instructions

Substrates 1300 Series is designed for treated corrugated polypropylene (Correx) and some high density polyethylene sheeting with a surface tension at or above 46 dynes/cm. Can also be used on Coated papers & Cardstock.

End Uses For indoor and outdoor real estate, political, and bus sign applications, along with other POP applications – advise the end use when ordering so that the most cost effective pigments can be used for the level of lightfastness required.
Not recommended for container, polyethylene banner, or nameplate applications.
1300 Series UV will replace 1200 Series UV once raw material stocks are exhausted

Product Information

The 1300 Series UV is a one part, 100% solids UV-curable screen printing ink which exhibits a high gloss finish in all colours. The ink series does not require a catalyst, thereby saving costly replacement of stained mesh and gelled ink due to shortened pot life.

The 1300 Series is intended to work well straight from the container on a wide range of printing equipment.

The 1300 Series has been formulated for applications on treated corrugated polypropylene (Correx) that require up to 12 months outdoor performance. Durability of a sign can typically be affected by under curing the ink, abrasive marring or cleaning of the print, poor surface treatment of the substrate, or the inability of the substrate to withstand degradation from sun, heat, or humid environmental conditions. **Correx ages very rapidly and the treatment level decreases with age and can result in adhesion failure.**

The 1300 Series film flexibility enables the finished sign to undergo bending, die cutting, hole punching, and stapling.

The 1300 Series does **NOT** contain N-vinyl-2-Pyrrolidone (trade name V-Pyrol®).

Application Information

Mesh 140-150T Monofilament polyester mesh is recommended for most applications.120-165T Monofilament polyester can be used for specialty applications.

Stencil Direct emulsions and thin capillary films that are solvent resistant, UV ink compatible, and yield a thin ink deposit will work best.

Squeegee Sharp 70-90 single durometer polyurethane blades as well as multi-durometer blades that produce an even, thin ink deposit will work best.

Coverage 60-100 Square meters/kilo depending upon ink deposit.

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Reducer D564 S082 UV Reducer is to be used to reduce the viscosity of these inks by adding no more than 5% by weight. It is recommended that these inks be thoroughly mixed, and acclimatised to an 18°C - 30°C environment prior to reducing.

Mixing Clear Mixing Clear is used to reduce the density of colours, or as a clear base for metallic powders (refer to Metallic Colours mixing Guidelines later in this TDS).

Clean Up Use Special UV Screen Wash - D574 S016.

Storage These inks are reactive to light and temperature extremes. Store in a clean area below 35°C sealed tightly in dark plastic containers out of direct sunlight. For maximum shelf life, store ink in ambient temperatures of 15°C to 30°C. Ink taken from the press should not be returned to the original container; store separately to avoid contaminating unused ink.

Shelf life is 2 years from date of manufacture.

General Guidelines

Ink Handling Direct contact with the skin is the primary route of exposure and irritation with UV inks. Therefore, it is recommended that all personnel mixing and handling these products wear gloves and barrier cream to prevent direct skin contact. Safety glasses are suggested in areas where ink may be splashed. If ink does come in contact with skin, wipe ink off with a clean, dry absorbent cloth or rag (**DO NOT USE SOLVENT OR REDUCER**). Proceed to wash and rinse the affected area with soap and water. Consult the 1300 MSDS for further instructions and warnings.

Printing 1300 Series Inks are formulated to print from the container with excellent flow characteristics. If the need arises to reduce the viscosity, add 2-5% of D564-S082 UV Reducer. The use of a mixer is recommended to thoroughly mix inks prior to printing. Inks will maintain optimum print and cure performance when the ink temperature is 18°C - 30°C. Temperatures below 18°C will increase the ink viscosity, impairing both flow and cure. Elevated temperatures will lower the ink viscosity, reducing print definition, film thickness and opacity. When the ink is cold, it is best to mix the ink with a high-speed mixer until it returns to the proper temperature, 18°C - 30°C. Add reducer at this point if necessary (maximum 5% as previously advised).

All UV inks can be affected by stray UV light in and around the printing facility. Be aware of overhead lights, skylights & windows curing inks in the screen. Light filters are recommended. Leaving a container without its lid may result in the ink's surface forming a skin caused by reaction with ambient lighting. Keep containers covered.

If ink is left on screen while not printing (lunch breaks etc.) it is advisable to cover with black plastic sheeting.

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Cure Parameters

The 1300 Series UV Inks are formulated to cure when exposed to a focused medium pressure mercury vapour lamp set at 200 watts per inch with millijoules (mJ) and milliwatts (mW) of:-

80-100mJ/cm² @ 600mW/cm² for Process colours

150-180mJ/cm² @ 600mW/cm² for Solid colours

The most accurate means of determining the ultraviolet energy output of specific equipment is to measure the light output with a radiometer. For printers using radiometers and/or using equipment where ultraviolet dosage is determined by means other than a belt speed, contact your GL Technical Representative for a suggested level of ultraviolet energy exposure required to cure the 1300 Series Inks on specific equipment.

Adhesion Testing

Even when recommended UV energy output levels are achieved, it is imperative to check adhesion on a cooled down print by checking:

1. **Touch of ink surface** – The 1300 ink will be smooth and soft.
2. **Thumb twist** – The ink surface will not mar or smudge.
3. **Scratch surface** – The 1300 ink will resist scratching when cool.
4. **Cross hatch tape test** – Use a cross hatch tool, or a sharp knife to cut through ink film only, and then apply 3M #600 clear tape on a cut area, rub down and rip off. Ink should only come off in actual cut areas.

The properly cured ink film will withstand normal water exposure, i.e. a rainy day. However, abrading the ink film while wet may result in ink delamination. Do not expose stacks of printed materials to water; printed materials must be stored in a dry area.

Warning: Multilayer Printing

UV ink by its nature becomes brittle and inflexible when printed in multiple layers, and after multiple and repeated exposure to curing lamps. This will manifest itself most noticeably when printing onto flexible substrate, where more than 2 to 3 layers of ink are printed on top of each other.

This problem is also more frequently found on highly plasticized substrates where it is possible that some plasticizer has migrated to the surface and this can give a weak ink bond. Unfortunately this failure of adhesion may only become apparent several days after printing.

We must therefore emphasise the importance of testing both a new print construction and new supplies of substrate.

Colour Availability

For the SA market we hold stocks of the CMYK colours plus Black and White and a small selection of popular corporate colours. All other colours are quickly blended in our factories to customer specific requirements.

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Weatherability

The 1300 Series has been formulated for applications on treated corrugated polypropylene that require up to 12 months outdoor performance. Durability of a sign can typically be affected by under curing the ink, abrasive marring or cleaning of the print, poor surface treatment of the substrate, or the inability of the substrate to withstand degradation from sun, heat, or humid environmental conditions.

Metallic Colours

Recommended mesh for printing metallics is a 120T plain weave monofilament polyester. Mix only enough metallic ink to be used the same day – Chemical reactions in metallic inks may result in viscosity, colour and printability changes over time. Check curing – Metallic colours are possibly more difficult to cure.

When inks are to be printed over a metallic colour, the overprinting ink(s) must be evaluated for intercoat adhesion over the metallic colour before proceeding with the production run. To maximize intercoat adhesion over metallic colours, we recommend that the metallic be printed as late as possible in the print sequence.

Recommended ratios: Metallic Powders

*Silvers (*aluminum*)*	8% by weight – 80gms powder to 1kg Clear
Gold (bronze)	15% by weight – 150grms powder to 1kg Clear

Additives

N690-S463 NB80 Adhesion Promoter may be added to the 1300 Series to further enhance adhesion and water resistance. Improved adhesion will not be demonstrated for 24 hours, with full cross linking in 4-7 days. Catalyzed Ink will have a 6-8 hour pot life.

Substrates

Never re-use a sign and print on the reverse side. The treatment level necessary for adhesion is destroyed very quickly under outdoor exposure.

Troubleshooting Guide

Ink not curing

Check for proper mesh count.

Check squeegee pressure, angle and sharpness. Too much pressure or a dull edge blade will significantly affect ink film thickness and cure.

Check UV unit for effective millijoules and milliwatts (UV output).

Colour may be too opaque for UV light to penetrate. This can occur when a colour match requires the use of opaque white or black. Reduce the opaque colour with the addition of Mixing Clear until effective cure is obtained.

Poor adhesion

Excess ink deposit causing poor through-cure.

Surface contamination on substrate. Wipe a section of the substrate with isopropyl alcohol prior to print, and check adhesion.

Try another type or batch of substrate.

Insufficient cure. Check UV unit for effective millijoules and milliwatts (UV output). Ensure the reflectors are clean & shiny bright silver.

Under-treatment of substrate – Dyne level too low.

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caution

Please proof this ink, reduced to the consistency you wish to adopt, on a sample of the ACTUAL SUBSTRATE you will be printing BEFORE starting a production run.

Give the proof 4 hours to post cure then check for: Abrasion resistance, adhesion, print appearance and correctness of colour. The adequacy of this ink in these properties cannot be fully established on laboratory equipment on a small scale.

Based on information from our raw material suppliers, these products are formulated to contain less than 0.06% lead. If exact heavy metal content is required, independent lab analysis is recommended.

GL stands behind the quality of this product. GL cannot, however, guarantee the finished results because GL exercises no control over individual operating conditions and production procedures. While technical information and advice on the use of this product is provided in good faith, the User bears sole responsibility for selecting the appropriate product for their end-use requirements. Users are also responsible for testing to determine that our product will perform as expected during the printed item's entire life-cycle from printing, post-print processing, and shipment to end-use. This product has been specially formulated for screen printing, and it has not been tested for application by any other method. Any liability associated with the use of this product is limited to the value of the product purchased from GL.

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Last date amended: 10th July 2014