3800 Series UV Polybottle / Polybanner Screen Ink

Code Ref: 498

technical information and application instructions

Substrates Polyolefin bottles and surface treated polyethylene banner film.

End Uses Polyolefin bottles and indoor and outdoor polyethylene banners.
3800 Series, because of its flexibility, also finds use on paper and board printings that are subjected to heavy creasing – always pretest for suitability.

Product Information

The 3800 Series performs well on treated (46 dynes/cm²) polyolefin bottles and provides improved flexibility over the 3100 Series. Production speeds of 60-80 bottles per minute are achieved when using **FUSION BULBS**.

The 3800 Series Polybanner Ink was originally formulated specifically for treated polyethylene banner film, (treated to 45 dynes/ cm² or higher) where excellent adhesion and superior flexibility are required. Properly cured, this ink will resist blocking when stacked ink to ink.

The 3800 Series is a one-part, 100% solids UV-curable screen printing ink which exhibits a high gloss finish in all colours, except for the halftone colours having a semi-gloss finish. This ink is intended to work well straight from the container on a wide range of printing equipment.

The 3800 Series does **NOT** contain N-vinyl-2-Pyrrolidone (trade name V-Pyrol®).

User Information

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. See full disclaimer at the end of the document.

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.

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.

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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). For Process Colours use Process Medium to maintain ink structure.

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 3800 MSDS for further instructions and warnings.

Printing

3800 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.

Cure Parameters

When printing polyolefin bottles it is essential that the curing unit is equipped with **FUSION BULBS** to provide the energy required to cure these inks at high production speeds.

When printing polyethylene banners or paper & board, the 3800 Series Inks is formulated to cure when exposed to a medium pressure mercury vapour lamp set at 200 watts per inch with millijoules (mJ) and milliwatts (mW) of:-

100 – 130 mJ/cm² @ 600+ mW/cm² for CMYK & most colours

150 – 180 mJ/cm² @ 600+ mW/cm² for Dense Black & White

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 suggested levels of ultraviolet energy exposure required to cure the 3800 Series Inks on specific equipment.

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The High Performance Halftone colours can be more susceptible to stray UV light in and around a printing facility resulting in the appearance of an ink drying in the screen during the course of a long run. Be aware of skylights, windows, and overhead lights possibly curing the ink in the screen. Precautions include the use of light filters that remove the damaging wavelengths.

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

1. **Adhesion Testing** Even when recommended UV energy output levels are achieved, it is imperative to check adhesion on a cooled down print by checking:
2. **Touch of ink surface** – The 3800 ink will be smooth and slick.
3. **Thumb twist** – The ink surface will not mar or smudge.
4. **Scratch surface** – The 3800 ink will resist scratching when cool. Polyethylene banner material scratches easily, so use magnification to determine if scratches are ink only or ink and the top layer of polybanner material.
5. **Cross hatch tape test** – Use a cross hatch tool, or a sharp knife to cut through ink film only, then apply 3M #600 clear tape on a cut area, rub down and rip off. Ink should only come off in actual cut areas.

Full adhesion characteristics will be demonstrated within 4 hours after cure.

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 US market NAZDAR has a range of PMS matching colours available, as well as a selection of popular spot colours, 2 or more ranges of Process Colours and a range of single pigment toners.

The demands of the SA market are very different and at GL we hold stocks 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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Metallic Colours

Recommended mesh for printing metallics is 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 (aluminium)	8% by weight – 80gms powder to 1kg Clear
Gold (bronze)	15% by weight – 150grms powder to 1kg Clear

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). Ensure reflectors are clean & shiny bright silver.

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 reflectors are clean & shiny bright silver.

Check dyne level - Minimum 46 dynes is necessary for good adhesion.

HDPE & PP bottles need to be flame treated to achieve correct Dyne level (surface tension level) – check flame treatment equipment is working correctly.

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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.

[end]

Last date amended:11th July 2014