UV Point-of-Sale Screen Ink 3200 Series

Code Ref: 493

technical information and application instructions

Substrates ABS, rigid PVC, self-adhesive vinyl's, acrylics, some coated papers, and some coated cardstocks.

End Uses For Point-of-Sale applications on a wide range of plastics, coated papers, and coated boards that will be used for indoor and outdoor advertising.

Product Information

The 3200 Series UV POS Screen Ink has been formulated to meet the processing speeds of the most modern printing equipment, while curing at low levels of ultraviolet energy, reducing costs and substrate heat exposure. This ink will cure to a tough, glossy finish that will resist blocking in two-sided print applications on rigid plastics.

The 3200 Series is a one part, 100% solids ultraviolet curable screen printing ink which exhibits a high gloss finish in all colours except for the halftone and fluorescent colours which will have a semi-gloss and satin finish respectively when cured. This ink is intended to work well straight from the container on a wide range of printing equipment.

The 3200 Series does **NOT** contain N-Vinyl-2-Pyrrolidone (trade name, V-Pyrol®).

3200 Series has largely been replaced by 1600 & 1610 Series as they provide a similar result at a lower cost.

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). Use Process Medium in process colours to maintain 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 3200 MSDS for further instructions and warnings.

Printing 3200 POS 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 (as advised above not more than 5%).

Cure Parameters The 3200 Series POS Inks are 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:-

80-100mJ/cm² @ 600mW/cm² for most 3200 Series Colours.

100-130 mJ/cm² @ 600mW/cm² for Dense Black & White and other highly pigmented colours.

The values mentioned above are representative of measurements taken using an EIT UVICURE Plus radiometer measuring the UVA bandwidth (320-390nm). When measuring the peak irradiance using the UVICURE Plus, it is recommended that a belt speed less than 12 meters per minute be used in order to obtain accurate readings.

These High Performance Inks can be affected by 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 block out the damaging wavelengths.

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

NOTE: Porous substrates (not recommended) can allow ink to dive below the surface requiring a more thorough cure to overcome the added ink thickness.

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 3200 will be smooth and slick.
2. **Thumb twist** – The ink surface will not mar or smudge.
3. **Scratch surface** – The 3200 will resist scratching when cool. Some soft vinyls scratch easily, so use magnification to determine if scratches are ink only or ink and the top layer of vinyl.
4. **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, wait for 1 minute and rip off at a 180 degree angle. 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 of the Process Colours and a small selection of popular corporate colours. All other colours are quickly blended in our factories to customer specific requirements.

Weathering

These colours are formulated for 2 years outdoor durability – 3 years when an over-varnish is used.

Where more economical colours are required for short term indoor displays we suggest 1600 Series UV be considered.

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Fluorescent Colours

Fluorescent colours are made on request – These colours require special consideration due to their high pigment content. Best results are obtained when printing through a mesh, 120-140 that offers more open area. These inks will have a tendency to settle, so high speed mixing is required prior to printing. The cured ink will have a satin finish. Fluorescent colours will fade on exposure to ultraviolet light – this includes UV reactor exposure as well as outdoor exposure. It is recommended to adjust the art-work so that these colours are the last printed on the image.

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 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

Finishing

The excellent adhesion and hard surface finish of the 3200 POS Inks allow the stacking of printed sheets, ink to ink, without blocking problems on most substrates.

Additives

N690-S463 NB80 UV Adhesion Promoter is recommended to be added at a level of 2- 5% by weight in the 3200 Series Inks to further enhance adhesion on rigid high density polyethylene and treated fluted polypropylene substrates. Improved adhesion will not be demonstrated for 24 hours, with full cross linking in 4-7 days.

Ink mixed with N690-S463 NB80 UV Adhesion Promoter will have a 4-8 hour pot life.

Post Finishing

The 3200 Series POS Inks may chip when die cut even if good adhesion to the substrate is achieved. Multiple layers of ink are very hard and must be tested prior to production printing.

Substrates

1. **Paper and Card Stocks** – Coated grades are recommended. Avoid the use of uncoated stock, as it may allow the ink to penetrate too deeply into the substrate – This results in poor curing and high odour levels. Consider also 1600 & 1610 Series as these are more economical.
2. **Flexible Vinyl** – 3200 Inks are not sufficiently flexible to permit the 180° folds required for sewing on banners. For this application, 3900 or 1900 Series is recommended.
3. **Correx Board, Chromadek, HDPE** – 3200 Series does not have good adhesion, however, it has been found that the addition of 2-5% N690 S463 NB80 Catalyst to the ink prior to printing, enables good adhesion and outdoor durability to be achieved in most cases (refer Printing notes on Page 2).
4. **For maximum outdoor durability**, it is recommended that the inks be overvarnished with either 3200 O/P Clear for rigid substrates or 3500 O/P Clear for flexible substrates.

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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 the 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 resulting in poor through-cure.

Surface contamination on vinyl substrate. Wipe a section of the vinyl 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.

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: 11th July 2014