

## 350 Series UV FG Polybottle Screen Ink

Code Ref: 350

technical information and application instructions

<b>Substrates</b>	Properly treated polyethylene containers.
<b>End Uses</b>	Formulated in accordance with the Nestle - Guidance note on packaging inks, dated 22/4/2010 to give low odour, low migration inks for exterior printing of foodstuff and pharmaceutical containers. Also suitable for Cosmetics, hair products, paints, adhesives, chemical, and specialty product container packaging.

### Product Information

The **350** Series is a 100% solids UV-curable screen printing ink designed for high-speed printing of treated polyethylene bottles. Properly cured, these inks will exhibit excellent adhesion, as well as superior resistance to solvents, chemicals, and other products typically packaged in polyethylene containers.

Formulated to be suitable for the printing of foodstuff & pharmaceutical packaging.

**All inks are formulated in accordance with Nestle - Guidance note on packaging inks, dated 22/4/2010 and subsequent versions. It is the responsibility of the converter to test for migration before the first application, and ensure that the inks comply with the migration specific limits.**

The **350** Series screen printing ink exhibits a high gloss finish in all colours. This ink is intended to work well straight from the container on a wide range of printing equipment.

### 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.*

<b>Mesh</b>	140-150T Monofilament polyester mesh is recommended for most applications. 120-165T Monofilament polyester can be used for specialty applications.
<b>Stencil</b>	Direct emulsions and thin capillary films that are solvent resistant, UV ink compatible, and yield a thin ink deposit will work best.
<b>Squeegee</b>	Sharp 70-90 single durometer polyurethane blades as well as multi-durometer blades that produce an even, thin ink deposit will work best.
<b>Coverage</b>	60-100 Square metres/kilo depending upon ink deposit.

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<b>Reducer</b>	D564-S159 UV FG 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 acclimatized to a 18°C - 30°C environment prior to reducing.
<b>Mixing Clear</b>	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).
<b>Clean Up</b>	Use Special UV Screen Wash D574-S016
<b>Storage</b>	<p>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.</p> <p>Shelf life is 2 years from date of manufacture.</p>

## General Guidelines

<b>Ink Handling</b>	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 ( <b>DO NOT USE SOLVENT OR REDUCER</b> ). Proceed to wash and rinse the affected area with soap and water. Consult the <b>350</b> Series MSDS for further instructions and warnings.
<b>Printing</b>	<p><b>350</b> Series UV Screen 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-S159 UV FG Reducer. The use of a mixer is recommended to thoroughly mix inks prior to printing.</p> <p>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.</p>
<b>Cure Parameters</b>	<p>The <b>350</b> Series Inks are formulated to cure at production speeds of 60-80 bottles per minute with properly maintained automatic equipment.</p> <p><b>Millijoules:</b> radiometer readings in Millijoules represent the total amount of UV energy arriving on the surface. In container printing, the total amount of energy the ink and the container is exposed to depends on the number of bottle rotations under the curing unit. A minimum of 100 Millijoules is required, however up to 300 Millijoules may be necessary to cure certain colours.</p> <p><b>Milliwatts;</b> The radiometer readings in Milliwatts represent the penetrating power of the UV energy arriving at the surface. A minimum of 600 Milliwatts may be necessary for through cure.</p>

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### Milliwatt & Millijoule readings done using an EIT – Microcure Data Reader

Due to the fast cure speeds of the **350 Series**, care should be taken during printing to minimize unwanted ultraviolet light exposure to the screen. 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.

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

### 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 **350 Series** UV ink will be smooth and slick.
2. **Thumb twist** – The ink surface will not mar or smudge.
3. **Scratch surface** – The **350 Series** 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, 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.

### Metallic Colours

Recommended meshes for printing metallic are 120-140T 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

Silver (Aluminium)	8% by weight	80gms powder to 1kg Clear
Gold (Bronze)	15% by weight	150gms powder to 1kg Clear

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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 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.

For PP & HDPE check Dyne level minimum 44 dynes, maximum 60 dynes. Ensure flame treatment equipment is operating correctly.

## **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: 14 January 2013