

Nazdar 2400 UV-LED Screen Ink Series

Membrane Overlay

The 2400 Series UV-LED Screen Ink has been formulated to cure with a LED curing system with wavelength emission of 395 nanometers and minimum output of 4 watts. The ink is designed for second surface printing on polycarbonate and polyester used as membrane overlays where the lamination of pressure sensitive adhesive directly to the ink film may be necessary.

The ink has been formulated to meet the processing requirements of membrane overlay applications such as compatibility with most acrylic adhesives, flexibility for embossing, opacity, ink to ink adhesion and speed of cure.

Primary Substrates

Substrates

- Polycarbonate
- Some top coated polyester (UV ink receptive primer)

Substrate recommendations are based on commonly available materials intended for the ink's specific market when the inks are processed according to this technical data. 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. Reference the 'Quality Statement' at the end of this document.

User Information

Mesh

355-420 tpi (140-165 tpcm) with a mesh opening of 22-38 um monofilament polyester mesh for most applications.

Coarser mesh counts and/or twill weave result in heavier ink deposit requiring additional cure output.

Stencil

Use direct emulsions and capillary films which are solvent resistant and UV compatible.

Squeegee

70-90 durometer polyurethane squeegee.

Coverage

Estimated 3,200 – 4,200 square feet (295 - 390 square meters) per gallon depending upon ink deposit. Reference www.nazdar.com for examples of coverage calculations.

Printing

2400 Series is formulated to be press ready. Thoroughly mix the ink prior to printing. Improper mixing can lead to inconsistent color and ink performance.

Maintain ink temperature at 65°-90°F (18°-32°C) for optimum print and cure performance. Lower temperatures increase the ink viscosity, impairing flow and increasing film thickness. Elevated temperatures lower the ink viscosity, reducing print definition and film thickness.

Pretest to determine optimum printing parameters for a particular set of ink, substrate, screen, press, and curing variables/conditions.

The ink can be affected by stray UV light. Be aware of skylights, windows and overhead lights curing the ink in the screen; light filters are recommended. Leaving a container uncovered may result in the ink's surface forming a "skin", caused by reaction with ambient lighting. Keep containers covered.

Nazdar does not recommend inter-mixing of 2400 Series with other inks besides the 2400 Series.

Cure Parameters

2400 Series ink cures when exposed to LED curing unit:

- 395 or 405 nanometer wavelength
- 4 watts/cm or higher
- Less than 4 mm distance from substrate to LED lamp

These guidelines are intended only as a starting point for determining cure parameters, which must be determined under actual production conditions. "Undercuring" the ink may result in poor adhesion, lower block resistance, reduced durability, and higher residual odor. "Overcuring" the ink may reduce the flexibility of the printed part and adhesion of subsequent ink layers.

Clears / Varnishes

Mixing Clear: Use 2426 Mixing Clear to reduce the density of colors.

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Common Performance Additives

The market specific performance properties of the 2400 Series should be acceptable for most applications without the need for additives. When required, any additives should be thoroughly mixed before each use. Prior to production, test any additive adjustment to the ink. Inks containing additives should not be mixed with other inks.

Example for additives: Ink at 100g with 8% of an additive is calculated as:

$$100\text{g ink} + 8\text{g additive} = 108\text{g total}$$

Reducer: Use RE310 UV Reducer to reduce the viscosity of these inks. Add up to 10% by weight. Over reduction can reduce print definition, film thickness and adversely affect cure.

Adhesion Promoter: Use NB80 UV Adhesion Promoter to enhance adhesion. Add up to 5% by weight. Improved adhesion will be demonstrated within 24 hours, with full cross linking in 3-7 days. Ink mixed with NB80 has a 4-8 hour pot life.

Cleanup

Screen Wash (Prior to Reclaim): Use IMS201 Premium Graphic Screen Wash, IMS203 Economy Graphic Screen Wash, or IMS206 Graphic Auto Screen Wash.

Press Wash (On Press): Use IMS301 Premium Graphic Press Wash.

Storage / Shelf Life

Store closed containers at temperatures between 65°-78°F (18°-25°C). Storing products outside of these recommendations may shorten their shelf life. Ink taken from the press should not be returned to the original container; store separately to avoid contaminating unused ink.

Standard 2400 Series items supplied 1 gallon (4/5 kilo) containers or smaller are useable for a period of at least 24 months from the date of manufacture. Inks packaged in 5 gallon or greater (20 kilo or greater) containers may have a significantly reduced shelf life. To obtain the official shelf life letter, Contact Nazdar Technical Service at InkAnswers@nazdar.com or see contact listing at the end of this document.

Processing

Die Cutting, Embossing, Forming: Allow the cured ink film at least a 24 hour post cure prior to post print processing.

Adhesive Lamination: Wait 24 hours after printing before application of transfer adhesive. Laboratory test results indicated the possibility that laminating adhesives may be applied immediately. However, testing was conducted under controlled laboratory environment with thoroughly cured ink film. Since production environments vary, if adhesive needs to be applied immediately after printing and curing; the printer needs to pre-test before production.

General Information

Ink Handling

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 cloth (do not use solvent or reducer). Wash the affected area with soap and water. Consult the applicable [Safety Data Sheet](#) (SDS / MSDS) for further instructions and warnings.

This ink series is a one-part, 100% solids UV-curable screen printing ink and does not contain N-vinyl-2-pyrrolidone (trade name V-Pyrol[®]).

For assistance on a wide range of important regulatory issues, consult the following Regulatory Compliance Department link at <http://www.nazdar.com> or contact Nazdar Ink Technologies - World Headquarters (see contact listing at the end of this document).

Adhesion Testing

Even when recommended UV energy output levels are achieved, it is imperative to check the degree of cure on a **cooled down** print:

1. Touch of ink surface – the ink surface should be smooth.
2. Thumb twist – the ink surface should not mar or smudge.
3. Scratch surface – the ink surface should resist scratching. With aggressive gouging of the surface, the ink should not scratch away to the substrate surface. This level of scratch resistance indicates a cure level appropriate for use with laminating adhesive.

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- Cross hatch tape test – per the ASTM D-3359 method, use a cross hatch tool or a sharp knife to cut through ink film only; then apply 3M #600 clear tape on cut area, rub down, and rip off at a 180 degree angle. Ink should only come off in actual cut areas.

Full adhesion characteristics at proper cure levels are demonstrated within 24 hours.

Weathering / Outdoor Durability

The 2400 Series was formulated for second surface printing on membrane overlays for the appliance, automotive and similar applications. The inks are not recommended for long-term outdoor exposure. If the inks are to be used in any type of outdoor application, whether printed first or second surface, the printer has the responsibility to test the inks and substrate to the end use specifications.

Manufacturer’s Product Offering

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

Standard Printing Colors

Standard Printing Colors have excellent opacity and flow characteristics. These colors are intended to work as supplied.

Pantone Matching System® Base Colors

Pantone Matching System Base Colors are used to simulate the Pantone® Formulation Guide. These inks are press ready, can be used in matches to achieve Pantone color simulations, or let down with mixing clear. ColorStar® Color Management System software uses Pantone Matching System Base Colors to match Pantone colors. Blend formulations are also available at www.nazdar.com using ColorStar On-Line.

360 Series Colors: 24360-24369 colors are formulated to have no white or opaque pigments. This allows the colors to be more vibrant and allows for a better match of intense and darker colors.

Halogen-Free Colors

The halogen-free colors are press ready and may also be used to match special colors. These colors

are free of the halogens chlorine and bromine based on supplier information and in compliance with the electronics industry standard, IEC 61249-2-21 (<http://www.iec.ch/>).

Color Card Materials

The following is a list of available screen printed samples of the 2400 Series.

UV Color Card (CARDUV): shows the Standard Printing Colors, Pantone Matching System Base Colors.

Halogen-Free Color Presenter (CARDHF): shows the Halogen-Free Colors.

Packaging / Availability

Contact your Nazdar distributor for product availability and offering.

**These colors are not recommended in applications that require high heat during processing.*

Non-Standard Ink Items

Non-Standard ink items listed below are special order, non-inventoried colors which may require additional lead time. These items are available in gallon containers. Those items available in 1 kilogram containers only are indicated.

Standard Printing Colors

Item Number	Color
2410	Primrose Yellow
2419*	Fire Red
2426	Mixing Clear
2478	High Intensity White
2479	High Intensity Black
24PB18	Transparent Red (BS)

Pantone Matching System® Base Colors

Item Number	Color
24358	Tinting White
24359	Tinting Black
24360	Orange
24361	Yellow
24362*	Warm Red
24363	Rubine Red
24364	Rhodamine Red
24365	Purple
24366	Violet
24367	Reflex Blue
24368	Process Blue
24369	Green

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Halogen-Free Colors (only in kilograms)

Item Number	Color
24200	Halogen-Free Mixing Clear
24201	Halogen-Free Tinting Black
24202	Halogen-Free Tinting White
24205	Halogen-Free Super Opaque Black
24206	Halogen-Free Super Opaque White
24210	Halogen-Free Yellow
24211	Halogen-Free Orange
24212	Halogen-Free Red
24213	Halogen-Free Carmine
24214	Halogen-Free Magenta
24215	Halogen-Free Maroon
24216	Halogen-Free Violet
24217	Halogen-Free Blue RS
24218	Halogen-Free Blue GS
24219	Halogen-Free Green

Additives / Reducers

Item Number	Color
RE310	UV Reducer
NB80	UV Adhesion Promoter

Cleaners / Clean Up

Item Number	Color
IMS203	Economy Graphic Screen Wash
IMS206	Auto Graphic Screen Wash
IMS301	Premium Graphic Press Wash

Nazdar Quality Statement

Nazdar® stands behind the quality of this product. Nazdar® cannot, however, guarantee the finished results because Nazdar® 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 Nazdar®.

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