

The 3400 Series Nameplate UV Screen Ink has been formulated to meet the processing requirements of the membrane overlay market; including compatibility with most standard transfer adhesives, flexibility, opacity, ink to ink adhesion, and speed of cure. The 3400 Series 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 3400 Series with the addition of 5% by weight NB80 UV Adhesion Promoter may also be printed over HP Indigo[®] digital offset prints.

SUBSTRATES Polycarbonate, some top coated polyester (UV ink receptive primer).

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 355 - 420 threads per inch (140 - 165 threads per cm) monofilament polyester mesh for most applications

STENCIL Solvent resistant, UV ink compatible direct emulsions and capillary films

SQUEEGEE 70 - 90 durometer shore hardness polyurethane squeegee

COVERAGE 2500 - 3800 square feet (232 - 353 square meters) per gallon depending upon ink deposit

PRINTING The 3400 Series ink is formulated to be press ready. Thoroughly mix the ink prior to printing. Maintain ink temperature at 65° - 90°F (18° - 32°C) for optimum print and cure performance. Lower temperatures increase the ink viscosity, impairing both flow and cure. Elevated temperatures lower the ink viscosity, reducing print definition, film thickness and opacity. Pretest to determine optimum printing performance for a particular set of ink, substrate, screen, press, and curing variables/conditions. The ink can be affected by stray UV light in and around a printing facility. Be aware of skylights, windows and overhead lights curing the ink in the screen. Light filters are recommended.

CURE PARAMETERS The 3400 Series ink cures when exposed to a medium pressure mercury vapor lamp set at 300 watts per inch with millijoules (mJ) and milliwatts (mW) of:

- > 300 mJ/cm² @ 800 mW/cm² for opaque whites and blacks
- > 200 mJ/cm² @ 800 mW/cm² for other colors

These guidelines are intended only as a starting point for determining cure parameters, which must be determined under actual production conditions. To increase mJ levels, slow down the belt speed or scan speed. To increase mW levels, increase the wattage setting of the UV reactor. To optimize mJ and mW output, maintain the bulb and reflector condition and focus to the substrate. The values mentioned above are representative of measurements taken using an EIT UVICURE Plus radiometer measuring the UVA bandwidth (320 - 390 nm). To obtain accurate readings with the UVICURE Plus, reduce the belt speed to less than 40 ft/min.

CLEAR / VARNISHES Mixing Clear / Metallic Mixing Clear: Use 3426 Mixing Clear to reduce the density of colors or as a clear base for specialty additives such as metallic powders.

ADDITIVES

All additives should be thoroughly mixed into the ink before each use. Prior to production, test any additive adjustment to the ink.

Reducer: Use RE 304 UV Reducer to reduce the viscosity of these inks. Add up to 10% by weight.

Adhesion Promoter: To gain additional adhesion performance to aged or difficult to adhere to substrates use NB80 UV Adhesion Promoter. Add up to 5% by weight. Improved adhesion will be demonstrated after 24 hours, with full cross linking in 3 to 7 days. Ink mixed with NB80 has a 4 to 8 hour pot life.

CLEAN UP

Screen Wash (Prior to Reclaim): Use IMS203 Economy Graphic Screen Wash or IMS207C Graphic Recirculating Wash.

Press Wash (On Press): Use IMS 301 Premium Graphic Press Wash.

STORAGE

Inks react to light and temperature. Store tightly covered at temperatures between 65° - 90°F (18° - 32°C). Ink taken from the press should not be returned to the original container; store separately to avoid contaminating unused ink.

PROCESSING

Die Cutting, Embossing, Forming: Allow the thoroughly cured ink film at least a 24 hour post cure.

Adhesive Lamination: With proper cure (see Adhesion Testing section), laminating adhesive can be used with the 3400 Series. It is recommended to wait 24 hours after printing, but it is possible that a shorter post print time would be acceptable to achieve required function. A printer should pre-test before production.

In-Molding: The 3400 Series may be used in in-mold decorating applications where a deep draw is not required. A tie coat is necessary for printing over the cured ink film for maximum adhesion to the mold resin. The purpose of the tie coat is to create an adhesive layer between the cured ink film and the mold resin.

GENERAL INFORMATION

INK HANDLING

Direct skin contact to UV inks is the primary route of exposure and irritation. Therefore, it is recommended that all personnel 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 cloth (do not use solvent or reducer). Wash the affected area with soap and water. Consult the 3400 Series Material Safety Data Sheet for further instructions and warnings.

The 3400 Series is a one-part, 100% solids UV-curable screen printing ink and does not contain N-vinyl-2-pyrrolidone (trade name V-Pyrol[®]).

**ADHESION
TESTING**

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

1. Touch of ink surface – the ink surface should be smooth and slick.
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.
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 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 are demonstrated within 24 hours after cure.

**WEATHERING /
OUTDOOR
DURABILITY**

The 3400 Series was formulated for second surface printing on membrane overlays for the appliance, automotive and other 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.

PHYSICAL PROPERTIES TEST RESULTS

Property	Test	Result
Adhesion	Cross-hatch Tape (ASTM D3359)	Pass
Gloss	60° meter >70	Pass
Hardness	Gardco/Wolff Wilborn Pencil Hardness Tester	4H
Adhesive Resistance	3M 468MP adhesive, 24 hours at 60°C	Pass
Chemical Resistance	Isopropyl Alcohol >100 double rubs	Pass
Flexibility	180° bend	Pass
Weather Resistance	Second Surface, 3 years exterior*	Pass

*3400 Series inks were formulated with durable pigments. Weather resistance depends on substrate and climate conditions. The 3400 inks were tested for Weather Resistance as second surface prints on polycarbonate film, fully cured, and placed in a QUV weatherometer for 1000 hours. QUV settings for this testing were: UVA-340 lamps, 8 hours UV at 60°C and 4 hours condensation at 50°C.

Except for the Weather Resistance test, the results above were obtained by laboratory testing of 3496 Jet Black on polycarbonate using 355 threads per inch (140 threads per centimeter) plain weave mesh and fully cured. Curing conditions were with one medium pressure mercury bulb at 300 watts per inch and conveyor speed of 40 feet per minute, producing 350 millijoules per square centimeter and 1000 milliwatts per square centimeter.

This information is provided as a general indication of ink performance, not as a specification or a guarantee.

PRODUCT OFFERING

STANDARD PRINTING COLORS

The Standard Printing Colors have excellent opacity, flow characteristics, and are intended to work well from the container.

PANTONE MATCHING SYSTEM[®] BASE COLORS

The Pantone Matching System[®] Base Colors are used to simulate the Pantone[®] Color Formulation Guide. These inks are press ready, can be used in matches to achieve Pantone[®] color simulations, or let down with mixing clear. The ColorStar[®] Color Management System software provides blend formulations using Pantone Matching System[®] Base Colors. These blend formulations are also available at www.nazdar.com.

60 Series Colors: 3461 - 3469 colors have a high pigment concentration. These colors are formulated with some white or opaque pigment in order to increase opacity.

HALFTONE COLORS

Halftone Extender Base is used to reduce the density of any of the halftone colors.

Dense Halftone Colors are formulated with increased densities over the Standard Halftone densities, which are matched to the high end of the SWOP standards, and are designed for printers that want to have the latitude to adjust the density levels of their halftone inks.

TONERS

Toners produce clean and vibrant colors and are press ready. Toners can be used in color matches, or let down with mixing clear.

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/>).

TEXTURED CLEARS

Various first surface UV Texture Clears and Lens Clears are used for the membrane overlay market for selective texturing are available as well as a UV-curable lens clear for windows. These products should be used independent of the 3400 Series inks, which would be used for the second surface printing.

SPECIAL ADDITIVES

When inks are to be printed over a special effect color, the overprinting ink(s) must be evaluated for inter-coat adhesion before proceeding with the production run. To maximize inter-coat adhesion, specialty colors should be printed as late as possible in the print sequence.

The following special effect pigments may be added to 3400 Series. These pigments are available in 1-pound containers. Contact Nazdar for the item number(s) and availability of special effect products. Pigments may settle in the container; prior to printing, thoroughly mix the ink.

Silver (aluminum) Metallic: add up to 8% by weight.

Gold (bronze) Metallic: add up to 15% by weight.

Mix only enough metallic ink to be used the same day. Chemical reactions in metallic inks may result in viscosity, color and printability changes over time.

Pearlescent / Interference Pigments: add up to 20% by weight.

Pantone[®] 871c to 877c has been matched in 3400 Series Ink using Pearlescent Pigments.

Multi-Chromatic Pigments: add up to 10% by weight.

COLOR CARD MATERIALS

The following is a list of screen printed samples available.

3400 Series UV Screen Ink Color Card: shows all standard 3400 colors.

Halogen-Free Color Presenter: shows all the halogen-free colors.

UV Texture Clears Color Card: shows all standard UV texture clears available, including air texture clears and nitrogen texture clears.

NSC UV Crystal Clear Transparent Ink Color Card: shows standard high density crystal clear transparent colors designed to print on windows.

Special Effects Color Card: shows Metallic, Pearlescent, Interference, and Multi-Chromatic effects mixed with clear.

Non-Metallic Pantone® Simulations Sheet: shows representations of the 871c to 877c Pantone® Metallic color matches using pearlescent pigments.

PACKAGING

All items listed below are available in kilogram and gallon containers, unless indicated.

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

** Refer to the Technical Data Sheet for each clear for detailed information on these inks. These clears are for first or top surface printing only.

Item Number	Standard Printing Colors	Item Number	Pantone Matching System® Base Colors
3419*	Fire Red	3426	Mixing Clear
3478	High Intensity White	3458	Tinting White
3479	High Intensity Black	3459	Tinting Black
3498	Bright White	3461	Yellow
34PB24	Deadfront Black	3462*	Warm Red
		3463	Rubine Red
		3464	Rhodamine Red
		3465	Purple
		3466	Violet
		3467	Reflex Blue
		3468	Process Blue
		3469	Green
Item Number	Toners (only in kilogram)	Item Number	Halftone Colors
3480	Yellow Toner (GS)	3490	Halftone Extender Base
3481	Orange Toner	34101	Halftone Cyan Dense
3482	Carmin Toner	34102	Halftone Magenta Dense
3483	Magenta Toner	34103	Halftone Yellow Dense
3484	Maroon Toner	34104	Halftone Black Dense
3485	Green Toner		
3486	Blue Toner (GS)		
3487	Blue Toner (RS)		
3488	Violet Toner		
3489	Red Toner		
34PB12	Medium Yellow (RS)		
34PB18	Red (BS)		
34PB60	Red (YS)		

Item Number	Clears for Selective Texturing**	Item Number	Clears for Selective Texturing** (only in gallons)
NSC40	UV Air Texture Clear Fine	PSPC27	Very Coarse Nitrogen TC
NSC41	UV Air Texture Clear	PSPC27H	Very Fine Nitrogen TC
NSC43	Lens Clear	PSPC27T	Fine Nitrogen TC
NSC47	UV Air Texture Very Fine	PSPC27Y	Fine Nitrogen TC
NSC48	UV Air Texture Medium		
NSC49	UV Air Texture Coarse		
NSC50	UV Air Texture Very Coarse		
NSC51	UV Air Texture Clear		
NSC52	UV Air Texture Clear		

PACKAGING / AVAILABILITY

Special order colors: all items listed below are non-inventoried items and may require additional lead time to provide products and a minimum quantity per color.

These items are available in kilogram and gallon containers, unless indicated.

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

** Refer to the Technical Data Sheet for each clear for detailed information on these inks. These clears are for first or top surface printing only.

Item Number	Standard Printing Colors	Item Number	Halogen-Free Colors (only in kilograms)
3411*	Lemon Yellow	34200	Halogen-Free Mixing Clear
3420*	Orange	34201	Halogen-Free Tinting Black
3477	Super Opaque Black	34202	Halogen-Free Tinting White
3496	Jet Black	34205	Halogen-Free Super Opaque Black
3499	Black Concentrate	34206	Halogen-Free Super Opaque White
		34210	Halogen-Free Yellow
		34211	Halogen-Free Orange
		34212	Halogen-Free Red
		34213	Halogen-Free Carmine
		34214	Halogen-Free Magenta
		34215	Halogen-Free Maroon
		34216	Halogen-Free Violet
		34217	Halogen-Free Blue RS
		34218	Halogen-Free Blue GS
		34219	Halogen-Free Green

PACKAGING

Additives/Reducers are available in quart and gallon containers.
Cleaners are available in gallon, 5 gallon and 55 gallon containers.

Item Number	Additives/Reducers	Item Number	Cleaners
RE304	UV Reducer	IMS203	Economy Graphic Screen Wash
NB80	UV Adhesion Promoter (quarts only)	IMS207C	Graphic Recirculating Wash
		IMS301	Premium Graphic Press Wash

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[®].

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.

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