Nazdar 3400 UV Screen Ink

3400 Series 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. 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 (PC)

Substrate Material(s) listed below may be Limited in Adhesion *(testing highly recommended for each print run)*
Top coated / Print treated polyester (PET)
HP Indigo® digital offset prints *(Addition of 5% NB80, see additives section)*

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.

Mesh

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

305-355 tpi (120-140 tpcm) with a mesh opening of 50 um or more monofilament polyester can be used for specialty applications (i.e. pearlescents, aluminums, etc.).

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

Depending upon ink deposit, the estimated coverage per gallon: 2,500 – 3,800 square feet (232 - 353 square meters)
Reference www.nazdar.com/en-us/ColorStar for examples of coverage calculations.

Screen Printing

Standard items are 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 this ink series with other inks or series.

Cure Parameters

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

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residual odor. “Overcuring” the ink may reduce the flexibility of the printed part and adhesion of subsequent ink layers.

Mercury Vapor UV Curing: Standard ink cures when exposed to a single medium pressure mercury vapor lamp emitting output millijoules (mJ) and milliwatts (mW) of:

200+ mJ/cm² @ 800+ mW/cm² for most colors
300+ mJ/cm² @ 800+ mW/cm² for opaque whites and blacks

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, and ensure proper focus to the substrate.
These guidelines are representative of measurements taken using an EIT® UVICURE® Plus radiometer measuring the UVA bandwidth (320-390 nm). To obtain accurate mJ readings with the UVICURE® Plus, reduce the belt speed to less than 40 ft/min.

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.
In-Mold Decorating: This 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

Adhesion Testing

When recommended UV energy output levels are achieved, checking the degree of cure on a **cooled down** print is imperative:
- Touch of ink surface – the ink surface should be smooth.
- Thumb twist – the ink surface should not mar or smudge.
- Scratch surface – the ink surface should resist scratching.
- 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

Cleanup

For screen cleaning, similar products to those listed below may be used.

Screen Wash (Prior to Reclaim): Use IMS201 Premium Graphic Screen Wash or IMS203 Economy Graphic Screen Wash
Press Wash (On Press): Use IMS301 Premium Graphic Press Wash

Ink Modifications

Clears / Varnishes

Mixing Clear: use to reduce the density of colors.

Additives

The market specific performance properties of this ink series / ink item 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.

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Example for additives: Ink at 100g with 8% of an additive is calculated as: 100g ink + 8g additive = 108g total

Reducer / Thinner

Use the following item(s) to reduce the viscosity of these inks. Over reduction can reduce print definition, film thickness and adversely affect cure.
RE304 Reducer add up to 10%.

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Adhesion Promoter
Use the following item(s) to enhance adhesion.
NB80 UV Adhesion Promoter: add up to: 5%. Improved adhesion will be demonstrated within 8-24 hours, with full crosslinking in 4-7 days. Ink mixed with NB80 UV Adhesion Promoter has a 4-8 hour pot life. NB80 is sensitive to humidity and moisture; clean the lid and container thoroughly after each use to prevent fusing of the container.

General Information
Handling
Refer to the SDS for recommendations on handling.
Wear gloves and barrier cream to prevent direct skin contact. Safety glasses are suggested in areas where ink may be splashed. If product 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).

Weathering / Outdoor Durability
This Series was formulated for second surface printing on membrane overlays for 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.

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. Store closed containers at temperatures between 65°-78°F (18°-25°C). Storing products outside of these recommendations may shorten their shelf life.

Standard items supplied in 1-gallon (4/5 kilo) containers or smaller. Useable for a period of at least **24 months** from the date of manufacture.

Shelf life above applies to the standard ink items listed on this TDS. To obtain the shelf life for special inks and additives, contact Nazdar Customer Service or Nazdar Technical Service. See contact listing at the end of this document.

Physical Properties Test Results
These results were obtained by laboratory testing; this information is provided as a general indication of the ink performance, not as a specification or a guarantee.
3496 Jet Black was used on polycarbonate using 355 threads per inch (140 threads per centimeter) plain weave. The ink was cured 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.

Adhesion	Test: Cross-hatch tape (ASTM D3359) : Pass
Gloss	Test: 60° meter >70 : Pass
Pencil Hardness	Test: Gardco/Wolff Wilborn Pencil Hardness Tester : 4H
Chemical Resistance	Test: 100 double rubs with Isopropyl Alcohol : Pass
Adhesives Resistance	Test: 3M 468MP adhesive, 24 hours at 60°C: Pass
Flexibility	Test: 180° bend: Pass

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Weather Resistance Test: Second Surface, 3 years exterior*: Pass

Standard Color Range

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.

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 colors and are designed for printers who want to have the latitude to adjust the density levels.

Standard Printing Colors

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

Standard Colors Product Specific

34PB24 Deadfront Black appears as an opaque black lighted 1st surface and transparent when lighted 2nd surface.

Pantone Base Colors

Pantone Matching System Base Colors are used to simulate the Pantone® Formulation Guide when printed on a white substrate. These inks are press ready, can be used in matches to achieve Pantone color simulations, or let down with mixing clear.

60 Series Colors: 61-69 colors have a high pigment concentration. These colors are formulated to have some white pigment or opaque pigment to increase opacity.

Toners

Toners can be used as supplied, in color matches, or let down with clear.

Series Specific

Textured and Lens Clears

Various first surface UV Texture Clears and Lens Clears are used for the membrane overlay market for selective printing. These products should be used independently of the 3400 Series inks, which would be used for the second surface printing. Nazdar's range of UV Texture Clears and Lens Clears are listed in the 'Packaging / Availability' section. Reference the specific product's Technical Data Sheet at www.nazdar.com for processing information.

NSC UV Crystal Clear Transparent Inks

NSC UV Crystal Clear Transparent Screen inks exhibit excellent clarity with very little haze, making them ideal for use as transparent window colors. NSC UV Crystal Clear Transparent inks may be printed top or sub surface. Nazdar's range of NSC UV Crystal Clear Transparent colors are listed in the 'Packaging / Availability' section. Reference the specific product's Technical Data Sheet at www.nazdar.com for processing information.

Black Concentrate

Mix 3499 Black Concentrate with 3400 black colors to increase density. 3499 Black Concentrate is not intended to be used as a standalone ink related to cure and performance issues.

Special Effect Pigments

When inks are to be printed with a special effect color, all ink layers must be evaluated for intercoat adhesion before proceeding with the production run. To maximize intercoat adhesion, specialty colors should be printed as late as possible in the print sequence.
Pigments may settle in the container; prior to printing, thoroughly mix the ink.
The following special effect pigments may be added to the ink. Contact Nazdar for the item number(s) and availability of special effect products or they can be found at www.nazdar.com.

Metallic Silver (aluminum), add up to: 8%
Metallic Gold (bronze), add up to: 15%
Chemical reactions in metallic inks may result in viscosity, color and printability changes over time; due to this, mix only enough

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metallic ink to be used the same day.

Pearlescent / Interference, add up to: 20%
Multi-Chromatic, add up to: 10%

Color Card Materials

The following is a list of available literature representing this ink series.
- 3400 Series UV Screen Ink Color Card (CARD34): shows all standard 3400 colors
- Special Effects Color Card (CARDSPL): shows various special effect pigments mixed with clear
- Halogen-Free Color Presenter (CARDHF): shows all the halogen-free colors
- NSC UV Air Texture Clears (LIT0217): shows the standard UV air texture clears.
- NSC UV Crystal Clear Transparent Ink Color Card (CARDSS2): shows standard high density crystal clear transparent colors designed to print on windows

Packaging / Availability

Contact your Nazdar distributor for product availability and offering.

Packaging / Availability Product Specifc

**Any of the following items noted with an asterisk are not recommended in applications that require high heat during processing.*

Item Type	Item Number	Item (or Color) Description
Standard Colors	3411*	Lemon Yellow
Standard Colors	3419*	Fire Red
Standard Colors	3420*	Orange
Clears / Varnishes	3426	Mixing Clear
Standard Colors	3477	Super Opaque Black
Standard Colors	3478	High Intensity White
Standard Colors	3479	High Intensity Black
Standard Colors	3496	Jet Black
Standard Colors	3498	Bright White
Standard Colors	3499	Black Concentrate
Blending Toners / Toners	34PB12	Trans Medium Yellow (RS)
Blending Toners / Toners	34PB18	Trans Red (BS)
Standard Colors	34PB24	Deadfront Black
Blending Toners / Toners	34PB60	Trans Red (YS)
Mixing Colors	3458	Tinting White
Mixing Colors	3459	Tinting Black
Mixing Colors	3461	Yellow
Mixing Colors	3462*	Warm Red
Mixing Colors	3463	Rubine Red
Mixing Colors	3464	Rhodamine Red
Mixing Colors	3465	Purple
Mixing Colors	3466	Violet
Mixing Colors	3467	Reflex Blue
Mixing Colors	3468	Process Blue
Mixing Colors	3469	Green
Blending Toners / Toners	3480	Yellow Toner (GS)
Blending Toners / Toners	3481	Orange Toner
Blending Toners / Toners	3482	Carmine Toner
Blending Toners / Toners	3483	Magenta Toner
Blending Toners / Toners	3484	Maroon Toner
Blending Toners / Toners	3485	Green Toner
Blending Toners / Toners	3486	Blue Toner (GS)
Blending Toners / Toners	3487	Blue Toner (RS)
Blending Toners / Toners	3488	Violet Toner
Blending Toners / Toners	3489	Red Toner

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Halftone Colors	3490	Halftone Extender Base
Halftone Colors	34101	Halftone Cyan Dense
Halftone Colors	34102	Halftone Magenta Dense
Halftone Colors	34103	Halftone Yellow Dense
Halftone Colors	34104	Halftone Black Dense
Series Specific Item	NSC43	Lens Clear
UV Air Texture Clears	NSC40	UV Air Texture Clear Fine
UV Air Texture Clears	NSC41	UV Air Texture Clear
UV Air Texture Clears	NSC47	UV Air Texture Very Fine
UV Air Texture Clears	NSC48	UV Air Texture Medium
UV Air Texture Clears	NSC49	UV Air Texture Coarse
UV Air Texture Clears	NSC50	UV Air Texture Very Coarse
UV Air Texture Clears	NSC51	UV Air Texture Clear
UV Air Texture Clears	NSC52	UV Air Texture Clear
Crystal Clear Transparent Colors	NSC29	UV Crystal Mixing Clear
Crystal Clear Transparent Colors	NSC30	UV Crystal Clear Yellow (GS)
Crystal Clear Transparent Colors	NSC31	UV Crystal Clear Yellow (RS)
Crystal Clear Transparent Colors	NSC32	UV Crystal Clear Red (BS)
Crystal Clear Transparent Colors	NSC33	UV Crystal Clear Red (YS)
Crystal Clear Transparent Colors	NSC34	UV Crystal Clear Magenta
Crystal Clear Transparent Colors	NSC35	UV Crystal Clear Violet
Crystal Clear Transparent Colors	NSC36	UV Crystal Clear Blue (GS)
Crystal Clear Transparent Colors	NSC37	UV Crystal Clear Blue (RS)
Crystal Clear Transparent Colors	NSC39	UV Crystal Clear Black
Additives	NB80	UV Adhesion Promoter
Additives	RE304	UV Reducer
Cleaners	IMS201	Premium Graphic Screen Wash
Cleaners	IMS203	Economy Graphic Screen Wash
Cleaners	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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