

4000 Series UV Screen Ink is a graphic screen printing ink formulated to adhere to a wide range of acrylic, PETG, and styrene requiring heat-bending, router cutting, and low draw thermoforming for the sign and graphics markets. 4000 Series ink provides a suitable ink surface hardness for immediate finishing.

### SUBSTRATES

Various Acrylic materials including:

Arkema: Plexiglas® G, Plexiglas® MC, Plexiglas® MCS, Plexiglas® SG, Plexiglas® T

Evonik Cyro: Acrylite® FF, Acrylite® SG, Acrylite® GP

Plaskolite: Optix®, Optix® LD, Duraplex

*Note: Acrylic recommendations are based on internal adhesion testing under the processing outlined in this technical data sheet. Nazdar does not have control over the substrate manufacturer's process tolerance, changes to formulation, aging of material, masking material, etc. It is recommended for user to qualify adhesion and finishing processing prior to full production.*

PETG, styrene, most rigid and flexible vinyl, static cling vinyl, most rigid and flexible treated polyethylene, most rigid and flexible treated polypropylene, and treated fluted polypropylene

*Note: The surface tension for polyethylene and polypropylene substrates should be at or above 44 dynes/cm.*

### 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 tpi (140-165 tpcm) monofilament polyester mesh for most applications

#### STENCIL

Solvent resistant, UV ink compatible direct emulsions and capillary films

#### SQUEEGEE

70-90 durometer polyurethane squeegee

#### COVERAGE

3,200-4,200 square feet (295-390 square meters) per gallon depending upon ink deposit

#### PRINTING

The 4000 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.

### CURE PARAMETERS

The 4000 Series ink cures when exposed to single medium pressure mercury vapor lamp emitting output millijoules (mJ) and milliwatts (mW) values of:

100-150 mJ/cm<sup>2</sup> @ 600+ mW/cm<sup>2</sup> (highly pigmented colors may require higher UV output)

When 2 lamps are used for curing a color, the first lamp should provide the required level of output. Additional cure may be required when printing over a dark or colored background.

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, and higher residual odor.

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 mW readings with the UVICURE Plus, reduce the belt speed to less than 40 ft/min.

### CLEARS / VARNISHES

Mixing Clear: Use 4026 Mixing Clear to reduce the density of colors or as a clear base for specialty additives such as pearlescent 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 RE315 UV Reducer to reduce the viscosity of these inks. Add up to 5% by weight.

Reducer/Hardener: Use Care58 Fast Rigid Thinner to increase the surface hardness and reduce the viscosity of these inks. Add up to 5% by weight. Addition of Care58 may reduce the formability and flexibility of 4000 Series.

Adhesion Promoter: To gain additional adhesion performance to aged or lower grade substrates, use NB80 UV Adhesion Promoter. Add up to 5% by weight. Improved adhesion will not be demonstrated for 24 hours, with full cross linking in 4-7 days. Ink mixed with NB80 UV Adhesion Promoter has a 4-8 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 IMS301 Premium Graphics Press Wash.

### STORAGE

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

4000 Series has been formulated to provide a mar resistant ink surface after UV curing. Exposure to additional high heat levels increases the level of gouging or scratch resistance.

Stacking: suitable for immediate stacking. Although surface hardness of the cured ink film has been optimized for handling, the printer must assume responsibility for pre-testing and qualifying the parameters for stacking prints prior to each production run. Block resistance is influenced by the level of cure, the weight or gauge of the substrates and/or the heat and humidity of the printing environment.

Cutting: suitable for router cutting, guillotine cutting, and laser cutting.

Heat Bending: suitable for heat bending at a 180° angle, inward and outward. Areas exposed to high heat may exhibit a harder ink surface.

Thermoforming / Drape Forming: suitable for 3-4" (8-10 cm) thermoforming draw and drape forming.

## 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 4000 Series Material Safety Data Sheet for further instructions and warnings.

The 4000 Series is a one-part, 100% solids UV-curable screen printing ink which 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 will be smooth.
2. Thumb twist – the ink surface will not smudge significantly.
3. Scratch surface – the ink surface will resist scratching.
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.

### WEATHERING / OUTDOOR DURABILITY

At full strength and properly cured, 4000 Series colors are formulated to provide 2 years outdoor durability when mounted vertically in the Central U.S.A.

Outdoor durability cannot be specified exactly. Slight color change and loss of gloss should be expected. Variables affecting a printed part's durability include:

- Ink film thickness and degree of curing
- Color formulation:
  - Adding large amounts of mixing clear or white to any color
  - Mixing several colors to achieve a specific color
  - Mixing a small quantity of any single color with any other color
- Substrate type and age, the substrate by itself should provide the required durability
- Mounting angle or directional orientation
- Geographical location
- Air pollution and exposure to excessive abrasion (for example, brush car washes)
- Non-clear coated prints exhibit more color change and loss of gloss

### 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

360 Series Colors: 40358-40369 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 4026 Mixing Clear.

#### HALFTONE COLORS

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

Standard Halftone Colors are formulated with hues and densities matched to the requirements of the graphics industry.

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

High Intensity Halftone Black has been developed to function as a dense halftone and line color in a single pass.

Yellow (RS) Halftone Color is intended to better facilitate matching redder shades without blending Halftone Magenta into the Halftone Yellow.

#### SPECIAL ADDITIVES

When inks are to be printed over a special effect color, the overprinting ink(s) 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 4000 Series. These pigments are available in 1-pound containers. Contact Nazdar® for the item number(s) and availability of special effect products.

Metallics: Silver (aluminum) - add up to 8% by weight, Gold (bronze) - 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.

Pearlescents / Interference / Multi-Chromatic: Pearlescent and Interference pigments - add up to 20% by weight, Multi-Chromatic pigments - add up to 10% by weight. See the Pearlescent, Interference, and Multi-Chromatic Technical Data Sheets for more information.

Phosphorescents: Add up to 50% by weight.

Fluorescents: Add up to 30% by weight. Fluorescent colors fade quickly with exposure to ultraviolet light. This includes outdoor exposure as well as UV reactor exposure.

#### COLOR CARD MATERIALS

The following is a list of screen printed samples available.

UV Color Card: shows the Standard Printing Colors, Pantone Matching System® Base Colors, Halftone Colors, Fluorescent Colors

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

**PACKAGING** All items listed below are available in gallon containers.

Stock Number	Standard Printing Colors	Stock Number	Pantone Matching System® Base Colors
4019	Fire Red	40358	Tinting White
4026	Mixing Clear	40359	Tinting Black
4078	High Intensity White	40360	Orange
4079	High Intensity Black	40361	Yellow
		40362	Warm Red
		40363	Rubine Red
		40364	Rhodamine Red
		40365	Purple
		40366	Violet
		40367	Reflex Blue
		40368	Process Blue
		40369	Green
Stock Number	Standard/Dense Halftone Colors MTR (Medium Tack Rheology)		
40140	Halftone Extender Base (MTR)		
40141	Halftone Cyan (MTR)		
40142	Halftone Magenta (MTR)		
40143	Halftone Yellow (MTR)		
40144	Halftone Black (MTR)		
40151	Halftone Cyan Dense (MTR)		
40152	Halftone Magenta Dense (MTR)		
40153	Halftone Yellow Dense (MTR)		
40154	Halftone Black Dense (MTR)		
40156	High Intensity Halftone Black (MTR)		

**PACKAGING / AVAILABILITY** Special order colors: all items listed below are non-inventoried items and may require additional lead time. These items are available in gallon containers.

Stock Number	Standard Printing Colors	Stock Number	Standard/Dense Halftone Colors MTR (Medium Tack Rheology)
4010	Primrose Yellow	40155	Halftone Yellow Dense RS (MTR)
4011	Lemon Yellow		
4012	Medium Yellow		
4013	Emerald Green		
4020	Brilliant Orange		
4052	Super Opaque Black		
4067	Reflex Blue		
4068	Process Blue		
4075	Super Opaque White		

### PACKAGING

Additives/Reducers are available in quarts.  
Cleaners are available in quart and gallon containers.

Stock Number	Additives/Reducers	Stock Number	Cleaners
NB80	UV Adhesion Promoter	IMS203	Economy Graphic Screen Wash
CARE58	Rigid Fast Thinner	IMS207C	Graphic Recirculating Wash
RE315	UV Reducer	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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