

3600 Series UV Screen Ink has been formulated for applications on pressure-sensitive decals requiring exceptional performance. 3600 UV Decal Series exhibits excellent exterior durability and chemical resistance. The inks will thermal die cut and accept pre-mask.

Substrates

- Pressure-sensitive calendar vinyls
- Pressure-sensitive cast vinyls (for extended outdoor weathering)
- Print treated polyesters

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

355-390 tpi (140-153 tpcm) with a mesh opening of 22-38 um monofilament polyester mesh for most applications.

305-420 tpi (120-165 tpcm) monofilament polyester mesh can be used for specialty applications with the mesh opening appropriate to the effect (*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

Estimated 2500-3500 square feet (232 – 325 square meters) per gallon depending upon ink deposit. Reference www.nazdar.com for examples of coverage calculations.

Printing

3600 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 3600 Series with other inks besides the 3600 Series.

Cure Parameters

The 3600 Series ink cures when exposed to a medium pressure mercury vapor lamp set at 200 watts per inch with millijoules (mJ) and milliwatts (mW) of:

- 90-100 mJ/cm² @ 600 mW/cm² for (Pantone® Base Colors, Most Standard Printing Colors, Halftone Colors and Blending Toners)
- 100-130 mJ/cm² @ 600 mW/cm² for (3678, 3679, 3698)

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.

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

Clears / Varnishes

Mixing Clear: Use 3626 Mixing Clear to reduce the density of colors or as a clear base for specialty additives such as Metallics.

Overprint Clear: Use 3627 Overprint Clear to provide added surface protection and extend the weatherability and outdoor durability of colors.

Common Performance Additives

The market specific performance properties of the 3600 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 RE306 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.

Flexibilizer: Use RE308 UV Reducer to increase the flexibility of these inks. Add up to 5% by weight. There is no pot life; however, the addition of RE308 could show a decrease in block resistance.

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 4-7 days. Ink mixed with NB80 UV Adhesion Promoter has a 6-8 hour pot life.

Gloss / Flattening Powders / Improved Slip: Use CARE59 Satin Paste to reduce gloss and improve slip. Add up to 10% by weight. CARE59 should be power mixed into 3600 Series ink.

Cleanup

Screen Wash (Prior to Reclaim): Use IMS207 Graphic Recirculating Screen Wash, IMS203 Economy Graphic Screen Wash, or IMS206 Graphic Auto Screen Wash.

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

Storage

Store closed containers at temperatures between 65°-78°F (18°-25°C). Ink taken from the press should not be returned to the original container; store separately to avoid contaminating unused ink.

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-Pyrrol®).

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 and slick.
2. Thumb twist – the ink surface should not mar or smudge.

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3. Scratch surface – the ink surface should resist scratching.
4. 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

At full strength and properly cured, 3600 Series colors are formulated to provide enhanced outdoor durability and can be used without an overprint clear. However, the use of 3627 Overprint Clear increases the projected outdoor durability. (See durability table estimates listed under product offering).

All rating estimates for outdoor weathering in this technical data sheet are based on 3600 Series colors or special additive pigmented colors being printed on pressure sensitive cast vinyl and mounted vertically in Central USA. Temperate climates can add to the rating estimates while hotter climates can reduce the rating estimates.

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:
 - Large amounts of mixing clear or white
 - Mixing several colors into one match
 - Mixing a small quantity of any single color
- Substrate type and age
- Mounting angle and directional orientation
- Geographical location
- Degree of air pollution
- Excessive abrasion
- Non-clear coated prints exhibit more color change and loss of gloss

Aluminum colors prepared according to the Special Additives section must be overprinted with 3627 Overprint Clear and properly cured to provide 3 years outdoor durability.

Pearlescent colors prepared according to the Special Additives section must be overprinted

with 3627 Overprint Clear and properly cured to provide 5 years outdoor durability.

Multi-Chromatic and Interference colors prepared according to the Special Additives section must be overprinted with 3627 Overprint Clear and properly cured to provide outdoor durability when mounted vertically in the Central U.S.A. While printed decals appear legible outdoors over a 3 year period, these pigments are prone to color shift with outdoor exposure.

Fluorescent colors fade quickly with outdoor exposure and are not recommended for outdoor durability.

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.

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 common to the graphic industry.

Medium Tack Rheology (MTR) Halftones can achieve processing speeds for flatbed, clam shell and most in-line presses while maintaining dot quality.

Standard Printing Colors

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

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.

60 Series Colors: 3660-3669 colors have a high pigment concentration. These colors are

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formulated to have some white pigment or opaque pigment to increase opacity.

pigments may cause the mixed ink to have shorter shelf life and may affect exterior durability

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Transparent Toners

80 Series Colors: Single Pigment Toners produce clean and vibrant colors. Single Pigment Toners can be used as supplied, in color matches or let down with mixing clear.

Blending Toners

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

Pantone 871c-877c Metallic Simulated Colors

Pantone® 871c to 877c colors have been matched in 3600 Series ink using pearlescent pigments. When printed on a white background, a gold or silver metallic effect is achieved. A 305 tpi (120 tpcm) mesh with a mesh opening of 50 um or more is recommended.

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 3600 Series. Contact Nazdar for the item number(s) and availability of special effect products. Technical Data Sheets for each of the following special effect pigments can be found at www.nazdar.com.

Recommended Aluminum Pigments:

SIPM571 313 Aluminum Paste (Coarse Aluminum)

SIPM606 Aluminum 6600 (Medium Aluminum)

SIPM573 2871 Aluminum Pigment (Fine Aluminum)

Using the above recommended aluminums with 3626 Mixing Clear, will result in a minimum of 6 month shelf life. Using any other aluminum

Aluminum Pigment Load: The maximum recommended aluminum load is 15% in 3626 mixing clear. Mixing aluminum with colors will lower the allowable concentration of metallic in a formulation. The allowable concentration will depend on ink deposit and curing parameters. Care should be taken to ensure proper cure and adhesion.

Exceeding these recommendations may lead to degradation of the ink's overall performance, including flexibility, adhesion, intercoat adhesion and exterior durability.

Gold and Bronze Powders: Gold and bronze powders are not recommended due to poor exterior durability. To achieve gold and bronze colors use pearlescent and aluminum pigments.

Pearlescent: Using Automotive Grade Pearlescent Pigments add up to 20% by weight.

SIP1519 9307 SW Gold Auto Grade

SIP1520 9520 SW Bronze Auto Grade

SIP1536 Card Silver BN001

Pantone® 871c to 877c (67330136 Gold through 67330736 Silver) has been matched in 3600 Series Ink using Automotive Grade Pearlescent Pigments. To achieve extended durability overprint these special colors with 3627 Overprint Clear, formulas are available through contacting technical service.

Interference: Using Interference Pigments add up to 20% by weight (Refer to Special Effects Color Card). Note: Interference Pigments may shift in shade and color with outdoor exposure.

Multi-Chromatic: Using Multi-Chromatic Pigments add up to 10% by weight (Refer to Special Effects Color Card). Note: Multi-Chromatic Pigments may shift in shade and color with outdoor 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

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60/360 Color Card: shows the 60 Series Pantone Matching System® Base Colors

Specialty Effects Color Card: shows Metallic and Pearlescent mixed with clear

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

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Packaging / Availability

Contact your Nazdar distributor for product availability and offering.

Standard Ink Items

Standard ink items listed below are inventoried in gallon containers.

Stock Number	Standard Printing Colors	Estimated Durability Without Clear Coating (Years) * Chalks	Estimated Durability With 3627 Clear Coating (Years)
3610	Primrose Yellow	2	3
3611	Lemon Yellow	4	5
3612	Medium Yellow	4	5
3619	Fire Red	4	5
3621	Peacock Blue	4	5
3652	Super Opaque Black	4	5
3675	Super Opaque White	4*	5
3678	High Intensity White	4*	5
3679	High Intensity Black	4	5
3698	Bright White	4*	5
3627	Overprint Clear	5	N/A

Stock Number	Pantone® Matching System Base Colors	Estimated Durability Without Clear Coating (Years) * Chalks	Estimated Durability With 3627 Clear Coating (Years)
3626	Mixing Clear	4	N/A
3658	Tinting White	4*	5
3659	Tinting Black	4	5
3661	Yellow	4	5
3662	Warm Red	4	5
3663	Rubine Red	4	5
3664	Rhodamine Red	4	5
3665	Purple	4	5
3666	Violet	4	5
3667	Reflex Blue	4	5
3668	Process Blue	4	5
3669	Green	4	5

Stock Number	+ Blending Toners	Estimated Durability Without Clear Coating (Years)	Estimated Durability With 3627 Clear Coating (Years)
3680	Yellow Toner	4	5

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3681	Orange Toner	4	5	EN
3682	Carmine Toner	3	5	Ref: v 10 EN
3683	Magenta Toner	4	5	
3684	Maroon Toner	4	5	
3685	Green Toner	4	5	
3686	Blue Toner (GS)	4	5	
3687	Blue Toner (RS)	4	5	
3688	Violet Toner	4	5	
3689	Red Toner	4	5	

Stock Number	Halftone Colors	Estimated Durability Without Clear Coating (Years)	Estimated Durability With 3627 Clear Coating (Years)
36HTEX	Halftone Extender Base	4	NA
36HTC	Halftone Cyan	4	5
36HTM	Halftone Magenta	4	5
36HTY	Halftone Yellow	4	5
36HTBK	Halftone Black	4	5

Stock Number	Special Order Halftone Colors	Estimated Durability Without Clear Coating (Years)	Estimated Durability With 3627 Clear Coating (Years)
36140	HT Extender Base G7 (MTR)	4	NA
36151	HT Cyan Dense G7 (MTR)	4	5
36152	HT Magenta Dense G7 (MTR)	4	5
36153	HT Yellow Dense G7 (MTR)	4	5
36154	HT Black Dense G7 (MTR)	4	5

Additives / Reducers

Additives/Reducers listed below are inventoried and available in quart/liter and gallon containers.

Item Number	Item Description
RE306	UV Reducer
RE308	UV Reducer [Flexibilizer]
CARE59	UV Satin Paste
NB80	UV Adhesion Promoter

Cleaners / Clean Up

Item Number	Item Description
IMS201	Premium Graphic Screen Wash
IMS203	Economy Graphic Screen Wash
IMS206	Graphic Auto 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®.

Nazdar Ink Technologies Offices

Nazdar Ink Technologies Offices

Nazdar Ink Technologies -World Headquarters

8501 Hedge Lane Terrace
 Shawnee, KS 66227-3290 USA

Toll Free US: 866.340.3579

Tel: +1 913-422-1888

Fax: +1 913-422-2296

E-mail: custserv@nazdar.com

Technical Support E-mail: InkAnswers@Nazdar.com

Nazdar Limited – England

Battersea Road, Heaton Mersey
 Stockport, England SK4 3EE

Tel: + 44 (0) 161-442-2111

Fax: + 44 (0) 161-442-2001

EMEA Technical Service E-mail:

technicalservicesuk@nazdar.com

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Nazdar – China
Room 17-04, Silver Centre
1388, North Shan Xi Road
Shanghai 200060 China
Tel: 86-13818301261
China E-Mail aspac@nazdar.com

Nazdar – Singapore
10, Changi South Street 3 #01-01
Singapore 486147
Tel: +65-65434920
Fax: +65-65433690
Asia E-mail: aspac@nazdar.com

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