

1500 UV Screen Ink Series is designed for three-dimensional vacuum or thermal forming on a wide variety of substrates. 1500 Series exhibits excellent adhesion, as well as superior flexibility for forming applications in point of purchase and specialty markets such as three-dimensional signs, game boards, beverage panels, recreational helmets and specialty displays.

Substrates

- Styrene
- Polycarbonate
- ABS
- Acrylic
- PETG
- PVC

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.

305-355 tpi (120-140 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.

Printing

1500 series ink 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.

Nazdar does not recommend inter-mixing of 1500 series ink with other inks besides the 1500 series ink.

Cure Parameters

1500 series ink cures when exposed to a single medium pressure mercury vapor lamp emitting output millijoules (mJ) and milliwatts (mW) of:

175-250 mJ/cm² @ 600+ mW/cm²
for most colors

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.

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 1526 Mixing Clear to reduce the density of colors.

Overprint Clear: Use 1527 Overprint Clear to provide added surface protection and increase durability.

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Common Performance Additives

The market specific performance properties of the 1500 series ink 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 RE315 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.

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 1500 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

1500 series has been formulated to provide a hard ink surface after a two-step curing process. The first process is curing with UV light providing a touchable surface with extreme flexibility required for thermoforming. The second process of exposure to heat during forming produces the

harder, more resistant surface. If the 1500 series ink is not exposed to high heat after initial curing with UV light, the surface may remain soft.

Stacking: 1500 series ink develops a very flexible elastic ink film after UV light curing. 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. It is Nazdar's recommendation to individually rack cured prints prior to vacuum or thermal forming.

Do not stack pre-formed prints face-to-face.

Forming: The ink's flexibility and adhesion properties allows for three dimensional thermal or vacuum forming. 1500 series ink can be formed when printed with multiple coats on a first surface or second surface application. The 1500 series ink can be formed under extreme heat (300°-380°F) without cracking, blistering, bleeding or fading.

Heat Bending: When heat bent, only the print area exposed to heat provides the immediate harder surface. Areas not exposed to high heat may retain a soft ink surface and require special handling.

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

UV Screen 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. 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 after forming is complete.

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: 15360-15369 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.

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.

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

Pantone 871c-877c Metallic Simulated Colors

Pantone® 871c to 877c colors have been matched in 1500 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 1500 series ink. 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.

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

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

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

Pearlescent / Interference: Add up to 20% by weight.

Multi-Chromatic: Add up to 10% by weight.

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Color Card Materials

The following is a list of available screen printed sample literature representing 1500 Series.

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

Special Effects Color Card (CARDSPL): shows various special effect pigments mixed with clear.

Non-Metallic Pantone Simulations sheet (LIT0121): shows the 871c to 877c Pantone metallic color matches using pearlescent pigments.

Packaging / Availability

Contact your Nazdar distributor for product availability and offering.

Standard Ink Items

Standard ink items listed below are inventoried in gallon containers.

Standard Printing Colors

Item Number	Color
1519	Fire Red
1526	Mixing Clear
1527	Overprint Clear
1575	Super Opaque White
1578	High Intensity White
1579	High Intensity Black

Pantone Matching System® Base Colors

Item Number	Color
15358	Tinting White
15359	Tinting Black
15360	Orange
15361	Yellow
15362	Warm Red
15363	Rubine Red
15364	Rhodamine Red
15365	Purple
15366	Violet
15367	Reflex Blue
15368	Process Blue
15369	Green

Halftone Colors

Item Number	Color
1590	Halftone Extender Base
15101	Halftone Cyan Dense
15102	Halftone Magenta Dense
15103	Halftone Yellow Dense
15104	Halftone Black Dense
15106	High Intensity Halftone Black

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.

Printing Colors

Item Number	Color
1510	Primrose Yellow
1511	Lemon Yellow
1512	Medium Yellow
1520	Brilliant Orange
1567	Reflex Blue
1568	Process Blue

Halftone Colors

Item Number	Color
15105	Halftone Yellow Dense (RS)

Pantone 871c-877c Metallic Simulated Colors

Item Number	Color
67332215	SPL 15 871C Pearl Gold
67332315	SPL 15 872C Pearl Gold
67332415	SPL 15 873C Pearl Gold
67332515	SPL 15 874C Pearl Gold
67332615	SPL 15 875C Pearl Gold
67332715	SPL 15 876C Pearl Gold
67332815	SPL 15 877C Pearl Silver

Additives / Reducers

Item Number	Item Description
RE315	UV Reducer

UV Screen Ink

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[®].

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