# Nazdar PowerPrint® Plus 1800 UV Screen Ink Series

v 15 EN
Ref: v 14 EN

**The multi-purpose PowerPrint® Plus 1800 Series UV Screen Ink has been formulated to meet the processing speeds of the most modern printing equipment including in-line presses, for a wide range of substrates including treated corrugated polypropylene. PowerPrint® Plus 1800 features include: fast curing, hard ink surface, and high block resistance.**

## Substrates

- Styrene
- Cardstock / Coated paper
- Matte vinyl
- Rigid vinyl
- Top coated polyester
- Pressure sensitive vinyl
- Treated polyethylene banner
- Treated polypropylene banner
- Treated corrugated polypropylene
- Some high density polyethylene sheeting

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

*Not recommended for highly plasticized vinyl materials such as vinyl banner and static cling, and not recommended for container or nameplate applications.*

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.

### Coverage

Estimated 2,500 – 3,500 square feet (232 - 325 square meters) per gallon depending upon ink deposit. Reference www.nazdar.com for examples of coverage calculations.

### Printing

1800 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 1800 Series with other inks besides the 1800 Series.

### Pad Printing

1800 Series can be pad printed. When pad printing with a UV ink on a 3D image, care must be taken to assure the correct amount of UV light output reaches the entire ink surface. Cure units that rotate the printed part in front of the cure lamp are the best solution for UV pad printing.

Use a silicone pad with good chemical resistance for printing. Clean equipment using the chemicals listed below in the cleanup section.

UV Screen Ink

## Cure Parameters

1800 Series cures when exposed to a single medium pressure mercury vapor lamp emitting output millijoules (mJ) and milliwatts (mW) of:

80-100 mJ/cm² @ 600+ mW/cm²
*for most colors*

100-130 mJ/cm² @ 600+ mW/cm²
*for 1820, 1878, 1879, and 18156*

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.

*Note:* Porous substrates can allow ink to dive below the surface requiring a more thorough cure to overcome the added ink thickness.

## Clears / Varnishes

*Mixing Clear:* Use 1826 Mixing Clear to reduce the density of colors.

*Overprint Clear:* Use 1827 Overprint Clear to provide added surface protection and increase durability.

## Common Performance Additives

The market specific performance properties of the 1800 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:

100g ink + 8g additive = 108g total

*Reducer:* Use RE310 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 10% by weight. The addition of RE308 UV Reducer could decrease block resistance.

*Adhesion Promoter:* Use NB80 UV Adhesion Promoter to enhance adhesion on aged or lower grade fluted polypropylenes or to increase adhesion on some acrylics. 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 4-8 hour pot life.

*Gloss / Flattening Powders / Improved Slip:*

Use CARE118 UV Satin Paste to reduce gloss and improve slip. Add up to 20% and power mix into the ink.

Use CARE63 Anti-Blocking Additive to reduce the potential for blocking, reduce gloss, and improve slip. Add up to 10% and power mix into the ink.

## 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 1800 Series items supplied in 1-gallon (4/5 kilo) containers or smaller are 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. Contact Nazdar Technical Service at InkAnswers@nazdar.com, for any questions.

### Processing

Qualify 1800 Series with respect to finishing processes before conducting full scale production; see the 'Additives' section for suggested Additives/Reducers to enhance finishing process performance.

## 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 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. 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.

### Weathering / Outdoor Durability

At full strength and properly cured, 1800 Series colors are formulated to provide 2 years outdoor durability when mounted vertically in the Central U.S.A. The use of 1827 Overprint Clear increases outdoor durability.

*Exceptions:* 1800 EC (Economy) Halftones have a projected 6 months outdoor durability.

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

## 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.

*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.

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

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

*Low Tack Rheology (LTR) Halftones* can achieve the fastest processing speeds on newer in-line presses and cylinder presses while maintaining dot quality with very minimum dot pile.

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

*Economy (EC) Magenta & Economy (EC) Yellow Halftones* are formulated to provide a cost effective alternative to the more durable Halftone Magenta and Yellow. Economy Halftone Colors are indoor/short-term outdoor colors.

*T7 Halftones:* are designed to print to the targeted values of the seven colors (CMYK & RGB) as stated in ISO 12647-2 specification for process color reproduction. These inks can meet the ISO targeted numbers and achieve a neutral 100x3 black when printed on a substrate with a white value similar to a #1 Grade Coated Paper. Best results are achieved when printing these inks at the following solid ink density values and printing sequence:

| | |
|---|---|
| Cyan | 1.45 – 1.50 |
| Yellow | 0.95 – 1.00 |
| Magenta | 1.25 – 1.30 |

## 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:* 18360-18369 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.

## Fluorescent Colors

1800 Series ink is inter-printable with the one-part PowerPrint® Fluorescent series and the Coroplus™ Fluorescent series on each ink series specific substrate range. Refer to the individual PowerPrint® Fluorescent series and the Coroplus™ Fluorescent series technical data sheets for item numbers, substrate range, and processing information.

Fluorescent colors fade with exposure to UV light. This includes outdoor exposure as well as UV reactor exposure. It is therefore recommended to adjust art so that these colors are the final colors printed on any image.

## Pantone 871c-877c Metallic Simulated Colors

Pantone® 871c to 877c colors have been matched in 1800 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 1800 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.

*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.

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

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

### Color Card Materials

The following is a list of available screen printed sample literature representing 1800 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

Check with your distributor for available container size.

MTR T7 Standard / Dense Halftone Colors
*(Medium Tack Rheology)*

| Item Number | Color |
|---|---|
| **18140** | Halftone Extender Base |
| **18141** | Halftone Cyan |
| **18143** | Halftone Yellow |
| **18146** | Halftone Magenta |
| **18144** | Halftone Black |
| **18151** | Halftone Cyan Dense |
| **18153** | Halftone Yellow Dense |
| **16154** | Halftone Black Dense |

MTR Standard / Dense Halftone Colors
*(Medium Tack Rheology)*

| Item Number | Color |
|---|---|
| **18142** | Halftone Magenta |
| **18EC142** | Economy Halftone Magenta |
| **18EC143** | Economy Halftone Yellow |
| **18152** | Halftone Magenta Dense |
| **18156** | High Intensity Halftone Black |

LTR Standard / Dense Halftone Colors
*(Low Tack Rheology)*

| Item Number | Color |
|---|---|
| **18120** | Halftone Extender Base |

Standard Printing Colors

| Item Number | Color |
|---|---|
| **1810** | Primrose Yellow |
| **1811** | Lemon Yellow |
| **1812** | Medium Yellow |
| **1813** | Emerald Green |
| **1819** | Fire Red |
| **1820** | Brilliant Orange |
| **1826** | Mixing Clear |
| **1827** | Overprint Clear |
| **1852** | Super Opaque Black |
| **1867** | Reflex Blue |
| **1868** | Process Blue |
| **1875** | Super Opaque White |
| **1878** | High Intensity White |
| **1879** | High Intensity Black |

Pantone Matching System® Base Colors

| Item Number | Color |
|---|---|
| **18358** | Tinting White |
| **18359** | Tinting Black |
| **18360** | Orange |
| **18361** | Yellow |
| **18362** | Warm Red |
| **18363** | Rubine Red |
| **18364** | Rhodamine Red |
| **18365** | Purple |
| **18366** | Violet |
| **18367** | Reflex Blue |
| **18368** | Process Blue |
| **18369** | Green |

### Non-Standard Ink Items

Non-Standard ink items listed below are special order, non-inventoried colors which may require additional lead time. Check with your distributor for available container size.

Pantone 871c-877c Metallic Simulated Colors

| Item Number | Color |
|---|---|
| **68157518** | SPL 18 871C Pearl Gold |

| | |
|---|---|
| **68157618** | SPL 18 872C Pearl Gold |
| **68157718** | SPL 18 873C Pearl Gold |
| **68157818** | SPL 18 874C Pearl Gold |
| **68157918** | SPL 18 875C Pearl Gold |
| **68158018** | SPL 18 876C Pearl Gold |
| **68158118** | SPL 18 877C Pearl Silver |

## Additives / Reducers

| Item Number | Item Description |
|---|---|
| **RE310** | UV Reducer |
| **RE308** | UV Reducer |
| **CARE118** | UV Satin Paste |
| **CARE63** | Anti-Blocking Additive |
| **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®.*

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