

# Product: Panel Display

## Series: PD™

**DESCRIPTION:** PD series is a single-package UV ink system specifically formulated for printing onto polycarbonate and top-coated polyester used in the manufacture of panel displays, membrane switch overlays and nameplates.

### PD SERIES CHARACTERISTICS & PRODUCT FEATURES:

- Supplied as “700 Series” High Density Colors and SunMatch™ Blending Colors, offering printers the versatility of using PD inks for both first surface graphics as well as second-surface backlit displays commonly seen on automotive dash panels and appliances.
- Resistant to delamination when in contact with pressure-sensitive adhesives
- Excellent flexibility for embossing and die-cutting operations
- Good multiple-pass intercoat adhesion
- Excellent image definition

### PROCESSING NOTES & RECOMMENDATIONS:

- Due to the many different substrates and processing variables used in the manufacture of panel displays and nameplates, pre-testing of all components and phases of application, to ensure adequate performance, is essential prior to use in production.
- For best results, adhesives should be applied 24 hours after curing.
- The surface of polycarbonate and top-coated polyesters can deteriorate and become less receptive to printing inks due to a combination of factors, which include: substrate grade; processing conditions; excessive exposure of the substrate to UV radiation; and spectral output of the particular UV curing unit.
- Blends of PD inks containing a high percentage of white or clear, will have reduced lightfastness properties.
- Any outdoor application requiring the use of white for either printing or blending purposes, must use PD-W50 Blending White. PD-W501 and PD-W70 Whites are not suitable for outdoor exposure.

**INTERCOAT ADHESION:** PD inks exhibit excellent intercoat adhesion and compatibility with pressure-sensitive adhesives. However, as with all UV inks, intercoat adhesion should be monitored throughout the print run when processing multiple ink layers.

### PRODUCT RANGE:

- Special “700 Series” High Density colors for Automotive and Appliance displays. 700 Series inks can be used at full strength or blended with PD-799 Mixing Clear to produce transparent or translucent colors.

- SunMatch™ Blending Colors
- PD-799 also serves as a Metallic Mixing Clear to produce blends using metallic pigments.
- SWOP 4-color process shades
- Opaque Black and White
- Extra Opaque Black and Super Opaque White

**CURING:** Actual cure speeds for PD series inks are dependant on a number of factors and processing variables, including ink film deposit; color shade, strength & opacity; mesh; wattage and type of UV lamps; efficiency of UV curing unit; and substrate.

**UV Energy** – Typical UV energy levels in the range of 250-300 mJ/cm<sup>2</sup> for PD colors, 300-350 mJ/cm<sup>2</sup> for PD Opaque White, and approximately 350-400 mJ/cm<sup>2</sup> for PD Opaque Black is required to ensure adequate cure. PD Super Opaque White will require approximately 400-450 mJ/cm<sup>2</sup> and the Extra Opaque Black requires approximately 450-500 mJ/cm<sup>2</sup> for adequate cure.

Substrates have differing receptivity to UV ink, and on certain rigid and/or colored materials, or when preparing blends of PD series inks containing a high percentage of white or black, it may be necessary to boost curing power to achieve satisfactory adhesion and cure.

**MODIFICATION:** PD does not require the use of additives under normal printing conditions. If viscosity reduction is required, 3-10% by weight of ST-290 Viscosity Modifier may be added.

**PROCESS COLORS:** PD 4-color process inks are available as high color-strength SWOP colors. PD-TPL or PD-TPS Transparent Bases may be used to adjust density. As with all UV halftone printing, plain-weave mesh counts and thin stencil coatings should be used to minimize ink deposit, and reduce dot gain.

**SCREEN MESH:** 305-420/in.(120-165/cm) monofilament polyester mesh, or finer, is suitable for processing. It is possible to use coarser fabrics, however, the curing parameters must be adjusted for sufficient cure of the increased ink film deposit. **Sun Chemical has the mesh best suited for your particular requirements. Contact your local Sun representative for details.**

**SQUEEGEE:** Sharp urethane squeegee of approximately 75-85 durometer. **Sun Chemical has the best squeegee for your particular application. Contact your local Sun representative for recommendations.**

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**METALLIC INKS:** Most Aluminum and Bronze pigments can be used with PD-799 Mixing Clear to produce inks with metallic appearance. Typical levels by weight are:

- 15-20% Bronze paste for gold colors
- 5-10% Aluminum paste for silver colors

**NOTE:** Care should be taken to select metallic pigments with a particle size sufficiently small to easily pass through the selected screen mesh.

**NOTE:** Do not exceed 120°F (49°C) when preparing metallic blends.

**NOTE:** Due to the instability of many metallic pigments, metallic blends must be considered a two-pack system with less than 24 hours (approximate) pot-life. Only mix sufficient quantities for immediate use.

**NOTE:** Pretest all metallic blends prior to use in production.

**COVERAGE:** When printed through a 380/in. (150/cm) plain-weave mesh, PD will cover approximately 3000 square feet per gallon, depending on printing variables. Higher coverage can be achieved when finer mesh counts are used.

**WASH-UP:** PD Series inks may be cleaned from screens and processing equipment with any suitable screen wash, such as VL Wash. Sun Chemical has a variety of wash-ups including ECO friendly screen washes available for your particular needs. Contact us for all of your pre and post-press chemical requirements.

**STORAGE:** When stored in black polyethylene containers at temperatures between 40-90°F (5-32°C), PD has a shelf-life of 36 months.

**HEALTH AND SAFETY:** As with all inks, gloves and safety goggles should be used when handling this product. For more complete information, refer to the relevant **Material Safety Data Sheets**.

700 Series High Density Colors:	SunMatch™ Blending Colors:	Standard Products:
PD-711 GS Yellow PD-715 RS Yellow PD-721 YS Red PD-725 BS Red PD-749 Green PD-755 RS Blue PD-759 GS Blue PD-783 Magenta PD-785 Violet PD-799 Mixing Clear	PD-Y30 Primrose PD-Y50 Golden Yellow PD-O50 Orange PD-R20 Scarlet PD-R50 Red PD-M50 Magenta PD-V50 Violet PD-B50 Blue PD-G50 Green PD-N50 Blending Black PD-W50 BlendingWhite PD-E50 Mixing Clear <b>Note:</b> Although SunMatch pigments are lightfast, we do not recommend this series for applications requiring extreme outdoor durability. If blended inks contain high contents of white, lightfastness is reduced.	PD-C50 Overprint Clear PD-N501 Opaque Black PD-W501 Opaque White  <b>Super Opaque Black &amp; White:</b> PD-W70 Super Opaque White PD-N70 Extra Opaque Black  <b>SWOP Process Colors:</b> PD-S231 SWOP Process Yellow PD-S235 SWOP Process Cyan PD-S240 SWOP Process Magenta PD-S271 SWOP Process Black PD-TPL Long-Flow Transparent Base PD-TPS Short-Flow Transparent Base
<b>Modifiers:</b> ST-290 Viscosity Modifier		

In accordance with information received from suppliers, the full PD series is formulated without heavy metals and complies with: 16 CFR, Part 1303; ANSI Z66.1-1964; ASTM F 963; CONEG packaging regulations; EC Packaging Waste Directive EC/94/62; EN71, section 3; RoHS 2002/95/EC; WEEE 2002/96/EC; E2003/11/EC.

All information on this data sheet is based on Sun Chemical laboratory tests and experience in print shops. Procedures and directions for use of Sun Chemical products (including printing and after-treatment) must be considered as recommendations only, with no warranties expressed or implied. The user of the products described herein is solely responsible for determining suitability of any Sun Chemical product for the particular application. Sun Chemical recommends that all products be pre-tested prior to full-scale production use. This data sheet supersedes all previous publications. Feb. 2009