

Panel Display Hytek™ PDH Series Inks

SunHytek™ family of Screen Automotive Products

1. Description

Panel Display Hytek PDH series inks are UV curing inks specifically formulated for printing onto polycarbonate and print treated polyester used on large format backlit panels, vending machines, membrane switch overlays, nameplates, industrial labels, automotive appliques, fascias and various other similar applications.

Panel Display Hytek PDH series inks are single pack easy to use UV curing inks with exceptional flexibility and resistance to delamination when used in combination with pressure sensitive adhesives and tapes. Panel Display Hytek PDH series inks may also be printed onto PVC and may be used for some forming applications.

2. Product Features*

- UV curing
- Excellent Adhesion
- Low Radii Forming Characteristics
- Superior Inter-coat Adhesion
- High Flexibility
- Chemical Resistant
- TPO free

*Specific application performance data, where available can be provided by your Sun Chemical representative.

3. Product Suitability*

3.1 Applications

Panel Display Hytek PDH series inks are suitable for use on large format backlit panels, vending machines, membrane switch overlays, nameplates, industrial labels, automotive appliques, fascias and various other, similar applications.

3.2 Substrates

Panel Display Hytek PDH series inks are recommended for use on print treated polyester, polycarbonate and PVC.

Note that not all grades of PVC are suitable for printing with UV curing inks as some PVC grades suffer from embrittlement, resulting in difficulties during the cutting and forming processes.

3.3 Intercoat Adhesion

Panel Display Hytek PDH series inks exhibit excellent intercoat adhesion. However, as with all UV inks, intercoat adhesion should be monitored throughout the print run especially when processing multiple colours and layers.



3.4 End Use Testing

Panel Display Hytek PDH series inks have been tested for suitability in a number of end use applications and under the test conditions found fully suitable for use. Common tests include:

- Environmental cycle testing and heat ageing
- Scratch adhesion and resistance
- Cross cut and adhesive tape adhesion
- Non-yellowing and colour change
- Adhesive tape and PSA compatibility
- Switch actuation testing

However, customers should always satisfy themselves of full suitability for specific final use under their print conditions prior to commencing full production runs.

3.5 Forming

Depending on the depth and angle of draw, Panel Display Hytek PDH series inks are suitable for forming and embossing applications. However, as formability depends on a number of factors, including filmweight, adhesion, number of ink layers, depth of draw and draw radii, pre-tests are strongly recommended before commencing full production runs.

3.6 Switch Actuation

Panel Display Hytek PDH series inks have been independently assessed for switch actuation life in graphic overlay membrane touch switch applications, where actuation life exceeded 2 million actuations. However, actuation life is dependent on a number of factors such as substrate, ink filmweight, numbers of layers, switch form and type, etc. therefore customers should satisfy themselves of full suitability under their specific conditions before commencing a full production run.

Panel Display Hytek MTS Opaque White PDHW70 differs slightly in formulation from other Panel Display Hytek PDH products and is recommended as a high performance opaque backing white for membrane touch switch applications. In membrane touch switch applications, the other PDH opaque whites (PDHW501 and PDHW90) should be fully tested on actual switch designs prior to commercial use as the number of expected actuations may be reduced.

3.7 Wet Adhesive and Adhesive Tape Compatibility

Panel Display Hytek PDH series inks have been formulated for use with common wet adhesives (pressure sensitive adhesives, PSA's) and adhesive tapes and will resist discolouration and delamination, however some specific ink and adhesive combinations may delaminate and change appearance due to components in the adhesive soaking into the ink film over time. It is recommended that specific ink and adhesive (or tape) combinations are thoroughly tested prior to commercial use.

3.8 Post Print Finishing

Panel Display Hytek PDH series inks can be guillotined, die-cut and embossed, however as these processes can be affected by a number of variables, printers should satisfy themselves of suitability before commencing a full production run.

3.9 Lightfastness, Durability and Chemical Resistance

Panel Display Hytek PDH series inks are based on the SunMatch lightfast pigments, however they are not recommended for extreme outdoor exposure. If Panel Display Hytek PDH series inks are mixed to contain high contents of white or clear, lightfastness may also be reduced.

Panel Display Hytek PDH series inks have been evaluated for resistance to a number of common chemicals such as bleach, oils, water, white spirit, dilute ammonia, disinfectant, fats and industrial alcohol and were found to have excellent resistance to a minimum of 100 rub cycles.

*Please refer to your local Sun Chemical representative for specific details.

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4. Product Range

Panel Display Hytek PDH SunMatch Base Inks			
Primrose	PDHY30	Blending Black	PDHN50
Golden Yellow	PDHY50	Blending White	PDHW50
Orange	PDHO50	Blending Clear	PDHC50
Scarlet	PDHR20	Dense Black	PDHN501
Red	PDHR50	Opaque White	PDHW501
Magenta	PDHM50	MTS Opaque White	PDHW70
Violet	PDHV50	Ultra Opaque White	PDHW90
Blue	PDHB50	Structured Base	PDHE70
Green	PDHG50		
Panel Display Hytek PDH inks modifiers			
Reducer / Thinner	TU04	Accelerator Solution	UVAD905

4.1 Colour Range

Panel Display Hytek PDH series inks are available in the SunMatch colour range of 9 strong, bright mono-pigmented shades which together with black, white and clear form a complete ink blending and mixing system. The SunMatch blending system allows mixing of practically any colour, including Pantone®, RAL and HKS and is fully compatible with both Formulator and Formulator IDS ink and colour match management systems. Special effects and metallic shades are also available on request.

For further information on Pantone®* (and other colour specification systems) or Formulator ink management products, contact your local Sun Chemical branch.

The Panel Display Hytek PDH range also includes opaque whites ideally suited for automotive fascia, industrial label and backlit graphic applications. The ultra-opaque white, PDHW90 is also perfectly suited for use as a diffuser white (or as a mixed diffuser grey) or highlight white for automotive appliques and fascias.

Panel Display Hytek PDHW70 MTS Opaque White is a specially formulated white for membrane touch switch (MTS) applications. This white has been fully tested for use as an opaque backing white on critical membrane switch overlays.

Panel Display Hytek PDHN50 Blending Black is not suitable as a printing black and should only be used in blend formulations. Where a printing black is required, Panel Display Hytek PDHN501 Dense Black should be used, adjusting the density with Panel Display Hytek PDHC50 Blending Clear or Panel Display Hytek PDHE70 Structured Base as required.

Should an overprint clear or varnish be required, the blending clear PDHC50 can be used as such.

* Pantone Inc.'s check standard trademark for colour

4.2 Process and Tone Printing

Panel Display Hytek PDH series inks are not available as process colours, however, if structured inks are required the structured base, PDHE70 can be used to structure standard inks.



5. General Handling

5.1 Storage and Shelf Life*

Panel Display Hytek PDH series inks should be stored in closed, black polyethylene containers at temperatures between 5-32°C. Panel Display Hytek PDH series inks have a minimum shelf life of 24 months but can remain usable for longer periods, depending on storage conditions.

Panel Display Hytek PDH series inks can be sensitive to strong daylight, internal artificial light and stray UV light and therefore care must be taken to ensure they are not overexposed to such light during storage and printing.

*For more specific handling advice refer to the Safety Data Sheet.

6. Printing Conditions

6.1 Mixing

Panel Display Hytek PDH series ink requires thorough mixing prior to use on press. To achieve optimum mixing the use of an industrial shaker is recommended. Shaking for 2 minutes usually ensures thorough mixing.

6.2 Curing

Panel Display Hytek PDH series inks cure by exposure to UV light. Actual cure speeds will vary depending on the UV curing unit used, the ink shade, mesh grade and other printing parameters that affect ink deposit. Belt speeds as high as 40 m/min, with two 80 watts/cm lamps can be achieved, dependent on these variables. The use of UV LED curing systems may also be possible, subject to the UV LED light source being of an appropriate wavelength (usually 385nm to 395nm) and of sufficient power (W) to cure the inks. UV LED curing can in many instances give improved cure, especially on very opaque colours, dense blacks and opaque whites. Full ink adhesion can only be achieved if the ink film is fully cured.

Substrates can have differing receptivity to UV ink, and on certain rigid and/or coloured materials it may be necessary to cure ink more effectively to achieve satisfactory adhesion. It is always advisable to determine optimum drying schedules under specific conditions before commencing with full production.

Cure Accelerator UVAD905 is a liquid additive which can be used to improve the through curing of thicker ink films or where difficult to cure, blended colours have to be used. A maximum of 3% by weight should be added.

6.3 Intercoat Adhesion

Panel Display Hytek PDH series 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 especially when processing multiple colours and layers.

6.4 Viscosity Reduction

Panel Display Hytek PDH series inks are single package inks which do not require the use of any additives under normal printing conditions. If viscosity reduction is required, up to 5% by weight of UV Thinner TU04 may be added.

6.5 Printing Materials

High quality stencil materials such as those in the SunCoat range are recommended for best results. Product Data Sheets and detailed specialist advice on choice of emulsions, films and all related stencil products can be obtained from your local Sun Chemical branch.

Fine polyester mesh with a mesh count of 120 – 180 threads/cm and a medium/hard sharp polyurethane squeegee should be used.

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6.6 Coverage

Up to 70 m²/kg may be expected, but coverage is dependent on a number of printing factors including, mesh choice, stencil thickness, squeegee, etc.

6.7 Washing Up

Commercial screen cleaners, such as those in the 'SunCoat' range are recommended for best results. Product Data Sheets and advice on the SunCoat range of screenwashes is available from your local Sun Chemical branch.

7. End-use safety

7.1 Handling

Panel Display Hytek PDH series inks should be used in accordance with normal standards of industrial hygiene. Please refer to the information provided on product labels and relevant Safety Data Sheets. For more details on handling of UV materials please refer to EuPIA's latest document, 'Guidelines for Printers on the Safe Use of Energy Curing Printing Inks and Related Products' (www.eupia.org).

7.2 EN71-3:2013 Safety of Toys – Migration of certain elements

These inks have been formulated to comply with the requirements of toy standard, EN 71-3:2013 Safety of toys – Migration of certain elements (category III: scraped off material). However, inks are supplied without warranty due to risk of contamination throughout the many processing steps from raw materials to finished toy. To ensure conformity, analysis, is therefore essential (note that the legislative limits apply to the toy itself and not to the wet ink as supplied). Please refer to our company statement concerning inks for toys. For further compliance confirmation and advice please refer to your local Sun Chemical branch.

7.3 Food Contact

Sun Chemical cannot guarantee the suitability of any of its products for use where direct or indirect food contact may occur.

7.4 EuPIA

Panel Display Hytek PDH series inks are formulated in accordance with the EuPIA exclusion policy for printing inks and related products. In particular, this excludes from use all materials classified according to the CLP Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures as carcinogenic, mutagenic or toxic for reproduction in categories 1A or 1B with hazard statements H340, H350 or H360, in addition to toxic or highly toxic materials with hazard statements H300, H301*, H310, H311*, H330, H331, H370 or H372* (* may be permitted if safe use can be demonstrated following risk assessment). Pigments based on compounds of Sb, As, Cd, Cr (VI), Pb, Hg, Se, certain dyes, solvents, plasticisers and miscellaneous materials are also excluded.

8. Technical Assistance / Contacts

For further information, please contact your local Sun Chemical team.

Our Products are intended for sale to professional users. The information herein is general information designed to assist customers in determining the suitability of our products for their applications. All recommendations are made without guarantee, since the application and conditions of use are beyond our control. We recommend that customers satisfy themselves that each product meets their requirements in all respects before commencing a print run. There is no implied warranty of merchantability or fitness for purpose of the product or products described herein. In no event shall Sun Chemical be liable for damages of any nature arising out of the use or reliance upon this information. Modifications of the product for reasons of improvements might be made without further notice.

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Registered Address: Sun Chemical Ltd, 3 High View Road, South Normanton, Derbyshire, DE55 2DT, UK. Tel: +44 1773 815 704

