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Advanced Thermographic Technologies



Technical Product Information

THERMOSTAR® WATER BASED UV CURE SCREEN INK 1450

Functionality: Reversible Thermochromic ink

Revision: 02

Last Revision: 15/09/2011

Description

THERMOSTAR® Water Based UV cure Screen ink is suitable for absorbent paper, carton and board substrates. Supplied as a 1 part ink system ready formulated, THERMOSTAR® Water Based UV Cure Screen ink allows flexibility in application and optimisation in appearance of printed articles.

Application

Screen printing ink ideally suited to flat bed screen printing processes onto absorbent paper and board substrates for applications such as labels, tags, tickets and boards, providing the ink is cured (exposed to UV lamps).

As with all Thermochromic inks the printed effect is dependent upon several factors including press speed, substrate, drying time/temperature and mesh count. The prints exhibit a matt finish. Therefore, it is always recommended that over laminate or spot varnish is used to give a glossy aspect.

Product Properties

Thermochromic properties

THERMOSTAR® Water Based UV Cure Screen ink brings **reversible colour changing properties** to printed items. The print is fully coloured 3 degrees below the activation temperature and colourless above the activation temperature.

Standard activation temperatures are 15, 31 and 47°C (59, 88 and 117°F). Activation temperatures included within -10 and +69°C (14 and 149°F) are all so available.

Adhesion

THERMOSTAR® Water based Screen ink is suitable for absorbent paper and boards. Due to the wide variety of substrates it is recommended that this ink is evaluated fully prior to any commercial use.

Rub Resistance

An over varnish or laminate is recommended if resistance to abrasion is required.

Lamination Properties

Both heat and cold set laminates can be used with THERMOSTAR® WB Screen Inks. THERMOSTAR® WB Screen Inks can be also overprinted with UV offset, UV flexo and UV Screen varnish. However an evaluation for compatibility should always be carried out prior to commercial use.

For applications that use a Thermochromic ink activated at cold temperatures (less than 20°C/68°F) we would recommend the use of a matt laminate for optimum effect. For warm and hot temperatures activation inks (20°C/ 68°F and above) , we would recommend a gloss laminate.

Additional Product Properties

Pigment Content (%)	24 ± 1.5
Pigment Size (µm)	95% less than 6
Solid Content (%) ¹	50 ± 2.0
Solvent	Water
Supplied Viscosity (cps) ²	1200-1500

¹ AMB50 Moisture Content Analyzer

² Mixed ink measured on a LVT Brookfield Viscometer Spindle #2

Light Fastness

Thermochromic inks are inherently susceptible to damage by UV light. They are only recommended for uses in application with minimal exposure to UV light. UV protective varnish should be used to slow degradation caused by UV light.

Light fastness properties of supplied THERMOSTAR® colours are as follows:*

Green	1
Red, Orange & Magenta	1-2
Yellow, Blue, Purple	2
Turquoise	3

*Rating according to measurement on Blue Wool Scale

Heat Behaviour

Reversible Thermochromics are showing thermal Hysteresis. This means temperature against colour curves on the heating cycle does not match the cooling cycle curve. Thermochromic prints can experience far more than 1000 heating/cooling cycles above their activation temperature.

Thermochromics consistently heated up at temperatures above 50°C (122°F) will slowly lose colour intensity below the activation temperature.

Recommended Printing Parameters

Screen Configuration

The optimum screen configuration depends on several factors, the most important of which is the desired opacity and colour of the finished product.

The theoretical ink volume of the screen is crucial for matching the desired effect. Using a higher theoretical ink volume will affect the print as follows:

- Below the activation temperature, colour intensity is increased
- Beyond the activation temperature, the level of residual colour is increased accordingly.

	Activated Below 20°C European/US Measurement	Activated Above 20°C European/US Measurement
Recommended Mesh Size	120T / 310	70T / 195
Minimum Mesh Size	150T / 379	150T / 379

Do not allow the ink to sit dormant on the screen as this will cause 'drying in' on the screen and affect print definition and quality.

Dilution

The printing ink is supplied in a format that is at printing viscosity. Should the ink need to be thinned to suit application then only water should be used. No alternative thinners should be used as these will affect both the performance of the ink and ThermoChromic function. No more than 10% water to the total ink volume should be added

Drying

The ink should be dried using conventional UV Cure methods or UV flash drying unit. Should hot air dryers or IR lamps be used, then set at a maximum of 70 °C (158 °F).

Cleaning recommendations

THERMOSTAR® Water Based UV Cure Screen Ink should be cleaned on screen using water only. Glycol based cleaners should not be used as these will damage the function of the ink. After use screens can be cleaned with water. A high powered water jet may be required to remove all ink remnants.

Handling and Storage

THERMOSTAR® Water Based UV cure Screen Ink is a 1 part ink system that will remain stable if kept in the supplied container and stored in the correct storage conditions. As the product is water based, it is important to keep the containers tightly shut to avoid evaporation and skinning of the product.

THERMOSTAR® Water Based UV Cure Screen Ink should be stored away from solvents, sources of UV light and high temperature. Ink should be thoroughly mixed prior to application. Please consult MSDS prior to use.

Shelf Life

3 Months

Do not store in temperatures in Excess of 25°C / 77 °F

Do not freeze

SDS number: 1450 or 1452

Information in this Product Data Sheet is compiled from our general experience and data obtained from various technical publications. Whilst we believe that the information provided herein is accurate at the date hereof, no responsibility for its completeness or accuracy can be assumed. Tests are carried out under controlled laboratory conditions. Information is given in good faith, but without commitment as conditions vary in every case. The information is provided solely for consideration, investigation and verification by the user. We do not except any liability for any loss, damage or injury resulting from its use (except as required by law). Please refer to the Material Safety Data Sheet before using products to ensure safe handling.