



Technical Product Information

THERMOSTAR® WATER BASED GRAVURE INK 1310

Functionality: Reversible Thermochromic ink
Article No: 1310
Revision: 04
Last Revision: 15/04/2015

Description

THERMOSTAR® Water Based Gravure ink is suitable for absorbent papers and board substrates. Supplied as a 1 part ink system ready formulated, THERMOSTAR® Water Based Gravure Ink allows flexibility in application and optimisation in appearance of printed articles by bringing **reversible colour changing properties**. The ink is available as Bisphenol A free grade for most colours and temperatures.

Application

THERMOSTAR® Water Based Gravure ink is suitable for in line gravure printing onto paper, carton and board substrates for applications such as labels, tags, tickets and boards. As with all Thermochromic Inks the printed effect is dependent upon several factors including press speed, substrate, drying time/temperature.

Product Properties

Thermochromic properties

The print is fully coloured 3-5 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 also available.

Adhesion

THERMOSTAR® Water Based Gravure Ink is suitable for absorbent papers and board substrates. However, due to the wide variety of substrates it is recommended that this ink is evaluated fully prior to any commercial use.

In some cases 1-3 % Aziridine (cas number: 64265-57-2) can be added for better adhesion and also better water resistance. The modified ink will then show viscosity increase over time, resulting in a reduced shelf life. Carbodiimide is another potential option where less hazards are associated.

Rub Resistance

The ink exhibits good rub resistance properties on absorbent substrates. If a higher level of resistance is required or if the printed product is going to be exposed to humid conditions then a suitable over varnish or laminate should be used.

Overprintability/Lamination Properties

Both heat and cold set laminates can be used with THERMOSTAR® Water Based Gravure Ink. THERMOSTAR® WB Gravure 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 that is 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 temperature activation inks (20°C/68°F and above) we would recommend a gloss laminate.

Additional Product Properties

Pigment Content (%)	24 ± 1
Pigment Size (µm)	95% less than 6
Solid Content (%) ¹	41 ± 3.0
pH	6.7 to 7.4
Supplied Viscosity (cps) ²	70 ± 30.0

¹ AMB50 Moisture Content Analyzer

² Mixed ink measured on a LVT Brookfield Viscometer at 25°C

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 .

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. Temperature against colour on the heating cycle does not match the cooling cycle. Thermochromics consistently heated up at temperatures above 50°C (122°F) will slowly lose colour intensity below the activation temperature.

Recommended Printing Parameters

Cylinders engraving

The optimum cylinder configuration depends on several factors. The theoretical ink volume of the cylinder is crucial for the desired effect. We recommend using a higher theoretical ink volume will increase the intensity of colour of the product when below its activation temperature.

Printing Speed

The maximum press speed is dependent on press setting. With sufficient drying power press speeds of 170 m/min to 300m/min are realistically achievable.

Dilution

The printing ink is supplied at printing viscosity. Should the ink need to be thinned then 5% water maximum can be added. Excess Dilution will reduce colour intensity. Ink should be thoroughly mixed prior use.

Acceleration of drying process: Mixture of 80/20 of Isopropanol and water. Maximum addition of 5 %.

Retarding drying process: Propylene glycol. To be added on press only. Propylene glycol is reducing shelf life and can also affect the thermochromic properties of the ink when stored. Maximum addition of 2%.

Drying

The driers should be suitable for drying water based inks. Temperature of the print should not be higher than 70 to 90 C.

Cleaning recommendations

After use the cylinder can be cleaned with water or with a standard commercial general purpose cleaner/wash. Care should be taken not to contaminate the Thermochromic ink with any cleaning solution as this can inhibit the Thermochromic function.

Handling and Storage

THERMOSTAR® Water Based Gravure Ink is a 1 part ink system that will remain stable if stored below 20 C in the supplied closed container. It is important to keep the containers tightly shut to avoid evaporation and skinning of the product. The Ink should be stored away from solvents, sources of UV light. Do not freeze.

Please consult MSDS prior use.

Shelf Life

3 Months

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.