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Advanced Thermographic Technologies

CHAMELEON® **THERMOCHROMIC WATER BASED GRAVURE INK**

Functionality: Reversible Thermochromic ink

Revision: 02

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Description

This Water Based Thermochromic Gravure ink is suitable for absorbent papers and board substrates. Supplied as a 1 part ink system ready formulated, CHAMELEON® Water Based Gravure Ink allows flexibility in application and optimisation in appearance of printed articles.

Application

CHAMELEON® 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

CHAMELEON® Water Based Gravure 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 also available.

Adhesion

CHAMELEON® 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.

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 CHAMELEON® Water Based Gravure Ink. CHAMELEON® 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 Thermo-chromic 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 caused by UV light.

Light fastness properties of supplied CHAMELEON® 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

Anilox Configuration

The optimum cylinder 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 cylinder is crucial for the desired effect. 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, substrate, and chosen anilox. With sufficient heating power press speeds of 170 m/min are realistically achievable. Faster speeds are frequently achieved without any issue.

Dilution

The printing ink is supplied in a format that is at printing viscosity. Should the ink need to be thinned down to suit application then a mixture of isopropanol and water mixed at a 1:1 ratio can be added. No more than 5% diluent should be added. No other diluents should be used as these can damage the Thermochromic functionality and ink performance.

Accelerating 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 5%.

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 anilox can be cleaned with water or with a standard commercial general purpose anilox 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

CHAMELEON® Water Based Gravure 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.

CHAMELEON® Water Based Gravure 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

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.