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Advanced Thermographic Technologies

CHAMELEON® **THERMOCHROMIC WATER BASED FLEXO INK**

Functionality: Reversible Thermochromic ink

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Description

CHAMELEON Water Based Thermochromic Flexo ink is suitable for absorbent papers and board substrates.

Supplied as a 1 part ink system ready formulated CHAMELEON® Water Based Flexo Ink allows flexibility in application and optimisation in appearance of printed articles.

Application

CHAMELEON® Water Based Flexo ink is suitable for in line 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, print thickness.

Product Properties

Thermochromic properties

CHAMELEON® Water Based Flexo 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 Flexo 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 Flexo Ink. CHAMELEON® Water Based Flexo 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 ± 1.5
Pigment Size (µm)	95% less than 6
Solid Content (%) ¹	41 ± 3.0
Solvent	Water
Supplied Viscosity (cps) ²	80 ± 30

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 anilox 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 anilox is crucial for matching the desired effect. Using a higher theoretical ink volume will increase the colour intensity of the product when below its activation temperature.

	Anilox Line SPI	Anilox Line SPC
Recommended Anilox Number*	180- 330	70 - 130
Minimum Anilox Number	400	157

*anilox used is dependent upon desired end result. These figures serve as guideline only.

Printing Speed

The maximum press speed is dependent on press settings, substrate, and chosen anilox. With sufficient heating power, press speeds of 100 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, then a mixture of isopropanol and water mixed at a 1:1 ratio only can be added. No more than 5% diluent should be added. No other diluents should be used as these can minimize ink performance and damage the Thermochromic functionality

Drying

The ink should be dried using hot air dryers or IR lamps set to a maximum temperature of 70°C / 158°F

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 or solvents as this can inhibit the Thermochromic function.

Handling and Storage

CHAMELEON® Water Based Flexo 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

