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Advanced Thermographic Technologies

CHAMELEON®
THERMOCHROMIC PAD PRINTING INK

Functionality: Reversible Thermochromic ink
Revision: 02
Last Revision: 14/09/2011

Description

CHAMELEON® Pad Printing ink is suitable for printing onto numerous substrates including plastic substrates, paper, Carton, glass and fired Ceramic. Substrates may differ in their chemical structure or method of manufacture. A test for suitability must always be carried out before printing.
Once cured, the print shows good mechanical and solvent resistance.
Supplied as a 2 parts ink system, CHAMELEON® Pad Printing ink allows optimisation in appearance of printed article.

Application

CHAMELEON® Pad Printing ink printed effect is dependent upon several factors including print thickness, substrate, printing speed, drying time/temperature.

PRODUCT PROPERTIES

Thermochromic properties

CHAMELEON® Pad Printing 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® Pad Printing ink shows adhesion onto plastic substrates (ABS, polyamide, polycarbonate, pre-treated polyethylene, (PE) and polypropylene (PP)), paper, Carton, glass and fired Ceramic glass, fired ceramics, plastics and metal. Antistatic, Mould Release Agents and Slip Additives may have negative effects on adhesion, and should be detected and removed
However, due to the wide variety of substrate properties it is recommended that CHAMELEON® Pad Printing ink is evaluated fully prior to any commercial use.

Abrasion Resistance
The CHAMELEON® Pad Printing ink exhibits acceptable abrasion resistance properties on multiple substrates when cured in optimum conditions.

Overprintability/Lamination Properties
CHAMELEON® Pad Printing ink does not require to be overprinted or laminated.

Additional Product Properties

Pigment Content (%)	**28 ± 1.5**
Pigment Size (µm)	**90% less than 8**
Viscosity (Cps) when both parts mixed	**200 000 ± 100 000**

Light Fastness
Themochromic 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. Most thermochromic prints can experience more than 1000 heating/cooling cycles above their activation temperature.
Thermochromic prints consistently heated up at temperatures above 50°C (122°F) will slowly lose colour intensity below the activation temperature.

RECOMMENDED PRINTING PARAMETERS

MIXING
The CHAMELEON® Pad Printing ink is supplied as a 2 parts system.
For optimum properties, prepare the ink as follows by mixing:
- 9 parts of the CHAMELEON Thermochromic pad printing base,
- 1 part of the hardener.

Mix thoroughly to obtain homogeneous mixture and the right viscosity. Once mixed the ink has a pot life of 8 hours.

THINNER
Prior to production, the pad printing ink has to be adjusted to the printing viscosity by the addition of thinner.
Adhesion of 15 to 25 % PMA or 15-25 % of a mixture of (9 parts of PMA and 1 part of cyclohexanone) is recommended.

SUBSTRATE PREPARATION
Pre-treatment of polyolefin (PE/PP) must be performed by Flame Treatment or CORONA-discharge in order to insure the adhesion of the pad printing ink to the substrate. In case of PE, surface tension needs to be at least 42 Dynes/cm, in case of PP at least 52 Dynes/cm.

CROSSLINKING AND CURING
During The printing process (processing and drying of the printed ink) of the CHAMELEON® Pad Printing ink, the temperature should not be lower than 15° C otherwise the chemical crosslinking is stopped. Also avoid high humidity for several hours after printing as the hardener is sensitive to humidity
While adding hardener to the ink, drying of the ink will take approximately 36 hours at room temperature. To accelerate the ink drying onto the substrate the use of hot air blower or infrared lamps is recommended. It must be noted that after heat treatment a cooling section must be installed in order to avoid that the printed parts stick together.

OVERPRINTING
The final chemical and physical resistance of the ink is only achieved after 36 hours at room temperature of 20° C. The completely dried ink cannot be overprinted.

Cleaning recommendations
Standard ink cleaning system is recommended. However, care must be taken not to cross contaminate the next print run with cleaning fluids.
For the
Cleaning of the pad please see to the application references of the pad manufacturers. If cleaning is not performed by fully automatic cleaning equipment, protective gloves must be worn.

HANDLING AND STORAGE

CHAMELEON® Pad Printing ink should be stored away from solvents, sources of UV light and high temperature. CHAMELEON® Pad Printing ink is a 2 parts ink system that will remain stable if kept in the tightly closed supplied container and stored at temperatures included between 10 C and 25 C. It is important to keep the containers tightly closed.

Please consult MSDS prior to use.

Shelf Life 1 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.