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Technical Product Information

THERMOSTAR® WATER BASED FLEXOGRAPHICGRAPHIC INK 1210

Functionality: Reversible Thermochromic ink
Article No: 1210
Revision: 05
Last Revision: 14/04/2015

Description

THERMOSTAR® Water Based Thermochromic Flexographic ink is suitable for absorbent papers and board substrates. It is supplied as a 1 part ink system ready formulated. THERMOSTAR® Water Based Flexographic 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 Flexographic 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, dry ink film thickness.

Product Properties

Thermochromic properties

THERMOSTAR® Water Based Flexographic ink 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 Flexographic 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. Carbodidimide 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 if the Aziridine option is not considered.

Overprintability/Lamination Properties
Both heat and cold set laminates can be used with THERMOSTAR® Water Based Flexographic Ink. THERMOSTAR® Water Based Flexographic Inks can be also overprinted with UV offset, UV Flexographic and UV screen varnish. Evaluation for compatibility should always be carried out prior to commercial use.
For ink activated at cold temperatures (less than 20°C/68°F) a matt laminate is recommended for optimum effect. For warm and hot temperatures activation inks (20°C/68°F and above) a gloss laminate is recommended.

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] Ink measured on a LVT Brookfield Viscometer at 25°c

Light Fastness
Themochromic inks are sensitive to UV light. Minimal exposure to UV light is recommended. UV protective varnish can 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

Anilox Configuration
Using a higher theoretical ink volume will increase the colour intensity of the product when below its activation temperature. Thermochromic ink colour intensity increases with dry ink film thickness.

	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, driers and chosen anilox. With sufficient heating power, press speeds of 100 m/min are realistically achievable.

Dilution and mixing
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.

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

Handling and Storage

THERMOSTAR® Water Based Flexographic 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.
Please consult MSDS prior use. Do not freeze.

Shelf Life 3 Months

Material Safety Data Sheet No:1210 or 1212