Technical Product Information

Thermochromic Function: Irreversible
Product Name: Chromax Magenta K120-NH
Last Revision: 30/01/2009

Chromax Magenta K120-NH can be supplied as a Concentrate, Water Based Screen ink or Water Based Flexographic Ink.

Chromax Magenta K120-NH Concentrate.
A water based irreversible thermochromic pigment concentrate to allow formulation of aqueous inks. Supplied as an acrylic based pigment dispersion with optimised particle size to formulate flexographic and screen inks.

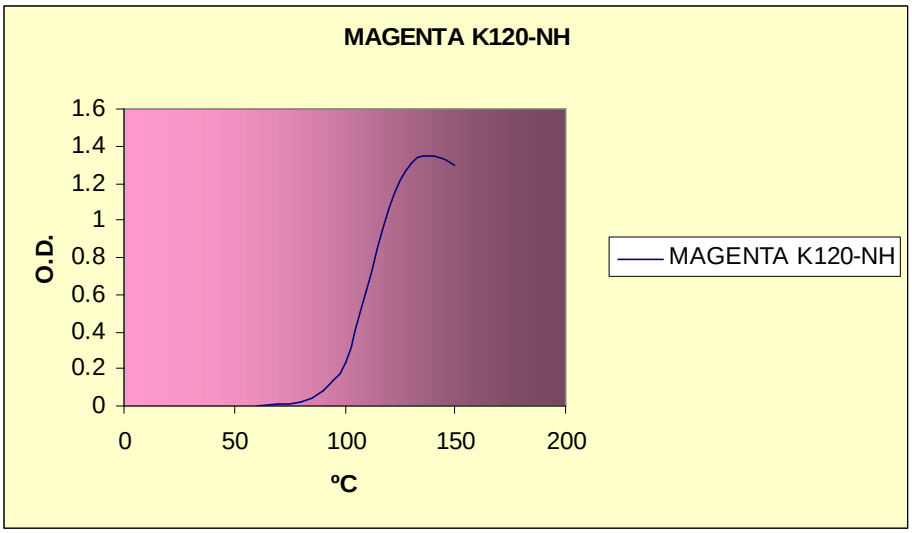
Application

The concentrates are primarily intended for use in the formulation of inks by addition of water based resins or binders. In certain circumstances they may be used directly as coatings or inks.

The concentrates should be stirred thoroughly before use as settlement on standing may occur. They may then be added into water based varnishes. The compatibility of the any additives or varnishes should be established by the user.

Colour Change Properties

The colour change profile for Magenta K120-NH Concentrate is shown below.



Magenta K120-NH as with all other products changes colour gradually over a temperature range. The following chart is based on 1 minute heating periods.

Magenta K120-NH goes off white to magenta on heating.

Recommended Formulation Guidelines

Solvents

Avoid ketones such as acetone which will cause the generation of colour. Isopropyl alcohol may be used. Glycols and glycol ethers should be avoided.

Once a varnish is added check for compatibility. Check that no premature colour is generated in the liquid ink, or as it is dried on printing. Establish the colour change on heating is not inhibited. Too high a binder level in the ink can reduce the strength of colour change.

Dilution

Should the concentrate need to be thinned to suit application then water or a mixture of isopropanol and water mixed at a 1:1 ratio can be added. Over dilution will reduce colour strength. No other diluents should be used as these can damage the thermochromic ink functionality and ink performance.

Drying

The ink should be cured using minimum heat to dry the print but not trigger an irreversible colour change. Slow air drying is recommended.

Cleaning recommendations

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

Handling

Always refer to the MSDS before initial use. Chromax Irreversible Water Pigment Concentrate is a 1 part ink system that will remain stable if kept in the supplied container and stored in the correct storage conditions. Settlement may occur.

Mixing Instructions

Contents may settle on transit. Ink should be thoroughly mixed using a mechanical stirrer prior to application.

Storage

Chromax Irreversible Water Pigment Concentrate should be stored away from solvents, sources of UV light, frost and high temperature to gain optimum performance from the product. The concentrate will settle on standing and should be thoroughly mixed before use.

Shelf Life 6 Months

Do not store in temperatures in Excess of 25°C / 77°F.
Do not freeze
As the product is water based it is important to keep the containers tightly shut to avoid evaporation and skinning of the product.

Chromax Magenta K120-NH Screen INK

Water based thermochromic ink for plastic films or absorbent paper and board substrates.

Supplied as a single pack ink system to give optimum shelf life and on press flexibility for control of colour intensity, opacity and press performance.

Application

Screen printing ink ideally suited to flat bed screen printing processes. As with all thermochromic inks the printed effect is dependent upon several factors including press speed, substrate, drying time/temperature and mesh count. The printed ink exhibits a silk finish when printed. The print is susceptible to damage by abrasion as the ink is relatively soft.

Product Properties

Adhesion

The adhesion of Chromax Irreversible Water Based Screen Ink depends upon the surface properties of the selected substrate. Due to the wide variety of substrates it is recommended that this ink is evaluated fully prior to any commercial use.

When using Chromax Irreversible Water Based Screen Ink to over print on a surface pre printed using offset inks it is recommended that the offset inks are wax free to reduce the risk of ink reticulation.

Rub Resistance

An over varnish or laminate is necessary if any resistance to abrasion is required as resistance to pressure is low. However many varnishes may affect the function of the thermochromic pigments. Water based varnish is preferred and should have a low solids content and applied as thin a coat as possible using a fine mesh. Compatibility should be checked to ensure that the unchanged Thermochromic print is not discoloured or that the temperature sensitivity is not inhibited.

Additional Product Properties

Pigment Content (%)	**29 ± 2**
Pigment Size (µm)	**95% less than 10 microns**
Solid Content (%) [1]	**60 ± 2.0**
Solvent	**Water**
Supplied Viscosity (cps) [2]	**1700-3400**

[1] AMB50 Moisture Content Analyzer
[2] Mixed ink measured on a LVT Brookfield Viscometer Spindle #2

Light fastness

Themochromic inks are inherently susceptible to damage by UV light. They are only recommended for use in applications were there will be minimal exposure to UV light. Were necessary a suitable UV protective varnish should be used to slow degradation caused by UV light.
Light fastness properties of supplied Chromax colours are as follows:*

Red, Orange & Magenta	1-2
Black, Blue, Purple	2
Turquoise	3

*Rating according to measurement on Blue Wool Scale

Recommended Printing Parameters

Screen Configuration

The optimum screen 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 screen is crucial for the desired effect. Using a higher theoretical ink volume will increase the intensity of colour of the product when below its activated.

	European / US Measurement
Recommended Mesh Size	**120T / 310**
Minimum Mesh Size	**150T / 379**

Do not allow the ink to sit dormant on the screen as this will cause ‘drying in’ on the screen and affect print definition and quality.

Ink Consumption

Typical ink consumption for Chromax Irreversible Water Based Screen Ink on a 70T mesh is approx 30 – 35gms per sqm. In some applications where high colour density is required 2 passes may be required.

Dilution

The printing ink is supplied in a format that once mixed is at printing viscosity. Should the ink need to be thinned to suit application then water should be used. No alternative thinners should be used as these will affect the thermochromic function and performance of the ink. Usually no more than 15% water should be added to the ink system.

Drying

The ink should be dried avoiding hot air dryers or IR lamps if the irreversible colour change is liable to be triggered in the drying system used. Some force drying may be used, depending on dwell time in the drying area and the rating of the irreversible. Users should carry out their own tests to confirm force drying does not trigger a colour change and spoil the print.

Care should be taken when stacking the finished product as if too much pressure is applied to uncoated ink (not varnished or laminated) offsetting of the print can occur.

Cleaning recommendations

Chromax Irreversible Water Based Screen Ink should be cleaned on screen using water only. Glycol based cleaners should not be used as these will damage the function of the ink.

After use screens can be cleaned with water. A high powered water jet may be required to remove all ink remnants.

Handling

Consult the appropriate supplied MSDS for safe handling. These inks are water based but may contain a small % of isopropyl alcohol.
Do not mix with other ink systems.

Storage

Chromax Irreversible Water Based Screen Inks should be stored away from solvents, sources of UV light and high temperature to gain optimum performance from the product.

Shelf Life of Ink 6 Months

Do not store in temperatures in Excess of 25°C / 77°F – Preferably store below 20ºC

Do not freeze

As the product is water based it is important to keep the containers tightly shut to avoid evaporation and skinning of the product.

Material Safety Data Sheet: chromax – non hazardous sds

Chromax Magenta K120-NH Flexo Ink.

Conventional water based irreversible thermochromic ink for paper, plastic, film and board substrates.
Supplied as a 1 part ink system ready formulated and easy to use allowing flexibility in application and optimisation in appearance of printed article.

Application

Flexographic in line printing onto paper, plastic, film and carton such as labels, folding carton and flexible paper. As with all thermochromic inks the printed effect is dependent upon several factors including press speed, substrate, drying time/temperature and mesh count.

Product Properties

Adhesion

The adhesion of Chromax Irreversible Water Based Flexo Ink depends upon the surface properties of the selected substrate. 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 itself exhibits moderate rub resistance properties on absorbent and non absorbent substrates. However abrasion can cause colour development of the thermochrome. If a high level of resistance is required then a suitable over varnish or laminate should be used. Any over varnish or laminate should be tested for compatibility with the irreversible ink.

Additional Product Properties

Pigment Content (%)	**26 ± 2**
Pigment Size (µm)	**95% less than 10**
Solid Content (%) [1]	**40 ± 2.0**
Solvent	**Water / Propan-2-ol**
Supplied Viscosity (cps) [2]	**45 – 60 seconds**

[1] AMB50 Moisture Content Analyzer
[2] Mixed ink measured on a B4 (BS 3900)Cup 25°C / 77°F

Light fastness

Themochromic inks are inherently susceptible to damage by UV light. They are only recommended for use in applications were there will be minimal exposure to UV light. Were necessary a suitable UV protective varnish should be used to slow degradation caused by UV light. The compatibility of any varnish should be first established by testing.

Light fastness properties of supplied Chromax colours are as follows:*

Magenta 1-2

*Rating according to measurement on Blue Wool Scale

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 the desired effect.

	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 setting, substrate, and chosen anilox. With sufficient heating power press speeds of 170ft / min are realistically achievable.

Dilution

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

Drying

The ink should be cured using sufficient heat to dry the print but not trigger an irreversible colour change.

Cleaning recommendations

After use the anilox can be cleaned 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

Chromax Irreversible 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.

Mixing Instructions

Contents may settle on transit. Ink should be thoroughly mixed using a mechanical stirrer prior to application. Do not mix with other ink systems.

Storage

Chromax Water Based Flexo Inks should be stored away from solvents, sources of UV light, frost and high temperature to gain optimum performance from the product.

Shelf Life 6 Months

Do not store in temperatures in Excess of 25°C / 77°F, preferably store at 20ºC or below.

Do not freeze

As the product is water based it is important to keep the containers tightly shut to avoid evaporation and skinning of the product.

Material Safety Data Sheet No: chromax – non hazardous sds