SpotSee®

Kromagen Black K90-NH – Technical Product Information

Thermochromic Function: Irreversible
Product Name: Kromagen Black K90-NH
Last Revision: 31/07/2019

Kromagen Black K90-NH can be supplied as a Concentrate, Water Based Screen ink or Water Based Flexographic Ink.

Kromagen Black K90-NH Concentrate

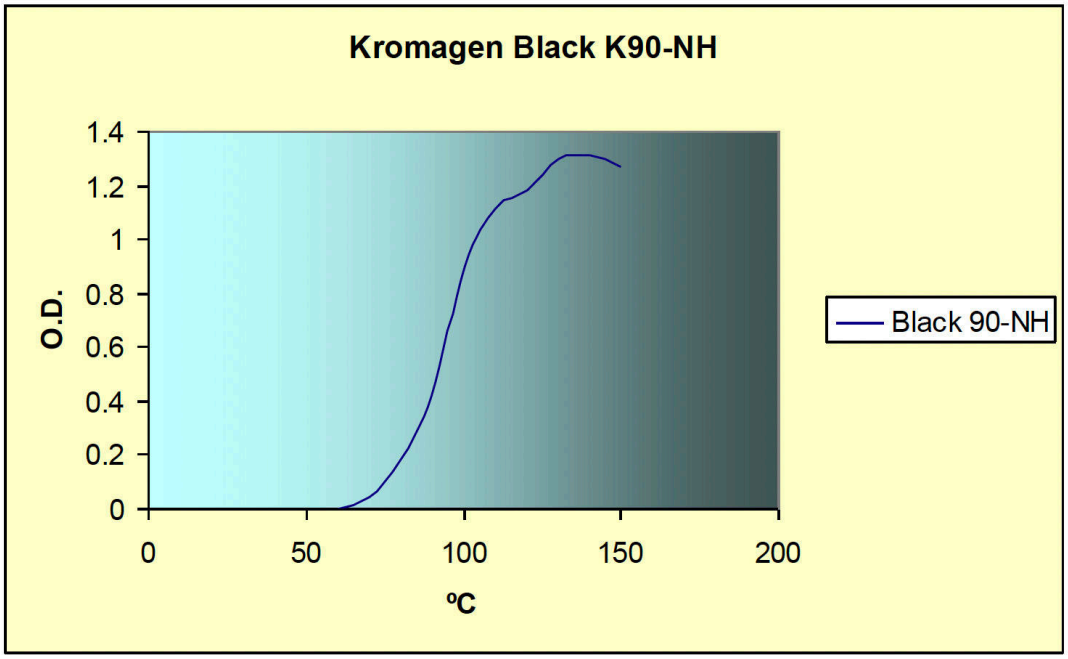
A water based irreversible thermochromic pigment concentrate to allow formulation of aqueous inks. Supplied as an acrylic based pigment dispersion with optimised particle size to formulate flexographic and screen inks.

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 Black K90-NH Concentrate is shown below.



Black K90-NH changes colour gradually over a temperature range. The chart is based on 1 minute heating periods. Black K90-NH goes from off white to black on heating.

SpotSee®

Kromagen Black K90-NH – Technical Product Information

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 SDS before initial use. Kromagen 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

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

Shelf Life: 6 Months

Do not store in temperatures in excess of 25°C / 77°F. Do not freeze. Please consult SDS prior use.

SpotSee®

Kromagen Black K90-NH – Technical Product Information

Kromagen Black K90-NH Screen INK

Water based thermochromic ink for plastic films or absorbent paper and board substrates.
The screen ink is supplied as a single pack ink 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. 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 Kromagen Irreversible Water Based Screen Ink depends upon the surface properties. Due to the wide variety of substrates it is recommended that this ink is evaluated fully prior to any commercial use. Cross-linker like Carbodiimide or Aziridine can help improving adhesion. When using Kromagen 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 Size (µm)	90%<10µm, mean <6µm
Solid Content (%) [1]	42 ± 2.0
Solvent	Water
Supplied Viscosity (cps) [2]	2200-9000

[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 Kromagen colours are as follows:*
• Red, Orange & Magenta: 1-2 • Black, Blue, Purple: 2 • Turquoise: 3

**Rating according to measurement on Blue Wool Scale.*

SpotSee®

Kromagen Black K90-NH – Technical Product Information

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 Kromagen Irreversible Water Based Screen Ink on a 70T mesh is approximately 30 – 35gms per sqm.

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.

Storage

Kromagen Irreversible Water based screen ink should be stored away from solvents, sources of UV light, frost and high temperature. The concentrate will settle on standing and should be thoroughly mixed before use. It is a water based product and it is important to keep the containers tightly shut to avoid evaporation and skinning of the product.

Shelf Life: 6 Months

Do not store in temperatures in excess of 25°C / 77°F. Do not freeze. Please consult SDS prior use.

SpotSee®

Kromagen Black K90-NH – Technical Product Information

Kromagen Black K90-NH Flexo Ink

Water based irreversible thermochromics Flexo ink for paper, plastic, film and board substrates. The ink is 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

The ink is designed for Flexographic in line printing onto paper, plastic, film and carton such as labels, folding carton and flexible paper. The printed effect is dependent upon several factors including press speed, substrate, drying time/ temperature and Anilox volume.

Product Properties

Adhesion

The adhesion of Kromagen Irreversible Water Based Flexo Ink depends upon the surface properties. Due to the wide variety of substrates it is recommended that this ink is fully evaluated prior to any commercial use. Cross-linker like Carbodiimide or aziridine can help improving adhesion.

Rub Resistance

The ink itself exhibits moderate rub resistance properties on absorbent and non-absorbent substrates. However abrasion can cause early colour development. If a high level of resistance is required then a suitable over varnish or laminate can be used or a cross-linker (Carbodiimide or aziridine) can be added to the ink. All options should be tested for compatibility with the irreversible ink.

Additional Product Properties

Pigment Size (µm)	90%<10µm, mean <6µm
Solid Content (%) [1]	40 ± 2.0
Solvent	Water / Propan-2-ol
Supplied Viscosity (DIN 4) [2]	45 – 60 seconds

[1] AMB50 Moisture Content Analyzer
[2] Mixed ink measured on a DIN 4 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.

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

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

**Rating according to measurement on Blue Wool Scale.*

SpotSee®

Kromagen Black K90-NH – Technical Product Information

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.

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

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

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 water or, in some cases 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 keep the colour unchanged.

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.

Mixing Instructions

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

Storage

Kromagen Irreversible Water based screen ink should be stored away from solvents, sources of UV light, frost and temperature above 25°C. The concentrate will settle on standing and should be thoroughly mixed before use.
It is a water based product and it is important to keep the containers tightly shut to avoid evaporation and skinning of the product.

Shelf Life: 6 Months
Do not store in temperatures in excess of 25°C / 77°F. Do not freeze. Please consult SDS prior use.

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. TMC HALLCREST/SpotSee 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.