



PVC/Phthalate Free Plastisol Inks (PNP)

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PROPERTIES

PNP is a PVC/phthalate free plastisol ink which is designed for direct printing and iron - on transfer printing onto light or dark fabrics. PNP has excellent screen stability, colour brightness and high opacity as well as high elasticity and good wash resistance.

PNP inks are suitable for printing fabrics made from natural fibers such as cotton and wool.

INSTRUCTIONS FOR USE

Thinning and Cleaning

- Stir well before use.
- PNP inks are supplied press ready and do not need to be thinned. However, they can be thinned by mixing with 5% PNP901 if required.
- PNP Flow Thinner (PNP901) can be used to increase the ink absorption into the fabric and give the print a softer handle. Addition of PNP901 is not recommended when printing dark coloured fabrics as a higher opacity is usually required.
- Cleaner 2940 should be used to clean PNP from the screen. For heavy ink stains, Screensolve or Thinner 2938 can be used. Please refer to the relevant P.I. Sheets for more information.

Printing

- PNP can be printed through a variety of stencils, such as Diazol Plus Ultra (U016), DiazolTex (T326) and Polyzol Tex (FT426).
- For dark coloured printing or transfer printing, screen mesh no. P43-80 to P61-64 is recommended. For single colour printing or multicolour printing that requires curing after printing each colour, mesh counts. P21-140 to P43-80 are required to optimize individual colour opacity. (See "**Drying and Curing**".)
- Apply Spray Way SW84 or Drystick AH388X all over the print table to firmly hold the substrate in place during printing.

Drying And Curing

PNP inks can only be dried through heat curing. The curing times will vary for different colours and different fabrics. For optimum printing results, the procedure below should be followed:

- For long/medium wave infra-red (IR) stoving, the temperature must be set at 150-170°C (300-340°F) for 30-60 seconds. For short wave IR stoving, the curing time is 15-20 seconds.
- For short wave IR stoving, the curing time for each colour differs; black cures more quickly than lighter colours. These recommendations are only guidelines. Compatibility with each curing condition should be tested prior to printing.

Direct Wet On Dry Printing:

In multicolour printing with coarse meshes, each colour (apart from the final colour) must be cured at a low temperature. Once the last colour has been printed it should be cured at the maximum temperature required.

Low Temperature Setting:

The temperature for convection oven stoving/jet air drying should be set at 100-130°C (210-265°F) for 30-60 seconds. For long/medium wave IR stoving, the temperature must be set at 100-130°C (210-265°F) for 15-30 seconds.

Final Curing:

The temperature for convection oven stoving must be set at 150-170°C (300-340°F) for 2-3 minutes.

Transfer Printing

In multicolour transfer printing, each colour must be cured at low temperature first before the next colour is printed.

Heat Setting

The temperature for convection oven stoving/jet air drying should be set at 100°C(210°F) for 30-60 seconds. For long/medium wave infrared stoving, the temperature should be set at 100°C (210°F) for 15-30 seconds. It is important that the curing of the transfer not exceed the required duration or the maximum temperature, as this will result in poor adhesion.

Transfer Application

Transfer prints must be cured in the heat-pressing unit at 180-190°C(355-375°F) for 10-15 seconds. Precaution against potential overheating of transfer print pressing should be taken because fabrics are subject to shrinkage or burn. Allow the transfer paper to cool prior to removal. If a pressing unit not available, heat from ironing can be an alternative but it is not as effective due to inconsistent heat and pressure.

Technique for soft handle

After printing PNP inks the handle of print will be quite hard and rough. To eliminate this problem the print must be placed in a transfer press with a piece of transfer paper over the print. Press the print at 130-150°C (265-300°F) for 30-60 secs and then peel the paper away. The finished print will be extremely smooth and soft. For a matt finish T75 transfer paper is recommended, if a gloss finish is required a teflon coated sheet is recommended.

Fastness

PNP inks have good wash resistance and may be ironed from the back of the fabric with a cool iron. **Prints will not resist dry-cleaning and garments should be marked to this effect.**

Expanding Prints

PTSE001 PTS Expanding Powder can be mixed with any PVC/Phthalate free plastisol Ink in the following proportions to produce 3 dimension expanded prints:

PVC/Phthalate Free Plastisol Ink :	100	parts	(by weight)
PTSE001 PTS Expanding Powder :	10-20	parts	(by weight)

The variable ratio of PTSE001 to ink allows control over the degree of expansion, colour strength and print distortion. Optimum expansion is produced at the higher level of PTSE001 addition, whereas maximum colour intensity and minimum distortion are achieved at the lower level.

Matt Prints

PTSE001 PTS Expanding Powder can be mixed with any ink in the PNP range Ink in the following proportions to produce matting prints:

PVC/Phthalate Free Plastisol Ink :	100	parts	(by weight)
PTSE001 PTS Expanding Powder :	not over 5	parts	(by weight)

The variable ratio of PTSE001 to ink allows control over the degree of matting, colour strength and print distortion.

Drying and Curing Expanding Prints / Matt Prints

Prints will expand and cure to a dry film only on the application of heat. Because different fabrics and colours require differing curing, the following should only be taken as a guide :

Note: Over-curing will cause ink film to collapse.

Full Cure:

Convection Oven Stoving and Long/Medium Wave Infra-Red Stoving: 150°C (300°F) for 2-3 minutes.

Wet-on-Dry Printing:

For production of multi-colour prints , set at a low temperature for each colour for followed by a full cure after the last.

Low Temperature Setting:

Convection Oven Stoving and Long/Medium Wave Infra-Red Stoving:
80-90°C(176-194°F) for 1-2 minutes.

COLOUR RANGE

The PNP range consists of 16 unleaded colours : 8 CMS (Chaiyaboon Matching System) Base Colours, 4 Standard Colours and 4 Trichromatic Colours.

CMS Base Colours

The following CMS colours are suitable for direct printing or colour-matching:

PNP327	PVC/Phthalate Free Plastisol Ink	Light Yellow/CMS Yellow GS
PNP347	PVC/Phthalate Free Plastisol Ink	Mid Chrome/CMS Yellow RS
PNP407	PVC/Phthalate Free Plastisol Ink	Deep Orange/CMS Orange
PNP540	PVC/Phthalate Free Plastisol Ink	CMS Deep Red
PNP550	PVC/Phthalate Free Plastisol Ink	CMS Red
PNP560	PVC/Phthalate Free Plastisol Ink	CMS Magenta
PNP590	PVC/Phthalate Free Plastisol Ink	CMS Violet
PNP700	PVC/Phthalate Free Plastisol Ink	CMS Green

Standard Colours

The standard colours are available as follows:

PNP100	PVC/Phthalate Free Plastisol Ink	Black
PNP290	PVC/Phthalate Free Plastisol Ink	Opaque White
PNP623	PVC/Phthalate Free Plastisol Ink	Mid Blue
PNP640	PVC/Phthalate Free Plastisol Ink	Deep Blue
PNP090	PNP Extender Base	Clear

Trichromatic Colours

PNP110	PVC/Phthalate Free Plastisol Ink	Trichromatic Black
PNP310	PVC/Phthalate Free Plastisol Ink	Trichromatic Yellow
PNP510	PVC/Phthalate Free Plastisol Ink	Trichromatic Magenta
PNP610	PVC/Phthalate Free Plastisol Ink	Trichromatic Cyan

Remarks:

CMS	Chaiyaboon Matching Systems
RS	Red Shade
BS	Blue Shade
GS	Green Shade
YS	Yellow Shade

Additive

PTSE001	PTS Expanding Powder
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Solvents

PNP901 2940	Flow Thinner For Phthalate Free Plastisol Ink Cleaner
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STANDARD PACKING

PNP inks are available in 25Kg, 5Kg and 1Kg containers.
PNP Expander (Powder) is available in 1Kg, 500g and 200g containers.
The Solvents are available in 200 ltr, 20 ltr, 5 ltr and 1 ltr containers.

COLOUR MATCHING SERVICE

CHAIYABOON BROTHERS COMPANY (CBC) offer a quality colour matching service. Colours can be matched to prints, wet ink samples or to PANTONE™ references. When placing an order, please include a sample of the substrate to be printed, along with any other relevant information, such as the type of mesh and squeegees that are to be used and the product resistance required. The minimum order for a colour match is 3Kg.

STORAGE

PNP inks should be stored away from heat, between 5-25°C. and in a sealed container.

Note : PNP will increase viscosity or set up or standing , however the ink will return to normal viscosity on stirring.

SAFETY AND HANDLING

PNP inks should be used with care. Wear suitable PPE, for example, appropriate gloves and safety glasses.
PNP inks are formulated to be free from any toxic, carcinogenic, mutagenic or reprotoxic chemicals.
PNP inks are suitable for printing children's products. All colours comply with the following standards: EN71 Standard of the European Economic Community, the United Kingdom Toys (Safety) Regulation 1974, the DIN EN 71 Standard of Germany and French Toys Standard NF 551204.
PNP inks do not have a flashpoint and are therefore exempt from the Highly Flammable Liquid Regulation.
Whilst working with the ink, the consumption of food and drink, and smoking are not recommended.

Please consult the information on ***The Safety and Handling of PNP inks*** in the Chaiyaboon Material Safety Data Sheet.

ENVIRONMENTAL INFORMATION

PNP Inks:

- Are formulated free from ozone depleting chemicals as described in the Montreal Convention.
- Do not contain heavy metals.
- Are formulated to be free from aromatic hydrocarbons known to have an adverse effect on the environment.
- Do not have any volatile solvents (VOCs) and are therefore less harmful to the environment when compared with solvent-based products.
- Do not contain PVC resins or phthalate plasticizers.

TECHNICAL SERVICE AND INFORMATION

For further information or other relevant data, please do not hesitate to contact us. Chaiyaboon Brothers Company (CBC) has a team of well-trained personnel who are ready to give help and advise regarding product information and application.