Product Data Sheet
Pad Printing Ink

SunChemical®
a member of the DIC group
Color & Comfort

TP 303

Solvent Based Pad Printing Ink Range, 1- and (alternatively) 2-Component

APPLICATION

Pad printing ink range TP 303 is especially suitable for printing on untreated polypropylene (PP). In addition, for printing on polyester, polyurethane, various metals and coated surfaces.

PROPERTIES

- Pad inks TP 303 are solvent based pad printing inks. They can be processed as 1-component and (alternatively) as 2-component ink with hardener.
- Processed as 1-component ink TP 303 dries physically, as 2-component ink physically chemically-reactive and results in a satin gloss finish.
- TP 303 inks can be processed on a variety of pad printing machines, from various flat systems to quick running rotation systems.
- The ink system shows good and reliable printability.
- For enhanced mechanical and chemical resistance and improved adhesion pad printing inks TP 303 can be processed as 2-component ink
- TP 303 inks are suitable for medium-term outdoor applications.

COLOUR SHADES - OVERVIEW

- Mixing System: C-MIX 2000 12 colour shades for mixing of RAL, PMS and HKS colours.
- Opaque: Standard Colour shades with medium to good opacity.
- Special colour shades are available upon request.
- More information about available colour shades in the detailed tables in section Colour Shades.

CHOICE OF PIGMENTS AND LIGHT FASTNESS

Colour shades of TP 303 ink range contain pigments with a high light fastness. Light fastness and weather resistance will reduce if thinner layers are applied or if base colours are mixed with a high ratio of white or varnish.

Applied on suitable substrates pad printing inks TP 303 are suitable for medium-term outdoor applications.

ADJUSTMENT FOR PAD PRINTING

- Pad printing inks TP 303 are not supplied in a ready-to-print adjustment.
- **Processed as 1-component ink (without addition of hardener):**
  Ink is adjusted to printing consistency by addition of thinner or retarder (stir with mixer or agitator).
- **Processed as 2-component ink (with addition of hardener):**
  As 2-component ink TP 303 inks have to be mixed with hardener at a specified ratio prior to processing. Thinner is added after addition of hardener.
  The mixed ink should be allowed to pre-react for approx. 15 minutes prior to processing (recommendation). Processing is then possible for a specified period of time (=pot life).

Hardener:
Alternatively, pad inks range TP 303 can be processed as 2-component ink with **hardener TP 219** (recommended) or **TP 219/N (suitable).**
Hardeners are added to TP 303 inks at a specified ratio.

Ink : Hardener =10 : 1 (parts by weight)

Hardeners are sensitive to humidity. Therefore, containers always have to be tightly closed.

Pot life:

- Ink mixed with hardener may only be processed within a limited period of time (=pot life)
- **Pot life of TP 303 + hardener is approx. 8 h (at 20°C).**
  Higher temperatures will reduce pot life.
- We do not recommend processing the inks for longer than the pot life as adhesion and resistance properties will then continually deteriorate, even if the ink still seems to be liquid and processable.

THINNERS / RETARDERS
Depending on local conditions ink is adjusted to printing consistency by addition of 15 – 35 % by weight of thinner or retarder.
Generally, the thinner suitable for TP 303 inks is Additive A!
The additional products listed below should only be used if the required printing quality/ink transfer cannot be achieved using additive A (e.g. drying too slow or too fast).

For adjustment of pad inks TP 303, the following products are available:

Thinner:	○	Additive C	Extremely quick thinner, good solving power
	○	VD 40	Quick, very strong solving power
	○	Additive B	Quick thinner, good solving power
	■	**Additive A**	**Standard thinner**
	○	Additive U	Standard thinner, free of cyclohexanone
	○	VD 60	Slow thinner
Retarder:	○	TPD	Very slow retarder
	■= Preferred	○= If required	
Note:	**For printing with thick and thin steel clichés sensitive to corrosion**		
	○	Additive A/00	Standard thinner with anti-corrosion additive
	○	Additive B/00	Quick thinner with anti-corrosion additive

Depending on printing conditions, the products listed above can be mixed into the inks individually or as mixtures. Please note that depending on evaporation rate of the thinner/retarder used drying times may be longer.
Thinner/retarder should be mixed into the ink thoroughly using a mixer or agitator. In addition, inks should be stirred well prior to each processing to obtain a homogeneous dispersion of all ingredients.

ADDITIONAL AUXILIARY AGENTS

Application	Product	Addition in % by weight	Additional Information
Antistatic paste	LAB-N 111420	Max. 10%	Possibly slightly reduced gloss
Retarder paste	LAB-N 111420/VP	Max. 10%	Possibly slightly reduced gloss
Viscosity increase	Thickening powder	Max. 3%	Stir with mixer
Matting	Matting powder	Max. 5%	Stir with mixer
Flow agent	VM 1	1 - 5%	Do not overdose!

OVERPRINTING
Generally, it is not necessary to overprint TP 303 inks with varnish. However, overprinting to achieve an enhanced protection of ink layers is possible with TP 303/E50.

BRONZE COLOURS

Bronze colours are available upon request.
Printers can mix bronzes themselves using bronze pastes B 75, B 76, B 77 and B 79 as well as bronze powder B 78-POWDER. For examples of colour shades please refer to our Bronze Colour Card.

These “B“ bronze pastes and “B” bronze powder are mixed with varnish TP303/E50 prior to processing.

Mixing ratios in parts by weight:

Gold bronze paste/powder	to	TP 303/E50	=	1 : 3 - 4
Silver bronze paste	to	TP 303/E50	=	1 : 4 - 5

Bronzes B 75 to B 79 are prone to oxidation (Exception B 78-POWDER). Therefore, they should be overprinted, e.g. with TP 303/E50.

B 78-POWDER does not tend to oxidation. The pale copper shade will not darken with time. Colour of inks mixed with B 78-POWDER is similar to colour 78/AB as shown on our “bronze colour card”.

Note: When overprinting bronze colours with varnish or other colour shades it is essential to carry out pre-tests to check intermediate adhesion of the ink layers (fingernail test, tape test).

DRYING / HARDENER REACTION

1. **Processing WITHOUT addition of hardener:**
   Ink dries physically, i.e. by evaporation of solvents.
2. **Processing WITH addition of hardener TP 219 or TP 219/N:**
   First, ink dries physically, followed by chemical cross-linkage reaction.
   Drying and reaction temperature of hardener must be at least 15°C when using TP 219 and 20°C using TP 219/N!

Drying

Drying times below are only approximate as drying properties depend on various factors:

- Type and amount of thinners/retarders used.
- Thickness of printed ink layer (single print, multi-layer print).
- Drying temperature.

Depending on local conditions, average drying time is approx. 2 – 3 minutes. Drying time with heat application (e.g. hot air fan) and air circulation is about 30 - 60 seconds.
Complete drying may take several hours, also depending on the substrate.

Hardener Reaction

Basically, the increased resistance properties of the printed ink film are only achieved after complete drying followed by chemical cross linkage reaction between ink and hardener. This cross linkage reaction depends on time and temperature. See table below.

The following are guide values only:

Temperature	Time approx.	Condition of ink	Additional information
<15°C air drying		Hardener TP 219 does not react!	Ink film will not achieve any resistance
<20°C air drying		Hardener TP 219/N does not react!	Ink film will not achieve any resistance
20°C air drying	20 min.	“Touch-dry”	No resistance yet
	>72 h	High degree of cross-linkage	High resistances achieved
	>5 days	Maximum degree of cross-linkage	Maximum resistances achieved
80°C oven curing	approx. 5 min.	Dry enough for overprinting	No resistance yet
	60 min.	High degree of cross-linkage	High resistance values achieved

Resistance Tests

Resistances should not be checked before the ink has fully cured/cross-linked:
Drying with 20°C/>72h; with 80°C/>60 minutes.

CLICHÉ

All commercial types of clichés (polymer, thin and thick steel, ceramic) are suitable for processing TP 303 inks.
Note: Standard shades 17, 50 and 51 cannot be used for closed ink systems with a magnet holder as they contain pigments with iron oxide content.

CLEANING

The longer inks dry on clichés, pots and tools the harder will be their removal due to the chemical cross-linkage reaction. Therefore, always remove ink residues as soon as possible using our universal cleaning agents URS, URS 3 or thinner VD 40.

PACK SIZE

Pad printing inks TP 303 are delivered in 1 litre containers. Other pack sizes are available upon request.

SHELF LIFE

In closed original containers, TP 303 inks generally have a shelf life of 3 years from date of production. Hardeners TP 219 and TP 219/N have a shelf life of 14 months from date of production, also in closed original containers.
For exact date of expiry, please refer to the label.

SAFETY DATA SHEETS

Read safety data sheet prior to processing
Safety data sheets comply with Regulation (EC) No. 1907/2006 (REACH), Appendix II.

CLASSIFICATION AND LABELLING

Hazard classification and labelling comply with Regulation (EC) No. 1272/2008 (CLP/GHS).

CONFORMITY

Coates Screen Inks GmbH does not use any of the substances or mixtures for the production of printing inks, which are banned according to the EUPIA (European Association of the Printing Inks Industry) exclusion policy.
Further compliance confirmations are available upon request.

ADDITIONAL INFORMATION ABOUT OUR PRODUCTS

Product data sheets:	Auxiliary Agents for Pad Printing HM
Brochures:	Pad Printing Inks
Internet:	Various technical articles are available for download on www.coates.de, section “SN-Online”; e.g. “Processing of 2-component Inks”

FOR COLOUR RANGES, PLEASE REFER TO NEXT PAGE.

COLOUR SHADES

C-MIX 2000 BASE COLOUR SHADES

Mixing system for matching of PMS, HKS, RAL colours (on white substrates)
Start formulations available in data base „Formula Management C-MIX 2000“
According to colour card C-MIX 2000

primrose	TP 303/Y30	red	TP 303/R50	green	TP 303/G50
golden yellow	TP 303/Y50	magenta	TP 303/M50	black	TP 303/N50
orange	TP 303/O50	violet	TP 303/V50	white	TP 303/W50
scarlet	TP 303/R20	blue	TP 303/B50	varnish	TP 303/E50

STANDARD (medium opacity)

According to colour card STANDARD 2 for pad printing inks or TP 218/ TP 300 …
Availability of further standard shades upon request

bright red	TP 303/21-NT	light green	TP 303/40-NT	black	TP 303/65-NT
light blue	TP 303/30-NT	white	TP 303/60-NT		

STANDARD Colour Range HD (high opacity)

According to colour card STANDARD HD for pad printing inks
Availability of further standard HD shades upon request

Upon request.	

SPECIAL PRODUCTS: Special Colour Shades, Varnishes, Pastes

Information about availability upon request

white, matt	TP 303/60-MT	black, matt	TP 300/65-00-MT-NT

4 COLOUR PROCESS INKS (CMYK)

According to colour card STANDARD 2 for pad printing inks or TP 218/ TP 300 …

Upon request	

AB – BRONZE INKS and MG – METAL GLOSS INKS

According to Bronze Colour Card

AB Bronze Inks	**MG Metal Gloss Inks**
Upon request	**Upon request**

Matching of PMS, RAL, NCS colours and special shades upon request.
All above information refers to the colour shades listed in this product data sheet and other standard shades of this pad printing ink range. Information about availability of further standard shades upon request.
In some individual cases the product characteristics of special colour shades and modifications of this ink type manufactured upon customer request may differ from the above properties.

The statements in our product and safety data sheets are based on our present experiences, however they are no assurance of product properties and do not justify a contractual legal relationship. We provide these details to inform customers about our products and their possible applications. However, on account of various factors influencing processing of our products it is absolutely essential to carry out printing trials under local production conditions. Choice of individual ink types and their suitability for the intended application is the sole and entire responsibility of the user. We do not assume any liability for any problems of technical or process-related nature. Any liability shall be limited to the value of the goods delivered by us and processed by the user.
All former product data sheets are no longer valid. ***March 2025 - Version B4***

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