Product Data Sheet
Pad Printing Ink

SunChemical®
Coates Screen Inks

TP 307

Solvent Based Pad Printing Ink Range, 2-Component

APPLICATION

TP 307 inks are suitable for printing on pre-treated polyolefines, i.e. polypropylene (PP) and polyethylene (HD-PE, LD-PE) such as bottles, formed parts etc. The ink range is also appropriate for printing on chromium-plated surfaces, coated substrates and various thermoplastics such as PMMA ("acrylic glass"), ABS and duroplastics (phenolic and melamine resins, glass-fibre reinforced polyester and epoxy resins).

TP 307 inks are especially used for a variety of technical-industrial applications.

PROPERTIES

- Pad inks TP 307 are solvent based pad printing inks. They are processed as 2-component ink with hardener.
- **In line with current safety requirements pad printing inks TP 307 have been formulated with especially environmentally compatible raw materials. TP 307 inks do not contain aromatics, butyl glycolate (GB-Ester), cyclohexanone, Bisphenol A (BPA) and also no polycyclic aromatic hydrocarbons (PAH).**
  Exception: AB bronzes 75/AB to 79/AB (contain aromatics) and black colour shades N50 and 65 (PAH-containing pigments).
- **If the criteria to obtain the GS mark (category 1) according to GS specification AfPS GS 2014:01 PAH have to be met, the following applies:**
  Colour shade black: Only colour shades N58, 68 or 68-HD-NT are suitable.
  Bronze colours: Only MG bronzes are suitable (available upon request)
  Thinner/Additives Only those products marked with symbol ☑ in this data sheet are suitable.
- Ink range TP 307 shows good printability. The inks dry chemical-physically and result in a glossy finish.
- This ink range is especially suitable for technical/industrial applications requiring high physical and chemical resistances.
- Fully cured prints show a good scratch resistance and a highly tough surface.
- TP 307 inks exhibit good resistance against chemical cleaning agents.
- TP 307 inks are suitable for long-term outdoor applications.
- Note: Because of the variety of substrates, pre-tests are essential. It is also advised to check efficiency of possibly required pre-treatment of substrates (cleaning/degreasing, flame/corona/plasma treatment) or maybe even post-treatment (flame-drying).

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 307 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 TP 307 inks are also suitable for long-term outdoor applications.

ADJUSTMENT FOR PAD PRINTING

- Pad printing inks TP 307 are not supplied in a ready-to-print adjustment.
- As this ink range is a 2-component system TP 307 inks have to be mixed with hardener at a specified ratio (% by weight) 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:
2-component pad printing inks TP 307 have to be mixed with hardener prior to processing. The following hardeners are available:
☑ **TP 219/N (Standard),** also suitable for outdoor applications
☑ **TP 219**, tends to yellowing, not suitable for outdoor applications.
The hardener is mixed with TP 307 at a ratio of i**nk : hardener = 4 : 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 307 + 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 – 30 % by weight of thinner or retarder.
Generally, the thinners suitable for TP 307 inks are Additive A or U☑!
The additional products listed below should only be used if the required printing quality cannot be achieved using additive A or U (e.g. drying too slow or too fast).
Note: If TP 307 inks have to be free of aromatics or butyl glycolate or cyclohexanone only those products marked with symbol ☑ in this data sheet are suitable.

For adjustment of pad inks TP 307, the following products are available:

Thinner:	☑○ Additive C	Extremely quick thinner, good solving power
	☑○ Additive D	Very quick thinner, good solving power
	○ Additive B	Quick thinner, good solving power
	○ VD 40	Quick thinner, very strong solving power
	■ **Additive A**	**Standard thinner**
	☑■ **Additive U**	**Standard thinner, free of cyclohexanone**
	☑○ Additive R	Medium thinner
	☑○ VD 60	Slow thinner
Retarder:	☑○ VZ 35	Very slow retarder
	○ TPD	Very slow retarder
	☑= Product is free of aromatics, butyl glycolate, cyclohexanone, PAK	
	■= Preferred ○= If required	
Note:	**For printing with thick and thin steel clichés sensitive to corrosion**	
	☑○ Additive U/00	Standard thinner with anti-corrosion additive
	☑○ Additive D/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	☑ STM-P1	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 11	1 - 5 %	Do not overdose!
Flow agent	VM 1	1 - 5%	Do not overdose!

OVERPRINTING

Generally, it is not necessary to overprint TP 307 inks with varnish. However, overprinting to achieve an enhanced protection of ink layers is possible with TP 307/E50.

BRONZE COLOURS, MIXING OF BRONZE INKS

Bronze colours AB and MG(☑) are available upon request.
Note: When overprinting AB or MG 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).

For technical reasons printers should not mix TP 307 inks with “B” bronze pastes or “B” bronze powder.

DRYING / HARDENER REACTION

Mixture of TP 307 ink/hardener is a chemically-reactive system with a physical pre-drying.

- Ink dries physically by evaporation of solvents.
- **Then the ink film cures by chemical cross-linkage reaction.**
- **The following drying and reaction temperatures are essential:**
  TP 219/N >20°C TP 219 > 15°C!

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.

Drying time is approx. 30 – 60 seconds at room temperature (20 – 25°). Drying time with heat application (e.g. hot air fan) and air circulation is about 10 - 20 seconds.
Complete drying may take up to several hours, also depending on the substrate.

Hardener Reaction

Basically, the special 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.

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
140° oven curing	30 min.	Maximum degree of cross-linkage	Maximum resistance values achieved

Resistance Tests
Resistances should not be checked before the ink has fully cured/cross-linked:
Drying with 20°C/>72 h; 80°C/>60 minutes* 140°C/30 minutes*
*After oven curing allow a cooling time (room temperature 20°C) of at least 1h.

CLICHÉ
All commercial types of clichés (polymer, thin and thick steel, ceramic) are suitable for processing TP 307 inks.
Note: Standard shades 17, 50, 51 and 65-HD 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.
Note: When producing prints for end products to be evaluated for compliance with PAH threshold values (e.g. AfPS GS 2014:01 PAH) we recommend to clean with our products Additive C, U, R or VD 60.

PACK SIZE
Pad printing inks TP 307 are delivered in 1 litre containers. Other pack sizes are available upon request.

SHELF LIFE
In closed original containers, TP 307 inks generally have a shelf life of 5 years from date of production. Hardener TP 219/N and TP 219 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. Pad printing inks range TP 307 C-MIX 2000 colour shades, standard shades, highly opaque standard colours (HD), process colours, silver, fluorescent colours and transparent colours comply with the requirements of toy standard „EN 71-3:2019 Safety of toys – Migration of certain elements (category III: scraped off material).
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”

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 307/Y30	magenta	TP 307/M50	**black, low-grade PAH**	**TP 307/N58**
golden yellow	TP 307/Y50	violet	TP 307/V50	white	TP 307/W50
orange	TP 307/O50	blue	TP 307/B50	varnish	TP 307/E50
scarlet	TP 307/R20	green	TP 307/G50		
red	TP 307/R50	black	TP 307/N50		

STANDARD Colour Range (medium opacity)

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

citric yellow	TP 307/10-NT	bright red	TP 307/21-NT	dark blue	TP 307/33-NT
medium yellow	TP 307/11-NT	carmine red	TP 307/22-NT	white	TP 307/60-NT
orange	TP 307/15-NT	light blue	TP 307/30-NT	black	TP 307/65-NT
light red	TP 307/20-NT	ultra marine	TP 307/32-NT	**black, low-grade PAH**	**TP 307/68-NT**

STANDARD Colour Range HD (high opacity)

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

white, highly opaque	TP 307/60-HD-NT	**black, highly opaque, low-grade PAH**	**TP 307/68-HD-NT**
black, highly opaque	TP 307/65-HD-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**

***AB bronze inks contain aromatic solvents.**

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.

Coates Screen Inks GmbH
Wiederholdplatz 1 90451 Nürnberg
Tel.: 0911 6422 0 Fax: 0911 6422 200
http://www.coates.de