Product Data Sheet
Pad Printing Ink

SunChemical®
Coates Screen Inks

TP 218

Solvent Based Pad Printing Ink Range, 2-Component

APPLICATION

Pad printing inks for printing on special thermoplastics, especially pre-treated polyolefines, i.e. polypropylene (PP), polyethylene (HD-PE, LD-PE), PMMA ("acrylic glass"), polyamide (PA), cellulose acetate, various duro-plastics as well as metals and coated surfaces.

PROPERTIES

- Pad inks TP 218 are solvent based pad printing inks. They are processed as 2-component ink with hardener.
- Ink range TP 218 shows good printability. The inks dry chemical-physically and result in a glossy finish.
- TP 218 inks are suitable for a variety of applications, especially for technical/industrial applications requiring high resistances.
- Cured prints exhibit high mechanical resistances as well as good chemical resistances against many organic solvents, thinned alkalis and acids, oils and grease.
- Due to the binders (epoxy resin) pad printing inks TP 218 are suitable for indoor and short-term outdoor applications. Pad printing inks TP 307 are a possible weather resistant alternative.
- TP 218 inks are certified according to USP Medical Class VI. They can be used for printing onto medical devices.
- 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.
	Standard HD	Highly opaque colour shades.
• Process Inks:	„180" colours	4 transparent colour shades according to Europe scale.
• Bronzes:	B / AB/ MG	Gold, silver and copper shades.

- 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 218 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. Due to the binders (epoxy resin) pad printing inks TP 218 are not weather resistant. They are suitable for indoor and short-term outdoor applications. Pad printing inks TP 307 are a possible weather resistant alternative.

ADJUSTMENT FOR PAD PRINTING

- Pad printing inks TP 218 are not supplied in a ready-to-print adjustment.
- As this ink range is a 2-component system TP 218 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, up to 8h/20°C (=pot life).

Hardener:
Pad printing inks TP 218 are mixed with **hardener TP 219** (recommended) or **TP 219/N** (suitable).
Hardeners are sensitive to humidity. Therefore, containers always have to be tightly closed.
The required hardener is added to the colour shades of TP 218 range at a specified ratio (parts by weight).

Colour Shades:	Examples:	Ink : Parts	Hardener: Parts
Medium opacity	Colour ranges C-MIX 2000 / Standard / Bronze colours / Mixtures of these	**4**	**1**
High opacity	Colour range Standard HD / Mixtures of these	**5**	**1**
Transparent	Varnish E50, Transparent paste TP, Process colours	**3**	**1**

Note: Due to the very high pigment content highly opaque colours may have a slightly reduced resistance.

Pot life:

- Ink mixed with hardener may only be processed within a limited period of time (=pot life)
- **Pot life of TP 218 + hardener TP 219 or TP 219/N 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 thinner suitable for TP 218 inks is Additive A!
The additional products listed below should only be used if the required printing quality (ink transfer cliché/pad/substrate) cannot be achieved using additive A (e.g. drying too slow or too fast).

For adjustment of pad inks TP 218, the following products are available:

Thinner:	○	Additive C	Extremely quick thinner, good solving power
	○	VD 40	Quick thinner, 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. 5%	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 218 inks with varnish. However overprinting to achieve an enhanced protection of ink layers is possible with TP 218/E50. Overprinting should be carried out within <12 hours.

BRONZE COLOURS, MIXING OF BRONZE INKS

Bronze colours 75/AB to 79/AB and metal gloss colours 75/MG to 79/MG are available.
Printers can mix bronzes themselves using bronze pastes B 75 to B 79.
For examples of colour shades please refer to our Bronze Colour Card.
These “B“ bronze pastes are mixed with bronze binder TP 218/B or varnish TP 218/E50 prior to processing.

Mixing ratios in parts by weight:

Gold bronze paste	to	TP 218/B or TP 218/E50	=	1 : 3 - 4
Silver bronze paste	to	TP 218/B or TP 218/E50	=	1 : 4 - 5

Contrary to AB and MG bronze colours, B bronzes tend to oxidation. Therefore they should be overprinted, e.g. with TP 218/E50.
Note: When overprinting bronze colours (B/ AB/ MG) 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).
Overprinting should be carried out within <12 hours.

DRYING / HARDENER REACTION

Mixture of TP 218 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.
- **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.

Drying time is approx. 10 – 15 minutes at room temperature (20 – 25°). Drying time with heat application (e.g. hot air fan) and air circulation is about 40 - 60 seconds.

Complete drying may take up to 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. Until fully cured the minimum temperatures should not fall below 15°C (TP 219) and 20°C (TP 219/N). In addition, avoid high humidity.
Cross-linkage reaction will be much quicker using higher temperatures.

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
	<12 h	Still good overprintability	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/5 days; 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 218 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 218 are delivered in 1 litre containers. Other pack sizes are available upon request.

SHELF LIFE

In closed original containers, TP 218 inks generally have a shelf life of 5 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. Pad printing inks range TP 218 C-MIX 2000 colour shades, standard, highly opaque standard colours (HD), process colours, silver, fluorescent colours and transparent colours comply with the requirements of toy standard „EN 71-3:2013 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”; 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 218/Y30	red	TP 218/R50	green	TP 218/G50
golden yellow	TP 218/Y50	magenta	TP 218/M50	black	TP 218/N50
orange	TP 218/O50	violet	TP 218/V50	white	TP 218/W50
scarlet	TP 218/R20	blue	TP 218/B50	varnish	TP 218/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

citric yellow	TP 218/10-NT	pink	TP 218/25-NT	fir green	TP 218/41-NT
medium yellow	TP 218/11-NT	light blue	TP 218/30-NT	brilliant green	TP 218/42-NT
dark yellow	TP 218/12-NT	medium blue	TP 218/31-NT	light brown	TP 218/50-NT
orange	TP 218/15-NT	ultra marine	TP 218/32-NT	dark brown	TP 218/51-NT
ochre yellow	TP 218/17-NT	dark blue	TP 218/33-NT	white	TP 218/60-NT
light red	TP 218/20-NT	turquoise	TP 218/34-NT	black	TP 218/65-NT
bright red	TP 218/21-NT	violet	TP 218/37-NT		
carmine red	TP 218/22-NT	light green	TP 218/40-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

citric yellow, highly opaque	TP 218/10-HD-NT-NEU	carmine red, highly opaque	TP 218/22-HD-NT-NEU
medium yellow, highly opaque	TP 218/11-HD-NT-NEU	light blue, highly opaque	TP 218/30-HD-NT-NEU
dark yellow, highly opaque	TP 218/12-HD-NT-NEU	violet, highly opaque	TP 218/37-HD-NT-NEU
orange, highly opaque	TP 218/15-HD-NT-NEU	light green, highly opaque	TP 218/40-HD-NT-NEU
light red, highly opaque	TP 218/20-HD-NT-NEU	white, highly opaque	TP 218/60-HD-NT
bright red, highly opaque	TP 218/21-HD-NT-NEU	black, highly opaque	TP 218/65-HD-NT

SPECIAL PRODUCTS: Special Colour Shades, Varnishes, Pastes

Information about availability upon request

white, matt	TP 218/60-MT-NT	matt paste	TP 218/MP
black, matt	TP 218/65-MT-NT	bronze binder	TP 218/B
black, low-grade PAH	TP 218/68-NT	overprint varnish	TP 218/70-NT
transparent paste	TP 218/TP	overprint varnish, matt	TP 218/70-MT-NT

4 COLOUR PROCESS INKS (CMYK)

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

process yellow	TP 218/180-NT	process black	TP 218/65-NT
process magenta	TP 218/181-NT	transparent paste	TP 218/TP
process cyan	TP 218/182-NT		

Matching of PMS, RAL, NCS colours and special shades upon request.

FOR FURTHER COLOUR RANGES, PLEASE REFER TO THE NEXT PAGE.

AB – BRONZE INKS and MG – METAL GLOSS INKS According to Bronze Colour Card			
AB Bronze Inks		**MG Metal Gloss Inks**	
rich gold	TP 218/75-AB-NT	rich gold	TP 218/75-MG
rich pale gold	TP 218/76-AB-NT	rich pale gold	TP 218/76-MG
pale gold	TP 218/77-AB-NT	pale gold	TP 218/77-MG
copper	TP 218/78-AB-NT	copper	TP 218/78-MG
silver	TP 218/79-AB-NT	silver	TP 218/79-MG

Matching of PMS, RAL, NCS colours and special shades upon request.

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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. *May 2017 - Version B1*

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