

Product Data Sheet

Pad Printing Ink

TP 418

Solvent Based Pad Printing Ink Range, 2-Component

APPLICATION

Pad printing inks for printing on glass, metals, chromium-plated and coated surfaces, pre-treated polyolefins. Also, for printing of various thermoplastics like PMMA (acrylic glass) and ABS and duroplastics (phenolic and melamine resins, glass-fibre reinforced polyester and epoxy resins).

TP 418 inks are a good choice for technical-industrial applications.

PROPERTIES

- Pad printing inks TP 418 are solvent based 2-component screen printing inks, which must be processed with hardener.
- **In line with current safety requirements TP 418 inks have been formulated with raw materials low in harmful substances. Thus, TP 418 inks do not contain aromatics, butyl glycolate (GB-Ester), cyclohexanone, Bisphenol A (BPA) and also no polycyclic aromatic hydrocarbons (PAH).**
- **If the criteria to obtain the GS mark (category 1) according to GS specification AfPS GS 2019:01 PAH have to be met, the following applies:**
Thinner/Additives Only those products marked with symbol ☒ in this data sheet are suitable.
- TP 418 inks show good printability. They dry chemically-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 418 inks exhibit good resistance against chemical cleaning agents.
- TP 418 inks are suitable for long-term outdoor applications.
- Note: Because of the large 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. The TP 418 mixing colours show high pigmentation to achieve high opacity on transparent substrates. If high opacity is not required, the ink can be blended with varnish E50.
- 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 418 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 substrate pad printing inks TP 418 are suitable for long-term outdoor applications.

ADJUSTMENT FOR PAD PRINTING

- Pad printing inks TP 418 are not supplied in a ready-to-print adjustment.
- As this ink range is a 2-component system TP 418 inks must be mixed with hardener at a specified ratio prior to processing.
- Thinner is added after addition of hardener.
- The mixed ink **must** pre-react, especially when printing on **glass**, for approx. 15-20 minutes prior to processing.
- Processing is then possible within a specified period of time (=pot life) of approx. 6-8 hours/20 C°.

Hardener:

Pad printing inks TP 418 must 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.
- **SGF/H** is to be used for printing on glass/metals.

The hardener is mixed with TP 418 at a ratio of **ink : hardener = 4 : 1** (parts by weight).

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

Pot life:

- Ink mixed with hardener may only be processed within a limited period of time (=pot life)
- **Pot life is approx. 6 - 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 20 – 30 % of thinner or retarder.

Generally, the thinners suitable for TP 418 inks are Additive A or U.

The additional products listed below should only be used if the required printing quality/ink transfer cannot be achieved using additive A or U (e.g. drying too slow or too fast).

Note: If TP 418 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 printing inks TP 418, the following products are available:

Thinner:	☒ ☐ Zusatzmittel C	Extremely quick thinner, good solving power
	☒ ☐ Zusatzmittel D	Very quick thinner, good solving power
	☐ Zusatzmittel B	Quick thinner, good solving power
	☐ VD 40	Quick thinner, very strong solving power
	☒ Zusatzmittel A	Standard thinner
	☒ Zusatzmittel U	Standard thinner, free of cyclohexanone
	☒ ☐ VD 60	Slow thinner
Retarder:	☒ VZ 35	Very slow retarder
	☐ TPD	Very slow retarder
■ = Preferred ○ = Suitable ☒ = product is free of aromatics, butylglycolate, cyclohexanone, PAH		
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
Retarder paste	☒ STM-P1	Max. 10%	Possibly slightly reduced gloss
Antistatic paste	LAB-N 111420/VP	Max. 10%	Possibly slightly reduces 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!
	VM1	1 - 5%	Do not overdose!

OVERPRINTING

Generally, it is not necessary to overprint TP 418 inks with varnish. However, overprinting to increase resistances of ink layers is possible with TP 418/E50.

DRYING / HARDENER REACTION

Mixture of TP 418 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 below drying and reaction temperatures must be strictly adhered to:**
TP 219/N >20°C or TP 219 >15°C or SGF/H >20°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.
- Drying temperature.

Hardener Reaction

The special adhesion and resistance properties of the ink are achieved only by chemical cross linkage reaction. This cross-linkage reaction depends on time and temperature.

The following are guide values only:

Temperature	Time approx.	Condition of ink	Condition of ink film
<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		Hardener SGF/H does not react!	Ink film will not achieve any resistance
20°C air drying	60 min.	"touch-dry"	No resistance yet
	<12h	Overprinting still good	No resistance yet
	>72h	High degree of cross-linkage	High resistance achieved
	>5 days	Maximum cross-linkage	Maximum resistance achieved
80°C oven curing	ca. 10 min.	Dry enough for overprinting	No resistance yet
	60 min.	High degree of cross-linkage	High resistance achieved
140°C oven curing	15 min.	High degree of cross-linkage	High resistance achieved
	30 min.	Maximum cross-linkage	Maximum resistance achieved

Resistance

Ink range TP 418 can be used for a large range of partially quite demanding substrates. These materials may require pre-cleaning/degreasing or a mandatory pre-treatment of substrates such as flame, corona, plasma (e.g. polyolefines) treatments. Duroplastics and coatings may show quite different qualities. Therefore, suitability should always be determined by pre-trials taking into consideration above processing parameters.

Resistances should not be checked before the ink has fully cured / cross-linked:

Drying: 20°C/> 72 h, 80°C/>60 Min.*, 140°C/>30 min.*

*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 418 inks.

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 2019:01 PAH) we recommend to clean with our products Additive C, U or VD 60.

PACK SIZE

Pad printing inks TP 418 are delivered in 1 litre containers. Other pack sizes are available upon request.

SHELF LIFE

In closed original containers, TP 418 inks and hardener SGF/H generally have a shelf life of 2 years from date of production. TP 219 and TP 219/N have a shelf life of 24 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 to produce 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 Screen 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) C-MIX 2000 Colours of TP 418 range have a higher pigmentation than the usual C-MIX shades. Start formulations available in data base „Formula Management C-MIX 2000“ According to colour card C-MIX 2000-P					
primrose	TP 418/Y30	red	TP 418/R50	green	TP 418/G50
golden yellow	TP 418/Y50	magenta	TP 418/M50	black, PAH-free	TP 418/N58
orange	TP 418/O50	violet	TP 418/V50	white	TP 418/W50
scarlet	TP 418/R20	blue	TP 418/B50	varnish	TP 418/E50
AB – BRONZE INKS and MG – METAL GLOSS INKS According to Bronze Colour Card					
Upon request					

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

All the above information refers to the colour shades listed in this product data sheet and other standard shades of this pad 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.

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