Product Data Sheet
Pad Printing Ink

SunChemical®
a member of the DIC group
Color & Comfort

TP/UV-P & TP/UV-P2

UV-Curing Pad Printing Ink Range, 1- and (alternatively) 2-Component

APPLICATION

Pad printing inks **TP/UV-P** for printing of thermoplastics, especially ABS, in addition SAN, polystyrene (PS), polycarbonate (PC), rigid PVC, polyamide (PA), pre-treated polypropylene (PP) and duroplastics.
Pad printing inks **TP/UV-P2** especially for printing of polyamide (PA), glass-fibre reinforced polyamide (PA-GF) and metals.

PROPERTIES

- Ink ranges TP/UV-P and TP/UV-P2 cure by UV-radiation (radical).
  For technical reasons TP/UV-P and TP/UV-P2 inks also contain organic solvents.
- TP/UV-P2 is a modification of TP/UV-P used for PA, PA-GF and metals.
- TP/UV-P and TP/UV-P2 inks can be processed as 1- and (alternatively) as 2-component system with hardener.
- Processed as 1-component ink TP/UV-P and TP/UV-P2 cure by UV-radiation and as 2-component system they additionally cure chemically-reactive.
- TP/UV-P prints result in a glossy finish. TP/UV-P2 inks show a satin gloss finish.
- Processing as 2-component ink will increase resistances and ink adhesion properties on difficult substrates, such as pre-treated PP.
- Ink ranges TP/UV-P and TP/UV-P2 are also suitable for short and medium-term outdoor applications.
- Note: Because of the variety of substrates/materials, 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). Also check efficiency of UV-radiation.

COLOUR SHADES - OVERVIEW

- Mixing System: C-MIX 2000 12 colour shades for mixing of RAL, PMS and HKS colours.
- Process Inks: “180” colours 4 transparent colour shades according to ISO 2846-4.
- 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/UV-P and TP/UV-P2 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 UV-curing pad printing inks TP/UV-P and TP/UV-P2 are suitable for short- and medium-term outdoor applications.

ADJUSTMENT FOR PAD PRINTING

- Pad printing inks TP/UV-P and TP/UV-P2 are not supplied in a ready-to-print adjustment.
- **Processed as 1-component ink (without addition of hardener):**
  TP/UV-P and TP/UV-P2 are UV-curing pad printing inks, however they still have to be adjusted prior to printing by addition of thinner or retarder (stir with mixer, agitator).
- **Processed as 2-component ink (with addition of hardener):**
  Prior to thinning TP/UV-P and TP/UV-P2 inks have to be mixed with hardener at a specified ratio. Thinner is added after addition of hardener.
  Processing is then possible for a specified period of time (=pot life).

Hardener:
Alternatively, pad printing inks TP/UV-P and TP/UV-P2 can be processed as 2-component ink with **hardener TP 219/N**.
Hardener is mixed with TP/UV-P and TP/UV-P2 at a **mixing ratio of 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/UV-P and TP/UV-P2 is approx. 12 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, the ink is adjusted for printing by addition of 10 to 20 % by weight thinner or retarder.
Generally, the thinner suitable for TP/UV-P and TP/UV-P2 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/UV-P and TP/UV-P2, the following products are available:

Thinner:	○	Additive C	Extremely quick thinner, good 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.
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
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/UV-P and TP/UV-P2 inks with varnish. Basically, overprinting to achieve an enhanced protection of ink layers is possible with TP/UV-P E50 or TP/UV-P2 E50.

BRONZE COLOURS, MIXING OF BRONZE INKS

For technical reasons bronze colours AB and MG are not available.

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.

These “B“ bronze pastes and “B” bronze powder are mixed with varnish TP/UV-P E50 or TP/UV-P2 E50 prior to processing.

Mixing ratios in parts by weight:

Gold bronze paste/powder	to	TP/UV-P E50 or TP/UV-P2 E50	=	1 : 3
Silver bronze paste	to	TP/UV-P E50 or TP/UV-P2 E50	=	1 : 4

These bronze mixtures have no shelf life and have to be processed within 24 hours after mixing.

Bronzes B 75 to B 79 are prone to oxidation (Exception B 78-POWDER). Therefore, they should be overprinted, e.g. with TP/UV-P E50 or TP/UV-P2 E50.

B 78-POWDER does not tend to oxidation. The pale copper shade will not darken with time.

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 (cures) with UV-radiation.
2. **Processing WITH addition of hardener TP 219/N:**
   First, ink dries under UV-radiation followed by chemical cross-linkage reaction.
   Drying and reaction temperature of hardener must be at least 20°C using TP 219/N!

Drying / UV-Curing

- TP/UV-P and TP/UV-P2 inks only dry/cure under UV-radiation.
- Suitable UV-driers with Hg medium-pressure lamps (250 – 400 nm) and an efficiency between 80 and 400 W/cm have to be used.
- Preferably, use reflectors with a focussed radiation.
- Ensure an even radiation (intensity/distance to the lamps) of the whole printed image.
- TP/UV-P and TP/UV-P2 inks cure with an energy of approx. 500 – 1000 mJ/cm² (measured with Kühnast UV-integrator).
- The UV-energy required depends on the thickness of the printed ink layer, colour shade and type of substrate. Hence, printers should determine the exact required energy with their own UV-drier.
- Adhesion should only be checked after several minutes after curing. Due to the post-curing process of the inks and depending on the substrate, sufficient adhesion may sometimes only be achieved after up to 24 hours.

Hardener Reaction

Basically, the increased adhesion and resistance properties of the printed ink film are only achieved after UV-curing followed by chemical cross linkage reaction between ink and hardener. This cross linkage reaction depends on time and temperature. Minimum requirement is 72h/20°C.

Cross-linkage reaction will be quicker using higher drying temperatures on suitable substrates: 80°C/60 minutes.

Resistance Tests

Resistances should not be checked before completion of curing and cross-linkage.

Processing without hardener: after 24 hours

Processing with hardener: after 72 hours

CLICHÉ

All commercial types of clichés (polymer, thin and thick steel, ceramic) are suitable for processing TP/UV-P and TP/UV-P2 inks. For TP/UV-P and TP/UV-P2 inks use clichés with a depth between 16 and 18µ.

CLEANING

If not exposed to UV-radiation clichés, ink pots and tools can easily be cleaned. When processed with hardener, 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/UV-P and TP/UV-P2 inks are delivered in 1 litre containers. Other pack sizes are available upon request.

SHELF LIFE

In closed original containers, TP/UV-P inks generally have a shelf life of 2 years and TP/UV-P2 inks have a shelf life of 1 year from date of production. Hardener TP 219/N has 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:	www.coates.de, Service & Support, Technical Articles

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/UV-P Y30 *TP/UV-P2 Y30*	red	TP/UV-P R50 *TP/UV-P2 R50*	green	TP/UV-P G50 *TP/UV-P2 G50*
golden yellow	TP/UV-P Y50 *TP/UV-P2 Y50*	magenta	TP/UV-P M50 *TP/UV-P2 M50*	black	TP/UV-P N50 *TP/UV-P2 N50*
orange	TP/UV-P O50 *TP/UV-P2 O50*	violet	TP/UV-P V50 *TP/UV-P2 V50*	white	TP/UV-P W50 *TP/UV-P2 W50*
scarlet	TP/UV-P R20 *TP/UV-P2 R20*	blue	TP/UV-P B50 *TP/UV-P2 B50*	varnish	TP/UV-P E50 *TP/UV-P2 E50*

STANDARD Colour Range HD (high opacity)

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

white	TP/UV-P 60-HD *TP/UV-P2 60-HD*	black	TP/UV-P 65-HD *TP/UV-P2 65-HD*

4 COLOUR PROCESS INKS (CMYK)

According to colour card STANDARD 1 for pad printing inks or TP 247/ TP 249 ...

process yellow	TP/UV-P 180 *TP/UV-P2 180*	process black	TP/UV-P N50 *TP/UV-P2 N50*
process magenta	TP/UV-P 181 *TP/UV-P2 181*	varnish (for brightening)	TP/UV-P E50 *TP/UV-P2 E50*
process cyan	TP/UV-P 182 *TP/UV-P2 182*		

AB – BRONZE INKS and MG – METAL GLOSS INKS

According to Bronze Colour Card

AB Bronze Inks **For technical reasons not available**	**MG Metal Gloss Inks** **For technical reasons not available.**

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 B5***

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