

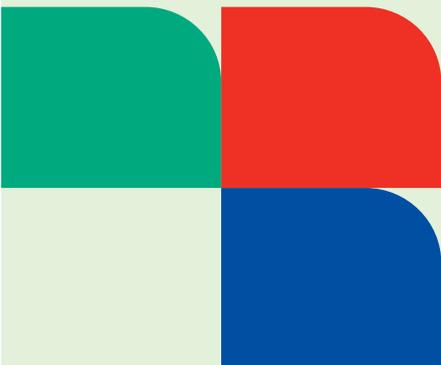
SunChemical®

Coates Screen Inks

INK RANGES
COLOUR RANGES
ADDITIVES



PAD PRINTING INKS





TP 313 The Fast

Gloss level: high
Drying speed: fast
Alternatively: hardener 10:1 TP 219
Good resistances,
fast production speed

Fast drying pad printing inks TP 313 show good printability properties even on modern fast running pad printing equipment. This ink range is mainly suitable for thermoplastics such as PS, ABS, PVC, PC and PMMA as well as various coated surfaces. TP 313 can also be processed with or without hardener.

One special feature of this ink range is its excellent abrasion resistance, thus mainly recommending this ink for the printing of articles requiring high mechanical resistances.

In addition TP 313 inks are certified according to USP Medical Class VI and can therefore be used for printing onto medical devices.

TP 247 The Front Panel Specialist

Gloss level: high
Drying speed: fast
Alternatively: hardener 10:1 TP 219 or TP 219/N
Good resistance against cleaning agents

Front panels of household appliances often are formed parts produced through complex injection moulding technology. Adjustment scales, functions and company names are often applied by



pad printing. These markings are essential for safe operation thus they should adhere for the whole long-life period of such equipment. Another basic requirement is resistance against aggressive cleaning agents, grease, oils and textile detergents. Easy and safe printability onto these partially large and bulky parts is also essential.

A number of white goods manufacturers have been using TP 247 as 2-component ink for years.

TP E-HF The Halogen Free

Gloss level: high
Drying speed: fast
Alternatively: hardener 8:1 TP 219
Fast production speed

Since approx. 2007 there is a trend towards "Green Electronics" in the Electronics Industry with the aim to refrain from the use of halogen in products such as computers, television, mobile phones etc. as much as possible. Thus there is also a requirement for printing inks completely free of halogens. For the pad printing inks this applies to very low contents of chlorine compounds in binders and some pigments.

To meet the requirements of the "Guide to Greener Electronics" campaign Coates Screen Inks GmbH has developed an ink system free of halogens, TP E-HF. In addition TP E-HF does not contain PVC, aromatic or cycloaliphatic solvents.

The TP E-HF inks can be processed as 1- or 2-component system, even on fast running machines. This range is suitable for polystyrene (PS), ABS/SAN, PMMA and polycarbonate (PC) substrates. As a 2-component ink TP E-HF is also suitable for pre-treated polyolefines, e.g. bottle caps.

TP 273/T · TP 253 The Flexibles

Gloss level: high
Drying speed: medium
Alternatively: hardener 10:1 TP 219/N
Very flexible,
good adhesion onto TPE and TPU materials

Soft-Touch is up-to-date. Promotional materials (pens) and toys (soft-ball), sports articles (handles), automotive appliances and also tools (handles) are available as soft elastic and flexible objects or with velvet like soft-touch coatings. These are diverse and various plastic mixtures, called TPE (thermoplastic elastomer). TPU (thermoplastic urethane) is one well-known type within



this group of plastics. Due to their various compositions and quite scratch sensitive surfaces one property these TPE substrates have in common is their difficult printability. Coates Screen ink ranges TP 273/T and TP 253 show good results in that respect. Final choice of ink type however, depends on the results of tests carried out on individual substrates. Both ink types can be processed with or without hardener, however we recommend the 2-component process using hardener TP 219/N onto TPE materials.

TP 253 is also suitable for natural and synthetic textiles and artificial leather materials.

TP 307 The Outdoor Specialist

Gloss level: very high
Drying speed: medium
Hardener: 4:1 TP 219/N
High resistances,
suitable for outdoor applications

The TP 307 inks are very resistant 2-component pad inks for polyolefines (PP/PE), coated surfaces, PMMA and polycarbonate (PC). In addition to the mechanical and medium chemical resistances main feature of these inks is their excellent weather resistance, even for long-term outdoor applications.



TP/UV Curing by UV Radiation

UV-curing inks dry by high-speed polymerisation reaction initiated by exposure to UV-light. The wet printed ink layer becomes a rigid and dry ink film within only a split of seconds. Most UV inks cure by so-called radical reaction where ink curing/polymerisation takes directly and completely place during the exposure to UV light. While UV-curing inks are commonly used for many applications in other printing technologies, they are not yet that popular within the pad printing industry. The main reason for this is that solvent based pad printing inks already exhibit quite fast drying properties allowing printing wet on wet. Often also pad prints are applied onto various three-dimensional objects which may be a technical problem for the following curing process.

Therefore to-date TP-UV inks are mainly used for industrial serial production when short and compact elements are sufficient for UV-curing. In-line production, e.g. injection moulding, printing, further processing or immediate packaging is no problem at all. Depending on the ink type the 1-component TP/UV systems show the same resistances you can otherwise only achieve using 2-component solvent based pad printing inks.

At the opposite to UV-inks used in other printing technologies TP/UV inks are not completely free of solvents. A certain amount of solvent content in pad inks is essential to achieve a good transfer from plate to pad and then to the substrate.

The curing energies of the following TP-UV ink ranges are based upon measurement with a Kühnast UV-integrator within a wavelength of 250-410 nm (maximum 365 nm).

TP/UV-R

TP/UV-R inks are suitable for polystyrene (PS), polycarbonate (PC), PMMA and various lacquer-coated surfaces. This ink system shows very good chemical and abrasion resistances. The required curing energy is approx. 500-1000 mJ/cm².

TP/UV-P and TP/UV-P2

As the TP/UV-P ink range largely covers the same application possibilities as TP 300 inks it can be considered to be the UV alternative to this solvent based system. TP/UV-P inks can be used for the same range of various substrates, mainly thermoplastics, however applications focus on decoration of ABS materials.

For printing on the more demanding substrate polyamide (PA), modification TP/UV-P2 is available. The required curing energy for both ink systems is approx. 500 - 1000 mJ/cm².

TP/UVG

The benefits of UV inks, mainly fast drying properties, are the reasons that pad printers show increasing interest in decoration of glass articles with UV inks, mainly for applications on hollow glass articles and small flat glass elements. The required curing energy for TP/UVG inks is approx. 500-1000 mJ/cm². For prints only requiring adhesion and scratch resistances TP/UVG can be processed without hardener addition. For increased resistances addition of 5% hardener TP 219/GL is recommended.

TP/UV-D

This ink range was mainly developed for uncoated and also coated golf balls. TP/UV-D is processed as a 2-component system with hardener TP 219/D (ratio 8:1). In addition to polymerisation initiated by UV-exposure the hardener will cause a further chemical cross linkage reaction of the binder system contained in the ink. This dual cross linkage will result in very high chemical and mechanical resistances.

Furthermore TP/UV-D is suitable for polystyrene (PS), polycarbonate (PC) and PMMA. The required curing energy is approx. 500-1000 mJ/cm².

TP/UV-K (cationic curing)

TP/UV-K inks are UV cationic curing inks based on epoxy resins. This epoxy binder system results in excellent mechanical and chemical resistances. TP/UV-K is suitable for a variety of plastics as well as metal surfaces. As an alternative to 2-component solvent based inks TP/UV-K ink range is mainly used in industrial applications, mostly onto metal surfaces (front panels, name plates etc.).

Originally the curing energy was approx. 2000 mJ/cm². Now TP/UV-K has been adjusted to be more reactive and only requires a curing energy of approx. 500 mJ/cm².

For curing of TP UV-Inks a UV dryer is required. To achieve effective and secure ink curing prints applied on three dimensional objects need specially designed equipment.



(Photo: Technigraf)

COLOUR SHADES



C-MIX 2000

Brilliant, mono-pigmented colour shades, for mixing of Pantone (PMS), RAL, HKS and other colour shades.

The 12 semi-opaque or transparent colour shades of the C-MIX 2000 system are suitable for the exact mixing of shades of various colour systems or of specific corporate colour shades. They show special suitability for matching of brilliant Pantone or HKS colours. Due to this mono-pigmentation, i.e. every base colour only contains one pigment, easy and quick matching of any colour

sample is possible. Our database Formula Management C-MIX 2000, which is available free of charge, contains guide-formulations of Pantone, HKS and RAL colours. There are separate formulations for 1- and 2-component inks. Just like Pantone and HKS colour swatches, formulations of C-MIX 2000 shades are suitable for printing on white or very bright surfaces.

Standard Colour Shades

The classic colours. Strong colour shades with medium opacity.

Our standard colour shades 10, 11, 12 etc. represent our classic colour range, developed before Pantone and others became popular systems. Printers can choose any colour from several yellow, red, blue and more shades. The colours of this standard range mostly contain

4 Colour Process Shades

Special shades for four colour process printing (CMYK).

4 colour process pad printing technology (CMYK) is very suitable for reproduction of high resolution images. We offer process colours within almost all our pad printing ink ranges.

These Colours are:
Process yellow 180 (= Y),
Process red 181 (= M),
Process blue 182 (= C)
and black 65 (= K).

Also transparent paste "TP" is offered in case adjustment (= brightening) of colour brightness is necessary.

Standard HD Colour Shades

Colour shades exhibiting unsurpassed opacity.

Pad prints are often applied to a variety of transparent, black, very dark objects or onto substrates of any other colour. To achieve good results the printing ink has to exhibit the best possible opacity. Our 12 colour shades (10 colours, black and white) of our standard HD colour range have been formulated with a very

Bronze Colours

All that glitters is not gold...

Gold, silver, bronze. We offer four different ranges: B, AB, MG and MI.

B-Bronze Colours are highly opaque, and available as ready-to-print adjustment or in paste or powder forms. These pastes and powders are used for mixing with our E50 varnish, also available within our ink ranges.

AB-Bronzes are available as ready-to-print adjustments. They show good resistance against smearing and leafing as well as good opacity and brilliance.

MG bronzes (= metal gloss) are very brilliant and have a medium opacity.

MI bronzes are mirror gloss inks for printing behind glass. Contrary to other bronzes MI bronzes are only available in one ink range, TP-MI.



Y30	Y50	O50	R20	R50	M50
V50	B50	G50	N50	W50	E50

10	11	12	15	17	20	21	22	25	30	31	32
33	34	37	40	41	50	51	65	60			

182	181	180	65	TP
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10...	11...	12...	15...	20...
21...	22...	30...	37...	40...
60...	65...			

..-HD-NT-NEU

B75	B76	B77	B78	B79
75/AB	76/AB	77/AB	78/AB	79/AB
75/MG	76/MG	77/MG	78/MG	79/MG
MI 75	MI 76	MI 78	MI 79	

SINGLE PRINT	DOUBLE PRINT

Available in ink ranges: TP 218, TP 287, TP 260, TP 300, TP 313

Further ink ranges are available upon request.

For technical reasons the colour shades printed in this brochure do not show their exact colour strength and shade. Exact colour shades are shown on our colour cards, which can be obtained upon request!

AUXILIARY AGENTS



For more than 40 years pad printing inks offered by Coates Screen Inks GmbH have been successfully processed under different environmental conditions (climate) on various pad printing equipments at varying production speeds. Our pad printing inks are not delivered in a ready-to-print viscosity adjustment so that printers all over the world can adjust inks to their specific local requirements. Below please find a summary of our most important thinners, hardeners and other additives.

Thinners and Retarders

Thinners used for pad printing inks are organic solvents with a fast to very fast evaporation rate. The addition to our inks, mostly between 15 and 30%, will adjust the inks to a ready-to-print viscosity.

Standard thinner is our Additive A, which is the best choice as a thinner for approx. 70% of all applications.

Retarders are slow or very slow evaporating thinners. They are rarely used alone, but as an addition to the thinner if the printing process requires slow drying for technical reasons.

The following chart lists the most essential properties of thinners and retarders offered by Coates Screen Inks GmbH. In addition to evaporation rate most important characteristics are solubility of the binder system and of solvent sensitive substrates as well as suitability of these additives for our various ink ranges.

ADDITIVE A

Additive A is a universal thinner for all our pad printing ink ranges. Due to its balanced mixture of solvents Additive A is the first choice for all "regular" pad printing applications.

ADDITIVE U

Alternative to Additive A, free of cyclohexanone.

ADDITIVE C

The fastest thinner we offer for pad printing inks. Inks adjusted with Additive C can be processed on very fast running printing machines.

ADDITIVE B

Fast thinner, speed between Additives A and C.

THINNER VD 10

Thinner VD 10 is a very mild thinner for sensitive substrates with a low solubility. It is suitable as a mild alternative for 1-component inks such as TP 287 or TP 272.

Standard thinner for ink range TP 249.

VD 10 can also be used as mild cleaning agent, e.g. to remove faulty prints.

THINNER VD 40

VD 40 is an "aggressive thinner" with a high solving power which may improve adhesion of pad printing inks onto soluble substrates.

THINNER VD 60

This thinner can be used for slower printing speeds.

TPD

TPD is a very slow retarder with a good solubility. It is only used for very slow printing speeds, often in combination with other fast thinners.

TPV

TPV is a mild retarder, slower than TPD.

RETARDER PASTE LAB-N 111420/VP

As an alternative to liquid retarders LAB-N 111420/VP is supplied in paste form. Approx. 5-10% can be added to all pad printing inks. Will retard but not thin the ink.

All thinners and retarders listed above can also be added to our inks as proportional mixtures.

Product	Factor	Evaporation Rate	Solubility	Application
Additive C	0,25	very fast	medium	universal
Additive B	0,5	fast	medium	universal
VD 10	0,6	fast	weak, mild	all 1-component inks and TP 218/GL
Additive A	1	medium	medium	universal
Additive U	1	medium	medium	universal
VD 40	1	medium	strong	universal
VD 60	5	slow	medium	universal
TPD	25	very slow	medium	universal
TPV	50	very slow	mild	all 1-component inks and TP 218/GL

AUXILIARY AGENTS

Flow Agents

Efficiency	Overprintable	Addition
VM1		
good	no	1-5%
VM2		
very good	no	0,3- 0,5%
VM3		
medium	yes	1-5%

Caused by interactions between substrate, printing ink and printing conditions problems such as bubbles, pinholes, orange peel or the like may occur on the surface of the pad printing ink film. In order to avoid these undesired effects certain additives, so-called flow agents, can be mixed into the pad printing ink.

However, the flow agents should be added carefully and the amounts indicated below should not be exceeded.

Mostly only small amounts of additives are mixed into the inks. Therefore it is essential that these auxiliary agents are stirred in very thoroughly to achieve the required effect. Most additives should be mixed into the inks using efficient mixers/agitators/dissolvers or shakers (see chart below).



* Dissolvers are extremely powerful disc mixers allowing very effective mixtures of certain additives with printing inks.

Summary Additives

	Form	Addition	Add using	Overprintable
Flow agents / Defoamer				
- VM1	liquid	1-5%	mixer/stirrer, 2 minutes	no
- VM2	liquid	0.3-0.5%	mixer/stirrer, 2 minutes	no
Flow agent				
- VM3	liquid	1-5%	mixer/stirrer, 2 minutes	yes
Antiflotation Agent				
	liquid	3-5%	dissolver*, 10 minutes	yes
Antistatic Agent				
- TPC	liquid	1-2%	mixer/stirrer, 2 minutes	yes
- LAB-N 111420	Paste	5-10%	manually	yes
Thickening Powder				
	solid / powder	2-3%	dissolver*, 10 minutes	yes
Matting Powder				
	solid / powder	3-5%	dissolver*, 10 minutes	yes
Additives used to improve abrasion resistance				
- LAB-N 560469	solid / powder	1-3%	mixer/stirrer, 5 minutes	no
- LAB-N 561645	solid / powder	1-3%	mixer/stirrer, 5 minutes	limited
- LAB-N 561644	liquid	1-3%	mixer/stirrer, 2 minutes	no

SUITABILITY CHART INK-SUBSTRATE

	TP 212-NT	TP 218-NT + TP 219	TP 218/GL-NT + TP 219	TP 247-NT + TP 219	TP 249-NT	TP 253-NT + TP 219/GL	TP 253 L + TP 219/N	TP 260-NT + TP 219	TP 272-NT	TP 273/T-NT + TP 219	TP 287-NT	TP 300-NT + TP 219/N	TP 305-NT + TP 219	TP 307 + TP 219	TP 313 + TP 219	TP I-NT	TP/PP-NT-A	TP E-HF + TP 219	TP/UV-K	TP/UV-R	TP/UV-P	TP/UVG + TP 219/GL	TP/UV-D + TP 219/D
	3	4:1 2	20:1 2	10:1 1	10:1 1	10:1 2	2:1 2	10:1 1	10:1 1	10:1 1	10:1 1	4:1 2	10:1 1			8:1 1					20:1 1	8:1 1	
Compact Discs																							
Duroplastics	●	●	●				●				●										●		
Glass	●		●																	●		●	
Rubber, TPE, Synthetic Leather						●			●														
Silicone rubber						●																	
Wood								●			●	●											
Coated Surfaces	●	●		●		●				●	●	●	●	●	●			●		●	●		●
Leather, Textiles						●																	
Metals	●	●	●				●				●	●	●					●				●	
Polyamide PA		●						●		●	●		●				●				●		
Polyacetal (post-treatment required)		●					●			●	●												
Polyethylene, Polypropylene (pre-treated)	●			●			●			●	●	●					●						
Polycarbonate				●			●	●		●	●	●	●	●	●		●	●	●	●	●		●
Polyester		●					●			●	●		●				●			●			
PMMA	●		●	●			●	●		●	●	●	●				●	●	●	●	●		●
Polystyrene				●			●		●			●	●	●			●	●	●	●	●		●
ABS, SAN	●		●				●		●		●	●	●	●			●			●			●
Polyurethane	●		●		●		●		●	●	●		●										●
PVC rigid			●	●			●	●	●	●	●	●	●	●			●		●	●	●		●
PVC plasticized			●					●						●									
Polypropylene (untreated)																	●						

preferred for the application
oven-curing
air-drying
UV-curing

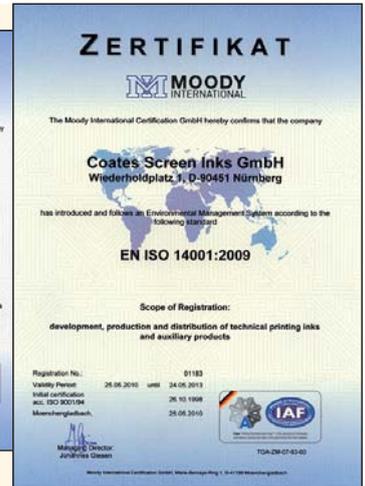
- 1 processing as 1- and as 2-component inks
- 2 2-component inks
- 3 20 minutes/140 °C
- 4 15 minutes/160 °C

This information is no guarantee for the suitability of pad printing inks for certain substrates but is intended to help the user to choose suitable pad inks. Pre-tests are always necessary. This information is based on our present experiences.

SAFETY AND QUALITY

Coates Screen Inks GmbH is a certified "Sony Green Partner".

Naturally Coates Screen Inks GmbH also has **ISO 9001** and **ISO 14001** certification.



All our pad printing inks are in conformity with the following guidelines:

- REACH** New European Chemical Regulation
- EN 71/3** Safety of Toys
- RoHS** European Directive 2011/65/EU (recast of RoHS directive 2002/95/EG), restriction on the use of certain hazardous substances in electrical and electronic equipment.
- GADSL** Global Automotive Declarable Substance List. GADSL list of forbidden substances and duty of declaration for automotive products.
- EuPIA** Raw material exclusion list for printing inks of the European Printing Ink Association.

Pad printing ink ranges TP 300, TP 313, TP 218 and TP 260 are certified according to USP Medical Class VI for application on medical articles.

TECHNICAL SUPPORT:

This "Pad Printing Inks Brochure" is a summary of our pad inks programme. For detailed information on individual products please refer to the relevant product data sheets.

For technical assistance please contact us:



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