

SunChemical®

Coates Screen Inks

PAD PRINTING INKS

INK RANGES • COLOUR RANGES • ADDITIVES



INK RANGES

TP 300 The Universal

Gloss level: high

Drying speed: medium

Alternatively: hardener: 10:1 TP 219

Universal application

Very good printability

USP MC VI and EN 71-3:2019 conformity*

Ink range TP 300 is the market leader in the pad printing inks industry.

This ink type shows excellent printability properties and is easy to process under various application conditions and different types of pad printing equipment.

TP 300 inks are suitable for a wide variety of substrates, for instance most thermoplastics including pre-treated polyolefines (PP/PE), duroplastics, many coated surfaces, metals and wood.

Consequently TP 300 ink range offers many application possibilities:

- promotional items
- PP/PE caps/closures and containers
- domestic appliances
- toys
- sports equipment
- various technical articles

Processed as 2-component system the ink shows even higher resistances and improved adhesion on difficult substrates.

Choice of colour shades comprises all colour ranges we offer for pad printing.

We also offer a cyclohexanone-free adjustment of TP 300 ink range: TP 300/111580-NT (EN 71-3 conformity*).

TP 218

The 2-Component System

Gloss level: high

Drying speed: medium

Hardener: 4:1 TP 219

High resistances,
Allrounder

USP MC VI and EN 71-3:2019 conformity*

2-component pad printing ink range TP 218 is an excellent choice for demanding printing materials requiring high resistances. This ink type shows excellent resistances even on difficult substrates such as polyester, polyurethane, coated surfaces, pre-treated polyolefines (PP/PE) duroplastics and metals.

TP 218 inks are mainly used for demanding technical and industrial applications, such as for various components in the automotive or medical technology sector.



TP 218/GL – The One for Glass, Ceramics and Metals

Gloss level: high

Drying speed: slow

Hardener: 20:1 TP 219/GL air drying
20:1 TP 219/02-GL oven curing
20:1 TP 219/03-GL air drying or oven curing

Water resistant
Good dishwasher resistance
Good corrosion resistance

EN 71-3:2019 conformity*

Glass, ceramics, precious metals, chromium-plated surfaces are very demanding substrates requiring a special pad printing ink: TP 218/GL.

This ink type is used for promotional items such as drinking glasses and ceramic cups, cosmetic articles (e.g.

perfume bottles), for stainless steel panels, chromium-plated surfaces such as bathroom fittings (taps, shower sets).



TP 260

The Extremely Resistant

Gloss level: high

Drying speed: medium

Hardener: 2:1 TP 219

Outstanding resistances
Highest abrasion resistance

USP MC VI conformity*

TP 260 is an excellent choice if prints with the best possible resistance against organic solvents, acids and alkalis as well as excellent abrasion resistance are required. The binder base of this ink type permits a high addition of hardener at a ratio of 2:1. Consequently there is an extremely high degree of cross-linkage, which is the reason for the aforementioned good properties. TP 260 inks are mainly used for technical-industrial applications, mainly on thermoplastics, duroplastics and coated surfaces.

* **USP Medical Class VI certification** suitable for application on medical devices.

EN 71-3:2019 Safety of toys. Ink meets the requirements of toy standard: migration of certain elements.

TP 273/T • TP 253

The Flexible Ones

Gloss level: high

Drying speed: medium

Alternatively: hardener: 10:1 TP 219/N

Very flexible

Good adhesion on TPE and TPU materials

EN 71-3:2019 conformity*

Soft-Touch is "hip" and very popular. Promotional materials and toys, sports articles, automotive appliances, even tools are available as soft elastic and flexible objects or with velvet like soft-touch coatings.

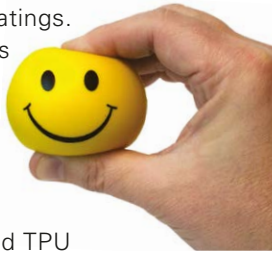
These materials are various plastic mixtures, known as TPE (thermoplastic elastomer) and TPU

(thermoplastic urethane). Because of 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 the individual substrates.

Both ink types can be processed with or without hardener, however we recommend the 2-component process using hardener TP 219/N on TPE materials.

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



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 with a complex injection moulding technology. Adjustment scales, functions and company names on such parts are often pad printed. These designs are essential for a safe operation of these appliances. Another basic requirement is resistance

of these prints against aggressive cleaning agents, grease, oils and textile detergents. In addition, easy and safe printability on these partially large and bulky parts is also essential.

Many white goods manufacturers have been using the 2-component ink range TP 247 for years.



TP 249

The Mild System

Gloss level: high

Drying speed: medium

Hardener: -

For printing onto plastics sensitive to solvents, such as polystyrene, injection moulded polycarbonate, PMMA

Plastics such as polystyrene (PS) and polycarbonate (PC), especially those manufactured by injection moulding often have inherent tensions in the material. Printing with "conventional" inks will release such tensions resulting in tension cracks.

TP 249 inks are used for such applications as the formulation of this ink range is based on especially mild solvents.



INK RANGES

TP/PP

The Polypropylene Specialist

Gloss level: high

Drying speed: medium

Hardener: -

Printing onto untreated polypropylene

EN 71-3:2019 conformity*

TP/PP is easy to process and suitable for printing on untreated polypropylene (PP) materials.

As 1-component ink, however, TP/PP has limited resistances against chemicals, water and hand sweat.

Therefore, this ink range is mainly used for promotional articles or disposables like measuring cups or syringes.



INK RANGES

TP 253 L The Silicone Rubber Ink

Gloss level:	medium
Drying speed:	oven-curing, 160°C, 15 min
Hardener:	TP 219/L 10:1
Printing of silicone rubber	

Silicone rubber materials such as swimming caps, bracelets, soft keyboards cannot be decorated with conventional pad printing inks.

TP 253 L is an oven-curing special ink system suitable for printing many silicone rubber products.



TP/UV-Inks Curing with UV-Radiation

UV-curing inks are mainly used for industrial serial production. UV-curing only requires short and compact elements. In-line production, for instance injection moulding, printing, subsequent processing or immediate packaging is no problem.

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).

For curing of TP/UV-Inks a UV dryer is mandatory. Prints on 3-dimensional objects require special designs to achieve effective and safe ink curing.

Photo: Technigraf

TP 212 The Oven Curing

Gloss level:	high
Drying speed:	oven-curing, 140°C, 20 min
Hardener:	–
Very high resistance	

Many coated articles, metals and ceramics can usually only be printed with 2-component inks.

TP 212 ink range offers an interesting alternative.

This is a 1-component ink system which is oven cured at 140°C for 20 minutes after printing. This heat application initiates a cross linkage reaction of the binder. After curing TP 212 prints show the same excellent mechanical and chemical resistances as 2-component inks.



TP/UV-P • 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.



TP272 • TP287 • TPI The 1-Component

These three ink types are 1-component pad printing inks for printing on thermoplastics such as polystyrene (PS), PVC, polycarbonate (PC), PMMA and ABS.

These “1-component” are used for applications mainly requiring adhesion and scratch resistance. These ink systems do not show resistance against aggressive chemicals.

The special properties of these ink ranges are:

TP 272 *

High gloss level, weather resistant, limited alcohol resistance.

TP 287 *

Satin gloss, hard surface, very good adhesion on ABS.

TPI

Matt finish, excellent alcohol resistance.

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-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 on metal surfaces. The required curing energy is approx. 500 mJ/cm².

* EN 71-3:2019 Safety of toys. Ink meets the requirements of toy standard: migration of certain elements.

Pad Printing Ranges

with especially environmentally compatible and user-friendly formulations



Naturally all printing ink ranges of Coates Screen Inks comply with REACH, RoHS and the EuPIA Guidelines. Additionally many of our ink ranges comply with Toy Standard EN 71-3:2019. Some types even have USP Medical Class VI certification for applications on medical devices.

Owing to product/occupational safety or self-imposed guidelines and for specific applications printers or end users need substrates and subsequently also pad printing inks which are free of certain substances (solvents, resin components). Often only particular individual substances/substance groups have to be excluded, but in some cases the inks have to be completely free of a combination of several substances/substance groups.

The following six pad printing ink ranges of our comprehensive product portfolio meet the extra high requirements with respect to product safety.

THESE RANGES ARE FREE OF:

TP 307



TP 313



TP 318



TP 340



TP 400



TPE-HF



- Aromatics
- Bisphenol A (BPA)
- Butyl glykolate (GB-Ester)
- Cyclohexanone
- Phthalates
- Polycyclic aromatic hydrocarbons (PAH)
- Solvent Naphtha
- + All these ink ranges meet the requirements of EN 71-3:2019 (Toy Standard)
- + In addition TP 313 and TP 400 have USP Class VI certification (medical devices)
- + Additionally TP E-HF is free of halogens according to DIN EN 61249-2-21

To ensure compliance with all guidelines and limits the appropriate suitable thinners, retarders, hardeners and additives must be selected for adjustment of these inks.

SELECTION TABLE FOR THINNERS AND RETARDERS				
Product	Evaporation	Factor	Solving Power	Application
Additive C	very quick	0,25	medium - strong	universal
Additive D	quick	0,5	medium	universal
Additive U	medium	1	medium	universal
Additive R	medium to slow	3	medium	universal
VD 60	medium to slow	5	medium	universal
VZ 35	very slow	25	mild - medium	universal

PAD PRINTING

with especially environmentally compatible and user-friendly formulations



TP 313 The Tough

1- and 2- component

Gloss level: high

Drying speed: quick

Hardener: 10:1 TP 219
10:1 TP 219/N

USP MC VI and EN 71-3:2019 conformity*

- Good printability
- For flat and rotation systems
- Extensive colour range
- Large variety of substrates
- Very high abrasion resistance
- Good light and weather resistance

Main applications

- Promotional items
- Household appliances (white goods)
- Toys
- Packaging
- Medical devices

As 1-component ink mainly for printing on thermoplastics such as ABS, SAN, PS, PC, PMMA, as 2-component system (with addition of hardener) also suitable for e.g. PP and PE plastics.



TP 340 The Super-Fast

1- and 2- component

Gloss level: high

Drying speed: very quick

Hardener: 10:1 TP 219
10:1 TP 219/N

EN 71-3:2019 conformity*

- Good printability, even at high printing speeds
- Very quick drying
- High resistances against
 - Alcohol
 - Test fuel
 - Cosmetics
- High abrasion resistance
- Large variety of substrates
- Good light and weather resistance

Main applications

- Promotional items
- Toys
- Cosmetics

Mainly for printing on thermoplastics such as ABS, SAN, PS, PC, PMMA.



TP E-HF The Halogene-Free

1- and 2- component

Gloss level: high

Drying speed: quick

Hardener: 8:1 TP 219
8:1 TP 219/N

EN 71-3:2019 conformity*

- Free of halogens according to DIN EN 61249-2-21
- Good printability
- Good abrasion resistance
- Large variety of substrates
- Good light and weather resistance

Main applications

- Promotional items
- Toys
- Cosmetics

Mainly for printing on thermoplastics such as ABS, SAN, PS, PC, PMMA, as 2-component system (with addition of hardener) also suitable for e.g. PP and PE plastics.



* **USP Medical Class VI certification** suitable for application on medical devices.

EN 71-3:2019 Safety of toys. Ink meets the requirements of toy standard: migration of certain elements.

TP 400

Modern • Reliable • Versatile

1- and 2- component

Gloss level: high

Drying speed: medium

Hardener: 10:1 TP 219
10:1 TP 219/N

USP MC VI and EN 71-3:2019 conformity*

- Vast variety of substrates
- Excellent printability
- For flat and rotation systems
- Comprehensive colour range

Main applications

- Promotional items
- Toys
- Sports articles
- Packaging
- Medical devices
- Household appliances
- Cosmetics
- Electrotechnical products
- Automotive (plastics)



TP 318

The New Versatility

2- component

Gloss level: medium

Drying speed: quick

Hardener: 4:1 TP 219
10:1 TP 219/VCH

EN 71-3:2019 conformity*

- **New formulation**
- **New hardener concept, two different hardeners**
- **Excellent printability**
- **Colours with especially high intensity.**
- **Excellent chemical and mechanical resistances**
- **Vast variety of different substrates**

Main applications

For demanding technical-industrial applications in the fields:

- **Glass and ceramics**
- **Metals**
- **Chromium-plated and coated surfaces**
- **Thermoplastics**
- **Duroplastics**



TP 307

The Extra Resistant

2- component

Gloss level: very high

Drying speed: medium

Hardener: 4:1 TP 219
4:1 TP 219/N

EN 71-3:2019 conformity*

- Excellent light fastness and weather resistance
- High resistance against chemical cleaning agents
- High abrasion resistance
- Large variety of substrates
- Good printability

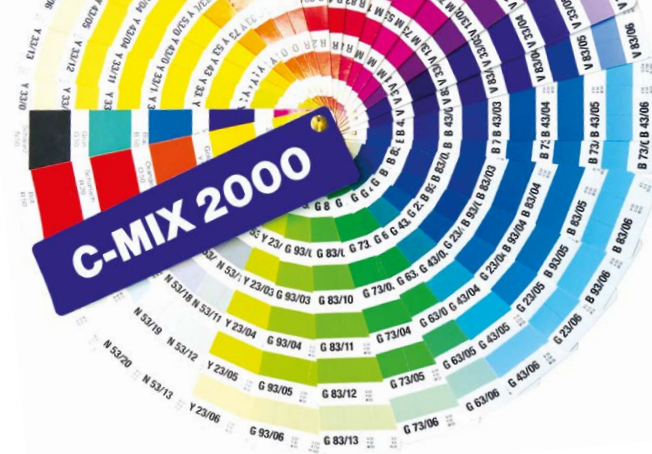
Main applications

- Automotive
- Household appliances
- Electrotechnical products

Mainly for demanding technical-industrial applications, especially printing on thermoplastics such as PC, PMMA, PP, PE as well as coated substrates.



COLOURS



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 are especially suitable 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 – 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 select any colour from several yellow, red, blue and more shades. The colours

of this standard range mostly contain more than one pigment, exhibit high colour strength and medium to good opacity.

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 therefore has to be as opaque as possible. Our 12 colour shades (10 colours, black and white) of our standard HD colour range have been formulated with a

very high concentration of extremely opaque pigments to achieve best possible opacity of pad prints. Standard HD colours are available within many of our pad ink ranges.

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 in 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.

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 E 50 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
			N58*		



10	11	12	15	17	20	21	22	25	30	31	32
33	34	37	40	41	50	51	65	68*	60		

10 HD	11 HD	12 HD	15 HD	20 HD
21 HD	22 HD	30 HD	37 HD	40 HD
60 HD	65 HD	68 HD*		

182	181	180	65	TP
			68*	Transparent-Paste

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	

STANDARD HD: HIGHEST OPACITY ON DARK SUBSTRATES

[Yellow bar]	Coates Screen
[Yellow bar]	Coates Screen
[Yellow bar]	Coates Screen
[Orange bar]	Coates Screen
[Orange bar]	Coates Screen
[Orange bar]	Coates Screen
[Orange bar]	Coates Screen
[Orange bar]	Coates Screen
[Blue bar]	Coates Screen
[Purple bar]	Coates Screen
[Green bar]	Coates Screen

Available in ink ranges: TP 218, TP 287, TP 260, TP 300, TP 313, TP 318, TP 340, TP 400, TP/PP

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!

* If PAH threshold limits are required, the black colours N58 • 68 • 68HD with a low PAH content must be used.

AUXILIARY AGENTS THINNERS AND RETARDERS

For more than 50 years Coates Screen Inks GmbH pad printing inks have been successfully processed under different environmental conditions (climate) on various pad printing equipments at varying production speeds. As our pad printing inks are not delivered in a ready-to-print viscosity adjustment printers all over the world can easily adjust these pad inks to their specific local requirements.

Below please find a summary of essential properties of thinners, hardeners and other additives.

THINNERS

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.

We recommend to print our inks with a low viscosity (=thin).

Standard thinners are Additive A and U.

Additives A and U are the best choice for approx. 70% of all applications.



RETARDERS


Retarders are slow to very slow evaporating thinners.

They are rarely used alone, but as an addition to the thinner if for technical reasons a very slow transfer from the cliché to the substrate is required, that means the ink will remain on the pad longer.

INFORMATION ABOUT ESPECIALLY ENVIRONMENTALLY AND USER-FRIENDLY AUXILIARY AGENTS

Naturally all printing ink ranges by Coates Screen Inks comply with REACH, RoHS and the EuPIA Guidelines. Owing to product/occupational safety or self-imposed guidelines and for specific applications printers or end users need pad printing inks which are additionally free of certain substances (solvents, resin components). Often only particular individual substances/substance groups have to be excluded, but in some cases the inks have to be completely free of a combination of several substances/substance groups.

Our ink ranges TP 307, TP 313, TP 318, TP 340, TP 400 and TP/E-HF generally meet such requirements.

For these applications, the required auxiliary agents and additives also must be free of the solvents cyclohexanone, butyl glycolate (GB-Ester), aromatics and Solvent Naphtha. Hereinafter all additives, which do not contain these substances, are marked with symbol . These additives have to be used with the above mentioned pad inks in order to meet such special requirements.

ADDITIVE A

The Standard Thinner

Basically, Additive A is the first choice for all our pad printing ink ranges. Medium evaporation, good solving power.

- For medium to fast printing cycles

ADDITIVE U

The “free of...” alternative to Additive A.
Same application as “A”

ADDITIVE C

The fastest thinner we offer for pad printing inks.

- For very quick printing cycles.

ADDITIVE B

Very fast thinner, speed between Additives A and C

ADDITIVE D

The “free of...” alternative to Additive B.
Same application as “B”

VD 10

Thinner VD 10 is a very mild special thinner for plastic materials sensitive to tension cracks. VD 10 has a low solubility. Standard thinner for ink range TP 249. It is suitable as a mild alternative for 1-component inks such as TP 287 or TP 272.

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

XVH

Very mild, slow retarder for plastic materials sensitive to tension cracks.

ADDITIVE R

VD 60

Additive R and VD 60 are slow thinners with a good solving power. If required, they can be used for slow printing cycles.

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 faster thinners (e.g. Additive A, Additive R or VD 60).

VZ 35

The “free of” alternative to TPD. Same application as “TPD”

TPV

TPV is a mild retarder, even slower than TPD.

VD 40

“Aggressive thinner” with a high solving power, medium evaporation. Not recommended for substrates, which are sensitive to solvents.

The following table is a summary of the most important characteristics of our thinners and retarders. These are evaporation rate, solving power of the product and application. The factor of the evaporation rate of the individual products is listed in relation to Additive A. Example: VD 60 with factor 5 evaporates 5 times slower than Additive A, whereas Additive B with factor 0.5 evaporates twice as fast than Additive A. These are only guide values.

PRODUCT		EVAPORATION RATE	FACTOR*	SOLVING POWER	APPLICATION
Additive C	✓	very fast	0,25	medium	universal
Additive B		fast	0,5	medium	universal
Additive D	✓	fast	0,5	medium	universal
VD 10	✓	fast	0,5	very mild	all 1-component inks and TP 218/GL
Additive A		medium	1	medium	universal
Additive U	✓	medium	1	medium	universal
VD 40		medium	1	strong	universal
Additive R	✓	medium to slow	3	medium	universal
VD 60	✓	medium to slow	5	medium	universal
XHV	✓	slow	10	mild	all 1-component inks and TP 218/GL
TPD		very slow	25	medium	universal
VZ 35	✓	very slow	25	medium	universal
TP/V	✓	very slow	50	mild	all 1-component inks and TP 218/GL

* = Evaporation factor always in relation to Additive A

✓ = Product free of aromatics, cyclohexanone, butyl glycolate (GB-Ester), Solvent Naphtha.

INFORMATION ABOUT PROCESSING OF 2-COMPONENT INKS

Generally 2-component inks (2-c) are used for long-lasting pad prints on substrates such as glass, metals, duroplastics, polyolefins and similar materials. 2-c inks are also essential if you want to achieve exceptionally high physical resistances (light fastness, weather resistance, abrasion resistance etc.) and/or high chemical resistances. Compared to 1-component inks (1-c) working with 2-c inks is much more demanding.

Errors during processing may result in significant quality problems. The following is an outline of the essential processing parameter of 2-component inks:

1 Selection Criteria

- **Requirement profile**
2-component system suitable for the requirements (see ink selection chart of Coates Screen Inks GmbH).
- **Hardener**
must be suitable for ink system and requirement profile.
- **Shelf life:**
Hardeners have a much shorter shelf life than printing inks. Minimum storage time is between 6 months and 1 year. Please refer to the expiration date.
If not stored properly (insufficiently closed cans) the hardener may even become unusable before that date. Spoiled hardeners show signs of crystallization, increase of viscosity.
- Use only hardeners and thinners recommended for 2-c inks (please refer to product data sheets of the relevant ink types) as some solvents react with hardeners.

2 Adjusting 2-Component Inks For Printing

- Stir ink well in its original container to ensure an even distribution of all ingredients.
- Calculate amount of hardener required for that amount of ink. Mixing ratio ink : hardener significantly varies from ink range to ink range.
- Carefully weigh correct hardener, add to ink and stir in well.
- Always tightly re-seal opened hardener cans, as hardeners will react with humidity.
- Ink is only thinned and/or retarded AFTER hardener addition.
- After mixing we recommend to allow inks to pre-react (degassing) for about 15 minutes before printing.
- Ink is now ready to print.

3 Printing

Printing process is technically the same as that of 1-component inks, however, there are some special issues you have to consider during printing.

POT LIFE

Cross linkage reaction between binder and hardener starts as soon as hardener is added. When a certain degree of cross linkage is reached ink can no longer be used.

This is the reason why we specify the pot life of readily mixed 2-component inks. Depending on ink type this is usually a period ranging from 2 – 12 hours.

- The indicated pot life always refers to processing temperatures of 20°C. The higher the temperatures the shorter the pot life. Here you can apply the rule of thumb: 10 °C temperature increase will reduce pot life by 50% (possibly even a much shorter pot life).

4 Drying, Curing (Cross Linkage)

There is a difference between ink drying and the following curing (cross linkage) of the ink.

Minimum reaction temperature

Every hardener requires a certain minimum temperature for cross linkage with the (printed) ink. There will be no reaction below this temperature.

REACTION TIME:

The reaction time is defined as the period of time after printing and drying until the maximum possible curing/cross linkage of ink and hardener is completed; a combination of time and temperature of prints (also in storage).

Drying/curing takes place at room temperature of 20°C:

Thumb rules for curing times are as follows:

Minimum: 72h at 5 > 20°C

Optimum: 120h at > 20°C

Drying /curing at high temperatures:

Drying time can be reduced if higher temperatures are applied (e.g. oven-drying).

Hardeners crosslink with the binder of the right ink type in a chemical reaction.

Please refer to the information about processing of inks with hardeners on page 12.

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

AUXILIARY AGENTS HARDENERS

✓ TP 219

Suitable for: TP 218 • TP 247 • TP 253 • TP 260 • TP 267 • TP 273 & TP 273/T
TP 305 • TP 307 • TP 313 • TP 318 • TP 340 • TP 400 • TP/E-HF

Reaction temperature: > 15° C

Note: TP 219 is the most commonly used hardener.

Not recommended for outdoor applications as TP 219 has a tendency to yellowing.

✓ TP 219/N

Suitable for: TP 247 • TP 253 • TP 273 & TP 273/T • TP 300 • TP 307 • TP 313
TP 340 • TP 400 • TP/E-HF • TP/UV-D • TP/UV-P & TP/UV-P2

Reaction temperature: > 20° C

Note: Also suitable for outdoor applications.

TP 219/N-00

Suitable for: TP 267 • TP 305

Reaction temperature: > 20° C

Note: Also suitable for outdoor applications.

✓ TP 219/VCH

Suitable for: TP 318

Reaction temperature: > 15° C

Note: Must be used for printing on glass, ceramics, can be used for prints on metal.

Suitable for air and oven drying (up to 140°C/30 minutes).

SPECIAL HARDENERS FOR INK RANGE TP 218/GL

TP 219/GL

Suitable for: TP 218/GL • LAB-N 341705

Reaction temperature: > 20° C

Note: Suitable for air and oven drying up to 140°C/30 minutes. Cured prints show a very good water resistance and good chemical resistance.

TP 219/02-GL

Suitable for: TP 218/GL • LAB-N 341705

Reaction temperature: > 20° C

Note: Suitable for air and oven drying up to 140°C/30 minutes. After oven curing prints show a very good chemical resistance. Also recommended for substrates made of metal or duroplastics.

TP 219/03-GL

Suitable for: TP 218/GL • LAB-N 341705

Reaction temperature: > 20° C

Note: Suitable for air and oven drying up to 140°C/30 minutes. Prints show a very good water and chemical resistance, especially after oven curing (140°C/30 minutes).

TP 219/L

Suitable for: TP 253 L

Reaction temperature: > 160° C/15 minutes.

AUXILIARY AGENTS

FLOW AGENTS

Caused by unfavourable interactions between substrate, printing ink and printing conditions, sometimes problems such as bubbles, pinholes, orange peel or the like may occur on the surface of the pad printed image. In order to eliminate such undesired effects certain additives can be mixed into the pad printing ink. Additives, especially flow agents, however, should be added carefully. Amounts indicated below should not be exceeded as any over dosage may cause undesired effects or even worsen the problem.

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).



SUMMARY ADDITIVES

APPLICATION / PRODUCT NAME	FORM	ADDITION	MIXING	OVER-PRINTABLE
FLOW AGENTS				
VM 1 or VM 11 <input checked="" type="checkbox"/>	liquid	1 – 5%	mixer/stirrer	no
VM 2 or VM 21 <input checked="" type="checkbox"/>	liquid	0,3 – 1%	mixer/stirrer	no
VM 3 or VM 31 <input checked="" type="checkbox"/>	liquid	1 – 5%	mixer/stirrer	yes
ANTI FLOATING AGENT				
Anti floating agent	liquid	3 – 5%	10 Min. dissolver*	yes
LAB-N 561969	liquid	1 – 2%	10 Min. dissolver*	yes
ANTISTATIC PASTE				
LAB-N 111420	paste	5 – 10%	manually	yes
STM-P1 <input checked="" type="checkbox"/>	paste	5 – 10%	manually	yes
VISCOSITY				
Thickening powder <input checked="" type="checkbox"/>	solid/powder	2 – 3%	10 Min. dissolver*	yes
DEGREE OF GLOSS				
Matting powder <input checked="" type="checkbox"/>	solid/powder	3 – 5%	10 Min. dissolver*	yes
ABRASION RESISTANCE				
LAB-N 560469 <input checked="" type="checkbox"/>	solid/powder	1 – 3%	10 Min. dissolver*	no
LAB-N 561645 <input checked="" type="checkbox"/>	solid/powder	1 – 3%	10 Min. dissolver*	limited
LAB-N 561644 <input checked="" type="checkbox"/>	liquid	1 – 3%	10 Min. dissolver*	no

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

Pad Printing Inks

Ink Ranges	Ink Type	TP 212	TP 249	TP 272	TP 287	TPI	TP/PP	TP 247	TP 253	TP 273	TP 300	TP 305	TP 313	TP 340	TP 400	TP/E-HF	TP 218	TP 218/GL	TP 253 L	TP 260	TP 307	TP 318	TP/UV-K	TP/UV-R	TP/UV-P	
Addition of Hardener	☐	☐	☐	☐	☐	☐	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣
							10:1	10:1	10:1	10:1	10:1	10:1	10:1	10:1	8:1	4:1	20:1	10:1	2:1	4:1	4:1	10:1	10:1	10:1	10:1	
Drying	1	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	2	▲	▲	▲	▲	●	●	●	
ABS, SAN			●	●	●		●			○	○	●	●	○	●	●					●	●			●	
Polystyrene (PS)		●	●	●	○							●	○		●						○		○	○	●	
Polycarbonate (PC)		●	●	●	○				●		●	●	●	●					○	●	●	●	●	●	●	
Acrylic Glass (PMMA)		●	●	●			●		●		●	●	●	●	●				●	●	●	○		○		
PVC rigid		●	●	●	●		●		●	●	●	●	○	●						○			○	○	●	
PVC plasticized			○		●		●		●		○	●														
Polyamide (PA)									2	2		2	2	2	2	●						●			●	
with pre-treatment Polypropylene (PP)							2			2	2	2	2	2	●				●	●	●					
Polyethylene (PE)																										
without pre-treatment Polypropylene (PP)					●																					
Polyacetal (POM) post-treatment required									2			2	2		●				●		●					
Polyester									2		2	2	2	2	●				●		●			●		
Polyurethane (PUR)							●	●	●	2		2			●				●	●	●					
TPE/TPU, Synthetic Leather, Rubber							2	2																		
Silicone Rubber																		●								
Duroplastics	●								2				2		●	●			●		●	●		●	●	
Glass																		●			●	○				
Metals	●								2	●		2	2		●	●			●	●	●	●				
Coated Surfaces	●			○	●		●	●	●	●	●		2	●	●				●	●	●		●	●		
Leather, Textiles							●																			
Wood		●							●	●		●														

- = preferred for the application
- ② = processing with hardener required
- = suitable for the application
- ② = processing with hardener required
- = potentially suitable

The information given above is no guarantee for the suitability of pad printing inks for individual substrates. The intention of this chart is to help printers choose suitable pad printing inks. Pre-tests are always essential. This information is based on our present experiences 01/2020

- ✓ = Does not contain: aromatics, cyclohexanone, butyl glycolate, PAH, Solvent Naphtha
- ✓* = In addition: **free of halogens** according to DIN EN 61249-2-21
- ☐ = 1 - component ink
- ▣ = processing as 1- and 2- component ink
- ▣ = 2 - component ink
- ▲ = air-drying
- 1 = oven-curing at 140°C/20Min
- 2 = oven-curing at 160°C/20Min
- = UV-curing

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SAFETY AND QUALITY



SunChemical®

Coates Screen Inks

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



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

- REACH** Substances listed in the REACH Candidate List are not used.
- EN 71-3:2019** Safety of Toys, Requirements of Toy Standard: migration of certain elements. Many of the ink ranges listed in this brochure (marked with *) meet the requirements of Toy Standard.
- 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.
- USP Medical Class VI** Pad printing ink ranges TP 300, TP 313, TP 400, TP 218 and TP 260 are certified according to USP Medical Class VI for application on medical articles.

FOR TECHNICAL ASSISTANCE PLEASE CONTACT US:

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.



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