

Product Data Sheet

Screen Printing Ink

SunChemical[®]
Coates Screen Inks

TZ

Solvent Based Screen Ink Range, 1- and (alternatively) 2-Component

APPLICATION

Screen printing ink for direct printing on natural fabrics, especially cotton as well as synthetic fibres such as polyamide and polyester. Also suitable for polyurethane, leather, synthetic leather, TPU/TPE (thermoplastic urethanes or elastomer) and rubber.

Combined with suitable printable hot melt adhesives TZ is also suitable for the production of textile transfers.

PROPERTIES

- Screen inks TZ are solvent based screen printing inks. They can be processed as 1-component and (alternatively) as 2-component ink with hardener.
- Processed as 1-component ink TZ dries physically, as 2-component ink physically/chemically-reactive and results in a satin matt finish.
- Applied on suitable substrates TZ prints are highly elastic and flexible.
- Processing as 2-component ink (=with hardener) is especially recommended for:
 - prints on difficult substrates, e.g. synthetic fibres
 - high requirements regarding adhesion and mechanical resistance.
 - chemical resistance against detergent solutions (60°C) and dry-cleaning.
- TZ inks are suitable for outdoor applications.
- Note: Because of the variety of substrates, pre-tests are essential. The above mentioned substrates, especially synthetic fibres may show different properties due to various types of surface treatments. 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 ISO 2846-4.
- 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 TZ 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 TZ inks are suitable for outdoor applications.

ADJUSTMENT FOR SCREEN PRINTING

- Screen printing inks TZ are not supplied in a ready-to-print adjustment.
- **Processed as 1-component ink (without addition of hardener):**
Ink is adjusted to printing consistency by addition of thinner or retarder (stir with mixer or agitator).
- **Processed as 2-component ink (with addition of hardener):**
As 2-component ink TZ 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 (=pot life).

Hardener:

Alternatively, screen inks range TZ can be processed with **hardener Z/H** or **hardener ZH/N**.

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

- **Hardener Z/H** for printing of textile materials.
- **Hardener ZH/N** for prints resulting in a slightly more elastic ink film. ZH/N is preferred for printing of elastomers, TPE/TPU (=soft-touch surfaces), textile transfers and for outdoor applications.

Mixing ratio of TZ inks with **hardener Z/H** or **hardener ZH/N** is:

10 parts ink : 1 part hardener (parts by weight).

Pot life:

- Ink mixed with hardener may only be processed within a limited period of time (=pot life).
- **Pot life of TZ + hardener Z/H or ZH/N is up to 10 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 – 25 % of thinner or retarder.

For adjustment of screen inks TZ, the following products are available:

Thinner:	■ VD 20	Standard thinner, quick
	■ VD 60	Standard thinner, (low odour)
Retarder:	■ VZ 25	Medium retarder
	○ VZ 40	Very slow retarder
■= Preferred ○= Suitable		

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
Viscosity increase	Thickening powder	Max. 3%	Stir with mixer
Matting	Matting powder	Max. 5%	Stir with mixer
Flow agent	---	---	Not required!!

OVERPRINTING

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

BRONZE COLOURS, MIXING OF BRONZE INKS

Bronze colours are available upon request.

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. For examples of colour shades please refer to our Bronze Colour Card.

These "B" bronze pastes and "B" bronze powder are mixed with bronze binder TZ/B or varnish TZ/E50 prior to processing.

Mixing ratios in parts by weight:

Gold bronze paste/powder	to	TZ/B or TZ/E50	=	1 : 3 - 4
Silver bronze paste	to	TZ/B or TZ/E50	=	1 : 4 - 6

Gold bronzes tend to oxidation. Therefore, bronze prints could become spotty or change colour – especially in outdoor applications or when washed.

Overprinting will not enhance protection or only to a very limited extend - especially on porous textile substrates.

DRYING / HARDENER REACTION

1. Processing **WITHOUT** addition of hardener:

Ink dries physically, i.e. by evaporation of solvents.

2. Processing **WITH** addition of hardener Z/H or ZH/N:

First, ink dries physically, followed by chemical cross-linkage reaction.

Drying and reaction temperature of hardener Z/H must be at least >15°C!

Drying and reaction temperature of hardener ZH/N must be at least >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.

Depending on local conditions, drying time in a drying frame (rack) is approx. 20 minutes at room temperature (20°C). Drying time with heat application (hot air fan/oven) is about 60 seconds at a temperature of 50°C.

Note: Addition of retarders may result in much longer drying times!

Hardener Reaction

Basically, the special adhesion and resistance properties of the ink are achieved only by chemical cross linkage reaction between ink and hardener. 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 Z/H does not react!	Ink film will not achieve any resistance
<20°C air drying		Hardener ZH/N does not react!	Ink film will not achieve any resistance
20°C air drying	20 min.	Dry enough for overprinting	No increase of resistance yet
	>72h	High degree of cross-linkage	Very high resistance values achieved
	>5 days	Maximum cross-linkage	Maximum resistance achieved
80°C oven curing	approx. 5 min.	Dry enough for overprinting	No resistance yet
	60 min.	Very high degree of cross-linkage	Very high resistance values achieved

Resistance Tests

When processing TZ inks with hardener Z/H or hardener ZH/N resistances should not be checked before the ink has fully cured/cross-linked: Drying with 20°C/5 days, with 80°C/>60 minutes.

SCREEN FABRIC / STENCILS

TZ inks have been formulated for printing with fabrics ranging from 43 to 120 threads/cm. Depending on substrate and when printing with fabrics between 43 and 77 threads/cm addition of up to 1.5% thickening powder may be necessary.

Suitability for printing with coarser or finer fabrics should be determined by corresponding pre-trials.

All copy emulsions and capillary films suitable for solvent based screen inks can be used, such as our program of SunCoat or Murakami products.

CLEANING

Stencils and tools can be cleaned with our universal cleaning agents URS or URS 3.

When processing as 2-component system, the longer inks dry on stencils and tools the harder will be their removal due to the chemical cross-linkage reaction. Therefore, always clean stencils and tools as soon as possible. Thinner VD 40 can be used to remove persistent ink residues.

PACK SIZE

Screen printing inks TZ are delivered in 1 litre containers. Other pack sizes are available upon request.

SHELF LIFE

In closed original containers, TZ inks generally have a shelf life of 5 years from date of production. Hardeners Z/H and ZH/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. Screen printing inks range TZ 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 71-3:2019 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 Screen Printing HM

Brochures: Solvent Based Screen 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	TZ/Y30	red	TZ/R50	green	TZ/G50
golden yellow	TZ/Y50	magenta	TZ/M50	black	TZ/N50
orange	TZ/O50	violet	TZ/V50	white	TZ/W50
scarlet	TZ/R20	blue	TZ/B50	varnish	TZ/E50
STANDARD Colour Range (medium opacity)					
According to colour card TZ Availability of further standard shades upon request					
citric yellow	TZ 10	light blue	TZ 30	light brown	TZ 50
medium yellow	TZ 11	ultra marine	TZ 32	white	TZ 60
light red	TZ 20	violet	TZ 36	black	TZ 65
bright red	TZ 21	light green	TZ 40		
carmin red	TZ 22	grass green	TZ 44		
STANDARD Colour Range HD (high opacity)					
According to colour card STANDARD HD for screen printing inks Availability of further standard HD shades upon request					
white, highly opaque	TZ 60/HD	black, highly opaque	TZ 65/HD		
SPECIAL PRODUCTS: Special Colour Shades, Varnishes, Pastes					
Information about availability upon request					
black, low-grade PAH transparent paste	TZ 68 TZ/TP	bronze binder	TZ/B		
4-Colour Process Inks (CMYK)					
According to colour Card STANDARD 2 or TZ/Z/M for screen printing inks					
process yellow	TZ 180	process black	TZ 65		
process magenta	TZ 181	transparent paste	TZ/TP		
process cyan	TZ 182				
AB – BRONZE INKS and MG – METAL GLOSS INKS					
According to Bronze Colour Card					
AB Bronze Inks			MG Metal Gloss Inks		
rich gold	TZ 75/AB		Upon request		
rich pale gold	TZ 76/AB				
pale gold	TZ 77/AB				
copper	TZ 78/AB				
silver	TZ 79/AB				

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

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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