

# Product Data Sheet

# Screen Printing Ink

# ZE 1690

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

### APPLICATION

Screen printing ink for direct printing on various synthetic fibres, leather, synthetic leather, TPU/TPE (thermoplastic urethanes or elastomers). Limited suitability for vulcanised rubber.

### PROPERTIES

- Screen inks ZE 1690 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 ZE 1690 dries physically, as 2-component ink physically/chemically-reactive and results in a satin gloss finish.
- Applied on suitable substrates ZE 1690 prints are highly elastic and flexible.
- As ZE 1690 are applied to highly demanding substrates and prints usually have to meet high resistance requirement, these inks are generally processed as 2-component ink with hardener.
- ZE 1690 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.
- 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 ZE 1690 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 ZE 1690 inks are suitable for outdoor applications.

### ADJUSTMENT FOR SCREEN PRINTING

- Screen printing inks ZE 1690 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 ZE 1690 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 ZE 1690 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) and for outdoor applications.

Mixing ratio of ZE 1690 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 ZE 1690 + hardener Z/H or ZH/N is 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 15 – 25 % of thinner or retarder.

For adjustment of screen inks ZE 1690, the following products are available:

<b>Thinner:</b>	■ <b>VD 20</b>	<b>Standard thinner, quick</b>
	■ <b>VD 60</b>	<b>Standard thinner, medium (low odour)</b>
<b>Retarder:</b>	■ <b>VZ 25</b>	<b>Medium retarder</b>
	○ <b>VZ 40</b>	<b>Very slow retarder</b>
■= 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**

<b>Application</b>	<b>Product</b>	<b>Addition in % by weight</b>	<b>Additional Information</b>
Viscosity increase	Thickening powder	Max. 3%	Stir with mixer
Matting	Matting powder	Max. 5%	Stir with mixer
Flow agent	VM 2	0.3 – 0.5%	Do not overdose!

**OVERPRINTING**

Generally, it is not necessary to overprint ZE 1690 inks with varnish. However, overprinting to increase resistances of ink layers is possible with ZE 1690/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 varnish ZE 1690/E50 prior to processing.

Mixing ratios in parts by weight:

Gold bronze paste/powder    to    ZE 1690/E50    = 1 : 3 - 4  
Silver bronze paste            to    ZE 1690/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 ZE 1690 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**

ZE 1690 inks have been formulated for printing with fabrics ranging from 77 to 120 threads/cm. 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 ZE 1690 are delivered in 1 litre containers. Other pack sizes are available upon request.

**SHELF LIFE**

In closed original containers, ZE 1690 inks generally have a shelf life of 3 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 ZE 1690 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](http://www.coates.de), section "SN-Online"; e.g. processing of 2 component inks

**FOR COLOUR RANGES, PLEASE REFER TO NEXT PAGE.**

## COLOUR SHADES

<b>C-MIX 2000 BASE COLOUR SHADES</b>					
<b>Mixing system for matching of PMS, HKS, RAL colours (on white substrates)</b> Start formulations available in data base „Formula Management C-MIX 2000“ <b>According to colour card C-MIX 2000</b>					
primrose	ZE 1690/Y30	red	ZE 1690/R50	green	ZE 1690/G50
golden yellow	ZE 1690/Y50	magenta	ZE 1690/M50	black	ZE 1690/N50
orange	ZE 1690/O50	violet	ZE 1690/V50	white	ZE 1690/W50
scarlet	ZE 1690/R20	blue	ZE 1690/B50	varnish	ZE 1690/E50
<b>STANDARD Colour Range (medium opacity)</b>					
<b>According to colour card ZE 1690</b> Availability of further standard shades upon request					
white	ZE 1690/60-NT	black	ZE 1690/65-NT		
<b>STANDARD Colour Range HD (high opacity)</b>					
<b>According to colour card STANDARD HD for screen printing inks</b> Availability of further standard HD shades upon request					
white, highly opaque	ZE 1690/60-HD-NT	black, highly opaque	ZE 1690/65-HD-NT		
<b>SPECIAL PRODUCTS: Special Colour Shades, Varnishes, Pastes</b>					
Information about availability upon request					
black, low-grade PAH	ZE 1690/68-NT	bronze binder	ZE 1690/B		
transparent paste	ZE 1690/TP				
<b>4-Colour Process Inks (CMYK)</b>					
According to colour Card STANDARD 2 or ZE 1690/Z/ZM for screen printing inks					
Upon request.					
<b>AB – BRONZE INKS and MG – METAL GLOSS INKS</b>					
According to Bronze Colour Card					
<b>AB Bronze Inks</b>			<b>MG Metal Gloss Inks</b>		
Upon request			Upon request.		

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 screen 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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