

Product Data Sheet

Screen Printing Ink

SunChemical®
Coates Screen Inks

Z/GL

Solvent Based Screen Printing Ink Range, 2-Component

APPLICATION

Screen printing inks for printing on glass, ceramics, duroplastics, metals as well as chromium-plated surfaces.

PROPERTIES

- Z/GL are solvent based screen printing inks. They are processed as 2-component ink with hardener.
- Ink range Z/GL shows good printability. The inks dry chemical-physically and result in a glossy finish.
- Cured prints exhibit high mechanical resistances as well as good chemical resistances against many organic solvents, thinned alkalis and acids, oils and grease.
- Due to the binders (epoxy resin) screen printing inks Z/GL are only suitable for indoor and short-term outdoor applications.
- We offer three different hardeners to optimally adjust Z/GL inks to various requirements.
- Z/GL prints are suitable for application of reflective coatings. Pre-tests based on the reflective coating process used have to be carried out to confirm suitability.
- Note: Because of the variety of substrates, 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).

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.
- 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 Z/GL 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. Due to the binders (epoxy resin) screen printing inks Z/GL are not weather resistant. They are suitable for indoor and short-term outdoor applications.

ADJUSTMENT FOR SCREEN PRINTING

- Screen printing inks Z/GL are not supplied in a ready-to-print adjustment.
- As this ink range is a 2-component system Z/GL 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:

Screen printing inks Z/GL are mixed with hardener 20 : 1 (parts by weight ink : hardener).

If necessary, hardener addition can be increased up to 7:1 to 10:1 to improve resistances. This especially applies to varnishes and transparent colours. Please make tests to determine the right level of addition.

The following hardeners are available:

- ZH/GL** Good water resistance, limited solvent resistance.
Recommended when only air drying (> 20°C) is possible.
Oven-curing 140°C / 20 minutes is possible
- ZH/02-GL** Recommended, when oven curing 140°C / 20 – 30 minutes is possible.
Prints will show good water resistance and quite a good solvent resistance.
This hardener tends to yellowing and is therefore not recommended for light colours and bronzes.
- ZH/03-GL** For air (> 20°C) and oven curing 140°C / 20 – 30 minutes.
Very good water and chemical resistance.
Preferred for metal/chromium surfaces.

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 Z/GL + hardeners is approx. 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 10 – 20 % by weight of thinner or retarder.

Depending on glass type and surface of the materials (e.g. contaminations) flow problems may occur. These can be improved with thinner VD 10 or XVH. Basically, however, substrates should be cleaned and degreased before printing.

For adjustment of screen inks Z/GL, the following products are available:

Thinner:	<input type="radio"/> VD 10	Very quick thinner, mild
	<input type="radio"/> VD 20	Very quick thinner, good solving power
	<input checked="" type="checkbox"/> XVH	Standard thinner, mild
	<input checked="" type="checkbox"/> VD 60	Standard thinner
Retarder:	<input type="radio"/> VZ 20	Medium retarder
	<input type="radio"/> VZ 25	Medium to slow retarder, good solving power
■= Preferred ○= If required		

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
Retarder paste	Z/GL-VP	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 3	3 - 5%	Do not overdose!

OVERPRINTING

Generally, it is not necessary to overprint Z/GL inks with varnish. However, overprinting to achieve an enhanced protection of ink layers is possible with Z/GL-E50 (hardener addition 7 – 10%). Overprinting should be carried out within <12 hours.

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 ZB/GL or varnish Z/GL-E50 prior to processing.

Mixing ratios in parts by weight:

Gold bronze paste/powder	to	ZB/GL or Z/GL-E50	= 1 : 3 - 4
Silver bronze paste	to	ZB/GL or Z/GL-E50	= 1 : 4 - 5

Contrary to AB and MG bronze colours, B bronzes are prone to oxidation (Exception B 78-POWDER). Therefore, they should be overprinted, e.g. with Z/GL-E50.

B 78-POWDER does not tend to oxidation. The pale copper shade will not darken with time. Colour of inks mixed with B 78-POWDER is similar to colour 78/AB as shown on our “bronze colour card”.

Note: When overprinting bronze colours (B/ AB/ MG) 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).

Overprinting should be carried out within <12 hours.

DRYING / HARDENER REACTION

Mixture of Z/GL ink/hardener is a chemically-reactive system with a physical pre-drying.

- Ink dries physically by evaporation of solvents.
- Then the ink film cures by chemical cross-linkage reaction.
- **Drying and reaction temperature of hardener must be at least 20°C for all three types of above-mentioned ZH/GL hardeners!**

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 (single print, multi-layer print).
- Drying temperature.

Hardener Reaction

Basically, the increased resistance properties of the printed ink film are only achieved after complete drying followed by chemical cross linkage reaction between ink and hardener. This cross linkage reaction depends on time and temperature. Until fully cured the minimum temperatures should not fall below 20°C. In addition, avoid high humidity.

Cross-linkage reaction will be much quicker using higher temperatures.

The following are guide values only:

Temperature	Time approx.	Condition of ink	Additional information
<20°C air drying		Hardeners ZH/GL, ZH/02-GL or ZH/03-GL do not react!	Ink film will not achieve any resistance
20°C air drying	20 min.	"touch-dry"	No resistance yet
	<12 h	Still good overprintability	No resistance yet
	>72 h	High degree of cross-linkage	High resistances achieved
	>5 days	Maximum degree of cross-linkage	Maximum resistances achieved
80°C oven curing	approx. 5 min.	Dry enough for overprinting	No resistance yet
	60 min.	High degree of cross-linkage	High resistance values achieved
140° oven curing	30 min.	Maximum degree of cross-linkage	Maximum resistance values achieved

Resistance Tests

Resistances should not be checked before the ink has fully cured/cross-linked:

Drying with 20°C/5 days; 80°C/>60 minutes* 140°C/30 minutes*

*After oven curing allow a cooling time (room temperature 20°C) of at least 1h.

SCREEN FABRIC / STENCILS

Z/GL 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

The longer the 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 with our universal cleaning agents URS, URS 3 or thinner VD 40 as soon as possible.

PACK SIZE

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

SHELF LIFE

In closed original containers, Z/GL inks generally have a shelf life of 5 years from date of production. Hardeners ZH/GL, ZH/02-GL and ZH/03-GL have a shelf life of 1 year 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 Z/GL 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	Z/GL-Y30	red	Z/GL-R50	green	Z/GL-G50
golden yellow	Z/GL-Y50	magenta	Z/GL-M50	black	Z/GL-N50
orange	Z/GL-O50	violet	Z/GL-V50	white	Z/GL-W50
scarlet	Z/GL-R20	blue	Z/GL-B50	varnish	Z/GL-E50
STANDARD (medium opacity)					
According to colour card STANDARD 2 for screen printing inks or Z					
Availability of further standard shades upon request					
citric yellow	Z 10/GL-NT	bright red	Z 21/GL-NT	violet	Z 36/GL-NT
medium yellow	Z 11/GL-NT	carmine red	Z 22/GL-NT	light green	Z 40/GL-NT
dark yellow	Z 12/GL-NT	light blue	Z 30/GL-NT	fir green	Z 41/GL-NT
light orange	Z 14/GL-NT	medium blue	Z 31/GL-NT	light brown	Z 50/GL-NT
orange	Z 15/GL-NT	ultra marine	Z 32/GL-NT	white	Z 60/GL-NT
light red	Z 20/GL-NT	dark blue	Z 33/GL-NT	black	Z 65/GL-NT
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	Z 60/GL-HD-NT	black, highly opaque	Z 65/GL-HD-NT		
SPECIAL PRODUCTS: Special Colour Shades, Varnishes, Pastes					
Information about availability upon request					
etch imitation	Z 63/GL-NT	black, low grade PAH	Z 68/GL-NT		
etch imitation	Z 63/06-GL-NT	transparent paste	Z/TP-GL		
white, matt	Z 60/GL-MT-NT	bronze binder	ZB/GL-NT		
black, matt	Z 65/GL-MT-NT				
4 COLOUR PROCESS INKS (CMYK)					
According to colour card STANDARD 2 for screen printing inks or Z					
process yellow	Z 180/GL-NT	process black	TP Z 65/GL-NT		
process magenta	Z 181/GL-NT	transparent paste	Z/TP-GL		
process cyan	Z 182/GL-NT				
AB – BRONZE INKS and MG – METAL GLOSS INKS					
According to Bronze Colour Card					
AB Bronze Inks			MG Metal Gloss Inks		
Upon request			Upon request		

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.

April 2020 - Version B3

Coates Screen Inks GmbH
 Wiederholdplatz 1 90451 Nürnberg
 Tel.: 0911 6422 0 Fax: 0911 6422 200
<http://www.coates.de>