

Product Data Sheet

Screen Printing Ink

Z

Solvent Based Screen Ink Range, 2-Component

APPLICATION

Screen printing inks for printing on special thermoplastics, especially pre-treated polyolefines, i.e. polypropylene (PP), polyethylene (HD-PE, LD-PE), PMMA (acrylic glass), polyamide (PA), polyacetal (POM), various duroplastics, metal as well as coated substrates.

PROPERTIES

- Screen inks Z are solvent based 2-component screen printing inks, which have to be processed with hardener.
- Z inks show good printability. They dry chemically-physically and result in a glossy finish.
- This ink range is especially suitable for technical/industrial applications requiring high resistances.
- Fully cured prints show high mechanical resistance as well as good chemical resistance against many organic solvents, thinned alkalis and acids, oils and grease.
- Adjusted with quickly evaporating thinners, e.g. ZVSP, Z inks can also be used for roller or spray coating applications.
- Z inks are not weather resistant due to the binders (epoxy resins) used in the formulation. They are suitable for indoor and short-term outdoor applications.
Possible weather resistant alternative inks are ranges ZM and ZMN.
- 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.
Standard HD Highly opaque colour shades.
- 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 Z 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.

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ADJUSTMENT FOR SCREEN PRINTING

- Screen printing inks Z are not supplied in a ready-to-print adjustment.
- As this ink range is a 2-component system Z 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 have to be mixed with **hardener Z/H**.

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

Hardener Z/H is added to the colour shades of Z range at a specified ratio (parts by weight):

Colour Shades: Examples:

		Ink : Parts	Hardener: Parts
Medium opacity	Colour ranges C-MIX 2000 / Standard / Bronze colours / Mixtures of these	4	1
High opacity	Colour range Standard HD / Mixtures of these	4	1
Transparent	Varnish E50, Transparent paste TP, Process colours	3	1

Note: Due to the very high pigment content highly opaque colours may have a slightly reduced resistance.

Pot life:

- Ink mixed with hardener may only be processed within a limited period of time (=pot life)
- **Pot life of Z + hardener Z/H is up to 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 Z, the following products are available:

Thinner:	<input type="radio"/> VD 20	Very quick thinner, good solving power
	<input type="radio"/> VD 40	Quick, very high solving power
	<input checked="" type="checkbox"/> VD 60	Standard thinner (mild odour)
Retarder:	<input checked="" type="checkbox"/> VZ 25	Medium retarder
	<input type="radio"/> VZ 40	Very slow retarder

■ = Preferred ○ = Suitable

Note: Retarders VZ 10, VZ 20 and VZ 30 are not suitable for Z inks!

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.

ADJUSTMENT FOR SPRAY COATING APPLICATION

Z inks can also be applied with a spray gun. For these applications, Z inks are thinned with quick evaporating thinner ZVSP. Addition of thinner, usually >50%, depends on the required processing viscosity.

ADDITIONAL AUXILIARY AGENTS

Application	Product	Addition in % by weight	Additional Information
Retarder paste	Z/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 1	3 - 5%	Do not overdose!

OVERPRINTING

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

BRONZE COLOURS, MIXING OF BRONZE INKS

Bronze colours 75/AB to 79/AB and metal gloss colours 75/MG to 79/MG are available.

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 or varnish Z/E50 prior to processing.

Mixing ratios in parts by weight:

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

Silver bronze paste to ZB or Z/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/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).

DRYING / HARDENER REACTION

Mixture of Z 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 15°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.

Hardener Reaction

The special adhesion and resistance properties of the ink are achieved only by chemical cross linkage reaction. This cross linkage reaction depends on time and temperature. Therefore, during air drying the temperature should not be lower than the required minimum of 15°C. In addition, avoid high humidity.

Higher temperatures will significantly speed up the cross linkage reaction.

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	20 min.	Dry enough for overprinting	No resistance yet
	<12h	Overprinting good	No resistance yet
	>72h	High degree of cross-linkage	High resistance achieved
	>5 days	Maximum cross-linkage	Maximum resistance achieved
80°C oven curing	5 min.	Dry enough for overprinting	No resistance yet
	60 min.	High degree of cross-linkage	High resistance achieved
140°C oven curing	30 min.	Maximum cross-linkage	Maximum resistance achieved

Multiple Layer Printing – Overprintability / Intermediate Adhesion

Reliable overprinting of printed ink layers is only possible for a limited period of time - 12h/20°C. Higher drying temperatures will reduce this period. Oven curing at 140°C/30 min. to speed up the cross-linking process should only take place after printing of the last ink layer.

Resistance Tests

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

Drying: 20°C/5 days, 80°C/>60 min., 140°C/30 min.

After oven curing allow a cooling time of at least 1h.

SCREEN FABRIC / STENCILS

Z 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 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 are delivered in 1 litre containers. Other pack sizes are available upon request.

SHELF LIFE

In closed original containers, Z inks generally have a shelf life of 5 years from date of production. Hardener Z/H has 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 Z standard shades, 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/Y30	red	Z/R50	green	Z/G50
golden yellow	Z/Y50	magenta	Z/M50	black	Z/N50
orange	Z/O50	violet	Z/V50	white	Z/W50
scarlet	Z/R20	blue	Z/B50	varnish	Z/E50
STANDARD Colour Range (medium opacity) According to colour card STANDARD 2 or YN/Z/ZM for screen printing inks Availability of further standard shades upon request					
citric yellow	Z 10/NT-NEU	pink	Z 25/NT-NEU	fir green	Z 41/NT-NEU
medium yellow	Z 11/NT-NEU	light blue	Z 30/NT-NEU	brilliant green	Z 42/NT-NEU
dark yellow	Z 12/NT-NEU	medium blue	Z 31/NT-NEU	light brown	Z 50/NT-NEU
orange	Z 15/NT-NEU	ultra marine	Z 32/NT-NEU	dark brown	Z 51/NT-NEU
ochre yellow	Z 17/NT-NEU	dark blue	Z 33/NT-NEU	white	Z 60/NT-NEU
light red	Z 20/NT-NEU	turquoise	Z 34/NT-NEU	black	Z 65/NT-NEU
bright red	Z 21/NT-NEU	violet	Z 37/NT-NEU		
carmine red	Z 22/NT-NEU	light green	Z 40/NT-NEU		
STANDARD Colour Range HD (high opacity) According to colour card STANDARD HD for screen printing inks Availability of further standard HD shades upon request					
citric yellow, highly opaque	Z 10/HD-NT-NEU	carmine red, highly opaque	Z 22/HD-NT-NEU		
medium yellow, highly opaque	Z 11/HD-NT-NEU	light blue, highly opaque	Z 30/HD-NT-NEU		
dark yellow, highly opaque	Z 12/HD-NT-NEU	light green, highly opaque	Z 40/HD-NT-NEU		
orange, highly opaque	Z 15/HD-NT-NEU	white, highly opaque	Z 60/HD-NT-NEU		
light red, highly opaque	Z 20/HD-NT-NEU	black, highly opaque	Z 65/HD-NT-NEU		
bright red, highly opaque	Z 21/HD-NT-NEU				
SPECIAL PRODUCTS: Special Colour Shades, Varnishes, Pastes Information about availability upon request					
white, matt	Z 60/MT-NT-NEU	bronze binder	ZB		
black, matt	Z 65/MT-NT-NEU	overprint varnish, matt	Z 70/MT		
black, low PAH content	Z 68/NT	light scattering varnish	Z 70/188-MT-NT		
transparent paste	Z/TP	phosphorescent ink	Z 96		
matt paste	Z/MP				
4 COLOUR PROCESS INKS (CMYK) According to colour card STANDARD 2 or YN/Z/ZM for screen printing inks					
Upon request			Upon request		
AB – BRONZE INKS and MG – METAL GLOSS INKS According to Bronze Colour Card					
AB Bronze Inks			MG Metal Gloss Inks		
rich gold	Z 75/AB	rich gold	Z 75/MG		
rich pale gold	Z 76/AB	rich pale gold	Z 76/MG		
pale gold	Z 77/AB	pale gold	Z 77/MG		
copper	Z 78/AB	copper	Z 78/MG		
silver	Z 79/AB	silver	Z 79/MG		

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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