

Screen Printing Ink for glass, ceramics, metal, aluminium, chrome-plated parts, coated substrates

High gloss, high brilliance, medium opacity, silicone free, fast curing 2-component ink

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Field of Application

Substrates

The screen printing ink Mara® Glass MGL is excellently suited to print onto

- Glass
- Ceramics
- Metals (incl. thinly anodised aluminium)
- Chrome-plated parts
- Varnished surfaces

Equal surface tension of at least 40 mN/m ensures good adhesion. Furthermore, the glass surface must be clean and absolutely free of graphite, silicone, dust or grease (e.g. finger prints). Flame pre-treatment right before the start of the printing process generally improves adhesion.

Since all the print substrates mentioned may be different in their printability even within an individual type, preliminary trials are essential to determine suitability for the intended use.

Field of use

Mara® Glass MGL is designed for indoor decoration prints onto promotional items of glass or ceramics such as e.g. imprinted glass panes, bottles, tiles and a variety of metals, such as chrome-plated writing instruments or panels.

Mara® Glass MGL is also suited for the lamination of glass.

Characteristics

For silicone-free products it is important to use only thoroughly cleaned stencils, squeegees, ink pumps, tubes (in the case of an automatic ink supply), and injectors for the manual ink filling of the stencil, etc.

If cleaning is carried out with automatic screen washing systems, we recommend prior to

printing an additional manual cleaning with a fresh cleaner not having had any contact with ink residues containing silicone.

Care should be taken with some adhesive tapes, used to protect the outer areas of the print region, as the release agent of the tape may be silicone.

Ink Adjustment

The ink should be stirred homogeneously before printing and if necessary during production.

MGL is a 2-component ink system. Prior to printing, it is essential to add hardener in the correct quantity and to stir homogeneously.

The mixing ratio is as follows:

MGL + 5 % MGLH =
20 parts by weight ink + 1 pbw hardener

When using hardener, the processing and curing temperature must not be lower than 15 °C as irreversible damage can occur. Please also avoid high humidity for several hours after printing as the hardener is sensitive to humidity.

Pre-reaction time

It is recommended to allow the ink/ hardener mixture to pre-react for 15 minutes.

Pot life

The ink/hardener mixture is chemically reactive and must be processed within 6-8 h (referred to 20-25 °C and 45-60 % RH). Higher temperatures reduce the pot life. If the mentioned times are exceeded, the ink's adhesion and resistance may be reduced even if the ink still seems processable.

Drying

Parallel to physical drying, i. e. the evaporation of the solvents used, the actual hardening of the ink film is caused by the chemical cross-



linking reaction between ink and hardener.

The standard values concerning progressive cross-linking reactions (hardening) of the ink film (thickness 5-12 µ) are as follows:

touch-dry	20 °C	30 min
overprintable	20 °C	60 min
final hardness	20 °C	6 Tage
	140 °C	30 min

For multi-colour printing, please note that the previously printed ink films should not be entirely cured before the consecutive ink film is printed on it. Only after all ink films have been applied, they should be baked.

Fade resistance

Only pigments of high fade resistance are used in the Mara® Glass MGL range. Please note, however, that MGL is not suited for outdoor applications with direct sun irradiation or humidity contact as the epoxy resin tends to chalk and as a consequence, the shades will change their original colour soon. The pigments used are resistant to solvents and plasticizers.

Stress resistance

After proper and thorough drying, the ink film exhibits outstanding adhesion, as well as rub, and scratch resistance.

The following resistances have been achieved:

Dish washer resistance:

- Domestic dish washer: at least 500 cycles acc. to DIN 12875
- Industrial dish washer (Winterhalter UC-L): at least 700 cycles acc. to DIN 10511

Metallic shades generally have a reduced dishwasher resistance.

Chemical Resistance:

- Perfume: 24 h test, G1-test
- Ethanol and glass cleansing agent: 500 DRS
- Aceton/MEK: 50 DRS

Test device: Taber® Abraser 5700,
DRS: Double Rub Strokes (350 g)

Humidity resistance:

- Condensation Water Test 70°C/100% RH/ 30 min
- Cold Water Immersion Test / 24h

In order to increase the mechanical resistance, we recommend an overprint with MGL 910. Bright colour shades, e.g. white, may darken if the print is constantly exposed to temperatures > 40° C. If the drying/curing process takes place at room temperature, the resistance will generally be reduced. Preliminary trials are essential.

Range

Basic Shades

920	Lemon
922	Light Yellow
924	Medium Yellow
926	Orange
930	Vermilion
932	Scarlet Red
934	Carmine Red
936	Magenta
950	Violet
952	Ultramarine Blue
954	Medium Blue
956	Brilliant Blue
960	Blue Green
962	Grass Green
970	White
980	Black

High Opaque Shades

122	High Opaque Light Yellow
130	High Opaque Vermilion
152	High Opaque Ultramarine Blue
162	High Opaque Grass Green
170	Opaque White
180	Opaque Black, non-conductive
181	Opaque Black, non-conductive
188	Deep Black, non-conductive

Press-Ready Metallics

191	Silver
192	Rich Pale Gold
193	Rich Gold

Etch Imitation Effects

914	Satin Transparent Varnish
916	Structured Varnish



Further Products

910 Overprint Varnish

MGL 181 is more matt than MGL 180.

All shades are intermixable. To maintain the special characteristics of this outstanding ink range (e.g. silicone free), Mara® Glass MGL should not be mixed with other ink types or other auxiliaries.

All basic shades are included in our Marabu-ColorFormulator (MCF). They build the basis for the calculation of individual colour matching formulas, as well as for shades of the common colour reference systems HKS®, PANTONE®, and RAL®. All formulas are stored in the Marabu-Color Manager software.

Auxiliaries

MGLH	Hardener	5%
SA 1	Surface Additive	3-5%
MGLV	Thinner	1-15%
SV 11	Retarder	1-15%
MP	Matting Powder	1-3%
VM 2	Levelling Agent	1-3%
OP 170	Opaquing Paste	0-15%
UR 3	Cleaner (flp. 42°C)	
UR 4	Cleaner (flp. 52°C)	
UR 5	Cleaner (flp. 72°C)	

Shortly before use, the hardener should be stirred into the ink. MGLH is sensitive to humidity and is always to be stored in a sealed container.

Thinner MGLV is added to the ink/hardener mixture to adjust the printing viscosity.

For slow printing sequences and fine motifs, it may be necessary to add retarder to the thinner. For an additional thinning of the ink containing retarder, only pure thinner should be used.

The addition of Surface Additive SA 1 can increase the resistance against abrasion and other mechanical stress (max. addition 10 %).

By adding Matting Powder MP the ink film can

be matted individually (preliminary trials in terms of adhesion and resistance are essential, white shades addition max. 2 %).

Printing Modifier VM 2 (silicone-free) can be added to rectify flow problems. An excessive amount reduces the intercoat adhesion.

By adding Opaquing Paste 170, the opacity of the colour shades 920 - 962 can significantly be increased without considerably influencing the chemical and dry abrasion resistance.

The cleaners UR 3 and UR 4 are recommended for manual cleaning of the working equipment. Cleaner UR 5 is recommended for manual or automatic cleaning of the working equipment.

Printing Parameters

All types of commercially available polyester fabrics and solvent-resistant stencils can be used. For a good opacity on coloured substrates, we recommend a mesh count between 68-64 and 90-48, for printing fine details 100-40 to 120-34. A suitable mesh count for thin ink films is 165-27.

Shelf Life

Shelf life depends very much on the formula/reactivity of the ink system as well as the storage temperature. The shelf life for an unopened ink container if stored in a dark room at a temperature of 15 - 25 °C is:

- 2.5 years for the basic shades 920-932, 950-980, for High Opaque shades 122, 130, 152, 162, 170, 180, as well as 188, 910, 914, 916
- 2 years for the basic shades 934, 936
- 1 year for the Metallics 191-193, as well as 181

Under different conditions, particularly higher storage temperatures, the shelf life is reduced. In such cases, the warranty given by Marabu expires.

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Note

Our technical advice whether spoken, written, or through test trials corresponds to our current knowledge to inform about our products and their use. This is not meant as an assurance for certain properties of the products nor their suitability for each application.

You are, therefore, obliged to conduct your own tests with our supplied products to confirm their suitability for the desired process or purpose. The foregoing information is based on our experience and should not be used for specification purposes. All characteristics described in this Technical Data Sheet refer exclusively to the standard products listed under "Range", provided that they are processed in accordance with their intended use and only when used with the recommended auxiliaries. The selection and testing of the ink for specific applications is exclusively your responsibility. Should, however, any liability claims arise, they shall be limited to the value of the goods delivered by us and utilised by you with respect to any and all damages not caused intentionally or by gross negligence.

Labelling

For Mara[®] Glass MGL and its auxiliaries, there are current Material Safety Data Sheets available according to EC regulation 1907/2006, informing in detail about all relevant safety data including labelling according to EC regulation 1272/2008 (CLP regulation). Such health and safety data may also be derived from the respective label.