



**Screen printing ink for 3C applications
(3C = Computing, Communication, and
Consumer Electronics)**

**Silicone-free, high opacity, 2-component-
ink**

Field of Application

Field of use

MG3C is designed for 3C applications on special glass materials such as:

- Soda-lime glass
- Borosilicate glass
- Gorilla® glass
- Xensation® glass

Ideal printing conditions include a room temperature of 20-25° C and 45-60% humidity, and equal surface tension of at least 40 mN/m ensures good adhesion, ink flow, and surface homogeneity. 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 printability even within an individual type, preliminary trials are essential to determine the suitability for the intended use.

Characteristics

Mixing ratio

Before printing, it is essential to add the correct hardener to the ink. We recommend an addition of:

MG3C 180/181/188:
5% MGLH

MG3C 170 + Barrier Black 78435183RSZ:
15% HT 1+10% UV-HV 7

Pre-reaction time

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

MG3C 180/181/188:

For highest mechanical and chemical resistances (Ethanol, MEK, or Acetone), the addition of Hardener MGLH can be increased to up to 6%.

For the silicone-free MG3C it is important to use only thoroughly cleaned stencils, squeegees, ink pumps, as well as 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.

If ink flow problems may nevertheless arise, please clean once more stencil and squeegee with a fresh cleaner.

Pot life (processing period)

The ink/hardener mixture is chemically reactive and must be processed within a few hours after the addition of the hardener. Higher temperatures reduce the pot life.

20° C room temperature: 8 h pot life
30° C room temperature: 4 – 6 h pot life

If the room temperature (> 30° C) or the mentioned times are exceeded, the ink's adhesion and chemical 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

Maraglass MG3C



the ink film is caused by the chemical cross-linking reaction between ink and hardener. The following values, related to the **object temperature**, concerning progressive cross-linking reactions (hardening) of the ink film (thickness 5-12µ) are recommended (for black ink layers with 188, 181, 180, or white ink layers with MG3C 170 and MG3C 78435183RSZ):

Intermediate drying:
Overprintable after 3 min. at 150°C (+- 3°C)

Final drying:
165°C (+- 3°C), 20 min.

The processing and curing temperature should not be lower than 15° C within the first 12 hours as irreversible damage can occur.

After the print, until the hardening of the ink film, high air humidity (> 60%) or direct contact with water (rain) must be prevented categorically for otherwise the linkage between the ink and the substrate will be impaired significantly.

Stress resistance

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

The following resistances were tested:

- Cross Hatch Test: DIN EN 2409, ASTM 3359-02
- Heat Soak Test: Dwell for 72 h at 65 °C / 95 % RH
- Boiling Water /60 min.
- Thermal Cycling Test: 6 cycles
High: 65°C at 90% RH
Low: -20°C, RH uncontrolled
- 100 double rub strokes (850 g): MEK
- Ink adhesion after frost test at -18° C
- Resistivity survey Teraohmmeter TO 3

Range

High-opaque shades for black ink build-up (epoxy-based)

MG3C 188 Deep Black	glossy
MG3C 181 Opaque Black	matt
MG3C 180 Opaque Black	glossy

High-opaque shades for white ink build-up (acrylate-based)

MG3C 170 Opaque White	glossy
MG3C 78435183RSZ Barrier Black	glossy
(not a stock item yet)	

Basic Shades and Varnish

On request

Miscibility

Owing to the resistances required for this application like temperature resistance, light fastness, and brightness value for White, the colour shades differ in their formula as to binders, pigments, and amount and type of hardener to be added. The acrylate-based shades MG3C 170 Opaque White and Barrier Black MG3C 78435183RSZ can therefore not be mixed with the epoxy-based MG3C black shades 180, 181, and 188! Combination printing is possible.

Mixing with other ink types or auxiliaries must be avoided in order to maintain the special characteristics of this outstanding ink range.

Auxiliaries

MGLH	Hardener *	5-6 %
HT 1	Hardener	15 %
UV-HV 7	Adhesion Modifier	10%
MGLV	Thinner *	2-5 %
SV 5	Retarder	2-5 %
SV 11	Retarder *	2-5 %
SV 12	Retarder	2-5 %
VM 1	Printing Modifier*	0,5-2 %
UR 3	Cleaner (flp. 42°C)	
UR 4	Cleaner (flp. 52°C)	
UR 5	Cleaner (flp. 72°C)	

***Attention:**

Auxiliaries **marked with *** are **solely** for MG3C 180 – 188!

Auxiliaries **without *** (except cleaners) are **solely** for MG3C 170 + MG3C 78435183RSZ!

Shortly before use, Hardener MGLH (for MG3C 180-188) **or** Hardener HT 1 + Adhesion Modifier UV-HV 7 (for MG3C 170 + MG3C 78435183RSZ) should be stirred into the ink. The hardeners are sensitive to humidity and are always to be stored in a sealed container. The mixture ink/hardener is not storable and must be processed within pot life.

Thinner and/or retarder 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.

Printing Modifier VM 1 or 2 (silicone-free) can be added to rectify flow problems. An excessive amount of VM 1/2 reduces the intercoat adhesion.

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. A suitable mesh count for thin ink films is 100-40 - 165-27.

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 selection and testing of the ink for specific application is exclusively your responsibility. Should, however, any liability claims arise, such claims 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 Maraglass MG3C 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 the labelling according to the present EEC regulations as to health and safety labelling requirements. Such health and safety data may also be obtained from the respective label.