

Solvent-based phosphorescent ink for screen printing

Two phosphorescent duration qualities, low odour, matt, for PVC, PS, paperboard, and cardboard

Vers. 7
2020
19. Oct

Field of Application

Substrates

Mara® Glow GW is suitable for printing onto

- PVC self-adhesive film
- Rigid PVC
- Polystyrene PS
- ABS
- SAN
- Acrylic glass PMMA
- Polycarbonate PC
- Paperboard, and cardboard

Due to the very high thickness of printed ink layers, printing onto thin materials like PVC self-adhesive film might be difficult. To avoid material warpage, we recommend the use of quality films with a film thickness of at least 100 µm.

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.

Field of use

Mara® Glow GW is a phosphorescent solvent-based screen printing ink and is available in two different phosphorescent duration qualities. In general, phosphorescent inks absorb and store illuminated short wavelength UV rays and/or light and release them as longer wavelength visible light once the illumination has stopped. This results in illuminated signs or effects during darkness. For the long-term phosphorescent quality, this effect can be repeated many times. The following fields of application are possible:

Short-term phosphorescent duration

Mara® Glow GW 361 (yellow-green inherent colour) is suitable as effect ink for printing onto

self-adhesive material or signs in the realm of advertising.

Long-term phosphorescent duration

Mara® Glow GW 760 (white green) and Mara® Glow GW 761 (yellow green), both of them contain very high pigment qualities and, if processed properly, are suitable for producing long phosphorescent duration according to DIN 67510.

This quality is used in the manufacture of long-term phosphorescent products like emergency exit and hazard location markings and the marking of devices, instrument panels, and dials.

We recommend not to use a spray gun.

Characteristics

The basis of the long-term phosphorescent ink is an extremely hard pigment with a very high specific gravity as well as the high pigment content. The ink, therefore, must regularly be stirred homogeneously **before printing and during production**.

The pigment content in the printed ink layer will otherwise be reduced and the phosphorescent duration required by DIN 67510 will not be met. Due to the hard pigment quality, the stencil abrasion during production is quite significant. We recommend that the emulsion is only applied to the print side of the screen, and a hard squeegee with rounded edges is used. The drying rate as well as the block resistance are dependant upon the chosen mesh count and the drying conditions.

Processing GW 361

The ink containing the short-term phosphorescent pigment quality, GW 361, can be processed with a mesh of up to 48-55, analogous to other screen printing inks.

Processing GW 760 and GW 761

Both products require printing with a very coarse mesh (e.g. 27-120) due to the pigment size and the high ink film thickness necessary in order to comply with DIN 67510. This slows down the drying speed considerably and makes passing through the hot air channel and subsequent rack drying a necessity.

To achieve quick solvent evaporation, we always recommend using a hot air tunnel dryer.

Pad Printing suitability

The colour shade Mara® Glow GW 760 also features limited suitability for pad printing. We recommend using a thick steel plate (10 mm). Recommended etch depth: 25 - 30 µm. Phosphorescent pigments are very hard and therefore have a very strong abrasive effect on the cliché, doctor blade, and ink cup. Common photopolymer clichés do not resist this strong abrasion and become unusable after a few prints.

Opacity

To achieve a maximum phosphorescent effect, Mara® Glow GW should only be printed onto white substrates due to the low opacity of the ink.

Light storage saturation

All ink qualities produce a maximum storage with wave lengths of 380-400 nm, present in both daylight and neon light. If only incandescent lighting is available, even prolonged charging will result in only a reduced phosphorescent effect.

Phosphorescent duration

The phosphorescent quality GW 361 produces, if fully charged and properly processed, a phosphorescent effect of approx. 30 minutes.

The long-term phosphorescent qualities GW 760 and GW 761 achieve and exceed when properly processed, and provided that pigments are spread evenly, the values of DIN 67510 (20 mcd/m² after 10 min; 2.8 mcd/m² after 60 min; at least 0.3 mcd/m² after 340 min), so that it glows for several hours.

Fade resistance

All three phosphorescent inks are made without the use of phosphor, lead, and radioactive materials. We recommend a protective overcoat with a suitable varnish for long-term indoor and outdoor use and as an additional protection against humidity.

Range**Basic Shades**

361	Yellow Green, phosphorescent
760	White Green, long-term phosphorescent
761	Yellow Green, long-term phosphorescent

To protect the phosphorescent ink against fading, the entire surface must be over-varnished. Therefore, the varnish *Libra Print LIP 910* can be used.

Auxiliaries

UKV 1	Thinner, fast	5%
UKV 2	Thinner	5%
SV 1	Retarder	5%
SA 1	Surface Additive	3-5%
ES	Printing Modifier	0.5-1%
UR 3	Cleaner (flp. 42°C)	
UR 4	Cleaner (flp. 52°C)	
UR 5	Cleaner (flp. 72°C)	

Thinner is added to the ink to adjust the printing viscosity. For slow printing sequences and fine motifs, it may be necessary to add retarder to the thinner.

The addition of surface additive SA 1 can increase the resistance against abrasion and other mechanical stress (recommended addition 3-5 %, max. addition 10 %).

Printing Modifier ES contains silicone and can be used to rectify flow problems on critical substrates. If an excessive amount is added, flow problems are increased and adhesion may be reduced, especially when overprinting.

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.

Shelf Life

Shelf life depends very much on the formula/reactivity of the ink system as well as the storage temperature. It is 2 years for an unopened ink container if stored in a dark room at a temperature of 15-25°C. Under different conditions, particularly higher storage temperatures, the shelf life is reduced. In such cases, the warranty given by Marabu expires.

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.

The long-term phosphorescent screen printing inks Mara® Glow GW 760 and 761 are suitable for the production of long-term phosphorescent products in accordance with DIN 67510, part 4 (in the version of July 1996). Of crucial importance in this respect is the correct processing of the ink, the observation of printing parameters, the proper installation at the location, and the observation of illumination condi-

tions according to DIN 67510, part 2.

Labelling

For Mara® Glow GW 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.

Vers. 7
2020
19. Oct