9104

Technical Data Sheet 05/2023 V3

Solvent-based and UV-curable Dual-Cure screen print varnishes for polycarbonate PC and coated surface.

Very flexible, highest resistances, 2-component system

Field of Application

Substrates

9104 is an universal, very fast curing ink (solvent-based/UV) for screen printing, which is suited for the following substrates:

- Polycarbonate (PC)
- Coated surface
- Base coating aluminum plate

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

9104 is particularly suited for industrial indoor and outdoor application, such as interior and exterior applications for the automotive industry, or as surface protection of furniture.

The processing steps are as below:

1.Printing of the motif2.Drying/tempering
3.In case of 3D-applications: molding
4.UV-curing process
5.Cutting/Stamping/back injection molding

Characteristics

9104 is highly reactive and features a very flexible ink film. 9104 is dual-cure ink, which requires to be sealed without light, and the outdoor natural light should be avoided during ink application.

Recommendation:

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

9104 is a 2-component ink system. Prior to printing, it is essential to add hardener in the correct quantity.

This ink/hardener mixture must be stirred homogeneously and adjusted to the right printing viscosity by adding thinner (stir again). After stirring well, the ink can be left to make the air in the ink completely discharged, and allows printing a most homogeneous surface.

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. The ink added hardener should also avoid exposure under outdoor natural light.

Pre-reaction time

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

The ink/hardener mixture is chemically reactive and can only be processed within 6-8 hours, referred to an ambient temperature of 20°C. Higher temperatures reduce the pot life. If the room temperature (>30°C) or the mentioned times are exceeded, the ink's adhesion and chemical resistance may be reduced.

Drying

The drying/curing takes place in two steps:

1.Solvent evaporation
2.UV-curing

Between these two processes the printed item can be molded and stretched:

1. Solvent evaporation Touch and heat curing
dry 80°C 3-5minutes

Marabu Asia (Shanghai)
NO.130 Muhua Road Shanghai Chemical Zone 201417
Tel: + 86-021-3758 1311

Marabu Asia (Shenzhen)
NO.457 Huachang North Road, Longhua District, Jiading Tech Park
Tel: +86 0755 2101 6426

Marabu Asia (Hongkong)
Unit 701 The Workstation 43 Lyndhurst Terrace Central
TeL: +852 2426 6121

Heat curing 1 hour at 80°C or 20-30 minutes at 150°C.

After the surface has dried, the ink can be overprinted again with 9104 varnish. After overprinting, the PC film can be baked at 80°C for 1H to cure, and for temperature resistant, aluminum plates can be baked at 150°C for 20-30 minutes to cure. After the ink has dried or baked, the surface is not scratch resistant and the film and aluminium are recommended to be placed on a drying rack for turnover.

1. UV-curing
UV curing energy (medium-pressure mercury lamp)
UVA:
1000–2000mJ/cm²

2. Different applications
2D-application: 2D application requires force dry in oven and then UV-curing
3D-application: 3D application requires force dry in oven, then stretching, UV-curing, and cutting.

After the UV-curing process you can immediately start with post-processing steps such as cutting, stamping or back injection molding. 9104 is a post-curing UV ink which will achieve its best adhesion and resistance after 24 hours.

The curing speed of the ink is generally dependent upon the type of UV-curing numbers, age, and power of the UC-lamps, the printed ink film thickness, color shade, substrate in use, as well as the printing speed.

The physical and chemical resistance of the ink is closely related to the energy used for UV curing of the ink. Within the defined energy curing range, the resistance of the ink increases with increasing energy, while at lower UV curing energies, the resistance of the ink decreases to a certain extent compared to the optimum value. However, reduced ink resistance does not mean that the ink fails the relevant performance test. It is recommended that this is verified before use.

Stress resistance
After proper and thorough drying, the ink film exhibits outstanding adhesion as well as rub, scratch and block resistance (sun cream, hand cream and acetone drip test) , etc.

Color Range

9104/30047914	Matt varnish
9104/30080910	High gloss varnish

Auxiliaries

TS 108	Thinner	0-10%
TS 110	Thinner, slow	0-10%
MH 4	Hardener	5-10%
NT 1	Cleaner	

Hardener is sensitive to humidity and is always to be stored in a sealed container. Shortly before use, the hardener must be added to the ink and stirred homogeneously. The mixture ink/hardener is not storable and must be processed within pot life.

For PC film sheets and other applications with a large stretch in the film injection process, it is recommended to add 5% hardener to improve the flexibility of the ink layer; for aluminium plates and other products with a small stretch, the proportion of hardener can be increased to increase the surface scratch resistance of the ink before UV curing.

Thinners are used to adjust the viscosity of the ink and the ratio can be adjusted according to the circumstances.

Printing Parameters

All commercially available capillary films or solvent resistant photo emulsions and combined stencils can be used.Selection of fabric depends on the printing conditions, the desired curing speed and mileage as well as the required

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opacity. Generally, fabrics of 90-40 bis 120- 34 can be used.

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 1 year.

Under different conditions, particularly other 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 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 used by you with respect to any and all damages not caused intentionally or by gross negligence.

Labelling

For 9104 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 GB 15258- 2009. Such health and safety data may also be de- rived from the respective label.

More information

The above technical information is only for products under-development phase. It will be renewed after full market launch.

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