

Marapur PU

(for traffic signs)



Screen Printing Ink for reflective films with acrylate or alkyd resin top-coatings

High gloss, transparent, 2-component-ink, resistant to chemicals, weather resistant

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Field of Application

The screen printing ink Marapur PU for traffic signs is a solvent-based two-component ink and is suitable for printing onto self-adhesive reflective foils of different manufacturers.

Substrates

PU for traffic signs adheres to reflective foils with an acrylate or alkyd resin top-coating. Foils with PVC surfaces, however, are not suitable. As the mentioned substrates may be different in their printability even within an individual type since they vary according to the manufacturer, preliminary trials are essential to determine suitability for the intended use.

Field of use

Reflective traffic signs are safety products for traffic control, standardized e. g. in Germany according to DIN 6171 (colour specification) and DIN 67 520 (reflection value). The colour shades of Marapur PU for traffic signs have been externally tested and released on a foil type by the "Bundesanstalt für Materialprüfung" (Institute for Material Testing) in Berlin. Basis for the release was the printed ink layer thickness of a fabric 68-64 (T).

If foils of different manufacturers or types are used, the colour specification and reflection value can change and it will be necessary to formulate and test again. In addition, there are different standards for traffic signs in each country. Preliminary trials to determine the suitability of PU for traffic signs are, therefore, necessary before printing.

Characteristics

Mixing Ratio

Prior to printing, Hardener H 1 is to be added in the correct quantity to the ink. After having stirred it well, the ink/hardener mixture is press-ready and must not be changed by further additions such as e. g. thinner. The ink should rest for 10 minutes before printing in order to let escape the air which may have been stirred in.

Colour shades

1 part of ink	+ 1 part of Hardener H 1
	corresponds to
840 gs of ink	+ 200gs of Hardener H 1

Printing varnish

1 part of PU 911	+ 1 part of Hardener H 1
	corresponds to
600 gs of PU 911	+ 200gs of Hardener H 1

Pot life

The processing period (pot life) is approx. 8 hours at a temperature of 20 °C with Hardener H 1. If the mentioned pot life is exceeded, the ink's adhesion and resistance may be reduced even if the ink characteristics show no noticeable change.

Temperatures exceeding 20 °C during processing reduce the pot life, lower temperatures will extend it.

Drying/Hardening

Parallel to physical drying, i.e. evaporation of the solvents, the actual hardening of the ink film is caused by the chemical crosslinking reaction (hardening) between ink and hardener.



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The following standard values have been experienced:

(single printing, fabric 68-64 T):

Extent of drying	temp.	H 1
ready to be overprinted	20 °C	30 min.
	60 °C	5 min.
	120 °C	2 min.
stackable	20 °C	5 hours
	60 °C	40 min.
	120 °C	20 min.
final hardness	20 °C	8 days
pot life	20 °C	8 hours

The indicated drying times refer to single printing and are very much depending on the room temperature, air humidity, and drying conditions. The above mentioned times can thus only be considered as guidelines. If the prints are overcoated and ink is printed on ink, the drying speed will be reduced.

Processing and hardening temperature should not be below 15 °C as, otherwise, irreversible damage can occur when the ink film is formed.

Overprintability

For an optimum 'ink on ink' adhesion (varnish or colour shades), overprinting with Printing Varnish PU 911 must be carried out within 12 hours at room temperature 20 °C. If the first layer is pre-dried in a hot-air tunnel at 80 °C/ 1 min. and subsequently rack-dried, over-varnishing has to occur within 8 hours. This guarantees that the ink layer lying underneath will not totally cure chemically and the above print (varnish) will be able to anchor well by solving.

Fade resistance

Marapur PU ink type includes a weather resistant binder which is highly fade resistant in all colour shades (blue wool scale 7-8). Marapur PU is therefore suited for outdoor use with traffic signs for 5 years or more (referred to moderate Central European climate) if the total surface is over-varnished with Printing Varnish PU 911 + Hardener H 1.

Stress resistance

After proper and thorough drying (e.g. at 20 °C/8 days air drying), the ink film has an excellent mechanical resistance to cleaning brushes or permanent wind abrasion.

It is chemically resistant to all cleaning agents used for cleaning traffic signs such as alcohol, petrol, aromatics, esters as well as permanent car exhausts. The weather resistance of traffic signs printed with Marapur PU is in compliance with common practice.

Range

The following transparent colour shades are available (see printed samples PU for traffic signs). The colour shade black is opaque.

PU 521	Traffic Lemon	PU 552	Traffic Blue
PU 536	Traffic Red	PU 568	Traffic Green
PU 573	Black (opaque)		

One unit includes 840 grams of ink. All 5 colour shades are press-ready and must not be thinned in order to achieve the DIN standards.

PU 911 Printing varnish + UV absorber

Printing varnish for overcoating the whole surface as additional UV-protection. One unit of printing varnish contains 600 grams.

Auxiliaries

Hardener: H 1 (200gs)

Cleaner: UR 3

Cleaning

Immediately after printing, the fabric has to be cleaned with UR 3 before the ink/hardener reaction begins.

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Recommendations

Hardener H1 is sensitive to humidity. Therefore, please store it always in a sealed can.

If not, a reaction of hardener and air humidity will take place too early and the resistance of the printed ink film will be reduced. Furthermore, please avoid any high humidity or even direct rain water contact within the first 24 hours after drying.

Fabrics and Stencils

All 5 colour shades are adjusted to the printed ink film layer of a 68-64 (T) fabric (plain weave) in colour specification and transparency. Please do not use any other fabric for the colour shades. If the ink layer is over-varnished with Printing Varnish PU 911, we recommend a 90-48 (T) fabric. All stencils used must be solvent-resistant.

Labelling

For our ink type Marapur PU and its additives and auxiliaries there are current Material Safety Data Sheets according to EC-regulation 91/155, 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 derived from the respective label.

The ink has a flash point between 21 °C and 100 °C. Since the ink is not considered as a flammable liquid due to its pastous nature, any specific regulations for the handling of flammable liquids do not apply to the ink.

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.