Marasign TS

Marabu

Screen Printing Ink for traffic signs on Retroreflective sheetings

High gloss, transparent, 2-component-ink, resistant to chemicals and weathering

Vers.01
2009
15 June

Field of Application

The screen printing ink Marasign TS for traffic signs is a solvent-based two-component ink and is suitable for printing onto self-adhesive retroreflective sheetings of the categories RA1, RA2, and RA 3.
If sheetings of different manufacturers or types are used, the colour specification and reflection value may change.

Substrates

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 information, standardized e. g. in Germany according to DIN EN 12899-1, DIN 6171 (colour specification) and DIN 67 520 (retroreflection values).

Providing correct processing and material selection Marasign TS is ideal.

Material Approval

The colour shades of Marasign TS for traffic signs have been internally tested according to the European Norm (analog DIN EN 12899-1) and comply with all stipulated test criteria.

Nevertheless, each manufacturer needs an approval for each country before the production start.

Handling

The stipulated specifications are only achieved with standardised printing and processing parameters as below:

Ink:	Marasign TS (800 g)
Hardener:	H 1 (200 g)
Viscosity:	ink, ready for printing, no thinner addition necessary
Print:	mechanical
Mesh type ink:	PET-fabric 61-64
Printing varnish:	PET-fabric 90-48
Screen-tension:	> 15N
Squeegee:	65 – 75 shore
Squeegee angle:	75 – 80°

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 <u>not</u> be changed by further additions such as e. g. thinner. The ink should rest for 10 minutes before printing in order to let any air bubbles escape following the stirring.

Colour shades

1 part of ink + 1 part of hardener H 1
equals 4:1
800 g of ink + 200g of hardener H 1

Printing varnish

1 part of TS 911 + 1 part of hardener H 1
equals 3:1
600 g of TS 911 + 200g of hardener H 1

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Pot life

With the addition of the hardener to the ink, the pot life is limited.
Room temperature 22°C: 8 hours

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 22 °C during processing reduce the pot life.

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.

The following average drying times can be expected:

(single printing, mesh 61-64):

Extent of drying	temp.	H 1
ready to be	22 °C	30 min.
overprinted	60 °C	5 min.
	120 °C	2 min.
stackable	22 °C	5 hours
	60 °C	40 min.
	120 °C	20 min.
final hardness	22 °C	8 days
pot life	22 °C	8 hours

The indicated drying times refer to single prints and are very much dependant upon the room temperature, air humidity, and drying conditions. The above mentioned times can 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 to ink' adhesion (either varnish or colour shades), overprinting with Printing Varnish TS 911 must be carried out within 24 hours at room temperature 22° C. If the first layer is pre-dried in a hot air tunnel at 80° C/1 min. and subsequently rack-dried, over-varnishing must occur within 12 hours. This guarantees that the underlying ink layer will not be totally cured and the subsequent print (or varnish) will be able to anchor well by dissolving the lower layer.

Fade resistance

All colour shades of Marasign TS ink include a weather resistant binder which is highly fade resistant in all colour shades (blue wool scale 7-8). Marasign TS is, therefore, suited for a fairly long-term outdoor use. Referred to Central European climate (to the north of the 40th parallel of latitude) and a vertical installation following details can be given for outdoor use:

3 years	without over-printing
5 years	with over-printing (TS 911+H 1)

Stress resistance

After proper and thorough drying (e.g. at 22°C/8 days air drying), the ink film has an excellent mechanical resistance to cleaning brushes.
It is chemically resistant to all cleaning agents such as alcohol, petrol, aromatics, esters as well as car exhaust fumes.

Range

The following transparent colour shades (800 g) are available.
The colour shade black is opaque.

Basic shades

TS 521	Transp. Yellow	
TS 522	Transp. Orange	Available in 2010
TS 536	Transp. Red	
TS 552	Transp.Blue	
TS 568	Transp.Green	
TS 545	Transp.Brown	Available in 2010
TS 573	Black (Opaque)	

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Special Binder, Printing varnish

TS 904	Special Binder
TS 911	Printing varnish + UV absorber

The retroreflection value can be increased (up to 3 units) with an addition of maximum 10% Special binder TS 904 into the ink.
Preliminary trials are essential because the defined colour coordinates will change by adding Special Binder TS 904.

Printing varnish TS 911 is suited for overcoating the whole surface as additional UV-protection. One unit of printing varnish contains 600 grams (see section mixing ratio).

Auxiliaries

Hardener: H 1 (200g)
Cleaner: UR 3

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

Recommendations

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

Otherwise 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.

Labelling

For our ink type Marasign TS and its additives and auxiliaries there are current Material Safety Data Sheets 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 derived from the respective label.

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.

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