

Screen Printing Ink for PVC self-adhesive foil, rigid PVC, ABS, SAN, acrylic, polycarbonate, pre-treated polyester foils, thermosetting plastics, coated substrates

High gloss, high opacity, very fast drying, good resistance to petrol, weather-resistant, suitable for moulding and welding

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Field of Application

Marastar SR is a solvent-based, very fast drying and block-resistant screen printing ink.

Substrates

Marastar SR is designed for the following substrates:

- Rigid PVC and PVC self-adhesive foil
- ABS / SAN
- Acrylic (PMMA)
- Polycarbonate (PC)
- Pre-treated polyester foils
- Corrugated board and paper
- Wood

An addition of hardener H 1 extends the range of suitable substrates as below:

- PETG / PETA
- Thermosetting plastics
- Thinly anodized aluminium*
- Coated substrates*

*we suggest pre-treatment with PLR

Addition of hardener H 1 and post-treatment is necessary for these substrates:

- Polyamide (PA), post-treatment with hot air
- Polyacetal (POM), post-treatment with flame

Since all the print substrates mentioned may be different in printability even within an individual type, preliminary trials are essential to determine suitability for the intended use.

Field of use

Marastar SR is a high gloss ink, and best suited for printing onto high-quality labels, stickers, displays, industrial letterings of all kinds, scales, and membrane switches.

As a high-gloss ink, Marastar SR is highly block-resistant and excellently suited for fast printing machines such as flat-bed presses or fully automatic cylinder machines (up to 2500 prints/h) but can also be used for manual printing or on semi-automatic machines.

SR can also be processed with a spray gun but preliminary trials are necessary for this process. We recommend to filter the thinned press-ready ink (25 µm screen) before processing, as otherwise there could be bubbles in the ink film.

Characteristics

Drying

Physically very fast drying, at 20 °C air temperature overprintable within 5-10 min, when put at 50° C in a tunnel dryer stackable within 20-30 sec. With high dryer capacity and good ventilation provided, the drying temperature can be reduced to 40 °C for less material distortion. If SR is mixed with Hardener H1, the drying time and block resistance of the ink will be reduced.

The times mentioned above vary according to the substrate, the ink film thickness, drying conditions and the auxiliaries used. Generally, an extended drying time is necessary when overprinting the ink.

SR 270 High-gloss White dries slightly slower than the other SR colour shades.

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A hot air tunnel drying immediately after printing is recommended for multi-colour prints, as well as for overvarnishing in order to avoid a possible reduction of the high-gloss quality.

An extended drying time is necessary when Softener WM 1 (2-5%) has been added to the ink.

Gloss level

Marastar SR is a high-gloss ink with the following measured values (angle 60°, fabric 120-34, white self-adhesive foil). The value 100 stands for high-gloss while value 1 indicates deep-matt.

Colour prints: 70 - 80 gloss units
 Printing Varnish SR 910: 80 - 90 gloss units

Fade resistance

Pigments of excellent fade resistance according to DIN 16525 (blue wool scale 7-8) are used for the shades of our Marastar SR ink type except SR 520, 536, 568, 832 and 839.

Therefore, all System 21 basic shades are suitable for outdoor use of up to 3 years referred to the middle European climate. Prerequisite for this is the appropriate and professional processing, as well as a max. addition of 50% varnish or white to the standard shades.

A coat of Printing Varnish SR 911 onto the whole surface will extend the possible time for outdoor use to 4 or 5 years, especially when using the highly fade-resistant range of colour shades.

As Opaque White SR 170 is highly pigmented, it is not suited for long-term outdoor use. For this purpose, please use SR 070.

In countries with higher exposure to sunlight (between the 40th parallel north and 40th parallel south), as well as thinner printed ink films (fabric 140-34 and finer), the outdoor resistance will decrease accordingly.

The pigments used are resistant to plasticizers and solvents.

Stress resistance

After proper and thorough drying, the ink film exhibits outstanding adhesion as well as rub, scratch, and block resistance and is weldable (SR 173 Black). SR colour shades have a high chemical resistance to petrol (except SR 170).

Due to its high pigmentation, SR 170 Opaque White is not suitable for moulding. Please use SR 070 White or SR 270 High-gloss White instead.

To achieve a maximum rub resistance, SR can be overvarnished with Varnish SR 910 or SR 911.

In all cases requiring higher surface stability, chemical resistance, and adhesion, we recommend to add 10% Hardener H 1.

The pot life (processing period) of the mixture is approx. 12 h at room temperature (20° C). Higher temperatures and an addition of SR 170 Opaque White or SR 070 White will reduce the pot life (approx. 6-8 h). We recommend, therefore, to use SR 270 High-gloss White for a maximum pot life.

If the mentioned times are exceeded, the ink's adhesion and resistance may be reduced even if the ink characteristics show no noticeable change.

SR plus Hardener H 1 achieves its total chemical and mechanical resistance after 7 days when air-dried (20° C). If the drying temperature is maintained at 40° C, resistance will be achieved after 24 hours. Highest resistance is obtained with the drying method of 140° C for 30 min. Temperature resistance of the substrate must be taken into account.

Processing and hardening temperature must not be lower than 15° C as irreversible damage may occur when the ink film is formed. Also avoid high humidity for 8 hours after printing as the hardener is sensitive to humidity.



Range

Basic Shades - System 21

020	Lemon	055	Ultramarine Blue
021	Med. Yellow	056	Turquoise Blue
022	Yellow Orange	057	Brilliant Blue
026	Light Yellow	058	Deep Blue
031	Scarlet Red	059	Royal Blue
032	Carmine Red	064	Yellow Green
033	Magenta	067	Grass Green
035	Bright Red	068	Brilliant Green
036	Vermilion	070	White
037	Purple Red	073	Black
045	Dark Brown		

Shades for Pantone®* colour matches

(see Marabu PANTONE® colour fan)

829	PANTONE®*Yellow
832	PANTONE®*Rubin Red
836	PANTONE®*Warm Red
839	PANTONE®*Rhodamine Red
850	PANTONE®*Purple
851	PANTONE®*Violet
852	PANTONE®*Reflex Blue
859	PANTONE®*Process Blue
868	PANTONE®*Green

*Pantone® Inc.'s check standard trade mark for colour reproduction and colour reproduction materials

By using these 9 SR Pantone® basic shades together with SR 270, SR 073, and Printing Varnish SR 910, more than 1000 colour shades of the Pantone® Color Formula Guide can be mixed (see also text inside Marabu's Pantone® colour fan).

Highly fade-resistant shades

Shade range for high demands in long-term outdoor use. We recommend a finishing coat on the entire surface with UV-Absorber Printing Varnish SR 911.

720	Lemon	731	Scarlet Red
721	Medium Yell.	732	Carmine Red
722	Yellow Orange	735	Bright Red
726	Light Yellow	764	Yellow Green

For colour mixtures with the above mentioned shades we recommend the following System 21 basic shades, featuring almost similar light fastness:

033	Magenta	059	Royal Blue
036	Vermilion	067	Grass Green
055	Ultramarine Blue	068	Brilliant Green
056	Turquoise Blue	070	White
058	Deep Blue	073	Black

Further colour shades

170	High-opaque White
172	Offset Base (Opaque White)
173	Welding Black
182	Silver (Sandwich)
270	High-gloss White
273	Opaque Black

Transparent shades

For the production of transparent prints onto polycarbonate or pre-treated polyester foils. The pigments used for transparent shades are resistant to solvents and plasticizers:

520	Transparent Yellow	552	Transparent Blue
536	Transparent Red	568	Transparent Green

Press-ready bronzes

(just add Thinner/Retarder)

191	Silver
193	Rich Gold
291	High Gloss Silver
292	High Gloss Rich Pale Gold
293	High Gloss Rich Gold

All shades are intermixable. Marastar SR should not be mixed with other types of ink to maintain the special characteristics of this outstanding ink range.

All basic shades are included in our Marabu-ColorFormulator (MCF). They build the basis for the calculation of individual colour matching formulas, as well as for shades of the common colour reference systems HKS®, PANTONE®, and RAL®. All formulas are stored in the Marabu-Color Manager software.

The pigments used in the above mentioned standard shades, based on their chemical structure, correspond to the EEC regulations EN 71/part 3, safety of toys - migration of specific elements.

Additives

SR 409 Transparent Base
SR 910 Bronze Binder and Printing Varnish
SR 911 Printing Varnish with UV protection

Bronzes

Various bronze pastes are available which can be mixed with SR 910. They can be chosen according to the required opacity, cost limit, visual impression, and curing characteristics. Due to the bigger pigment size of bronze powders, we recommend a coarser fabric, e. g. 120-34.

Bronze powders

S 181	Aluminium	6:1 – 8:1
S 182	Rich Pale Gold	3:1 – 6:1
S 183	Rich Gold	3:1 – 6:1
S 184	Pale Gold	3:1 – 6:1
S 186	Copper	2:1 – 3:1
S 190	Aluminium, rub-resistant	3:1 – 6:1

Bronze mixtures cannot be put into storage for later use. Therefore, prepare fresh mixes daily (to be processed within 8 h).

High-Gloss Bronzes, Pastes

S 291	High-gloss Silver	3:1 – 8:1
S 292	High-gloss Rich Pale Gold	3:1 – 8:1
S 293	High-gloss Rich Gold	3:1 – 8:1

All Bronze shades are shown in a separate bronze colour chart.

The recommended mixing ratio can be varied according to the required opacity and curing properties.

All figures in brackets are guidelines for mixtures with SR 910 Bronze Binder while the first figure is standing for the parts by weight of SR 910.

Auxiliaries

Thinner:	UKV 1
Thinner, mild:	UKV 2
Spray Thinner:	7037
Retarder, fast:	SV 5, SV 1
Retarder, good solubilizer:	SV 10
Retarder, slow:	SV 9
Retarder Paste:	VP (5-20%)
Cleaner:	UR 3, UR 4
Hardener:	H 1 (10:1)
Matting Paste:	ABM (1-20%)
Matting Powder:	MP (1-4%)
Plasticizer:	WM 1 (2-5%)
Printing Modifier:	ES (0.5-1%)

To adjust the printing viscosity it is generally sufficient to add 10-15% thinner and/or retarder to the ink. To produce a retarding effect for slow printing sequences, retarder is added to thinner proportionately (e. g. 50%). For the printing of very fine details,

Retarder Paste VP (5-20%) or Retarder SV 9 (max. 5%, more for hand printing) may be added to the thinner. For an ink mixture already containing retarder, only pure thinner without retarder should be used for additional thinning during the print run.

For spray varnishing, our Spray Thinner 7037 should be used (addition up to 150%) after preliminary trials.

By adding Matting Paste ABM (5-20%) or Matting Powder MP (1-4%, in the case of White SR 070, 170 or 270 max. 2%) to the ink, the gloss effect of SR can be reduced decreasing the opacity at the same time.

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Plasticizer WM 1 (2-5%) is recommended for especially flexible ink films. This is important for thin substrates tending heavily to roll, as well as for PVC self-adhesive foils with removable backing (danger of edge curling) and in case of cutting or die-cutting the printed surface. The use of plasticizer WM 1 reduces the drying speed.

Printing modifier ES contains silicone. It can be used to rectify flow problems on critical substrates by adding 0.5 - 1 % max. by weight to the ink. If an excessive amount of printing modifier is added, flow problems are increased and adhesion may be reduced, especially when overprinting.

Cleaning

For manual cleaning of screen printing stencils and tools our cleaner UR 3 (flash point 42° C) or UR 4 (flash point 52°C) can be used.

We generally recommend to clean the tools immediately after printing, especially if hardener was used.

Fabrics, stencils

All types of commercially available fabrics and solvent-resistant stencils can be used.

Mileage

The ink mileage of one litre Marastar SR is approx. 70 m² of printed surface when diluted with 15% and using a 120-34 mesh.

Labelling

For our ink type Marastar SR and its additives and 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 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 55° C and 100° C.

Recommendation

Marastar SR must be stirred homogeneously before printing.

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.