

**Pad printing ink for rigid PVC, polystyrene, ABS, SAN, polycarbonate, acrylic glass, and varnished substrates**

**Glossy, good opacity, very fast drying, 1 or 2 component system, resistant to petrol**

## Field of Application

### Substrates

Tampa® Star TPR is particularly suited to print onto

- Polystyrene (PS)
- ABS / SAN
- Polycarbonate (PC)
- Acrylic (PMMA)
- Rigid PVC
- Some types of soft PVC
- Wood, paper, and cardboard

By adding hardener, Tampa® Star TPR adheres excellently to many other substrates such as

- Varnished surfaces
- Thinly anodized aluminium
- Some thermosetting plastics
- Polyacetal (POM)
- Polyamide (PA)

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

The glossy and very fast drying ink Tampa® Star TPR is especially suited for high-quality products such as cosmetic packaging, housings, and other items requiring high resistance.

## Characteristics

### Ink Adjustment

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

### Using TPR as a 2-component ink

According to the substrate and the required ink

characteristics, it is possible to add hardener to Tampa® Star TPR before printing:  
10 parts of ink : 1 part of hardener

### Pot life

The ink/hardener mixture is chemically reactive and must be processed within the respective pot life (referred to 20 °C and 50 % RH): 12-14 h (H 1), 8-10 h (H 2), 8 h (H 4), 8-10 h (HX). Higher temperatures reduce the pot life. If the mentioned times are exceeded, the ink's adhesion and resistance may be reduced even if the ink still seems processable.

If using HT 1, there is no pot life to consider since this hardener is only activated by a baking process (30 min/150 °C).

Parallel to physical drying (i. e. to the evaporation of the solvents used), the actual hardening of the ink film is caused by the chemical cross-linking reaction between ink and hardener. For Hardeners H 1, H 2, H 4, and HX this reaction can be accelerated by higher temperatures, in the case of HT 1 it is a must.

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.

### Drying

Physically very fast drying. Touch-dry at 20 °C after 60 sec, at 30 °C after 15 sec. The addition of hardener will extend the drying time.

The times mentioned vary according to substrate, depth of cliché, drying conditions, and the auxiliaries used.

### Fade resistance

Only pigments of high fade resistance are used in the Tampa® Star TPR range. Shades mixed



by adding overprint varnish or other colour shades, and especially white, have a reduced fade and weather resistance depending on their mixing ratio. The fade resistance also decreases if the printed ink film thickness is reduced. The pigments used are resistant to solvents and plasticizers.

## Stress resistance

After proper and thorough drying, the ink film exhibits outstanding adhesion as well as rub, scratch, and block resistance and is resistant to petrol. In some cases surface stability as well as adhesion and resistance to solvents may be improved by adding a hardener.

## Range

### Basic Shades

920	Lemon
922	Light Yellow
924	Medium Yellow
926	Orange
930	Vermilion
932	Scarlet Red
934	Carmine Red
936	Magenta
940	Brown
950	Violet
952	Ultramarine Blue
954	Medium Blue
956	Brilliant Blue
960	Blue Green
962	Grass Green
970	White
980	Black

### 4-Colour Process Shades Standard

409	Transparent Base
429	Process Yellow
439	Process Magenta
459	Process Cyan
489	Process Black

### High Opaque Shades

122	High Opaque Light Yellow
130	High Opaque Vermilion
152	High Opaque Ultramarine Blue
162	High Opaque Grass Green
170	Opaque White

### Press-Ready Metallics

191	Silver
192	Rich Pale Gold

193 Rich Gold

### Further Products

910 Overprint Varnish

All shades are intermixable. Mixing with other ink types or auxiliaries must be avoided in order to maintain the special characteristics of this ink.

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-ColorManager software.

Additionally there are high-opaque formulas available marked with + + behind the reference name. These formulas have been developed by using the System Tampacolor formulas for basic and high-opaque shades excluding the semi-transparent, resp. transparent shades.

## Metallics

### Metallic Powders

S 181	Aluminium	17%
S 182	Rich Pale Gold	25%
S 183	Rich Gold	25%
S 184	Pale Gold	25%
S 186	Copper	33%
S 190	Aluminium, rub-resistant	12.5%

These metallics are added to TPR 910 in the recommended amount, whereas the addition may be individually adjusted to the respective application. We recommend preparing a mixture which can be processed within a maximum of 8 h since metallic mixtures usually cannot be stored. Due to their chemical structure, the processing time of mixtures with Pale Gold S 184 and Copper S 186 is even reduced to 4 h.

Owing to the bigger pigment size of Metallic Powders we recommend the use of a halftone cliché with a minimum depth of 25-30 µm. Shades made of Metallic Powders are always subject to an increased dry abrasion which can only be reduced by overvarnishing. All metallic

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shades are displayed in the Marabu "Screen Printing Metallics" colour chart.

## Auxiliaries

TPV	Thinner	10-20%
TPV 2	Thinner, fast	10-20%
TPV 3	Thinner, slow	10-20%
TPV 7	Thinner	10-20%
H 1	Hardener	10%
H 2	Hardener, fast	10%
HX	Hardener	10%
H 4	Hardener, highly resistant	10%
HT 1	Hardener, heat reactive	10%
SA 1	Surface Additive	3-5%
MP	Matting Powder	2-4%
OP 170	Opaquing Paste	0-15%
SV 1	Retarder	0-15%
AP	Antistatic Paste	0-10%
VP	Retarder Paste	0-10%
ES	Printing Modifier	0-1%
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. The choice of thinner and the amount added are highly dependant upon the local climate and the printing speed.

TPV 7 is an all-purpose thinner for improved ink transfer for fast printing. It features good mixing and solving properties, combined with a long processing period.

For slow printing sequences and fine motifs, it may be necessary to add retarder to the thinner. For an additional thinning of the ink containing retarder, only pure thinner should be used. An excessive addition may result in ink transfer problems.

Hardener H 1 dries slowly, forms a flexible ink film, is non-yellowing and therefore suitable for outdoor applications.

Hardener H 2 dries quickly, forms a rigid ink film, and is not suitable for outdoor applications.

Hardener H 4 is used for significantly increased requirements concerning resistance to water and humidity and is suitable for outdoor use.

Hardener HX has the same properties as Hardener H 1, but is manufactured without the use of aromatic hydrocarbons.

All hardeners are sensitive to humidity and always to be stored in a sealed container. They can be added for increased resistance and adhesion and must be stirred well and homogeneously into the undiluted ink shortly before use. The mixture ink/hardener is not storable and must be processed within pot life. If using HT 1, there is no pot life to consider since this hardener is only activated by a baking process (30 min/150 °C).

The addition of surface additive SA 1 can increase the resistance against abrasion and other mechanical stress. At the same time, it is possible to improve the ink transfer from pad to substrate (recommended addition 3-5 %, max. 10 %).

By adding Matting Powder MP the ink film can be matted individually (preliminary trials in terms of adhesion and resistance are essential, white shades addition max. 2 %).

By adding Opaquing Paste 170, the opacity of colour shades can significantly be increased without considerably influencing the chemical and dry abrasion resistance. OP 170 is not suitable for white shades, and should not be used for prints that will be exposed to more than 2 years outdoor application.

The addition of Antistatic Paste AP reduces the impact of static charge on the ink. It lowers the viscosity of the ink and non-polar components help to avoid "stringy" behaviour when printing onto non-polar substrates.

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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 use of ES may reduce the degree of gloss.

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.

## Printing Parameters

### Clichés

All commercially available clichés made of ceramic, photopolymer, thin steel, and chemically hardened steel (10 mm) can be used. The recommended cliché depth is 18-21 µm.

### Printing pads

As per our experience, all common printing pads consisting of materials cross-linked by condensation or addition can be used.

### Printing machines

Tampa® Star TPR is suitable for closed ink cup systems, as well as for open ink wells. Depending on type and usage of the machine, it is to accordingly adjust type and amount of the thinner 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:

- 2.5 years for the Metallics 191, 192, 193
- 3.5 years for all other shades

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.

### Labelling

For Tampa® Star TPR 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.

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