



Pad printing ink for pre-treated polyethylene (PE) and polypropylene (PP), ABS, polyamide, thermosetting plastics, metal, and varnished surfaces

High gloss, good opacity, fast drying 2 component ink system, resistant to chemicals, universal use

Field of Application

Substrates

Tampa® Tech TPT is excellently suited to print onto

- Pre-treated polyethylene (PE)
- Pre-treated polypropylene (PP)
- ABS/SAN
- Polyamide (PA)
- Polyacetal (POM)
- Thermosetting plastics
- Melamine resins
- Metal (incl. thinly anodised aluminium)
- Varnished surfaces
- Powder-coated surfaces
- Wood
- Glass and Ceramics*

*for decorative purposes only since prints are not resistant to water and dishwasher cleaning.

On polyacetal (POM), e. g. Hostaform C or Delrin, a good adhesion can be achieved by a post-flame treatment or air drying (300- 400 °C, 3-4 sec).

When printing on polyethylene and polypropylene, please note that the surface of the substrate must be pre-treated by flaming or corona discharge. Experience has shown that good adhesion can be achieved with a surface tension of at least 42-48 mN/m. In the case of PP, the surface can also be pretreated by applying a thin layer of our primer P 2.

For multiple colour printing, please consider that you should not flame the substrate between print sequences, as this may reduce intercoat adhesion.

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

Tampa® Tech TPT is used when high chemical resistance on thermosetting plastics, polyethylene, polypropylene, and metals are required.

Characteristics

Ink Adjustment

Recommendation

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

Tampa® Tech TPT is a 2-component ink system. Prior to printing, it is essential to add hardener H 2 in the correct quantity and to stir homogeneously.

As an alternative, the heat-reactive Hardener HT 1 can also be used. The ratio is as follows:
4 parts ink/varnish : 1 part of hardener

Drying

Parallel to physical drying (i. e. 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. The following standard values concerning progressive cross-linking (hardening) of the ink film can be assumed:

		H 2	HT 1
touch-dry	20 °C	1-2 min	2 min
stackable	60 °C	30 min	---
final hardness	20 °C	5-7 days	---
final hardness	150 °C	30 min	30 min

Chemical cross-linking can be accelerated by higher temperatures. Drying times vary according to substrate, depth of cliché, drying conditions, and the auxiliaries used.

For fast printing sequences, we recommend forced air drying (about 200 °C for 2-3 sec) of the surface after each colour.

For multiple colour printing, we point out that the previous printed ink film should not be entirely cured before the consecutive ink film is printed on top of it. By drying at room temperature, the consecutive print should be carried out within 12 hours after the previous print.

Pot life

The ink/hardener mixture is chemically reactive and must be processed within 16 h (referred to 20-25 °C and 45-60 % RH). 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.

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

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.

Fade resistance

Only pigments of high fade resistance are used in the Tampa® Tech TPT range. Please note, however, that TPT is not suited for outdoor applications with direct sun irradiation or humidity contact as the epoxy resin tends to chalk and as a consequence, the shades will change their original colour soon.

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 solvents (see DIN 16 524), alcohol (96% ethanol), finger sweat, and further common alkaline and acid fillers.

On glass no resistance to dishwashers can be achieved. In this case, we recommend Tampa® Glass TPGL.

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

High Opaque Shades

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

Press-Ready Metallics

191	Silver
192	Rich Pale Gold
193	Rich Gold

Further Products

910	Overprint Varnish
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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-

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transparent, resp. transparent shades
922/930/936/950/952/956/962.

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%

These metallics are added to TPT 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. Metallic shades are subject to an increased dry abrasion which can only be reduced by over-vernishing. All metallic shades are displayed in the Marabu "Screen Printing Metallics" colour chart.

Auxiliaries

H 2	Hardener, fast	25%
HT 1	Hardener, heat reactive	25%
TPV 7	Thinner	15-25%
TPV	Thinner	10-15%
TPV 2	Thinner, fast	10-15%
TPV 3	Thinner, slow	10-15%
SA 1	Surface Additive	3-5%
OP 170	Opaquing Paste	0-15%
AP	Antistatic Paste	0-15%
SV 1	Retarder	0-15%
VP	Retarder Paste	0-10%
MP	Matting Powder	0-3%
ES	Printing Modifier	0-1%
UR 4	Cleaner (flp. 52°C)	
UR 5	Cleaner (flp. 72°C)	
P 2	Primer	

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).

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.

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.

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 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.

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%).

Printing Modifier ES contains silicone and can be used to rectify flow problems on critical sub-

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strates. 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.

Cleaner UR 4 is recommended for manual cleaning of the working equipment. Cleaner UR 5 is recommended for manual or automatic cleaning of the working equipment.

Special Primer P 2 is used for manual pre-cleaning and pre-treatment of PP substrates.

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 20-24 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® Tech TPT 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 TPT 191, 192, 193
- 3.5 years for all other TPT basic 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® Tech TPT 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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