Tampacure TPC

Pad printing ink for ABS, rigid PVC, some PC, PS, and PMMA materials, pretreated PE and PP, as well as some metals, and varnished surfaces

UV-curable, high gloss, good opacity, 1- or 2-component ink system, resistant to chemicals

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Field of application

Substrates

The UV-curable pad printing ink Tampacure TPC is suited to print onto ABS, rigid PVC, polycarbonate (PC), but also onto some polystyrene (PS) and acrylic materials (PMMA).

By adding Hardener H 2, Tampacure TPC will also achieve a good adhesion on many other substrates such as pre-treated polyethylene (PE) and polypropylene (PP), as well as polyamide (PA), and varnished surfaces.

When printing onto metals, an addition of Adhesion Modifier UV-HV 1 may improve the adhesion of the ink. In the case of printing onto polyethylene and polypropylene, please make sure to pre-treat the surface of your substrate by flaming or Corona discharge as usual.

As per our experience, you can achieve a good adhesion with the Tampacure TPC with a surface tension of at least 48 mN/m. On polypropylene, you can also apply a thin film of our colourless Primer P 2 for surface pre-treatment.

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 UV-curable Tampacure TPC is particularly suited when printed parts are immediately to be processed further, resp. when excellent mechanical and chemical resistances are required.

Multicolour and 'wet-on-wet' printing

With multicolour printing, it is important to note that Tampacure TPC can be printed wet-on-wet, without an intermediate UV-curing. When printing overlapping motives with opaque colour shades, however, the individual ink films must be cured one by one.

If the different ink layers do not overlap, it is possible to cure all printed layers with one single pass through the curing unit. Due to their transparency, 4-colour process shades can also be cured with one pass through the curing unit. Nevertheless, preliminary tests are always essential.

UV-curing conditions

According to the required curing speed, a UV-curing unit (medium-pressure mercury lamps) of 80-120 W/cm is necessary. The curing speed of the ink is generally depending on the kind of UV-curing unit (reflector), number, age and power of the UV-lamps, the printed ink film thickness, the colour shade, the substrate in use, as well as the printing speed.

The adhesion of the ink is usually tested by a tape test after the ink has been cooled down to room temperature (approx. 20°C).

Characteristics

Ink adjustment

Tampacure TPC is not press-ready and must therefore be adjusted to the required viscosity with the corresponding thinners prior to printing. In the case of higher requirements to the ink's resistance or reactivity, there are different additives available. For more details, please refer to the chapter 'Auxiliaries'.

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Using TPC as a 2-component ink
According to the substrate and the required ink characteristics, it is possible to add Hardener H 2 to Tampacure TPC before printing:

20 parts of ink : **1** part of hardener

Pot life
The pot life (processing period) at room temperature (approx. 20°C) will be about 12-16 h with H 2. Higher temperatures reduce pot life. If the mentioned times are exceeded, the ink's adhesion and resistance may be reduced even if the ink still seems to have a good processability.

UV-curing
Tampacure TPC contains solvents. Parallel to physical drying and the evaporation of the solvents used, the actual hardening of the ink film is caused by a chemical cross-linking reaction started by the UV-light.

Tampacure TPC is a slightly post-curing UV ink which will achieve its best resistances after 24 hours. If Hardener H 2 has been added, the curing speed will be reduced. Due to this, adhesion and scratch resistance should be tested only after 24 hours. A final curing of the ink film will be reached after approx. 48 hours.

When using Hardener H 2, 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
Pigments of medium to high fade resistance are used in Tampacure TPC. Owing to this, all TPC shades are generally suited to a short-term outdoor use of up to one year related to the moderate Central European climate.

Stress resistance
After proper and thorough drying, the ink film exhibits outstanding rub and scratch resistance and is resistant to a large number of chemicals, oils, greases, and solvents, as well as perspiration. These resistances can further be improved by adding 5% Hardener H 2.

Clichés
All commercially available clichés made of photopolymer material, thin steel, and chemically hardened steel (10 mm) can be used. We recommend a cliché depth of 22-23 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
Tampacure TPC is suitable for closed ink cup systems as well as for open ink wells. As for traditional ink types, a certain quantity of thinner should be added during longer print runs in order to control the ink's viscosity.

Range

Basic shades
Refer to colour chart 'System Tampacolor'

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

(*semi-transparent/transparent)

Further shades available
TPC 170 Opaque White
TPC 180 Opaque Black

High-opaque shades
TPC 122 Light Yellow
TPC 130 Vermilion Red
TPC 152 Ultramarine Blue
TPC 162 Grass Green

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All shades are intermixable. To maintain the special characteristics of this outstanding ink range, TPC must not be mixed with other ink types.

The basic shades according to System Tampacolor are included in our Marabu-ColorFormulator. They build the basis for the calculation of individual colour matching formulas as well as for shades of the common colour reference systems Pantone®, HKS®, and RAL®. All formulas are stored in the Marabu-Color Manager 2 (MCM 2) software.

The high-opaque formulas are additionally available in MCM 2 marked with + + behind the reference. These formulas have been developed by using the System Tampacolor formulas for basic and high-opaque shades excluding the semi-transparent, resp. transparent shades.

Shades for 4-colour process prints

TPC 429	Process Yellow (Yellow)
TPC 439	Process Red (Magenta)
TPC 459	Process Blue (Cyan)
TPC 489	Process Black (Black)

Bronzes

(to be mixed with Transparent Paste TPC 409)

S 181	Aluminium	S 291	High-gloss Silver
S 182	Rich Pale Gold	S 292	High-gloss Gold
S 183	Rich Gold	S 293	High-gloss Gold
S 184	Pale Gold		
S 186	Copper		
S 190	Aluminium, rub-resistant		

Due to their chemical structure, Pale Gold S 184 and Copper S 186 have a reduced processing time. Please prepare mixtures freshly as they cannot be stored and must be processed within 4 h. All other bronzes can be processed within 8 h max.

Clears

TPC 409	Transparent Paste, to increase the ink's transparency, as well as the curing speed;can also be used as bronze binder
TPC 910	Overprint Varnish, to overcoat and increase the resistance of pre-printed colour shades

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) and do not contain heavy metals.

Due to a possible direct contact with the mouth, however, **we do not recommend** using this ink neither for baby bottles or toys, nor for food packaging in direct contact with food since the possible presence of residual monomers and degradation products of the photoinitiators cannot be completely excluded even if sufficiently cured.

Auxiliaries

Thinner:	TPV 2, fast
Thinner for slow printing sequence:	TPV
Accelerator:	UV-B 1, addition: 1-2%
Hardener:	H 2, fast
Adhesion Modifier:	UV-HV 1, addition: 2%
Mixing ratio:	20 p. ink : 1 p. hardener
Matting product:	MP, Matting Powder
Antistatic Paste:	AP
Opaquing Paste:	OP 170
Special Primer:	P 2
Cleaner:	UR 3
Printing Modifier:	ES, addition: 0-max. 1%

Basic formula

As a starting formula, we recommend to use Thinner TPV 2. To adjust printing viscosity, it is generally sufficient to add 5-10% of thinner to the ink. For slow printing sequences, Thinner TPV can be used.

In the case of difficult substrates, we recommend to add 5% Hardener H 2 in order to reach an improved adhesion of the ink.

The addition of Accelerator UV-B 1 increases the curing speed of the ink, as well as the adhesion to the substrate owing to a better depth curing.

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When printing Tampacure TPC onto metals, the addition of Adhesion Modifier UV-HV 1 may be of advantage. Please mix only that quantity which will be processed within 8 hours.

By adding Matting Powder MP, the glossy effect of the ink is reduced to a silky or semi-matt finish. An addition of 2-5% MP (in the case of 970 White, max. 3%) will not influence significantly the resistances of the ink but reduce its opacity.

By adding Opaquing Paste 170, the opacity of colour shades can significantly be increased without influencing the chemical and dry abrasion resistance considerably. Maximum quantity to be added is 1%. OP 170 is not suitable for using it with white shades.

Printing Modifier ES contains silicone. It can be used to rectify flow problems on critical substrates by adding up to 1% by weight to the ink.

Shelf life

The shelf life is strongly depending on the formulation/reactivity of the ink system, and especially on the storing conditions. It is max. one year for originally closed cans stored in a dark place at 15 - 25°C. In the case of changed storing conditions and especially at higher storing temperatures, the shelf life will be reduced. In such cases, our guarantee will no longer be valid.

Labelling

For our ink type Tampacure TPC 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 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 55°C.

Safety rules

We recommend taking utmost care when working with UV-curable printing inks. Please pay also attention to the notes on labels and safety data sheets.

Note

Please refer to the information in our technical data sheets of pad printing inks. 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 your specific application 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.

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