

Tampapur TPU



Pad printing ink for pre-treated polyethylene and polypropylene, metal, and varnished surfaces

High gloss, good opacity, fast curing 2-component ink system, resistant to chemicals

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Field of Application

Substrates

Tampapur TPU is excellently suited to print onto pre-treated polyethylene (PE) and polypropylene (PP) but also onto polyurethane (PU), polyamide (PA), melamine resins, phenolic resins, metal, anodised aluminium, varnished surfaces, powder-coated surfaces, wood, and glass. Please note that the printing onto glass should only be carried out for decorative purposes since the ink is not resistant to water and dishwasher cleaning.

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

When 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 very good adhesion with the Tampapur TPU with a surface tension of at least 42-48 mN/m.

On polypropylene, you can also apply a thin film of our colourless Primer P 2 for surface pre-treatment.

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

Tampapur TPU is used when extremely high mechanical and chemical resistance on thermosetting plastics, polyethylene, polypropylene, and metals are required.

Characteristics

Mixing ratio

Prior to printing, it is a must to add Hardener H 1 or H 2 in the correct quantity. As an alternative, the heat-reactive Hardener HT 1 can also be used. The ratio is as follows:

4 parts of ink : **1** part of hardener
3 parts of varnish : **1** part of hardener

Pot life

The pot life (processing period) at room temperature (approx. 20°C) will be about 7-8 h with H 1 and about 3-4 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 characteristics show no noticeable change.

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).

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.

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The following values concerning progressive cross-linking (hardening) of the ink film can be assumed:

Drying times		H 1	H 2	HT 1
touch-dry	20°C	2 min	1 min	2 min
stackable	60°C	60 min	30 min	--
final hardness	20°C	7-10 days	4-6 days	--
final hardness	150°C	30 min	30 min	30 min
pot life	20°C	7-8 h	3-4 h	6 months

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

For quick 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 48 h after the previous print when Hardener H 1 is used and 8 h after the previous print when Hardener H 2 is used.

The processing and curing temperature should not be lower than 15°C as irreversible damage can occur. 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 Tampapur TPU 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. In the case the prints are intended for outdoor applications, Hardener H 1 must be used. 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 a large number of chemical products, oils, greases, and solvents. On glass, however, no resistance to dishwashers can be achieved; in this case, we recommend our Glass Ink GL.

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 20-28 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

Tampapur TPU 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.

Range

Basic shades

Refer to colour chart 'System Tampacolor'

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

(*semi-transparent/transparent)

High-opaque shades

TPU 122	Light Yellow
TPU 130	Vermilion Red
TPU 152	Ultramarine Blue
TPU 162	Grass Green

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

All basic shades according to System Tampacolor as well as the high-opaque shades are all included in our Marabu-ColorFormulator and are building the calculation basis for individual colour matching formulas. The basic shades are further the basis for colour matches according to the common Pantone®, HKS®, RAL®, and Marabu System 21 colour reference systems. 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 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.

Shades for 4-colour process prints

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

Press-ready gold and silver shades

TPU 191	Silver
TPU 192	Rich Pale Gold
TPU 193	Rich Gold

Clears

TPU 409	Transparent Base
TPU 910	Overprint Varnish, can also be used as bronze binder

Bronzes

(to be mixed with Overprint Varnish TPU 910)

S 181	Aluminium
S 182	Rich Pale Gold
S 183	Rich 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 generally prepare fresh mixtures only as they cannot be stored and must be processed within 4 h.

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. All colours are suited for printing onto toys.

Auxiliaries

Hardener:	H 1 H 2, fast hardener HT 1, heat-reactive
Mixing ratio:	4 p. ink : 1 p. hardener 3 p. varnish : 1 p. hardener
Thinner:	TPV TPV 2, fast thinner TPV 3, slow thinner
Retarder:	SV 1 VP, Retarder Paste
Matting product:	MP, Matting Powder
Antistatic Paste:	AP
Opaquing Paste:	OP 170
Primer:	P 2, for polypropylene
Cleaner:	UR 3
Printing modifier:	ES, addition: 0 - max. 1%

The hardener should be added to the ink briefly before printing in the correct ratio as mentioned before.

To adjust printing viscosity, it is generally sufficient to add 5-15% of Thinner TPV to the ink. Thinner TPV 2 can be used for fast printing, TPV 3 for slow printing requirements.

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

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For the printing of very fine motives, Retarder SV 1 or Retarder Paste VP may be added to the ink. An excessive addition may result in ink transfer problems.

Attention

For an ink mixture containing retarder, only thinner should be used for additional thinning during the print run.

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 15%. 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. If an excessive amount of printing modifier is added, flow problems are increased and adhesion may be reduced, especially when overprinting.

Cleaning

To clean ink containers, clichés, and tools, please use our Cleaner UR 3.

Recommendation

The ink should be stirred well before printing. To protect the ink in opened containers against excessive drying, it can be carefully covered with a layer of thinner which can then be later stirred into the ink prior to printing.

Labelling

For our ink type Tampapur TPU 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 100°C.

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 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.