TampaRotaSpeed TPRS

Marabu

Universal rotary pad printing ink for PP- and PE bottle and sealing-caps, as well as package-print and ABS, polystyrene (PS), SAN, rigid PVC, polycarbonate (PC), acrylic glass (PMMA), and soft PVC suitable only to a limited extent

Glossy, very fast drying 1-or 2-component system, for rotary pad printing machines as inline or stand-alone format, free of cyclohexanone, resistant to water and chemicals

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Field of Application

Substrates

TampaRotaSpeed TPRS is a universal rotary pad printing ink, suitable to print onto:

- Pre-treated polypropylene (PP)
- Pre-treated polyethylene (PE)
- ABS / SAN
- Polystyrene (PS)
- Polycarbonate (PC)
- PMMA
- Soft PVC, suitable only to a limited extent
- Rigid PVC

By adding hardener H 1 or H 2, the adhesion properties can be improved on different substrates such as

- Varnished surfaces
- Anodized aluminium

Printing on bottle caps and closures

The main application range is the printing onto polyethylene (PE) and polypropylene (PE) closures for drinking and household products. PP has similar characteristics as PE. Because of the surface energy of 31 mN/m for PE and ca. 29 mN/m for PP a pre-treatment of the material is essential.

Because the closures are packed as bulk goods into cartons, transported to the filling line, applied, and cleaned afterwards (together with the bottles), very good adhesion, scratch resistance, as well as a good water resistance is necessary.

TPRS may be used, by an appropriate printing process, to print on to the non food-contact surface of any material or article intended to come into contact with foodstuffs. However, full compliance with the regulation (EC) Nr. 2023/2006 must be ensured. In case of any queries please contact our Marabu product safety department directly.

Pre-treatment

Because of the characteristics of the material it is necessary to pre-treat the bottle closures. The pre-treatment in rotary pad printing will be predominantly with a gas-flame, and in rare cases with atmospheric Plasma.
The effectiveness of the pre-treatment is the most important factor for ink adhesion.
With gas flame, (as well as with atmospheric Plasma) good results are achievable on PP and PE so long as the burner is effective.

Conditions needed to achieve good adhesion are a surface energy of 42-48 mN/m for PP and 54-62 mN/m for PE.

Characteristics

- very good ink adhesion
- high opacity also onto dark surfaces
- high scratch resistance of the ink
- good printability and fast drying

Drying

TampaRotaSpeed TPRS is a very fast physically drying ink and it is, therefore, immediately over-printable when printing on multi colour machines (wet-on-wet). The addition of hardener H 1 will extend the drying time.

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

Pot life

The pot life (processing period) at room temperature (approx. 20° C) will be about 8-10h with hardener H 1. Higher temperatures during the processing reduce the pot life. If the mentioned times are exceeded, the ink's adhesion and resistance may be reduced even if the ink printing characteristics show no noticeable change.
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 for the TampaRotaSpeed TPRS range. Shades mixed by adding overprint varnish or other colour shades, especially white, have a reduced fade and weather resistance dependant upon their mixing ratio. 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.
In some cases, surface stability as well as adhesion and resistance to solvents may be improved by adding 10% Hardener H 1.
Even if TampaRotaSpeed TPRS seems to be dry a few minutes after printing, it is recommended to carry out resistance tests no earlier than 24 – 48 hours after printing.

Ink adjustment

Printing onto polypropylene closures:

- TPRS plus max. 20% thinner
  - TPV (normal)
  - TPV 2 (fast)
  - TPV 3 (slow)
- for printing onto re-ground polymer the addition of 10% hardener H 1 to the ink is usually necessary.

Printing onto polyethylene bottle closures:

- TPRS plus max. 20% thinner
- TPRS colour inks + 15% hardener H 1
- TPRS varnish 910 + 10% hardener H 1
- to receive a maximum water resistance, the TPRS must be over-coated with the varnish TPU 910 + 30% hardener H 1.

For printing on PE closures an addition of 15% hardener into the ink is necessary to achieve good adhesion.

For higher requirements concerning water resistance we recommend to overprint the varnish TPU 910. Please note that compared to TampaRotaSpeed TPRS (can be used as a 1 or 2 component system) TPU must be used as a 2 component system. The overprint need to be done wet-on-wet.

Range

Basic shades - System Tampacolor

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

(* semi-transparent/ transparent)

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High-opaque shades
122 Light Yellow
130 Vermilion
152 Ultramarine blue
162 Grass Green

Press-ready silver
191 Silver

All shades are intermixable. Mixing with other ink types or auxiliaries must be avoided in order 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®, PAN-TONE®, and RAL®. All formulas are stored in the Marabu-Color Manager software.

The high-opaque formulas are additionally 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.

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.

Additives

Clears
910 Overprint Varnish

Auxiliaries

Thinner:	TPV
	TPV 2, fast thinner
	TPV 3, slow thinner
	TPV 7
Hardener:	H 1
Mixing ratio:	10 p. ink :1,5 p. hardener
Retarder:	SV 1
	VP, Retarder Paste
Matting agent:	MP, Matting Powder
Antistatic Paste:	AP
Opaque Paste:	OP 170
Printing modifier:	ES, addition max.1%

It is generally sufficient to adjust the printing viscosity by adding 5–15% TPV if Continua /Big Wheel printers are being used, or 10–20% TPV 2 (or alternatively TPV 7) for Rotoprint / Mini Wheel printers, dependant upon the type of machine, printing speed, ambient temperature, and cliché depth.

Thinner TPV 2 or TPV 7can be used for fast printing, TPV 3 for slow printing requirements.
For the printing of very fine motives, a mixture of thinner TPV and TPV 3 (SV 1) or TPV 3 should be used. An excessive addition may result in ink transfer problems.

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

By adding Matting Powder MP, the gloss effect of the ink is reduced to a silky or semi-matt finish. The addition of 2-4% Matting Powder MP (in case of 970 White, max. 2%) will not significantly influence the resistance of the ink but may reduce opacity.

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By adding Opaque Paste 170, the opacity of colour shades can be significantly increased without significantly influencing the chemical or abrasion resistance. Maximum quantity to be added is 15%. OP 170 is not suitable for adding to 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 is added, flow problems are increased, and adhesion may be reduced, especially when overprinting.

Cleaning

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

Clichés

In rotary pad printing with TPRS, good results were achieved with a pad cylinder diameter of 100 mm or 200 mm. We recommend a cliché depth of 22-30µm for a half tone cliché and 20-22µm for a non half tone cliché (open etched).

With steel die plates, halftone films are used with large images to avoid the doctor blade falling into the etched area.

Doctor blade

Doctor blades of tempered steel are either ground from both sides 0,5 mm or specially ground from one side 0,3 mm.

Printing pads

Pads in use have normally a hardness between 30-55 Shore A. If pad cylinders are self-cast, an exact rotation must be guaranteed.

Printing machines

TampaRotaSpeed TPRS can be used for rotary pad printing machines in inline-construction, or for printing machines in satellite constructions (“big wheel”). Depending on the kind and use of the machine, the amount and type of the used thinner must be readjusted.

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 TampaRotaSpeed TPRS 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 45° C and 55° C.

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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, they shall be limited to the value of the goods delivered by us and utilized by you with respect to any and all damages not caused intentionally or by gross negligence.

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