



**Rotary pad printing ink for PP and PE closures**

**Free of aromatic hydrocarbons and halogens, glossy, very fast drying 1 or 2 component system, suitable for multi-lane or satellite constructions**

## Field of Application

### Substrates

Tampa® RotaSpeed TPHF is excellently suited to print onto:

- Pre-treated polypropylene (PP)
- Pre-treated polyethylene (PE)

Hardener can be added in order to meet increased adhesion requirements (e.g. hot filling or pasteurization, or strain during transport and packaging).

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 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.

The pre-treatment in rotary pad printing will usually be carried out with a gas-flame, and in some 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.

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

Hardener must be added to the ink if the substrate contains much lubricant or if the closures were manufactured longer than 2-4 weeks ago.

Appropriate migration tests must confirm the suitability prior to printing onto the non-food contact surface of food packaging.

## Characteristics

### Special feature

The ink series TPHF is free of aromatic hydrocarbons and halogens\*.

\*halogen free complying to IEC Standard 61249-2-21

### Ink Adjustment

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

### Use as 2-component ink

Depending upon the substrate and the requirements, hardener can be added to the ink before printing.

For printing onto **polypropylene** closures we recommend the addition of 5 - 10 % thinner

- TPV (normal)
- TPV 2 (fast)
- TPV 3 (very slow)
- TPV 8 (slow)

For printing onto re-granulate the addition of 10% Hardener H 2 is usually necessary.

Printing onto **polyethylene** bottle closures:

- TPHF colour shades + 10% Hardener H 2
- TPHF 910 varnish + 20% Hardener H 2

# Tampa® RotaSpeed TPHF



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For maximum water resistance, TPHF must be over-coated with a 2k varnish.

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.

### Pre-reaction time

It is recommended to allow the ink/hardener mixture to pre-react for 15 minutes.

### Pot life

The ink/hardener mixture is chemically reactive and must be processed within 8 h (referred to 20° C and 50% 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.

### Drying

Tampa® RotaSpeed TPHF is a very fast physical 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. The drying times vary according to substrate, depth of cliché, drying conditions, and the auxiliaries used.

### Fade resistance

Only pigments of high fade resistance are used for the Tampa® RotaSpeed TPHF 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 resist-

ance to solvents may be improved by adding 10 % Hardener H 2.

For special packaging conditions like hot filling, pasteurization, or the filling of carbonated beverages, we recommend the addition of 10 % Hhardener H2 to the ink and/or over varnishing with 20% hardener added to the varnish. Final chemical cross linking will be reached after 48 hours at > 20°C ambient temperature.

## 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

### Press-Ready Metallics

191	Silver
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### 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.



## Auxiliaries

H 2	Hardener	10-20%
TPV	Thinner	5-20%
TPV 2	Thinner, fast	5-20%
TPV 3	Thinner, very slow	5-20%
TPV 8	Thinner, slow	5-20%
STM	Thickening Agent, for flat bed printing only	0.5-2%
MP	Matting Powder	0-2%
UR 4	Cleaner (flp. 52°C)	
UR 5	Cleaner (flp. 72°C)	

Hardener H 2 is sensitive to humidity and is always to be stored in a sealed container. Hardener H 2 can be added for increased resistance and adhesion. The mixture ink/hardener is to be stirred well and homogeneously. The mixture ink/hardener is not storable and must be processed within pot life.

Thinner is added to the ink to adjust the printing viscosity. The choice of thinner and the amount added are highly depending upon the local climate and the printing speed. 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 for Rotoprint / Mini Wheel printers, dependant upon the type of machine, printing speed, ambient temperature, and cliché depth.

Thinner TPV 2 can be used for fast printing, TPV 8 for slow printing requirements at high temperatures. However, an excessive addition of TPV 3 may result in ink transfer problems. We recommend TPV 8 for the printing of very fine motifs.

The Thickening Agent STM enhances the ink's viscosity without significantly influencing the degree of gloss. Please stir well, the use of an automatic mixing machine is recommended.

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%).

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.

## Printing Parameters

### Clichés

In rotary pad printing, 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

Tampa® RotaSpeed TPHF 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.

## Shelf Life

Shelf life depends very much on the formula/ reactivity of the ink system as well as the storage temperature. It is 2 years for an unopened ink container if stored in a dark room at a temperature of 15-25°C. 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.

# Tampa® *RotaSpeed* TPHF



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 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® *RotaSpeed* TPHF 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 the present EEC regulations as to health and safety labelling requirements. Such health and safety data may also be derived from the respective label.

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