

Screen printing ink for pre-treated polyethylene and polypropylene, rigid PVC, varnished surfaces, thermo-setting plastics, and metals

High gloss, high opaque, fast drying 1-component or 2-component system, flexible, resistant to chemicals

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Field of Application

Substrates

Marapol PY is suited for the following substrates:

- Rigid PVC
- pretreated Polyethylene (PE)
- pretreated Polypropylene (PP)
- PETG / PETA
- ABS / SAN
- Metals
- Polyamide (PA)
- Thermosetting plastics
- varnished surfaces

The addition of hardener H 1, H 2, or HT 1 is highly recommended for polyamide, thermo-setting plastics, and varnished surfaces. In general, chemical and mechanical resistances as well as adhesion are increased if hardener is used.

Since all the print substrates mentioned may be different in their printability even within an individual type, preliminary trials are essential to determine suitability for the intended use.

Field of use

Marapol PY is mainly used to print onto packaging containers of PE, PP, and rigid PVC. When printing onto PE or PP, the surface of the substrate must be pre-treated in the usual way, either by flaming or by Corona discharge.

According to our experience, PY adheres on polyolefines beginning with a surface tension of 42-48 mN/m. Polypropylene can also be pre-treated with our colourless Primer P 2.

In case of multi-colour prints, flaming must **not** be done between the printing sequences in order to avoid problems of the intercoat adhesion.

PY 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.

PY can also be processed with a spray gun but preliminary trials are absolutely necessary for this process.

We recommend to filter the thinned, press-ready ink (25 µm screen) before processing it as otherwise you could have bubbles in the ink film.

Characteristics

Drying

Physically fast drying, dries at 20° C to be overprinted within 20-30 min, at 50° C in a tunnel dryer stackable within 30-60 sec.

The times mentioned above vary according to the thickness of the ink film and type of hardener used, resp. if hardener has been added, vary as to the drying conditions and auxiliaries used.

Please note that the drying speed slows down if shades are overprinted and hardener is added.

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Fade resistance

Pigments of high fade resistance are used for the Marapol PY range. For outdoor use we recommend overvarnishing the entire surface with Printing Varnish PY 910, and the use of a coarse fabric, such as 77-55 to 90-40.

A reduced fade and weather resistance will result from an addition of more than 20% of Printing Varnish PY 910 and/or other basic colour shades (especially by mixing White to the shades) to the original colour shade.

The fade resistance of the ink is also reduced as the density of the printed ink film decreases by using finer fabrics.

If PY plus hardener is exposed to the open air, we recommend the non-yellowing hardeners H 1 or HT 1 rather than H 2. Opaque White PY 170 is not suited for outdoor use, we recommend PY 070.

The pigments used are resistant to plasticizers and solvents.

Stress resistance

After proper and thorough drying, the ink film exhibits outstanding adhesion as well as rub and scratch resistance and is resistant to oils, greases, diluted acids and bases, and alcohol.

For a higher surface stability, chemical resistance and adhesion, we recommend to add 10% Hardener H 1, H 2 or HT 1 to the ink. Hardener HT 1 is a heat-reactive isocyanate hardener which must be dried heat-forced at 150° C for 30 minutes.

Pot life

Processing period PY + Hardener with 20°C:

| | |
|-----------|------------------|
| PY + H 1 | 12 - 14 hours |
| PY + H 2 | 8 - 10 hours |
| PY + HT 1 | approx. 6 months |

If the mentioned times are exceeded, the ink's adhesion and resistance may be reduced even if the ink characteristics show no noticeable change.

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.

For Hardeners H 1 and H 2, this reaction can be accelerated by higher temperatures, in the case of HT 1 it is a must.

Processing and curing temperature must not be lower than 15° C as irreversible damages can occur. Also avoid high humidity for 8 hours after printing as the hardener is sensitive to humidity.

Range

Basic Shades - System 21

| | | | |
|-----|---------------|-----|------------------|
| 020 | Lemon | 055 | Ultramarine Blue |
| 021 | Med. Yellow | 056 | Turquoise Blue |
| 022 | Yellow Orange | 057 | Brilliant Blue |
| 026 | Light Yellow | 058 | Deep Blue |
| 031 | Scarlet Red | 059 | Royal Blue |
| 032 | Carmine Red | 064 | Yellow Green |
| 033 | Magenta | 067 | Grass Green |
| 035 | Bright Red | 068 | Brilliant Green |
| 036 | Vermilion | 070 | White |
| 037 | Purple Red | 073 | Black |
| 045 | Dark Brown | | |

Further shades

| | |
|-----|--------------|
| 170 | Opaque White |
|-----|--------------|

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-

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TONE[®], and RAL[®]. All formulas are stored in the Marabu-Color Manager software.

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.

Additives

PY 910 Printing Varnish, Bronze Binder

Bronzes

Various bronze pastes are available which can be mixed with PY 910. They can be chosen according to the required opacity, cost limit, visual impression, and curing characteristics. Due to the bigger pigment size of bronze powders, we recommend a coarser fabric, e. g. 120-34.

Bronzes in PY 910 without hardener:

| | | |
|-------|--------------------------|-----|
| S 181 | Aluminium | 6:1 |
| S 182 | Rich Pale Gold | 4:1 |
| S 183 | Rich Gold | 4:1 |
| S 184 | Pale Gold | 4:1 |
| S 186 | Copper | 3:1 |
| S 190 | Aluminium, rub-resistant | 8:1 |

Bronze mixtures cannot be put into storage for later use. Therefore, prepare fresh mixes daily (to be processed within 8 h).

Bronzes in PY 910 with hardener:

| | | |
|-------|--------------------------|-----|
| S 181 | Aluminium | 6:1 |
| S 190 | Aluminium, rub-resistant | 8:1 |

All gold shades with hardener have a maximum pot life of about 30 minutes and are therefore not recommended.

Bronze shades made of bronze powder are always subject to dry abrasion which can only be reduced by appropriate overvarnishing with PY 910.

All bronze shades are shown in a separate Screen Printing Bronzes colour chart.

The recommended mixing ratio can be varied according to the required opacity and curing properties.

All figures in brackets are guidelines for mixtures with PY 910 while the first figure is standing for the parts by weight of PY 910.

Auxiliaries

| | |
|--------------------------|-----------------------|
| Thinner, fast: | UKV 1 |
| Thinner, slow: | UKV 2 |
| Spray thinner: | 7037 |
| Retarder standard: | SV 3 |
| Retarder, very slow: | SV 9 |
| Hardener: | H 1 |
| Hardener, fast: | H 2 |
| Hardener, heat-reactive: | HT 1 |
| Mixing ratio: | 10 p. ink: 1 p. hard. |
| Matting Paste: | ABM (1-20%) |
| Matting Powder: | MP (1-4%) |
| Special Primer: | P 2 |
| Printing Modifier: | ES (0.5 - 1% max.) |

To adjust the printing viscosity it is generally sufficient to add 15-20% thinner to the ink.

In order to produce a retarding effect for slow printing sequences, Retarder SV 3 is added to the thinner proportionately (e. g. 50%). For the printing of very fine details, Retarder SV 9 (max. 5%) may be added to the thinner. For an ink mixture containing retarder, only thinner without retarder should be used for additional thinning during print run.

For spray coating, fast Spray Thinner 7037 should be used (on parts sensitive to tension cracks, preliminary trials are essential).

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PY can be matted by adding 1-20% of Matting Paste ABM or 1-4% (for Whites PY 070 and 170 max. 2%) Matting Powder MP to the ink whereas opacity will be reduced.

Printing Modifier ES contains silicone. It can be used to rectify flow problems on critical substrates by adding 0.5-1 % max. 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.

Special Primer P2 is used for manual pre-cleaning and pre-treatment of PP substrates.

Cleaning

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

Fabrics, stencils

All types of commercially available fabrics and solvent-resistant stencils can be used. For long-term outdoor use, we recommend a 77-55 to 90-40 fabric.

Recommendation

The ink should be stirred well before printing.

Labelling

For our ink type Marapol PY 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 the labelling according to the present EC regulations as to health and safety labelling requirements. Such health and safety data may also be obtained from the respective label.

The ink has a flash point between 21° C and 100° C.

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 a specific application is exclusively your responsibility.

Should, however, any liability claims arise, such claims 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.