Marapol PY

Screen printing ink for pre-treated polyethylene and polypropylene, rigid PVC, coated substrates and 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

The Marapol PY screen printing ink is suited to print onto pre-treated polyethylene (PE), polypropylene (PP), and rigid PVC. By adding Hardener H 1, H 2, or HT, 1 the possible substrate range can be extended to thermosetting plastics and metals. Besides that, the chemical and mechanical resistances as well as adhesion in general are increased.

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. PP can also be pre-treated with our colourless Primer P 2.

When doing multi-colour prints, no flaming must be done between the printing sequences in order to avoid problems of the intercoat adhesion.

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.

Fade resistance

Marapol PY contains a highly weather-resistant binder which is pigmented highly fade-resistant, with exception of the shades 020, 026, 032, 064, and 067.

For long-term outdoor use, we recommend as a completion to the basic shades the use of the following special inks produced on order, an overcoating of the full surface with Printing Varnish PY 910, and the use of a coarser fabric, e. g. 77-55 to 90-40.

PY 452 52 00	Lemon, high fade resistance
PY 452 53 00	Light Yellow, high fade resistance
PY 452 54 00	Carmine Red, high fade resistance
PY 452 55 00	Yellow Green , high fade resistance
PY 452 56 00	Grass Green, high fade resistance

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.

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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 to PY 10 % of Hardener H 1, H 2 or HT 1. With Hardener H 1, the pot life (processing period) will be about 12-14 hours, and with H 2 about 8-10 hours, depending on the room temperature. Hardener HT 1 is a heat-reactive isocyanate hardener which must be dread heat-forced at 150 °C for 30 minutes.

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

(see shade card “System 21”)

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

All shades are intermixable. Marapol PY ink should not be mixed with other types of ink to maintain the special characteristics of this outstanding ink range.

These 21 basic shades 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 HKS®, RAL® and Marabu System 21.

All formulas are stored in the Marabu-Color Manager 2 (MCM 2) 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. All colours are suited for printing onto toys.

Further shades available

PY 170	Opaque White

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Additives

Printing Varnish, Bronze Binder: PY 910

Bronze shades

(to be mixed with bronze binder PY 910)
All bronze shades are shown in a separate bronze shades card.

Bronzes in PY 910 without addition of 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)

Mixtures of bronze shades are instable and have a processing time of 8 hours.

Bronzes in PY 910 with addition of hardener:

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

All gold shades plus hardener are instable and have a maximum pot life of about 30 min; we, therefore, do not recommend this.

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

All figures in brackets are guidelines which can be varied according to opacity and ink price. The ratio figures in brackets refer to the mixture Bronze Binder PY 910 to bronze powder or bronze concentrate whereas the first figure is standing for the parts by weight of Bronze Binder PY 910. Due to the larger grain size of bronze pigments, we recommend a fabric of 120-34 or 120-31 or even coarser.

For the processing of the bronzes, we refer to our separate data sheet “Screen Printing Bronze Inks”.

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.
Cleaner:	UR 3
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 10 - 15 % 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).
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.

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Cleaning

It is recommended to clean the screens with Cleaner UR3 immediately after use.

Fabrics and 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 according to EC-regulation 91/155 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. Since the ink is not considered as a flammable liquid due to its pasty nature, any specific regulations for the handling of flammable liquids do not apply for the ink.

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, 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.

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