

# Screen Printing System Ink

**High gloss, high opacity,  
fast drying one or two-component-system,  
flexible, resistant to chemicals**

## Field of Application

### Substrates

The screen printing ink Marapol PY is suitable for printing onto pre-treated polyethylene (PE), polypropylene (PP), as well as rigid PVC. By adding hardener PUH, PEMH, or HT 1, the possible substrates are extended to thermosetting plastics, coated substrates, and metal, and the chemical and mechanical resistance as well as the 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 or PP and onto rigid PVC-types. When printing onto PE and 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, the PY adheres on polyolefines with a minimum surface tension of 42-48 mN/m.

On PP, the surface can also be pre-treated with a thin coat of our colourless Special Primer P 2.

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

PY can also be processed with a spray gun, but preliminary trials are necessary for this process. We recommend to filter the thinned press-ready ink (25 µm screen) before processing it, as otherwise there could be bubbles in the ink film.

## Characteristics

### Drying

Physically fast drying, dries at 20 °C within 20 to 30 min. (for overprintability), at 50 °C in a tunnel dryer within 30-60 sec. The times mentioned vary according to thickness of the ink film, with or without addition of hardener and type of hardener, drying conditions and auxiliaries used.

Please note that the drying speed slows down if shades are overprinted and a hardener has been used.

### Fade resistance

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



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# Marapol PY

**For pre-treated polyethylene and polypropylene, rigid PVC, coated substrates and thermosetting plastics, and metal**

For long-term outdoor use, we recommend, in addition to the basic shades, the use of the following colours, an overcoating of the full surface with printing varnish PY 910, and the use of a coarser fabric, e.g. 77-55 (T) - 90-40 (T).

PY	452 52 00	Lemon
PY	452 53 00	Light Yellow
PY	452 54 00	Carmine Red
PY	452 55 00	Yellow Green
PY	452 56 00	Grass Green

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 with White) 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 the PY (plus hardener) is used in outdoor applications, we recommend the non-yellowing hardener PUH or HT 1 rather than PEMH. 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.

In all cases requiring higher surface stability, chemical resistance and adhesion, we recommend to add 10% hardener PUH, PEMH, or HT 1 to the PY. The hardener HT 1 is a heat-reactive isocyanate hardener which must be baked in the oven at 150 °C for 30 min.

### Pot life

Processing period of PY + hardener at 20 °C:

PY + PUH	12 - 14 h
PY + PEMH	8 - 10 h
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 crosslinking reaction between ink and hardener. This reaction can be accelerated by higher temperatures.



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

## Range

Marabu-mix colour matching system includes the basic shades System 21.

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

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.

## Basic Shades

See shade card "System 21"

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

By using these 21 basic shades in accordance with the mixing ratios given in the Marabu-ColorManager (MCM) software, it is possible to produce shades of the popular ink systems Marabu System 21, RAL, and HKS.

## Further basic shades

PY 170 Opaque White

## Additives

Bronze binder: PY 910  
Printing varnish: 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 184 Pale Gold (4:1)
S 182 Rich Pale Gold (4:1)	S 186 Copper (3:1)
S 183 Rich Gold (4:1)	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 addition of hardener are instable and have a maximum pot life of about 30 min.; therefore, we do not recommend this.

Bronze shades of bronze powder always have a dry abrasion which can only be reduced by an appropriate over-  
varnishing 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, the first figure 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 (T) or 120-31 (S) or coarser.

For further information, we refer to our separate data-sheet "Screen Printing Bronze Inks".

## Auxiliaries

Thinner, quick:	UKV 1
Thinner, slow:	UKV 2
Spray thinner:	7037
Retarder standard:	SV 3
Retarder, very slow:	SV 9
Hardener:	PUH
Hardener, quick:	PEMH
Hardener, heat-reactive:	HT 1
Mixing ratio:	10 parts of ink: 1 part of hardener
Cleaner:	UR 3
Matting Paste:	ABM (1-20 %)
Matting Powder:	MP (1-4 %)
Special Primer for PP:	P 2
Printing modifier:	ES (0.5 - 1 %)

To adjust the printing viscosity, it is generally sufficient to add 10 - 15 % thinner to the ink.

To produce a retarding effect for slow printing sequences the retarder SV 3 is added to the thinner proportionately (e.g. 50 %). For the printing of very fine details, retarder SV 9 (5 % max.) 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, the 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 the matting paste ABM or 1-4 % (White PY 070 and 170, 2 % max.) matting powder to the ink, however, opacity is 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.

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

### **Fabrics and stencils**

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

### **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 pastous 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.