Mara® *Pol* PY

Marabu

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

High gloss, high opacity, 1 or 2 component ink system, flexible, resistant to chemicals

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Field of Application

Substrates

Mara® *Pol* 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 is highly recommended for polyamide, thermosetting 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 printability even within an individual type, preliminary trials are essential to determine the suitability for the intended use.

Field of use

Mara® *Pol* 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 pretreated 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.

Mara® *Pol* PY can also be processed with a spray gun, but preliminary trials are necessary for this process. In order to avoid surface irregularities, we recommend to filter the thinned ink (25 µm screen) before processing.

Characteristics

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.

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 12-14 h (H 1) bzw. 8-10 h (H 2) (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. With the use of HT 1, there is no pot life to consider since this hardener is only activated by a baking process (30 min/150° C).

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. 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

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hours after printing as the hardener is sensitive to humidity.

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

Pigments of high fade resistance are used for the Mara® *Pol* 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 outside, 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.

Range

Basic Shades

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

High Opaque Shades

170	Opaque White

Further Products

910	Overprint Varnish

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.

Metallics

Metallics which are suited **for 1 k applications**:

Metallic Powders

S 181	Aluminium	17%
S 182	Rich Pale Gold	25%
S 183	Rich Gold	25%
S 184	Pale Gold	25%
S 186	Copper	33%
S 190	Aluminium, rub-resistant	12.5%

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For 2 k applications, only S 181 Aluminium and S 190 Aluminium (wipe resistant) can be used. The gold shades are not processable with hardener (max. pot life approx. 30 minutes).

These metallics are added to PY 910 in the recommended amount, whereas the addition may be individually adjusted to the respective application. We recommend preparing a mixture which can be processed within a maximum of 8 h since metallic mixtures usually cannot be stored. Due to their chemical structure, the processing time of mixtures with Pale Gold S 184 and Copper S 186 is even reduced to 4 h.

Owing to the larger pigment size of Metallic Powders we recommend the use of a coarser fabric like 100-40. Shades made of Metallic Powders are always subject to an increased dry abrasion which can only be reduced by overvarnishing.
All metallic shades are displayed in the Marabu "Screen Printing Metallics" colour chart.

Auxiliaries

UKV 1	Thinner	10-20%
UKV 2	Thinner	10-20%
H 1	Hardener	10%
H 2	Hardener	10%
HT 1	Hardener, heat-reactive	10%
SA 1	Surface Additive	3-5%
ABM	Matting Base	1-20%
MP	Matting Powder	1-4%
ES	Printing Modifier	0.5-1%
UR 3	Cleaner (flp. 42°C)	
UR 4	Cleaner (flp. 52°C)	
UR 5	Cleaner (flp. 72°C)	
SV 9	Retarder	
SV 12	Retarder	
7037	Spray Thinner	
P 2	Primer	

Thinner is added to the ink to adjust the printing viscosity. For slow printing sequences and fine motifs, it may be necessary to add retarder to the thinner.

Hardener H 1 and H 2 are sensitive to humidity and always to be stored in a sealed container. H 1 or H 2 can be added for increased resistance and adhesion. Shortly before use, the hardener is added to the ink and stirred homogeneously. The mixture ink/hardener is not storable and must be processed within pot life.

Hardener HT 1 is also sensitive to humidity and is always to be stored in a sealed container. If using HT 1, there is no pot life to consider since this hardener is only activated by a baking process (30 min/150°C).

The addition of surface additive SA 1 can increase the resistance against abrasion and other mechanical stress (max. addition 10%).

The degree of gloss can be reduced by adding Matting Paste ABM or Matting Powder MP (white shades max. 2 % MP), decreasing the opacity at the same time.

Printing Modifier ES contains silicone and can be used to rectify flow problems on critical substrates. If an excessive amount is added, flow problems are increased and adhesion may be reduced, especially when overprinting. The use of ES may reduce the degree of gloss.

The cleaners UR 3 and UR 4 are recommended for manual cleaning of the working equipment. Cleaner UR 5 is recommended for manual or automatic cleaning of the working equipment.

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

Special Primer P 2 is used for manual pre-cleaning and pre-treatment of PP substrates.

Printing Parameters

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.

Shelf Life

Shelf life depends very much on the formula/reactivity of the ink system as well as the storage temperature. It is 2.5 years for an unopened ink container if stored in a dark room at a tem-

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perature 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.
You are, therefore, obliged to conduct your own tests with our supplied products to confirm their suitability for the desired process or purpose. The foregoing information is based on our experience and should not be used for specification purposes.
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 Mara® *Pol* PY 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 EC regulation 1272/2008 (CLP regulation). Such health and safety data may also be derived from the respective label.

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