

Screen Printing Ink for PVC self-adhesive foils, rigid PVC, acrylics, polystyrene, ABS/ SAN, soft PVC, polycarbonate, paper, pasteboard, cardboard

Glossy, medium opacity, fast drying, block resistant, flexible, low odour, very good mesh opening, vacuum-formable

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Field of Application

Substrates

Libra *Print* LIP is suited to print onto:

- PVC self-adhesive foils
- Rigid and soft PVC
- Polystyrene (PS)
- ABS/SAN
- Acrylics (PMMA)
- PETG
- Polycarbonate (PC)
- Paper, pasteboard, cardboard
- Wood

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

Libra *Print* LIP is highly suitable for the production of PVC-stickers, advertising panels, displays, ring binders, book covers, straps, and letterings of every kind. To decorate tarpaulins made of PVC, we recommend our tarpaulin ink Maraplan PL instead of LIP.

LIP is vacuum-formable except for the 4x9 process shades.

LIP 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

Printability of the LIP is very simple and easy thanks to the very good mesh opening for standard and 4-colour process shades.

LIP can be processed by hand printing, with semi-automatic machines up to fully automatic machines.

LIP is suited for printing speeds up to 1400 prints/h (single prints).

The flow characteristics of LIP have been adjusted in such a way that the ink does not drip through the mesh when the machine is standing still or run together in angle opening machines.

Gloss level

Libra *Print* LIP is glossy and has the following measured gloss values (60° angle). Value 100 stands for high gloss, while value 1 stands for deep-matt:

Basic shades:	50 - 60 gloss units
LIP 971:	30 - 40 gloss units
Printing Varnish LIP 910:	70 - 80 gloss units
4-colour process shades:	25 - 35 gloss units

If a higher gloss is required, we recommend to overcoat with Printing Varnish LIP 910.

Opacity

The LIP colour shades are brilliant with medium opacity. To increase the ink's opacity on dark substrates, it is possible to add up to 15% of Opaquing Paste OP 170.

Ink Adjustment

The ink should be stirred well before printing.

Drying

Physically fast drying, at 20 °C air temperature to be overprinted within 10-15 min, at 50 °C in the tunnel dryer stackable after 30-40 sec. Drying speed and block resistance are reduced by about 20 % in overprinting.

With high dryer capacity and good ventilation provided, the drying temperature can be reduced to 40 °C for less material distortion.

Libra *Print* LIP



Vers. 9
2017
18. Jul

The times mentioned above vary according to the substrate, the ink film thickness, drying conditions and the auxiliaries used. An extended drying time is necessary if Plasticizer WM 1 has been added to the ink.

Fade resistance

Depending on the colour shade, pigments of good to excellent fade resistance (blue wool scale 6-8) are used in the *Libra Print* LIP range. All standard and 4-colour process shades are therefore suitable for outdoor use for two years if placed vertically and referred to the middle European climate. Precondition for this is the appropriate and professional processing as well as an max. addition of 50 % of varnish or white to the standard shades.

A coat of Printing Varnish LIP 910 over the whole surface will extend the possible outdoor limit to 3 years. In countries with higher exposure to sunlight (between 40th parallel north and 40th parallel south), outdoor resistance will decrease.

Stress resistance

After proper and thorough drying, the ink film of the standard shades exhibits outstanding adhesion as well as rub, scratch, and block resistance and can be moulded (caution with 4-colour process shades!).

LIP exhibits a normal chemical resistance against alcohol and other usual cleaners (e. g. window cleaner), and unleaded petrol.

For applications requiring a high solvent resistance in multiple overprinting (e. g. in the case of double-faced stickers), the colour shade LIP 922, Light Yellow must not be used (not even proportionately for ink mixtures) but is to be substituted by matching the other LIP basic shades without LIP 922.

For a higher rub resistance to dry abrasion of the colour shades, we recommend to overcoat with Printing Varnish LIP 910. If the chemical resistance is to be increased, the shades can additionally be overcoated with Printing Varnish SR 910 or a suitable UV-curing varnish.

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
971	White
980	Black

4-Colour Process Shades Standard

429	Process Yellow
439	Process Magenta
459	Process Cyan
489	Process Black

Further Products

409	Transparent Base
910	Overprint Varnish

LIP 971 White features a very high flexibility at a lower degree of gloss, and is best suited for vacuum-forming or shaping. When printing onto PVC self-adhesive foils, it shows less tendency to edge curling or shrinkage than LIP 970.

The process shades are not vacuum-formable.

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-Color Manager software.

Libra *Print* LIP



Vers. 9
2017
18. Jul

Metallics

Metallic Pastes

S 191	Silver	15-25%
S 192	Rich Pale Gold	15-25%
S 193	Rich Gold	15-25%
S 291	High Gloss Silver	10-20%
S 292	High Gloss Rich Pale Gold	10-20%
S 293	High Gloss Rich Gold	10-20%

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%

These metallics are to be added to LIP 910 in the recommended amount, whereat 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 smaller pigment size of Metallic Pastes it is possible to work with finer fabrics like 140-31 to 150-31.

Owing to the bigger 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 over-vernishing.

All metallic shades are displayed in the Marabu "Screen Printing Metallics" colour chart.

Auxiliaries

UKV 2	Thinner	10-15%
VP	Retarder Paste	5-20%
SA 1	Surface Additive	3-5%
WM1	Plasticizer	2-5%
ABM	Matting Base	1-20%
MP	Matting Powder	1-2%
ES	Printing Modifier	0.5-1%
OP 170	Opaquing Paste	0-15%
PSV	Thinner, quick and mild resp. spray thinner	
UR 3	Cleaner (flp. 42°C)	
UR 4	Cleaner (flp. 52°C)	
UR 5	Cleaner (flp. 72°C)	
SV 5	Retarder	
SV 10	Retarder, slow	

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. For an additional thinning of the ink containing retarder, only pure thinner should be used. Thinner PSV is suited for the use on polystyrene or other plastics sensitive to tension cracks.

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

Plasticizer WM 1 is recommended if high flexibility is required from the printed ink film. This is important for thin substrates with a natural tendency to roll, as well as for applications involving cutting or die-cutting of the printed surface. The use of Plasticizer WM 1 reduces the drying speed. For the production of double-sided stickers the use of WM 1 is essential.

The degree of gloss can be reduced by adding Matting Paste ABM or Matting Powder MP, decreasing the opacity as well as the vacuum-formability 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.

By adding Opaquing Paste 170, the opacity of colour shades can significantly be increased

Libra *Print* LIP



without considerably influencing the chemical and dry abrasion resistance. OP 170 is not suitable for white shades, and should not be used for prints that will be exposed to more than 2 years outdoor application.

For spray varnishing, our Quick Thinner PSV should be used (by adding approx. 40 %) after preliminary trials.

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.

Printing Parameters

All types of commercially available polyester fabrics (1:1 plain weave) and solvent-resistant stencils can be used.

Shelf Life

Shelf life depends very much on the formula/ reactivity of the ink system as well as the storage temperature. It is 3.5 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.

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 Libra *Print* LIP 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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