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**Screen Printing Ink for rigid and soft PVC, PVC self-adhesive foils, polystyrene, acrylic glass, and polycarbonate**

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**Matt, highly opaque, fast drying, low odour, weather resistant, and suitable for welding**

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## Field of Application

### Substrates

The screen printing ink Libramatt LIM is designed for application onto rigid PVC, PVC self-adhesive foils, soft PVC, polystyrene, acrylic, polycarbonate, coated polyester foils, as well as synthetic and resin-coated papers, cork, and cardboard.

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

### Field of use

The Libramatt LIM is a universal matt ink used for printing substrates where a particularly high requirement for ink opacity, flexibility, or resistance to plasticizers is required, e.g.

- scales, front panels and displays
- double-sided stickers as intermediate ink
- printing, rolling, spraying of PVC tarpaulins
- pressing, sealing into acrylic
- High opaque white LIM 170 can be used for signature stripe

For truck tarpaulins, we recommend the ink type Maraplan PL.

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

## Characteristics

### Drying

Physically fast drying, dries at 20 °C air temperature within 20-30 min to be overprinted, at 50 °C in the tunnel drier stackable after 30-40 sec.

The times mentioned above vary according to the substrate, the ink film thickness, drying conditions and the auxiliaries used. Generally an extended drying time is necessary when overprinting the ink.

### Fade resistance

For outdoor use, generally matt colours show a less colour shade stability than glossy colour shades.

We are using pigments of an excellent fade resistance for all shades of our Libramatt LIM ink type.

Shades mixed by adding transparent base LIM 409 or printing varnish LIM 910 (>30% parts) our shades, especially by mixing White to the shades, mostly have a reduced fade and weather resistance. The fade resistance of the ink is also reduced, as the density of the printed ink film decreases, therefore, we recommend a fabric 77-90 for outdoor use.

The pigments used are resistant to solvents and plasticizers.

## Stress resistance

After proper and thorough drying, the ink film is stackable, weather resistant as well as suitable for welding. Please note that the shades 980 and 180 Black are not suited for welding. We recommend to use MS 173 welding black instead. Due to their chemical composition, the basic shades are less rub-resistant than other glossy screen printing colour shades.

For a maximum rub and abrasion resistance, it is necessary to overcoat with printing varnish LIM 910.

## Range

Marabu-ColorManager (MCM) colour matching system includes the basic shades of **System Maracolor**.

All shades **except LIM 180 Opaque Black** are based on organic pigments, therefore, the heavy metal content complies with the EEC regulations EN 71, part 3, "safety of toys" – migration of specific elements. Therefore, all shades except LIM 180 Opaque Black can be used for printing onto toys. LIM 180 Opaque Black does **not** comply with the EN 71, part 3.

## Basic shades

See shade card **System Maracolor matt**

LIM 920 Lemon	LIM 950 Violet
LIM 922 Light Yellow	LIM 952 Ultramarine Blue
LIM 924 Medium Yellow	LIM 954 Medium Blue
LIM 926 Orange	LIM 956 Brilliant Blue
LIM 930 Vermilion	LIM 960 Blueish Green
LIM 932 Scarlet Red	LIM 962 Grass Green
LIM 934 Carmine Red	LIM 970 White
LIM 936 Magenta	LIM 980 Black
LIM 940 Brown	

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

By using these 17 basic shades in accordance with the mixing ratios given in the Marabu-ColorManager (MCM) software, it is possible to produce shades of the ink systems HKS, RAL, and Marabu System 21.

## Additional basic shades

LIM 170	Opaque White
LIM 180	Opaque Black
LIM 182	Silver (Sandwich)
LIM 570	Base, clear

The silver sandwich shade LIM 182 is a completely opaque silver layer, as used in the production of double-sided decals.

## Additives

Transparent base:	LIM 409
Printing varnish:	LIM 910

The printing varnish LIM 910 can also be used as bronze binder, it is gloss, not matt.

## Bronzes

(to be mixed with printing varnish LIM 910)

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 (8:1) (rubresistent)

Due to their chemical structure, Pale Gold S184 and Copper S186 reduce the processing time of bronze shades. Please mix only such a quantity which will be processed within 8 hours.

Bronze shades made of bronze powder are always subject to dry abrasion which can only be reduced by appropriate over-varnishing with LIM 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 printing varnish LIM 910 to bronze powder or bronze concentrate, the first figure standing for the parts by weight of printing varnish LIM 910.

## High-gloss-bronzes

Furthermore, 3 high-gloss bronze concentrates are available, to be used by mixing them with bronze binder LIM 910 (see separate Technical Data Sheet "High-Gloss Bronze Concentrates").

S 291 High Gloss Silver (5:1 - 10:1)

S 292 High Gloss Rich Pale Gold (5:1 - 10:1)

S 293 High Gloss Rich Gold (5:1 - 10:1)

Due to the smaller pigment size compared to bronze powder, it is possible to work with finer fabrics of 140-31 (S) to 150-34 (T) at an acceptable price. Bronze shades of high-gloss concentrates are highly weather-resistant and have a very small dry abrasion.

## Auxiliaries

Thinner:	UKV 2
Spray Thinner:	7037
Retarder:	SV 1
Retarder, slow:	SV 9
Retarder Paste:	VP
Cleaner:	UR 3
Plasticizer:	WM 1 (2-5 %)
Printing modifier:	ES (1 % max.)

To adjust the printing viscosity, it is generally sufficient to add 10-20 % thinner to the ink. To produce a retarding effect for slow printing sequences, the retarder SV 1 is added to the thinner proportionately (e.g. 50 % of the quantity).

For prints of fine details, retarder paste VP (10-20 %) or pure retarder SV 9 (5 % max.) can also be used. For spray varnishing, our spray thinner 7037 is preferably used.

Plasticizer WM 1 (2-5 %) is recommended for especially flexible ink films. This is important for thin substrates tending heavily to curl, as well as for PVC self-adhesive foils with removable adhesive (danger of edge curling) and in case of cutting or punching the printed surface. The use of plasticizer WM 1 reduces the drying speed.

Printing modifier ES contains silicone. It can be used to rectify flow problems on critical substrates by adding up to 1 % 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.

We recommend to clean the screens immediately after use with cleaner UR 3.

## Fabrics and Stencils

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

## Recommendation

The ink must be stirred well before printing.

## Labelling

For our ink type Libramatt LIM and its additives and auxiliaries there are current Material Safety Data Sheets according to EC-regulation 91/155, covering in detail 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. 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.