

Screen printing ink for PVC self-adhesive foils, rigid PVC, polystyrene, ABS, SAN, acrylics, polycarbonate, paper, pasteboard, and cardboard

Glossy, vacuum-formable, very fast drying, highly block-resistant, very good mesh opening, PVC-free

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Field of Application

Libraspeed LIS is a solvent-based, very fast drying and block-resistant screen ink for standard and 4-colour process shades suited for the daily tasks in graphic screen printing. For high-quality demands (e. g. backlit signage), highly fade-resistant colour shades and a vacuum-formable 4-colour process shades are additionally available.

Substrates

The following substrates have successfully been tested and proved in practice:

Plastics: PVC self-adhesive foils, rigid PVC, polystyrene (PS), ABS, SAN, acrylic (PMMA), polycarbonate (PC)

Others: paper, pasteboard, cardboard

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

Field of use

Libraspeed LIS is highly suitable for the production of advertising panels and displays on fast running fully automatic machines.

LIS excels due to a hard ink film and a high block resistance but must be tested for its suitability on plasticized and highly flexible substrates (e. g. soft PVC) before printing.

For the production of double-sided stickers, we do not recommend LIS but more flexible ink systems such as Libraprint LIP or Libragloss LIG. Two basic colour shades of LIS are available for boards of polystyrene which can be written onto with chalk.

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

Characteristics

Printability

- Very good mesh opening for standard and 4-colour process shades, i.e. printability of LIS is very simple and easy
- LIS is highly suitable for flat-bed or cylinder printing machines but can also be processed in manual printing or on semi-automatic machines
- Printing speed from 400 up to 2500 prints/hour

Drying

Physically fast drying, at 20 °C air temperature to be overprinted within 4-6 min, at 40 °C in a tunnel dryer stackable after 20-30 sec. Drying speed and block resistance are reduced by about 20 % when overprinting.

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 (2-5 %) has been added to the ink.

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Gloss level

Libraspeed LIS is glossy with the following gloss values (angle 60°, fabric 120-34, white self-adhesive foil). Value 100 means high-gloss whereas value 1 is deep matt.

Standard shades: 60-70 gloss units

Print Varnish LIS 910: 60-70 gloss units

4-colour process shades: 45-55 gloss units

Opacity

The LIS colour shades are brilliant with a medium to good opacity.

Ink odour

All solvents used for the LIS and other auxiliaries are very mild and have a softer labelling. This significantly reduces the strong solvent odour when printing.

Fade resistance

Pigments of excellent fade resistance (blue wool scale 7-8) are used for the Libraspeed LIS basic shades. Therefore, all System 21 basic shades are suitable for an outdoor use of up to 3 years referred to the middle European climate. Prerequisite for this is an appropriate and professional processing as well as a maximum addition of 50% varnish or white to the standard shades. A full-area coating with Print Varnish LIS 911 onto the whole surface will extend the possible outdoor exposure time to 4 years. When using the highly fade-resistant shades of the 7xx series, outdoor resistance can be increased to max. 5 years.

In countries with higher exposure to sunlight (between the 40th parallel North and 40th parallel South), outdoor resistance decreases.

Due to the required brilliance, the PANTONE shades are more transparent than the System 21 shades and do, therefore, not achieve the above mentioned high fade resistance. The pigments used are resistant to solvents and plasticizers.

Stress resistance

After proper and thorough drying, the ink film exhibits an outstanding adhesion as well as rub, scratch, and block resistance and can also be vacuum-formed.

LIS exhibits a normal chemical resistance of 20 double rubs with alcohol and other usual cleaners (e. g. window cleaner).

For a higher rub resistance to dry abrasion of the colour shades, we recommend to overcoat with Print Varnish LIS 910 or LIS 911. For a higher chemical resistance, the colour shades can be over-varnished with Print Varnish SR 910 or a suitable UV-curable varnish.

Range

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

Basic shades for System 21 and RAL

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

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 2.4 (MCM 2) software.

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Shades for mixing acc. to PANTONE®* (see Marabu PANTONE colour fan)

| | |
|---------|-------------------------|
| LIS 829 | PANTONE®* Yellow |
| LIS 832 | PANTONE®* Rubin Red |
| LIS 836 | PANTONE®* Warm Red |
| LIS 839 | PANTONE®* Rhodamine Red |
| LIS 850 | PANTONE®* Purple |
| LIS 851 | PANTONE®* Violet |
| LIS 852 | PANTONE®* Reflex Blue |
| LIS 859 | PANTONE®* Process Blue |
| LIS 868 | PANTONE®* Green |
| LIS 070 | White |
| LIS 073 | Black |
| LIS 910 | Print Varnish |

*Pantone, Inc.'s check standard trademark for colour reproduction and colour reproduction materials.

By using these 9 SR Pantone® basic shades together with LIS 070, LIS 073, and Print Varnish LIS 910, more than 1000 colour shades of the Pantone® Color Formula Guide can be mixed (see also text inside Marabu's Pantone® colour fan).

Highly fade-resistant shades

Basic shades for high demands to long-term outdoor resistance. If printed onto the top side of the material, we recommend a full-area over-varnishing with the UV-Absorber Print Varnish LIS 911.

| | | | |
|---------|---------------|---------|------------------|
| LIS 720 | Lemon | LIS 055 | Ultramarine Blue |
| LIS 721 | Medium Yellow | LIS 056 | Turquoise Blue |
| LIS 722 | Yellow Orange | LIS 058 | Deep Blue |
| LIS 726 | Light Yellow | LIS 059 | Royal Blue |
| LIS 731 | Scarlet Red | LIS 764 | Yellow Green |
| LIS 732 | Carmine Red | LIS 067 | Grass Green |
| LIS 033 | Magenta | LIS 068 | Brilliant Green |
| LIS 735 | Bright Red | LIS 070 | White |
| LIS 036 | Vermilion | LIS 073 | Black |

Further shades

If printed onto the reverse side of the substrate, the following brightened white shade with an optimized degree of white is available for vertical or backlit illumination:

| | |
|---------|-------|
| LIS 971 | White |
|---------|-------|

Two additional shades for printing onto boards of polystyrene and which can be written onto with chalk are completing the product range (fabric recommended 77-55 to 100-40):

| | |
|---------|------------------------|
| LIS 768 | Chalk Board Ink, Green |
| LIS 773 | Chalk Board Ink, Black |

Shades for 4-colour process printing (no vacuum formability)

| | | Density |
|---------|-----------------------|---------|
| LIS 429 | Process Yellow | 1.2-1.3 |
| LIS 439 | Process Red (Magenta) | 1.2-1.3 |
| LIS 459 | Process Blue (Cyan) | 1.4-1.5 |
| LIS 473 | Process Black | 1.8-1.9 |
| LIS 409 | Transparent Base | |

Shades for 4-colour process printing, vacuum-formable, with a higher density

| | | Density |
|---------|-----------------------|---------|
| LIS 428 | Process Yellow | 1.5-1.6 |
| LIS 438 | Process Red (Magenta) | 1.8-1.9 |
| LIS 458 | Process Blue (Cyan) | 2.4-2.5 |
| LIS 488 | Process Black | 2.5-2.6 |
| LIS 408 | Transparent Base | |

The above mentioned density values refer to the use of a 150-31 fabric at a dilution of 10%. By adding Transparent Base LIS 408 or 409 (depending on the process shades in use), the ink's density can be reduced individually.

Pre-mixed bronzes as basic shades

| | |
|---------|----------------------|
| LIS 191 | Silver, pre-mixed |
| LIS 193 | Rich Gold, pre-mixed |

The pigments used in these 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 suitable for printing onto toys.

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Additives

| | |
|------------------------------------|---------|
| Bronze Binder + Print Varnish: | LIS 910 |
| Print Varnish (UV-Absorber): | LIS 911 |
| Transparent Base, vacuum formable: | LIS 408 |
| Transparent Base | LIS 409 |

Bronze shades

(to be mixed with Bronze Binder LIS 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, rub-resistant (8:1) |

All bronze shades are shown in a special bronze shade card. They cannot be stored and must be processed in the course of 12 h. Due to their chemical structure, Pale Gold S 184 and Copper S 186 reduce the processing time to 8 h.

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 LIS 910 to bronze powder or bronze concentrate whereas the first figure is standing for the parts by weight of Bronze Binder LIS 910.

Due to the larger grain size of bronze pigments, we recommend a fabric of 120-34, 120-31, or even coarser.

High-gloss bronzes

Furthermore, 3 high-gloss bronze concentrates are available to be used by mixing them with Bronze Binder LIS 910.

| | |
|-------|--|
| 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 powders, you can work with finer fabrics from 140-31 to 150-34 at an acceptable price. Bronze shades of high-gloss concentrates exhibit a high weather resistance and are subject to only a small dry abrasion.

Auxiliaries

| | |
|--|--------------------|
| Thinner: | UKV 1 |
| Thinner, mild: | UKV 2 |
| Thinner: (polystyrene and for substrates sensitive to solvent corrosion) | PSV |
| Spray Thinner: | 7037 |
| Retarder, mild: | SV 1 |
| Retarder: | SV 10 |
| Retarder Paste: | VP |
| Matting Paste: | ABM (1-20%) |
| Matting Powder: | MP (1-4%) |
| Plasticizer: | WM 1 (2-5%) |
| Printing modifier: | ES (0.5 - 1% max.) |

To adjust the printing viscosity, it is generally sufficient to add 15-20 % Thinner UKV 1 or UKV 2 to the ink. For the use on polystyrene or other plastics sensitive to tension cracks, we recommend the mild and very fast Thinner PSV.

To produce a retarding effect for slow printing sequences, Retarder SV 1 is added to the thinner proportionately (e. g. 50% of the quantity). For printing very fine details, Retarder Paste VP (5-20%) or Retarder SV 10 (10% max.) may be added proportionately to the thinner.

For an ink mixture containing retarder, only pure thinner without retarder should be used for additional thinning.

For spray varnishing, our quick Thinner 7037 should be used or for polystyrene PSV (addition approx. 30-40%) after preliminary trials. By adding ABM Matting Paste (1-20%) or MP Matting Powder (1-4 %, for White LIS 070, 2% max.), the glossy effect of LIS can be reduced decreasing, however, the opacity as well as the vacuum-formability at the same time.

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 backing (danger of edge curling) and in the case of cutting or die-cutting the printed sur-

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face. 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 0.5 to 1% to the ink. Please weigh it exactly, because an excessive amount of printing modifier increases flow problems, and adhesion may be reduced, especially when overprinting.

Cleaning

For manual cleaning of screen printing stencils and tools our cleaner UR 3 (flash point 42° C) or UR4 (flash point 52°C) can be used.

In the case of longer machine stops (> 30 min), it is important that the ink remaining in the screen open area is removed with UR 3/ UR 4 as otherwise it may dry in and clog the mesh.

Fabrics and stencils

All types of commercially available fabrics and solvent-resistant stencils can be used.

Mileage

One litre of Libraspeed LIS yields about 75 m² of printed surface with a dilution level of 15% when using a 120-34 mesh.

Labelling

For our ink type Libraspeed LIS and its additives and auxiliaries there are current Material Safety Data Sheets available according to EC-regulation 1907/2006, 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 50°C and 100 °C.

Recommendation

The ink should be stirred well before printing.

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.