

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.

### 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.

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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 shades. Therefore, all System 21 basic shades as well as 4-colour process shades (Process Yellow LIS 476 97 429) 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 HKS and 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

(See shade card Libraspeed LIS or System 21)

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		

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

# Libraspeed LIS



## Shades for mixing according to HKS

(see colour fan HKS for screen printing)

LIS 020	Lemon	LIS 652	Medium Blue
LIS 021	Medium Yellow	LIS 058	Deep Blue
LIS 022	Yellow Orange	LIS 059	Royal Blue
LIS 026	Light Yellow	LIS 659	Cyan
LIS 032	Carmine Red	LIS 067	Grass Green
LIS 033	Magenta	LIS 068	Brilliant Green
LIS 035	Bright Red	LIS 070	White
LIS 636	Orange Red	LIS 073	Black
LIS 651	Blue Violet		

By using 13 LIS basic shades and 4 supplementary HKS LIS shades plus Print Varnish LIS 910, all 86 HKS colour fan K shades can be matched (see also Marabu-HKS colour fan). The mixing ratios according to HKS are included in the Marabu-ColorManager (MCM) software.

## 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 LIS PANTONE basic shades together with LIS 070, LIS 073, and Print Varnish LIS 910, 1147 colour shades of the PANTONE Colour Formula Guide can be mixed (see also 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 available

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
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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 476 97 429R	Process Yellow, highly fade resistant	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 611 10 428R	Process Yellow, highly fade resistant	
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	

For the yellow shade of 4-colour process prints subject to a medium to long-term outdoor use, it is always to use either the highly fade-resistant Yellow LIS 476 97 429R or LIS 611 10 428R (higher density, vacuum formability).

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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.

## Additives

Bronze Binder + Print Varnish:	LIS 910
Print Varnish (UV-Absorber):	LIS 911
Transparent Base:	LIS 408 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 (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 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 re-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.

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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 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 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

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

## Fabrics and stencils, mileage

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

One litre of Libraspeed LIS yields about 75 m<sup>2</sup> of printed surface with a dilution level of 15% when using a 120-34 mesh.

## Recommendation

The ink should be stirred well before printing.

## Labelling

For our ink type Libraspeed LIS 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.

## 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.