Ultrastar UVS

UV screen printing ink for PVC, PE and PP self-adhesive foils, rigid and soft PVC, polyester foils, adhesion foils, paper, pasteboard, cardboard

High gloss, quick cure, good opacity, high resistance to chemicals, versatile application, good weather resistance

Vers. 02
2004
19.Oct.

Field of Application

Substrates

The Ultrastar UVS is a universal and highly resistant UV screen printing ink which is suitable e.g for the following substrates:

-PVC self-adhesive and adhesive foils
-PE and PP self-adhesive foils, Corona-pre-treated or print varnished
-rigid and soft PVC
-print pre-treated polyester foils
-PVC adhesion foils
-paper, pasteboard, cardboard

For an optimal adhesion on the different substrates, various adhesion modifiers are available. How to use the adhesion modifiers, please see chapter "Auxiliaries" where they are described in detail.

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

Field of use

Ultrastar UVS is highly glossy and suitable for industrial label printing and as a universal ink type for graphic screen printing. As a result, the main use is on self-adhesive foils.

Characteristics

Ink characteristics

All UVS colour shades are very brilliant and high gloss with the best possible opacity.

Further characteristics:
-good flexibility of the printed ink film
-cutting and punching in the ink film possible
-high product resistance
-high mechanical resistance to abrasion
-good weather resistance for outdoor use
-can be overembossed with hot embossing foil
-Opaque White 170 for dark substrates
-not mouldable
-limited weldability

Adjustment of the ink

Ultrastar UVS is press-ready an must be stirred homogeneously before printing. Due to the various substrates, different printing machines, printing speeds, and UV dryers existing in the market, UVS can be modified with various additives in its reactivity, viscosity, and adhesion characteristics. For more detailed information, please see chapter ‘Additives and Auxiliaries’.

Curing

Ultrastar UVS is a fast curing UV-ink. A UV-curing unit with two medium pressure Mercury Vapour Lamps (capacity 80 - 120 W/cm) or one lamp (capacity 120-180 W/cm) will cure the UVS at a belt speed of 15 - 30 m/min. Opaque White UVS 170 and Opaque Black UVS 180 are drying more slowly (approx. 10 - 20 m/min) due to their high amount of pigments.

Generally, the hardening speed of the ink depends on the type of UV dryer (reflectors), number, age and capacity of the UV tubes, the printed ink thickness, colour shade, substrate and belt speed (number of passes) of the UV-curing unit.

Marabuwerke GmbH & Co. KG · Phone: +49-(0)7141-691- 0 · info@marabu-inks.com · www.marabu-inks.com

Ultrastar UVS

Ultrastar UVS is a slightly post curing UV ink. The ink film should pass a cross hatch tape test after having cooled to room temperature. Due to post-curing, the printed ink film achieves its maximum resistance to chemicals, as well as rub-resistance after 24 hours.

Fade resistance

Pigments of high fade resistance are used in the UVS range. If processed according to professional knowledge, all prints with basic shades or shade mixtures containing max. 20 % of white or varnish (fabric 140-34) are suitable for outdoor use of up to 3 years referred to the moderate Central European climate. Fade resistance can be extended to approx. 4 years if overcoated with Protection Varnish LA 331 15 911.

In the case special shade mixtures contain more than 50 % special binder or white, or the density of the printed ink film is reduced, and/or the print is used in a climate zone with more sun and UV-light, they have a reduced fade and weather resistance.

Stress resistance

After proper and thorough drying, the ink film exhibits outstanding adhesion as well as rub, scratch, and block resistance. It is highly resistant to solvents, alcohol, water and other usual fillers. UVS has a limited ability to be formed and cannot be moulded. Due to the low flexibility of UV inks, the UVS is not particularly weldable (preliminary trials are essential). For such applications, please refer to our more flexible Ultraflex UVF.

Fabrics, yield

The selection of fabric depends on the printing conditions, the desired hardening speed and yield, as well as the requested opacity. Generally, you can use all fabrics from 120-34 to 180-27 threads. For 4-colour process inks, we recommend fabrics between 150-27 and 180-31 (all in plain weave).

A high even stretching (>16 N) of the fabric is important allowing a smooth ink application.

The yield is about 60-80 sqm. per kg of ink depending on the chosen fabric and substrate.

Stencil

All commercially available capillary films (15-20 µm) or solvent resistant photo emulsions and combined stencils can be used for UV-inks.

Cleaner

The recommended cleaner is UR 3. Ink residues mixed with adhesion modifier must be removed from the screen immediately after printing.

Range

The UVS range consists of 13 monopigmented basic shades in the Ultracolor Colour System.

Basic shades

UVS 922	Light Yellow	UVS 952	Ultramarine Blue
UVS 924	Medium Yellow	UVS 956	Brilliant Blue
UVS 926	Orange	UVS 960	Blue Green
UVS 932	Scarlet Red	UVS 962	Grass Green
UVS 934	Carmine Red	UVS 970	White
UVS 936	Magenta	UVS 980	Black
UVS 950	Violet		

All shades are intermixable. Mixing with other ink types should be avoided in order to maintain the special characteristics of this outstanding ink range.

The basic shades according to System Tampacolor are included in our Marabu-ColorFormulator. They build the basis for the calculation of individual colour matching formulas, as well as for shades of the common colour reference systems Pantone®, HKS®, and RAL®.

All formulas are stored in the Marabu-Color Manager 2 (MCM 2) software.

Marabuwerke GmbH & Co.KG · Phone: +49-(0)7141-691- 0 · info@marabu-inks.com · www.marabu-inks.com

Ultrastar UVS

The pigments used in the above mentioned standard shades, based on their chemical structure, correspond to the EEC regulations EN 71/part 3, safety of toys - migration of specific elements.

Due to a possible direct contact with the mouth, however, **we do not recommend** to use this ink neither for baby bottles or toys, nor for food packaging in direct contact with food since the possible presence of residual monomers and degradation products of the photoinitiators cannot be completely excluded even if sufficiently cured.

For the print on packagings for food or consumer goods, we recommend a migration test of the finished product.

Further shades available

UVS 170	Opaque White
UVS 180	Opaque Black

Glossy 4-colour process shades

UVS 429	Process Yellow (Yellow)
UVS 439	Process Red (Magenta)
UVS 459	Process Blue (Cyan)
UVS 489	Process Black (Black)
UVS 409	Transparent Paste

Satin-gloss 4-colour process shades

4-clr inks with satin gloss and high reactivity according to Euro scale, very low odour

UVS 427 32 429	Process Yellow (Yellow)
UVS 427 33 439	Process Red (Magenta)
UVS 427 34 459	Process Blue (Cyan)
UVS 427 35 489	Process Black (Black)
UVS 418 87 409	Transparent Paste

Satin-gloss 4-colour process shades

4-clr inks, characteristics as above, especially for multi-colour printing lines

UVS 557 02 429	Process Yellow (Yellow)
UVS 560 15 429	Pr. Yellow, high fade resistant
UVS 557 03 439	Process Red (Magenta)
UVS 560 16 439	Pr. Red, high fade resistant
UVS 557 04 459	Process Blue (Cyan)
UVS 557 04 459	Pr. Blue, high fade resistant
UVS 557 05 489	Process Black (Black)
UVS 557 14 409	Transparent Paste

Additives

Special Binder UVS 904

-as bronze binder or printing varnish
-to increase cure speed
-to extend the ink

An addition of special binder UVS 904 (1-25 % parts by weight) accelerates the cure speed of colour shades but at the same time reduces opacity and weather resistance for outdoor use.

Protection Varnish LA 331 15 911

For long-term outdoor use, we recommend to overcoat the prints over the whole surface with the UV-absorbing Protection Varnish LA 331 15 911, 150-31 fabric. For a higher gloss of 4-colour process prints, we recommend a 140-34 fabric.

UVS 409 Transparent paste

Thixotropic auxiliary to aid 4-colour process prints, prints of fine lines or reverse printing. When adding transparent paste to 4-colour process inks, the density of the ink is reduced to match the original.

Bronzes

(to be mixed with Bronze Binder UVS 904)

S 181	Aluminium (6:1)
S 182	Rich Pale Gold (5:1)
S 183	Rich Gold (5:1)
S 184	Pale Gold (5:1)
S 186	Copper (4:1)
S 190	Aluminium, rub-resistant (6:1)

All figures in brackets are guidelines, which can be changed, depending on opacity and hardening speed. The ratio figures in brackets refer to the mixture bronze binder UVS 904 to bronze powder, the first figure stands for the parts by weight of bronze binder UVS 904. Due to the bigger pigment size of bronze pigments, we recommend a coarser fabric such as120-31.

Bronze mixtures cannot be put into storage for later use. Prepare fresh mixes daily (to be processed within 8 h).

Marabuwerke GmbH & Co.KG · Phone: +49-(0)7141-691- 0 · info@marabu-inks.com · www.marabu-inks.com

Ultrastar UVS

High-Gloss Bronze Pastes

Furthermore, five high-gloss bronze pastes are available to be mixed with UVS 904. The mixing ratio can be varied according to the required opacity, ink price, and curing conditions.

S-UV 191	High-gloss Silver (4:1 - 7:1)
S-UV 192	Rich Pale Gold (4:1 - 7:1)
S-UV 193	Rich Gold (4:1 - 7:1)

These 3 bronze mixtures can be stored for at least 6 months, they are glossy at an acceptable price and medium opacity.

S-UV 291	High-gloss Silver (4:1 – 10:1)
S-UV 293	High-gloss Rich Gold (4:1 – 10:1)

These both bronzes have a high gloss and a good opacity, they are very brilliant at a higher ink price and pot life of one day.

All figures in brackets are guidelines. The ratio figures in brackets refer to the mixture Special Binder UVS 904 to bronze paste whereas the first figure is standing for the parts by weight of UVS 904.

Due to the smaller pigment size compared to the above bronze powders, you can use finer fabrics between 140-31 and 150-31 with these pastes. For further information, please refer to our Technical Data Sheet 'High-gloss bronzes'.

Auxiliaries

Thinner UVV2

Thinner for reducing the print viscosity, for use on high-speed printing machines, and for processing printing bronzes.

Addition: **1 - 10 %** parts by weight

If an excessive amount is added, curing speed and surface durability of the printed ink film can be reduced. UVV2 thinner will be bonded chemically in the ink film during curing.

Adhesion Modifier UV-HV 1

UV-HV 1 can be added to the UVS, if adhesion problems arise. It is important to mix the additive carefully and homogeneously into the ink.

- To improve adhesion on coated papers and cartons (e.g. Chromolux)
- to improve adhesion on contaminated substrates
- UV-HV 1 is **not** suitable for printing onto plastic

Addition: **0.5 - 2 %** parts by weight

Ink UVS mixtures with UV-HV 1 cannot be put into storage for later use. Prepare fresh mixes daily (to be processed within 8 h).

Adhesion Modifier UV-HV 2

The addition of UV-HV 2 improves the adhesion on soft or rigid PVC and can avoid the necessity to preclean the substrate. UV-HV 2 also increases the curing speed of UVS.

Addition: **0.5 - 5 %** parts by weight

Please always check the intercoat adhesion of the ink and use as little UV-HV 2 as possible. Ink UVS mixtures with UV-HV 2 cannot be put into storage for later use. Prepare fresh mixes daily (to be processed within 8 h).

UV-HV 4 Adhesion Modifier

UV-HV 4 improves adhesion of UVS on very cross-linked substrate surfaces, as well as of heavily overcured colour shades when overprinting them. The best possible adhesion and scratch resistance is achieved after 12 to 24 h only (please carry out preliminary trials!).

Addition: **0,5 - 4 %** parts by weight
White 970 and 170: **2 %** parts by weight

UV-HV 4 must be stirred well into the ink. Ink mixtures cannot be put into storage for later use, please prepare fresh mixes (to be processed within 2 to 4 h).

Marabuwerke GmbH & Co.KG · Phone: +49-(0)7141-691- 0 · info@marabu-inks.com · www.marabu-inks.com

Ultrastar UVS

Accelerator UV-B1
Accelerates the curing reaction of the ink and increases the adhesion to the substrate owing to a better depth curing.

Addition: **1 – 2%** parts by weight

Accelerator UV-B2
Accelerates the curing speed, and increases the surface hardness of the ink further improving the degree of gloss.

Addition: **1 – 4%** parts by weight

Levelling Agent UV-VM
Auxiliary to rectify flow problems (e.g. bubbles etc.), which may be caused by residues on the substrate surface or wrong machine setting.

Addition: **0.5 - 1.5 %** parts by weight

Additions may affect intercoat adhesion.
UV-VM must be stirred well into the ink.

Thickening Agent STM
Auxiliary that enhances the ink viscosity without influencing significantly the gloss level.

Addition: **0.5 - 2 %** parts by weight

Stir well! The use of an automatic mixing machine is recommended.

Shelf life
Shelf life depends very much on the formula/reactivity of the ink system as well as the storage temperature. It is 2 years for an unopened ink, if stored in a dark room at a temperature of 15 to 25 °C. Under different conditions, particularly higher storage temperatures, the shelf life is reduced. In such cases, Marabu's warranty expires.

Labelling

For our ink type Ultrastar UVS 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 EEC regulations as to health and safety labelling requirements. Such health and safety data may also be obtained from the respective label.

Safety regulations for UV screen printing inks

UV inks contain skin irritating material, we therefore recommend that all UV-curing screen printing inks and auxiliaries should be handled with particular care. Skin polluted with ink must be cleaned immediately with water and soap. Follow the instructions given on the labels and in the Material Safety Data Sheets.

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.

Marabuwerke GmbH & Co.KG · Phone: +49-(0)7141-691- 0 · info@marabu-inks.com · www.marabu-inks.com