Ultra *Star-M* UVSM

UV Screen printing ink for PVC, pre-treated self-adhesive PE/PP films, polyester films, PS, PC, rigid PVC, paper, cardboard

Matt, fast curing, good opacity, high chemical resistance, versatile use

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Field of Application

Substrates

Ultra *Star-M* UVSM is suitable for printing onto the below mentioned substrates:

- Self-adhesive PVC films and rigid PVC
- Polystyrene, Polycarbonate
- Paper, cardboard, corrugated board
- Corona pre-treated PE/PP self adhesive films

The substrate surface must be absolutely free of disturbing residues such as grease, oil, and finger sweat.

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

Ultra *Star-M* UVSM is suited for versatile graphical and industrial screen printing applications.
When printing onto thin rigid PVC or PVC films, however, material embrittling of the printed ink film may occur (please carry out preliminary trials!).

Characteristics

All Ultra *Star-M* UVSM basic shades have a very evenly, matt appearance, as well as good opacity. The shades are not brilliant due to the matting agent.
The smell of the ink is nearly undetectable during printing, as well as after the curing process.

Ink Adjustment

Ultra *Star-M* UVSM is press-ready. The ink should be stirred homogeneously before printing and if necessary during production.

Hardener H 1 improves the ink's adhesion to the substrate.

Pre-reaction time
It is recommended to allow the ink/hardener mixture to pre-react for 15 minutes.

Pot life
The pot life (processing period) at room temperature (approx. 20°C) with hardener will be about 12-16 h. Higher temperatures reduce the pot life. If the mentioned times are exceeded, the ink's adhesion and resistance may be reduced even if the ink characteristics show no noticeable change. When using hardener, the processing and curing temperature must not be lower than 15°C as irreversible damage can occur. Please also avoid high humidity for several hours after printing as the hardener is sensitive to humidity.

Drying

Ultra *Star-M* UVSM is a fast curing UV-ink. A UV-curing unit with either two medium-pressure mercury lamps (80-120 W/cm) or one medium-pressure mercury lamp (120-180W/cm) cures Ultra *Star-M* UVSM at a belt speed of 10-25 m/min.

The curing speed of the ink is generally dependant upon the kind of UV-curing unit (reflectors), number, age, and power of the UV-lamps, the printed ink film thickness, colour shade, substrate in use, as well as the printing speed.

Ultra *Star-M* UVSM is a post-curing UV ink which will achieve its final adhesion and resistances after 24 hours. The ink film should pass a cross hatch tape test after having cooled down to room temperature.

Fade resistance

Pigments of medium to good fade resistance are used for the Ultra *Star-M* UVSM range. All

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shades are suitable for indoor and short-term outdoor use of 6 months, with reference to the middle European climate.

Stress resistance

After proper and thorough drying, the ink film exhibits outstanding adhesion as well as rub, scratch and block resistance, as well as good chemical resistance to alcohol (e.g 96% Ethanol) and customary cleaners. Ultra *Star-M* UVSM is only partly suitable for forming and is not suitable for deep-drawing.

Range

Basic Shades

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

High Opaque Shades

180	Opaque Black
181	Opaque Black

Further Products

409	Transparent Base
904	Special Binder

UVSM 180 Opaque Black

Opaque black with high opacity and a deep degree of black for printing speeds of up to 10-25 m/min. UVSM 180 is not suitable for embossing.

UVSM 181 Opaque Black

Highly reactive opaque black (10-35 m/min). If UVSM 181 is used on "stop-and-go" machines, no stripes will arise in the printed ink film due to UV-curing (important for flat bed label printing machines). Besides that, UVSM 181 shows an excellent receptivity when overprinting hot stamping and thermotransfer films. It is hereby essential (especially for printing motifs with very fine details) that the printed UVSM ink film is not over-cured which may otherwise lead to a loss of details.
The best matt effect is achieved either with a 150-31 or 165-31 mesh. If coarser fabrics (e. g. 120-34) are used, the printed ink film thickness will increase and result in a reduction of the matting degree.
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-ColorManager software.

We do not recommend this ink for toys due to the foreseeable contact with the mouth since the possible presence of residual monomers and decomposition products of the photo-initiators cannot be excluded even when sufficiently cured.

Metallics

Metallic Pastes

S 191	Silver	15-25%
S 192	Rich Pale Gold	15-25%
S 193	Rich Gold	15-25%
S-UV 191	Silver	15-25%
S-UV 192	Rich Pale Gold	15-25%
S-UV 193	Rich Gold	15-25%

These metallics are added to UVSM 904 in the recommended amount, whereas 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.
Owing to the smaller pigment size of Metallic Pastes it is possible to work with finer fabrics like 140-31 to 150-31.

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

Auxiliaries

H 1	Hardener	2%
UVV 2	Thinner	1-10%
UV-B1	Accelerator	1-2%
UV-HV 4	Adhesion Modifier	0.5-4%
STM	Thickening Agent	0.5-2%
UV-VM	Levelling Agent	0.5-1.5%
UR 3	Cleaner (flp. 42°C)	
UR 4	Cleaner (flp. 52°C)	
UR 5	Cleaner (flp. 72°C)	

Hardener H 1 is sensitive to humidity and is always to be stored in a sealed container. Hardener H 1 can be added for increased resistance and adhesion. Shortly before use, the hardener is added to the ink and stirred homogeneously. The mixture ink/hardener is not storable and must be processed within pot life.

The addition of thinner reduces the ink viscosity if necessary. An excessive addition of thinner will cause a reduction of the curing speed, as well as of the printed ink film's surface hardness. The thinner becomes part of the cross-linked matrix when UV-cured and may slightly change the inherent odour of the printed and cured ink film.

UV-B 1 accelerates the curing speed if necessary and may increase the adhesion to the substrate owing to a better depth curing. The addition of UV-B 1 may reduce the matt finish.

UV-HV 4 improves the adhesion on highly cross-linked substrates or when over-printing overcured colour shades. The best possible adhesion and scratch resistance is achieved after 12 - 24 h (preliminary trials are necessary!). UV-HV 4 must be stirred well into the ink.
Ink mixtures with UV-HV 4 are not storable, so we recommend to prepare mixtures which can be processed within 2-4 h.

The Thickening Agent STM enhances the ink's viscosity without significantly influencing the degree of gloss. Please stir well, the use of an automatic mixing machine is recommended.

The Levelling Agent UV-VM helps to eliminate flow problems which may arise due to residuals on the substrate's surface or incorrect adjustment of the machines. An excessive amount may reduce the ink's adhesion when overprinting. UV-VM must be stirred homogeneously before printing.

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

Selection of fabric depends on the printing conditions, the desired curing speed and ink mileage as well as the required opacity. Generally, fabrics of 120-34 to 180-27 can be used. A uniform screen tension (> 16 N) ensures even ink layers.
UV curable inks can be processed with all commercially available stencil techniques such as capillary films (15-20µ) or solvent-resistant photo emulsions.

Shelf Life

Shelf life depends very much on the formula/reactivity of the ink system as well as the storage temperature. It is 1 year 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

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purpose. 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 Ultra *Star-M* UVSM 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 the present EEC regulations as to health and safety labelling requirements. Such health and safety data may also be derived from the respective label.

Safety rules for UV printing inks
UV-inks contain some substances which may irritate the skin. Therefore, we recommend to take utmost care when working with UV-curable printing inks. Parts of the skin soiled with ink are to be cleaned immediately with water and soap. Please read the notes on labels and safety data sheets.

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