Ultra *Switch* UVSW

Marabu

UV-curable screen printing ink for membrane switches made of primed polyester foils and polycarbonate (PC)

Glossy, medium opacity, fast curing, flexible ink film, can be embossed

Vers. 6
2017
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Field of Application

Substrates

Ultra *Switch* UVSW was especially developed for the following substrates:

- Polycarbonate foils (PC)
- coated polyester foils

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 *Switch* UVSW is excellently suited for the printing of front panels/membrane switches, high-quality flat key pads, as well as for further operational control panels.
UVSW is, therefore, best suited for multi-layered ink layers with subsequent application of adhesive and stamping of the foil.
Combinations of UV-curable and solvent-based ink systems are possible if the bottom layer is printed with UVSW followed by an overprint with a solvent-based ink system like Mara® *Switch* MSW or Mara® *Star* SR.

Characteristics

Ultra *Switch* UVSW is glossy with low odour, and is block-resistant. It can be used on fast running presses such as flat bed or fully automatic cylinder machines with a printing speed of up to 1200 prints/h but is also suited for manual or semi-automatic machines.
Ultra *Switch* UVSW excels particularly with to its outstanding printability of fine details.

Recommendation

The ink should be stirred homogeneously before printing and if necessary during production.

Drying

Ultra *Switch* UVSW is a very fast curing UV-ink. A UV-curing unit with two medium-pressure mercury lamps (120 W/cm) cure UVSW at a belt speed of 20 m/min. The highly pigmented colour shades Opaque White 170 and Opaque Black 180 need a slower belt speed of max. 15 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.
UVSW is a slightly post-curing ink. The ink film will withstand a cross-cut tape test after having cooled down to room temperature.

Fade resistance

Depending on the colour shade, pigments of good to excellent fade resistance (blue wool scale 6-8) are used for the Ultra *Switch* UVSW range. All standard shades are, therefore, suitable for outdoor use of two years, with reference to the middle European climate.

Stress resistance

After proper and thorough drying, the printed ink film exhibits outstanding adhesion as well as rub, scratch, and block resistance. Furthermore, the UVSW is suited for post-processing steps such as stamping and cutting. UVSW is compatible with all common adhesives. After appropriate processing very high peel-off values > 15N are achieved.
For ink layers involving an overprint with Mara® *Switch* MSW or Mara® *Star* SR, it is essential that virtually all of the solvent residues have been eliminated from the printed ink film prior to the application of adhesives. Good pre-curing is also necessary.
Membrane switches manufactured in this way will display resistances of more than 2 million actuations according to DIN 42115.

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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

170	Opaque White
180	Opaque Black

Further Products

904	Special Binder
912	Overprint Varnish
913	Milky Matt Varnish

Attention: UVSW 912 (glossy-transparent) and 913 (anti-glare) are silicone-free window varnishes. For silicone-free products, it is important to use only thoroughly cleaned stencils, squeegees, ink pumps, as well as tubes (in the case of an automatic ink supply), and injectors for the manual ink filling of the stencil, etc. If cleaning is carried out with automatic screen washing systems, we recommend prior to printing an additional manual cleaning with a fresh cleaner not having had any contact with ink residues containing silicone. UVSW 912/913 are neither suited for overprinting or mixing with UVSW Ultracolor Shades. For colour mixes UVSW 904 Special Binder should be used.
UVSW 912 and 913 feature very high chemical and mechanical resistance.

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

Combination possibilities

UVSW is compatible with the other Marabu ink systems for membrane switches, Mara® *Switch* MSW and Mara® *Star* SR. They can be combined with the UV-curable Ultra *Switch* UVSW if the bottom layer is printed with UVSW, followed by an overprint with MSW or SR. Especially in combination with UVSW, we recommend to print the blocking layer with MSW 171 (Opaque White) or 182 (Block-out Silver). This gives you the flexibility to choose or combine UV-curable and solvent-based inks according to the respective requirements.

Metallics

Metallic Pastes

S-UV 191	Silver	15-25%
S-UV 192	Rich Pale Gold	15-25%
S-UV 193	Rich Gold	15-25%
S-UV 291	High Gloss Silver	10-25%
S-UV 293	High Gloss Rich Gold	10-25%
S-UV 296	High Gloss Silver	10-12.5%
S-UV 297	High Gloss Rich Pale Gold	10-12.5%
S-UV 298	High Gloss Pale Gold	10-12.5%

Metallic Powders

S 181	Aluminium	17%
S 182	Rich Pale Gold	20%
S 183	Rich Gold	20%
S 184	Pale Gold	20%
S 186	Copper	25%
S 190	Aluminium, rub-resistant	17%

These metallics are added to UVSW 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. Due to their chemical structure, the processing time of mixtures with Pale Gold S 184 and Copper S 186 is even reduced to 4 h. Owing to the smaller pigment size of Metallic Pastes it is possible to work with finer fabrics like 140-31 to 150-31.
Owing to the larger pigment size of Metallic

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Powders we recommend the use of a coarser fabric like 100-40.
Shades made of Metallic Powders are always subject to an increased dry abrasion which can only be reduced by overvarnishing. All metallic shades are displayed in the Marabu "Screen Printing Metallics" colour chart.

Auxiliaries

UVV 6	Thinner	1-5%
UV-B1	UV Accelerator	1-2%
UV-TA 1	Thickening Agent	0.1-0.5%
UR 3	Cleaner (flp. 42°C)	
UR 4	Cleaner (flp. 52°C)	
UR 5	Cleaner (flp. 72°C)	

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 liquid Thickening Agent UV-TA 1 increases the viscosity and improves the dot definition at higher processing temperatures.

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

All types of commercially available polyester fabrics and solvent-resistant stencils can be used. Typical mesh counts are 140-165 threads/cm.

Shelf Life

Shelf life depends very much on the formula/reactivity of the ink system as well as the storage temperature. It is 2 year(s) 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 purpose. The foregoing information is based on our experience and should not be used for specification purposes.
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 *Switch* UVSW 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 EC regulation 1272/2008 (CLP regulation). 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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