Maraswitch MSW

Screen printing ink for membrane switches made of polycarbonate and coated polyester foils

Satin gloss, good opacity, fast drying, flexible ink film, can be embossed, low odour

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Field of application

Maraswitch MSW is a solvent-based, fast drying, and block resistant screen printing ink.

Substrates

Maraswitch MSW was especially developed for the following substrates:

- polycarbonate foils (PC)
- coated polyester foils

Maraswitch MSW is also suited for the following substrates:

- ABS/SAN
- Polystyrene PS
- Rigid PVC
- Self-adhesive PVC foil
- PMMA (limited)
- PETG (limited)

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 as well as a sufficient adhesion.

Field of use

Maraswitch MSW is excellently suited for the printing of front panels/ membrane switches, high-quality flat key pads, as well as for further operational control panels. MSW is therefore best suited for a multi-layered ink build-up with subsequent application of adhesive and stamping of the foil.

Characteristics

MSW exhibits satin gloss, low odour, and good block-resistance. It can be used on fast running presses such as flat bed or fully automatic cylinder machines with a printing speed of up to 1400 prints/h but is also suited for manual or semi-automatic machines.

Maraswitch MSW excels particularly with its outstanding printability and mesh opening.

Drying

Fast physical drying system, can be overprinted within 5-10 min at 20 °C air temperature and is stackable after 20-30 sec at 60 °C in a tunnel dryer.
The times mentioned vary according to substrate, ink film thickness, drying conditions and auxiliaries used, e. g. the use of retarder.

Fade resistance

All pigments used for the MSW shades have a very high fade resistance according to DIN 16525 (wool scale 7-8) and are therefore suited for a medium-term outdoor use.
The pigments used are resistant to plasticizers and solvents.

Stress resistance

After proper and thorough drying, the printed ink film exhibits outstanding adhesion as well as rub, scratch, and block resistance. Post-processing procedures like stamping, forming, or die-cutting in the ink film are also possible.

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MSW is compatible with all common adhesives. After appropriate processing and a 72 h time period, very high peel-off values > 15N are achieved. It is essential, however, that virtually all of the solvent residues have been eliminated from the printed ink film prior to the application of adhesive. This can be done by an additional oven-baking of 30 min at 60-80°C.

Membrane switches manufactured in this way will display resistances of more than 2 millions of actuations according to DIN 42115.

Range

Basic shades – System Maracolor

920	Lemon	950	Violet
922	Light Yellow	952	Ultramarine Blue
924	Med. Yellow	954	Medium Blue
926	Orange	956	Brilliant Blue
930	Vermilion	960	Blue Green
932	Scarlet Red	962	Grass Green
934	Carmine Red	970	White
936	Magenta	980	Black
940	Brown		

*Attention: The colour shade 934 Carmine Red has an inferior fade resistance compared to the other basic shades and is thus more sensitive to direct solar radiation.

High-opaque shades

122	Light Yellow, high-opaque
130	Vermilion, high-opaque
152	Ultramarine Blue, high-opaque
162	Grass Green, high-opaque

All MSW shades are intermixable. MSW prints can be overprinted with SR, and vice versa. It is also possible to mix MSW and SR colour shades. Dependant upon on the ratio, however, the ink characteristics will change.

Combination with UV-Technology

MSW can also be combined with the UV-curable Ultraswitch UVSW if the bottom layer is printed with UVSW, followed by an overprint with MSW. Especially in combination with UVSW, we recommend to print the blocking layer with MSW 171 (Opaque White) or 182 (Block-out Silver).

Preliminary trials, especially in terms of the substrate quality, are always essential.

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 software.

Further shades / Additives

170	Opaque White (high opaque)
171	Opaque White
182	Block-out Silver
904	Special Binder

MSW 171 Opaque White is more opaque than MSW 970 and universally used for full-area applications.

MSW 170 Opaque White has a higher opacity than MSW 171 thanks to its high pigment content. Owing to this, the characteristics demanded such as e. g. stamping must be checked prior to printing. For a higher flexibility of MSW 170, MSW 904 Special Binder (approx. 10-20%) can be added. Please note, however, that this addition may decrease the opacity of the ink.

The flexible MSW 182 Block-out Silver is also high-opaque and used as a full-area printed blocking layer, impervious to light.

MSW 904 Special Binder is used for an individual addition to colour shades as well as for mixing bronze shades.

Transparent shades

Transparent shades are used for the printing of displays and are therefore highly transparent (no milky fog) at the best possible ink flow. The pigment quality is high and resistant to solvents and plasticizers.

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520	Transparent Yellow
536	Transparent Red
552	Transparent Blue
568	Transparent Green

Bronze shade, press-ready

197	Silver, medium-coarse

This press-ready silver has a medium-coarse pigmentation and can be used for further gold or coloured metallic effects by mixing it with transparent or basic shades.

Bronzes

Bronze powders

(to be mixed with Bronze Binder MSW 904)

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)

Bronze mixtures cannot be stored and must be processed in the course of 12 h.

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

High-gloss bronzes

Furthermore, 3 high-gloss bronze concentrates are available to be used by mixing them with Special Binder MSW 904.

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 the bronze powders, it is possible to work with finer fabrics of 140-31 to 150-34 at an acceptable price.
The recommended mixing ratio can be varied according to the required opacity and curing properties.
All figures in brackets are guidelines for mixtures with MSW 904 Special Binder while the first figure is standing for the parts by weight of MSW 904.

Bronze shades of high-gloss bronze concentrates exhibit a high weather resistance and only a small dry abrasion.
All bronze shades are shown in a bronze colour chart.

Auxiliaries

Thinner, mild	UKV 2
Retarder, fast:	SV 5
Retarder, slow:	SV 10
Retarding Paste:	VP (5-10 %)
Cleaner:	UR 3, UR 4
Adhesion Modifier:	ES (0.5-1 %)

To adjust the printing viscosity, it is generally sufficient to add 10-20 % thinner/retarder to the ink. For the printing of very fine details, we recommend to use Retarder Paste VP (5-10 %) or to proportionally add Retarder SV 10 (max. 5 %).
For an ink mixture containing retarder, only pure thinner should be used for additional thinning.

Printing modifier ES contains silicone. It can be used to rectify flow problems on critical substrates by adding 0.5 to 1 % max. by weight to the ink. Please weigh it exactly as 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.
We generally recommend to clean the tools immediately after printing.

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Fabrics, stencils

All types of commercially available polyester fabrics and solvent-resistant stencils can be used. Typical qualities are 77-120 threads/ cm.

Mileage

1ltr. of Maraswitch MSW yields about the following printed surface at a dilution level of 15%:

120-34 mesh: approx. 60 m²
90-48 mesh: approx. 45 m²
77-55 mesh:approx. 35 m²

Labelling

For Maraswitch MSW and its additives and 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.

Recommendation

The ink should be stirred homogeneously 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.

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