

Maraswitch MSW



Vers. 03
2006
6th Nov

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

Field of application

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.

For further information, see our latest Tech INFO „Update Membrane Switches“, issued in November, 2005.

Substrates

MSW displays excellent adhesion properties onto substrates common to this segment such as foils of polycarbonate (PC) and coated polyester.

As all the mentioned print substrates may differ in their printability due to varying surface tensions even within an individual type, preliminary trials are essential to determine the suitability for the intended use.

Characteristics

MSW exhibits a satin gloss, 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.

Maraswitch MSW excels particularly due to 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.

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.

Maraswitch MSW



Fabrics and 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 m ²
90-48 mesh:	approx. 45 m ²
77-55 mesh:	approx. 35 m ²

Range

Basic shades

(see shade card System Maracolor)

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

For higher requirements, the following highly fade-resistant special colour must be used which is colorimetrically deviating from the 934 standard shade:

MSW 625 00 934RH	Carmine Red, highly fade-resistant
------------------	---------------------------------------

High-opaque shades

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

All MSW shades are intermixable. It is also possible to mix them with colour shades of the Marastar SR ink series even if the ink characteristics may vary according to the percentage of MSW or SR added. Preliminary print tests are therefore essential.

The printing sequence of pure MSW and SR shades (if overprinted or pre-printed) can also be done as required. We recommend, however, to use MSW as the final layer owing to higher peel-off values of the adhesive.

The 17 basic shades according to System Maracolor 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 2.2) software.

The pigments used in the below mentioned 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 therefore suited for printing onto toys.

Further shades available

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

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

MSW 170 Opaque White is more opaque than MSW 171 and has a very high pigment content. Due 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.

Maraswitch MSW



The flexible MSW 182 Block-out Grey 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.

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

Bronze shades

MSW 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.

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. 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 MSW 904 to bronze powder or bronze concentrate whereas the first figure is standing for the parts by weight of Bronze Binder MSW 904.

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 (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 the bronze powders, it is possible to work with finer fabrics of 140-31 to 150-34 at an acceptable price. 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 special bronze shade card.

Auxiliaries

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

To adjust the printing viscosity, it is generally sufficient to add 10-15 % 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.

Maraswitch MSW



Cleaning

Cleaner UR3 is suitable to clean the screens and working equipment. We recommend to clean the tools immediately after having finished the printing process.

Recommendation

Each printing ink must be stirred well and homogeneously. The additives will separate in the ink, especially when stored for a longer time.

Labelling

For Maraswitch MSW 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 55°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.