NEW MUSKETEER MTR

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Constant development of UV-curing screen printing inks combined with a variety of new raw materials enabled our lab technicians to formulate a new UV-curing system, suitable for deep drawing applications. The name of this new crucial development is MUSKETEER MTR.

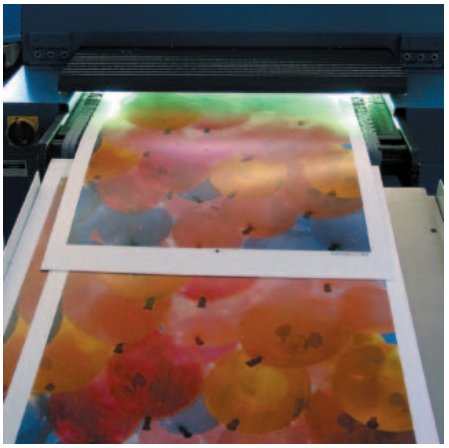
Perhaps readers of this article may now ask, how we came up with the name MUSKETEER. Actually it is quite simple. This name comes from the three or four famous MUSKETEERS and their slogan "One for all, all for one!" And this phrase clearly defines the quality of this ink range.

Print run with process inks

MUSKETEER MTR is an ink system for a variety of applications and a broad range of substrates. Nevertheless one should never make the mistake and define this or any other screen ink system as a universal system.

In the production of formable screen displays printers still use solvent-based inks to a large extent. For some years now screen ink manufacturers have been looking for a solvent-free, UV-curing ink system with optimal processing properties. In 2001 Coates Screen already offered the VACUPLAST VAC. This system was basically suitable for deep drawing applications, however, the main problem with that ink type were unsatisfactory printability properties combined with low reactivity. Solving these two deficiencies was the main aspect in the development work of MUSKETEER MTR. Reactivity, i.e. curing property of the ink, was significantly improved and printability of this ink range is excellent.

MUSKETEER MTR shows adhesion on PMMA, polycarbonate, polystyrene and PET-G. Printing and deep drawing tests of multi-layer prints gave excellent results.



UV-curing

DESCRIPTION OF INK RANGE MUSKETEER MTR:

PROPERTIES

MUSKETEER MTR is a UV-curing, multi-purpose ink range for various plastics. The printed parts can be deep drawn.

APPLICATION

Elasticised and rigid PVC, polystyrene, acrylic glass, polycarbonate as well as some types of PET. Properties of plastics of various manufacturers are often quite different. Thus suitability of the ink has to be evaluated prior to production. Also check, if the prints are stack proof before starting a print run.

PROCESSING

MUSKETEER MTR can easily be processed in artificial light conditions. Avoid direct sun light. Flow of MUSKETEER MTR line colours is smooth, surface is glossy. Process inks show semi-gloss. These inks come in a ready-to-print adjustment, usually thinning is not necessary. Commercial UV-thinners must not be used as they may affect deep drawing properties. If necessary thin with MTR/V.

DRYING

MUSKETEER MTR only cures under UV-radiation. The curing time depends on number, type, power and distance of the UV-radiators as well as on ink deposit which depends on screen fabric. Curing energy is approx. 250-300 mJ/cm^2 (measured with Kühnast UV-Integrator). This corresponds to a UV-dryer with two radiators (120 W/cm, distance 10 cm), belt speed of approx. 20 m/minute, 150-31 fabric. As the ink is not totally cured after this time one should wait about 2-3 hours before starting any further chemical and physical tests/processing.

As all UV curing ink types, the ink is completely cured after 24 hours.

SCREEN FABRIC

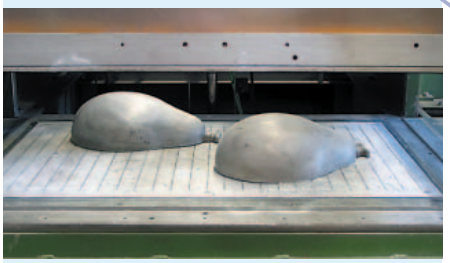
All commercial screen fabrics can be used, e.g. polyester fabrics between 120-34 and 150-31 threads/cm.

SQUEEGEE

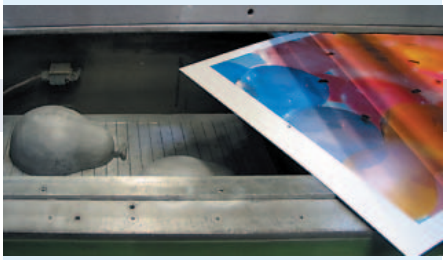
Squeegees made of hard rubber or plastic are suitable. We recommend squeegees with a hardness of 60-75° shore A.

STENCILS

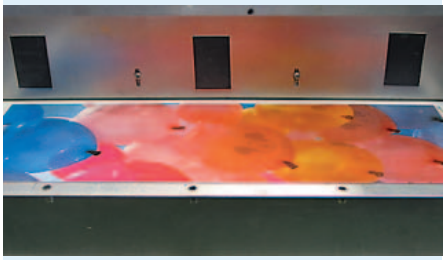
All solvent-resistant stencils are suitable.



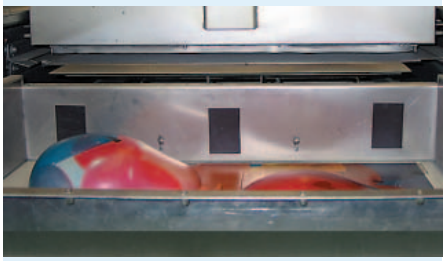
Set up deep drawing form



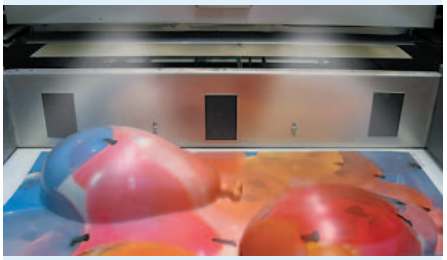
Insert printed sheet



Warming up of printed sheet



Forming process



Foil cooling down

Removal of formed parts

OUTDOOR EXPOSURE

Accelerated weathering tests have been carried out. Those tests indicate outdoor resistance of approx. 2 years in moderate climates.

Further processing with band saw

AVAILABLE COLOURS

Line colours of the C-MIX 2000 range, process colours according to Europe scale.

MUSKETEER MTR –

A MULTI-PURPOSE INK SYSTEM

During the development of this UV-curing ink range we mainly concentrated on properties like suitability for thermo-forming and deep drawing applications – and high reactivity.

Expectations regarding these properties and requirements were fully met. High quality prints with line and process colours on thermoplastics followed by forming applications can be achieved.

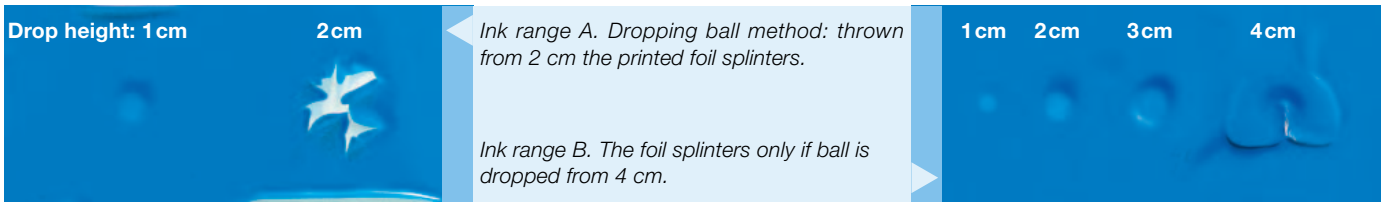
When taking an intensive look at such developments and their daily screen applications you will surely find further most interesting properties. At any rate that was the case with Musketeer MTR. Just think of substrates such as rigid PVC foils. Unfortunately, with these materials one often has the problem that the foil material becomes brittle when using rigid, highly cross-linking UV-inks. Sometimes even to such an extent that printed foils break or shatter like glass under low mechanical stress.

Using MUSKETEER MTR for such substrates there is hardly any or only a small extent of brittleness of rigid PVC materials. Naturally one has to consider using suitable, UV-resistant substrates.

Plasticized PVC-foils of various qualities have always been one of the classic and simple substrates for screen applications. However, use of UV-inks on that group of substrates is always problematic. On one hand there is the risk of edge curl of plasticized PVC foils, which is partially initiated by material tensions within the substrate and often partially increased by quite a high polymerisation shrinkage of the screen ink film. This polymerisation shrinkage during curing of the MUSKETEER MTR is extremely low compared to other highly cross-linking UV screen inks. Thus edge curl of printed foils and partially even of bonded large format foils is avoided completely.

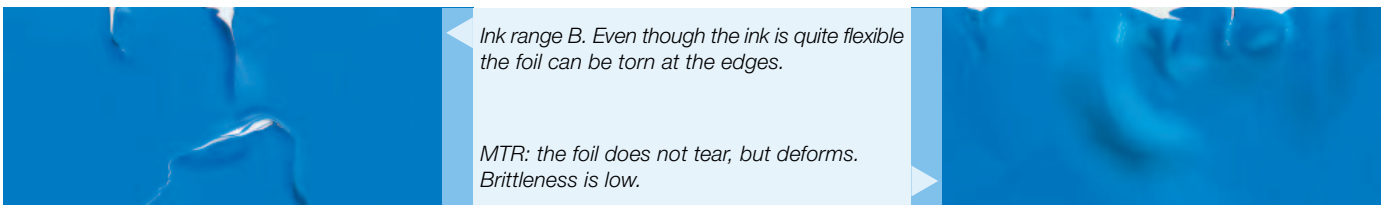
When printing plasticized PVC foils – especially low-priced ones – with UV-curing inks, one often experiences the problem of dramatic decrease of the tear resistance of the printed foil. There is an especially high decrease of that tear resistance when printing large colour surfaces onto foils with process inks. Although this phenomenon is influenced by quality and stability of the ink, naturally the screen ink itself also has quite an influence. PVC foils printed with process colours and also line and surface colours of MUSKETEER MTR inks will show a maximum of tear resistance.

A great variety of daily screen jobs can be done with MUSKETEER MTR inks. MUSKETEER MTR inks are suitable for many thermoplastics. For further details please refer to the product data sheet MUSKETEER MTR. MUSKETEER MTR inks are also suitable for the production of formable, i.e. three-dimensional displays. MUSKETEER MTR can be used for screen printing of adhesive foils and rigid PVC foils and naturally also for paper and cardboard. Use of such a multi-purpose ink system is quite cost efficient for many screen printers. In addition use of the base colours of C-MIX-2000 allows matching of any desired colour shade with MUSKETEER MTR inks.



Ink range A. Dropping ball method: thrown from 2 cm the printed foil splinters.

Ink range B. The foil splinters only if ball is dropped from 4 cm.

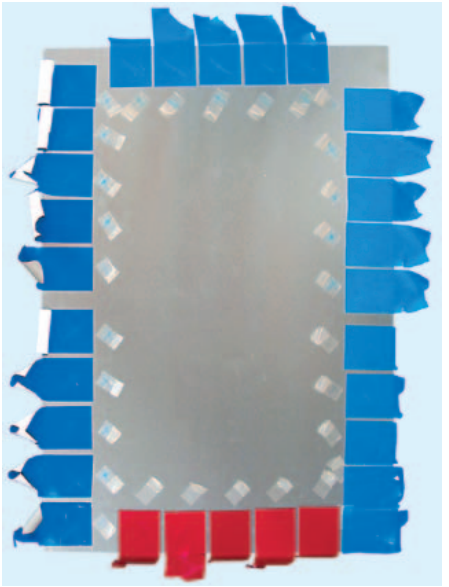


Ink range B. Even though the ink is quite flexible the foil can be torn at the edges.

MTR: the foil does not tear, but deforms. Brittleness is low.

Interested in this new development MUSKETEER MTR? Please ask your dealer or us for samples. Naturally our technicians will also be happy to demonstrate this product in our applications department or in your company.

Various ink ranges printed on different types of self-adhesive foils. Some inks show a high tendency to edge curl. In addition to the ink type tearing resistance strongly depends on the substrate.



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