Preliminary Technical Information
9/2019

Test Product

# NoriCure® IMS US

UV Curable Screen Printing for IMD/FIM Applications

## Area of Application

**NoriCure® IMS US is a thermo- or high pressure-formable UV curing screen printing ink for printing on the second surface of polycarbonate (PC).**

**Important note:**
**NoriCure® IMS US must be overprinted with a suitable adhesion promoter (= tie-coat) for IMD/FIM applications! For details, please refer to paragraph "Overprinting with Adhesion Promoter/Tie-coat".**

## Printing Substrates

**Preferentially polycarbonate, e.g. Makrofol® DE 1-1. It must be determined by precise and adequate testing, whether the ink is suitable for other materials such as pre-treated polyester (PET).**

## Characteristics of NoriCure® IMS US

- formable, e.g. by thermo forming or high pressure forming
- high gloss
- easy processability (press-ready formulation)
- unlimited screen open time
- excellent adhesion to tie-coat AquaPress® CA as well as NORIPHAN® XMR

The ink system is NVP and NVC free as well as solvent free.

## Color Shades

| | | |
|---|---|---|
| **Basic Colors** | 092 Blending Lacquer Colorless | 467 Pink Transparent |
| | 108 Citron | 472 Violet |
| | 112 Yellow | 570 Deep Blue |
| | 171 Yellow Transparent | 669 Green Transparent |
| | 312 Red | 945 White |
| | 318 Red Transparent | 948 Black |
| **Process Inks** | 156 Process Yellow | 558 Cyan |
| | 357 Process Magenta | 949 Process Black |

## Mesh

Polyester fabrics recommended.

- Process Inks: 150 – 180 threads/cm (380 – 460 threads/inch)
- Basic Colors: 150 threads/cm (380 threads/inch)

## Stencil

UV ink and solvent resistant emulsions must be used. Excellent results during long production runs are achieved by using Pröll Diazo-UV-Polymer Emulsion Norikop 10 HQ.

## Squeegee

All commercially available squeegees with an average hardness of 75° up to 80° Shore A.

## Light Fastness

High quality pigments are used for NoriCure® IMS US Basic Colors.

## UV Curing

Guideline: For curing UV screen printing inks, which were printed with a mesh 150-31 Y (380 threads / inch), a UV dose of approx. 300 mJ/cm² is necessary (measured with a Kühnast UV-Integrator, spectral range: UV 250 – 410 nm, max. 365 nm). A UV curing unit with medium-pressure mercury bulb (e.g. 2 x 120 W/cm) can be used.
The UV dose for sufficient curing depends on color shade, ink layer thickness (printing mesh) as well as the type and color of the substrate. Depending on such parameters the dose must be adjusted.

## Post-curing

Printed NoriCure® IMS US ink layers post-cure even without UV light. The optimum product characteristics are achieved not before the curing process is finished (approx. 24 – 48 hours).

## Processing

Direct sun light on open ink cans or on the ink in the stencil must be avoided!

## Overprinting with Adhesion Promoter/Tie-coat

NoriCure® IMS US without adhesion promoter is not suitable for IMD/FIM applications. Therefore, it is absolute mandatory to overprint the ink with a tie-coat. Two options are possible: Overprinting with a solvent-based **(1)** or water-based **(2)** system.

**(1)** Pröll NORIPHAN® XMR is a **solvent-based** two-component screen printing ink for IMD/FIM technology (In-Mold-Decoration/Film Insert Molding) for printing on PC films, PC blend films, PET films and PP films as well as scratch resistant surfaces after pre-tests.
NORIIPHAN® XMR shows the following features:

- extremely high wash out resistance
- extremely high cohesion in compound
- low odor
- optimized adhesion on PC films
- formable
- high electrical resistance in capacitive field (suitable for touch panel applications)

NORIPHAN® XMR is an **ink system with many color shades** available, whereas the water-based tie-coat AquaPress® CA is colorless transparent. This means, when using NORIPHAN® XMR, e.g. white, black, colorless transparent color shades can be printed. Several layers can be printed as well.

After overprinting with NORIPHAN® XMR and NORIPHAN® HTR N, NoriCure® IMS US can be back molded.

To achieve best results regarding washout and adhesion, we recommend overprinting the last layer NORIPHAN® XMR with NORIPHAN® HTR N (this should be done within one day (8 h) and post-drying should follow without delay)!

Special attention should be paid to drying of the last NORIPHAN® XMR layer as area print, which should not exceed 5 min. at 80 °C (175 °F) for good interlayer adhesion between NORIPHAN® XMR and NORIPHAN® HTR N. Consequently, the racks should be moved out of the oven right away after this drying period.

For further information concerning printing, tips on drying, processing etc. the corresponding Technical Information NORIPHAN® XMR is also basically valid.

**(2)** Pröll AquaPress® CA is a **water-based** two-component screen printable adhesion promoter for film lamination applications and IMD technology (back molding of screen printed films).

AquaPress® CA is **colorless transparent** and shows the following features:

- excellent adhesion to many plastic surfaces
- high flexibility and good forming properties
- good lamination properties and therefore good peel strength

After overprinting with AquaPress® CA, NoriCure® IMS US can be back molded.

For further information concerning printing, tips on drying, processing etc. the corresponding Technical Information AquaPress® CA is also basically valid.

## Printing Sequence (referring to the last paragraph)

### (1) NORIPHAN® XMR as adhesion promoter:

To achieve good peel strength, NoriCure® IMS US (UV curing after each printing step), should be overprinted with minimum two layers of NORIPHAN® XMR (recommended mesh: 77 threads/cm; 195 threads/inch), followed by minimum one layer NORIPHAN® HTR N.

### (2) AquaPress® CA HT as adhesion promoter:

To achieve good peel strength, minimum of two prints of NoriCure® IMS US (UV curing after each printing step) are recommended, followed by a single print of AquaPress® CA HT (recommended mesh: 77 threads/cm; 195 threads/inch), if the backmolding resin is PC. In case of ABS, AquaPress® CA HT is recommended.

## Backmolding

NORIPHAN® XMR / NORIPHAN® HTR N as well as AquaPress® CA can be back molded with the following plastic resins (IMD/FIM process):

- Polycarbonate, e.g. Makrolon® 2405

## Cleaning of Screens and Utensils

UNI-REIN A III or UNI-CLEANER FP61

## Shelf Life

The shelf life stated on the label assures the ink's quality and refers to unopened original cans stored in a dry place at temperatures between 5 °C (40 °F) and 25 °C (75 °F).

## Safety Precautions

UV inks which have not been cured may have an irritating and sensitizing effect to the skin and may cause allergic, hypersensitive reactions. Please use an accurate and clean working method when processing UV inks and auxiliaries. You should wear suitable personal protection equipment (gloves, safety goggles, working clothes)!

Uncured sheets are considered special waste and should therefore be cured under UV light before disposal. Please pay attention to the respective safety data sheets.

Supplementary information regarding the safe use of UV inks/lacquers can be found in the brochure "UV-Drying", of the Berufsgenossenschaft Energie Textil Elektro Medienerzeugnisse, Gustav-Heinemann-Ufer 130, 50968 Köln, can be downloaded from https://medien.bgetem.de/medienportal/artikel/TUIwMzQ-

## Important

Allow the ink as well as all the auxiliaries to be added to adjust to room temperature in the closed container before use.

Printing results, to a large extent, depend on the substrate as well as the printing and application conditions. We recommend checking your printing materials under your conditions of use prior to any production runs. Materials that are supposed to be identical may vary from manufacturer to manufacturer and even from batch to batch. Some substrates and printing inks may have been treated with or contain sliding agents, antistatics or other additives which will impair the adhesion of the ink.

Ink adhesion on the printed substrates have to be tested. Also the formability of the printed substrate has to be checked.

The curing of UV systems is influenced by the output and the emission spectrum of the UV bulb, thus affecting the adhesion of the cured ink film.

This is a test product which is still in development. For this reason, no assurances are currently given as to type conformity, processability or long-term performance characteristics. Therefore, the customer uses the product entirely at their own risk with no guarantee.

Before starting a production run, it is necessary to test samples of each newly designed part systematically with regard to the specifications for the intended use (e. g. climatic chamber, resistance, etc.).

**The suitability of the product for a particular project has to be checked individually by extensive pre-tests.**



This information supersedes all previous technical information.