Test Product

NORIPHAN® HTR N 093/800 and versions

Light Scattering Lacquer for IMD/FIM-Technology (film back-injection technology)

Area of Application

NORIPHAN® HTR N 093/800 is a solvent-based one-component screen printing lacquer based on decoration ink system NORIPHAN® HTR N. Further versions can be configured to different requirement profiles.

Characteristics

Films printed with NORIPHAN® HTR N 093/800 and versions have a whitish, diffuse appearance with a high light scattering effect and high transmission at the same time. Efficient homogenization of point light sources with high light output opens a new level of light design options.

In automotive exterior bezels with ambient lighting, luminescent shapes can be integrated into panels with large dimensions.

Interior panels with lighting applications also benefit from the unique homogenization of the light source in the screen printing design.

All other properties of the NORIPHAN® HTR N color system for printing, forming, and back-molding remain unchanged (see Technical Information NORIPHAN® HTR N).

Films

PC film: **Makrofol®**[1]

Light Scattering

Film: Makrofol® DE 1-1, 250 µm	Layering: 2x 100-40 threads/cm (255-40 threads/inch)	
Half Power Angle HPA	Average approx. 30 °	according to DIN 5036
Transmission	Average approx. 80 %	ASTM D1003

Mesh Count

Polyester mesh 77-48 threads/cm to 120-34 threads/cm (195-48 threads/inch to 305-34 threads/inch).

Preferably coarse fabric or higher lacquer layer thickness to increase the light scattering effect

Stencil

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

[1] Makrofol® is a registered trademark used by Covestro AG, Germany

Auxiliaries

All of the auxiliaries mentioned below are free of halogens (HF).

Thinner

Thinner F 013 (fast)
Thinner M 201 (medium)
Thinner S 403 (slow)

Retarder Pastes

NORIPHAN® HTR N 097/002
NORIPHAN® HTR N 097/005 (fast)
NORIPHAN® HTR N 097/006 (medium)
NORIPHAN® HTR N 097/007 (slow)

Auxiliaries may be mixed with each other in any desired proportions.

Only Thinner F 013 and Thinner M 201 should be used for large printing areas.

Recommended addition of thinner: 15 – 20 %.

Antistatic-Additive

NORILIN® C to prevent static charging.

Addition: 0.5 %

Defoamer

Defoamer 5702 to prevent any possible flaws in color gradient (craters, bubbles). Adding too much Defoamer 5702 causes white spots.

Addition: max. 0.5 %

Cleaning of Screens and Utensils

UNI-REIN A III

Drying

NORIPHAN® HTR N is a physically curing ink system which dries through evaporation of the solvent in a tunnel dryer.

Note:
To protect PC films from extensive solvent attack, tunnel dryers should be used also for small trial runs. Rack drying is not recommended (cracking!).

Tips on Drying

Drying performance can be improved by:

- drying at higher temperatures
- use of infrared rays (from second heating compartment on)
- completely opened exhaust air valve – good air exchange.
-

The following settings are recommended for use with 3 zone dryers:

- First Zone: 80 °C (175 °F).
- Second Zone:
  The maximum drying temperature for processing pure PC films (Makrofol®) is 100 °C (210 °F). If additional infrared emitters have been installed in the second compartment, they may be used to increase the efficiency of the drying operation.
- Third Zone: For cooling down to ambient temperature.

Drying results depend on the combination of thinner and retarder paste along with the thickness of the ink layer.

Conditioning / Post-curing

Complete evaporation of solvent residues in ink and film is necessary for further processing of printed films in the IMD/FIM process.

Thinner residues can lead to washout during the back molding process, or damage during the climatic test or use of the end product.

Fully benefiting from NORIPHAN® HTR N's superior properties (adhesion, suitability for back molding, etc.) requires guaranteeing an absolute minimum of solvent residues.

Post-curing is done after printing the last ink layer; the ideal conditions for each product must be determined individually.

For best results, dry separately on a rack in a well ventilated box oven with air exchange.

Conditions:
Post-curing at 75 – 90 °C (165 – 195 °F) for 1 – 5 hours.

Bonding Strength

The adhesion of a film/ink/plastic bonding system depends on a number of variables (production, process, and structure of compound). For this reason, specific tests with respect to individual requirements are essential.

For good adhesion, at least **2 fully covering layers of NORIPHAN® HTR N** should be printed. The first layer can be composed of almost fully covering graphic motifs.

Safety Precautions

NORIPHAN® HTR N inks are inflammable. Smoking or open flames are strictly prohibited during use of these products.

Processing NORIPHAN® HTR N inks requires normal hygiene in the workplace.
Please see recommendations on label and read the material safety data sheets before use.

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).

Important

Allow the ink as well as all the auxiliaries to be added to adjust to ambient 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 may have been treated with or can contain sliding agents, antistatics or other additives which will impair the adhesion of the inks.

It is not always possible to produce a given part using IMD/FIM technology.

The resins used for back molding IMD/FIM ink systems are supplied as commercial technical products. They are different in chemical composition as well as the content of additives. Process parameters will also influence the quality of the finished IMD/FIM parts.

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.).