



Norilux[®] DCAL-6

abrasion resistant, chemical resistant
formable Dual-Cure Protective Lacquer

Area of Application

Norilux[®] DCAL-6 is a formable, abrasion resistant dual-cure screen printing lacquer. Norilux[®] DCAL-6 can be used as first surface protective lacquer/hard coat on metal substrates, for example aluminum. The ink systems NoriScreen[®] ALU and NoriPUR[®] can be overprinted with Norilux[®] DCAL-6 as a protective lacquer. It is possible to create matt-glossy-effects on one part with this lacquer system. The over-printability as well as subsequent process steps must be tested thoroughly on each part.

Cured lacquer layers of Norilux[®] DCAL-6 are resistant to chemicals and pass various "creme tests" of the automobile industry.

Norilux[®] DCAL-6 is ideally suited for first surface coating for 2D and 3D applications.

Characteristics

Norilux[®] DCAL-6

- can be used for overprinting silicone free UV, solvent and water-based screen printing inks (pre-tests required)
- is formable, e.g. by high pressure forming or thermo forming
- shows excellent abrasion resistance
- shows excellent resistance to chemicals
- is available in a high gloss and a matt version (DCAL-6/001 and DCAL-6/002)
- further gloss levels are available upon request
- translucent/tinted lacquers are available
- versions containing levelling agents based on silicone compounds are available on request
- effect lacquers (e. g. sparkling effect) are available upon request
- is processible as 2K or 3K system (depending on substrate, an adhesion promoter may be necessary)

Mesh

To achieve a sufficiently thick layer of lacquer, depending on the forming depth a fabric of 90-40 threads/cm (230-40 threads/inch) or coarser is recommended.

Stencil

Solvent resistant emulsions must be used. Excellent results during long production runs are achieved by using Pröll emulsion Norikop 11.

Printing Sequence

Two options:

- 1) "Pre-print": Printing one layer as a primer, for example NoriScreen[®] ALU or NoriPUR[®], and subsequent overprinting of the dried primer layer (cf. separate corresponding Technical Information Sheets) with Norilux[®] DCAL-6.
- 2) "Direct print": The protective lacquer is printed directly onto the metal substrate (without a primer). Adding 10 % adhesion promoter NoriCure[®] HV-M to the homogenized Norilux[®] DCAL-6 / Hardener 036-mixture (please also see chapter **Hardener**) is necessary.

Norilux® DCAL-6

Processing

Please note:

Before processing, Norilux® DCAL-6 must be homogenized well by stirring.

Norilux® DCAL-6 may only be processed in areas without UV light, prior to UV curing. Invisible UV rays from sunlight as well as UV rays from artificial light sources (e.g. fluorescent lamps) have to be avoided.

Necessary equipment is available from EncapSulite® International Inc., Rosenberg, Texas, or EncapSulite European Office, Cologne, Germany. Making use of the following UV blocking products is especially recommended:

- UV-Stop Security Fluorescent Tubes, trade name "UV-Shrinkwrap Tube / Type C20" (clear), cut off point at 400 nm
- UV absorbing sleeves, trade name "UV-Safety Sleeve / Type C20 – clear", cut off point at 400 nm
- UV filter film, available in rolls for window application, trade name "EncapSulite UV-Filter C10"

Further information can be found on www.encapsulite.com or www.encapsulite-europe.com.

Hardener

Please note:

Before use, Hardener 036 must be homogenized well by shaking.

Stirred up Norilux® DCAL-6 is mixed homogeneously with shaken **Hardener 036** before printing.

Mixing ratio 10 : 1

e.g. 1 kg Norilux® DCAL-6 : 100 g Hardener 036

Please note: It may prove necessary to add **10 %** adhesion promoter **NoriCure® HV-M** to this mixture. Depending on the substrate and its pre-treatment, processing without adhesion promoter might be possible.

Pot life: 8 hours (with or without adhesion promoter), depending on temperature and humidity.

Drying

The Dual-Cure System Norilux® DCAL-6 dries by evaporation of the solvents in jet dryers.

Please note:

To protect PC films from solvent attacks, even for small print runs jet dryers should be used.

Before UV curing, printed Norilux® DCAL-6 layers must not be stacked. Therefore, the uncured sheets should be stored separately in a rack after jet drying.

To prevent decomposition reactions, the drying temperature must not exceed 100 °C (212 °F).

Drying results depend on the thickness of the lacquer layer.

Conditioning / Post-curing

Before further processing, the printed films must be dried at 80 °C to 100 °C (176 °F to 212 °F) for 30 minutes.

Minimizing solvent residues is necessary for Dual-Cure Lacquer Norilux® DCAL-6 to achieve its outstanding properties.

Forming

The overall geometry of the part as well as the selection of the forming technology (e.g. high pressure forming or thermo forming) has an important influence on the forming result.

UV curing

Norilux® DCAL-6 is UV cured using a high-output mercury bulb > 120 W/cm (300 W/inch).

Depending on the thickness of the lacquer layer, a UV dose of at least 2 000 mJ/cm² (13 000 mJ/sq inch) is necessary (Kühnast UV-Integrator, UV 250 to 410 nm, max. 365 nm). The higher the UV dose, the better the scratch and abrasion resistance.

Subsequently, processing of the substrate with the cured lacquer film can be continued: die cutting, trimming etc.

Please note:

As is typical for two-component and UV curing inks, the final, optimum product characteristics such as chemical and abrasion resistance are achieved not before the curing process is finished (approx. 1 week at ambient temperature).

Cleaning of Screens and Utensils

Screens and utensils can be cleaned with UNI-REIN A III or UNI-CLEANER FP61.

Shelf Life

The shelf life stated on the label assures the product'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).

Opened containers of hardener must be tightly sealed immediately after use as the hardener reacts with moisture in the air.

Safety Precautions

The abrasion resistant Dual-Cure Lacquer Norilux® DCAL-6 is inflammable. Smoking or open flames are strictly prohibited when using this product.

Processing Norilux® DCAL-6 requires usual industrial hygiene measures. Please see recommendations on the label and read the material safety data sheets before use.

Important

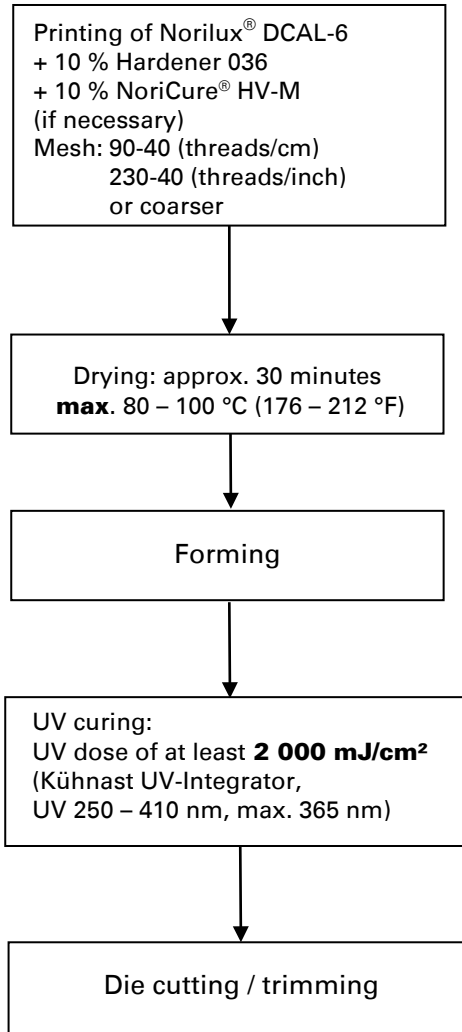
Allow the lacquer as well as all the auxiliaries to be added to adjust to ambient temperature in the closed container before use.

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 and printing inks may have been treated with or contain sliding agents, antistatics or other additives which will impair the adhesion of the lacquer.

When using Norilux® DCAL-6, the compatibility between the lacquer and the ink system to be overprinted must be tested. Trials concerning adhesion and abrasion resistance as well as the suitability for further processing or converting steps are necessary.

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.).

Flowchart



The information contained in the technical information/instruction sheets or other product information sheets is based on product testing conducted by Pröll. Because printing and environmental factors critically affect each individual ink application, the above mentioned information and instructions represent only general recommendations concerning product characteristics and directions for use and should not be construed as representing express warranties regarding the product. The information and instructions in no way release the purchaser from his obligation to verify and test the inks and their application for the specific request, regarding: product characteristics, weather resistance, mixing proportions, gloss, thinning, special mixtures, printability, drying speed, cleaning, effects on or of other materials to be contacted and safety precautions. All details contained in the instruction sheet "General Information on Screen Printing Inks" are to be considered. The further manufacture and use of products containing our inks by the purchaser takes place beyond our control, and the responsibility for further application and use of our product resides solely with the purchaser. Pröll disclaims any warranties, express or implied.

This information supersedes all previous technical information.