



Proell KG
P.O. Box 4 29
D-91773 Weissenburg i. Bay.
Germany
Phone: +49 9141 906-0
Fax: +49 9141 906-49
E-mail: info@proell.de
Internet: www.proell.de

Noricryl®

The Ink System for Second Surface IMD/FIM Technology with PMMA Films

Noricryl® is a solvent based one-component screen printing ink system based on a high temperature resistant thermoplastic resin.

The ink system Noricryl® was developed for the IMD/FIM process with PMMA films (such as PLEXIGLAS®¹ 99524 and 99526) and has the following key properties:

- good formability
- high temperature resistance during injection molding
- good adhesion between printed film and the injected resin

Noricryl® is part of the Triple AIM®-solution² (Acrylic Insert Molding), the all-acrylic innovation in the IMD/FIM-technology with PLEXIGLAS® films, PLEXIGLAS® resin and screen printing ink based on acrylic binder.

Finish Glossy. The gloss level is decisively influenced by the substrate.

Pigmentierung Noricryl® inks do not contain any pigments based on toxic heavy metals (DIN EN 71, part 3).

Basic Colors

Noricryl®

109	Citron	472	Violet
112 <i>HF</i>	Yellow	566 <i>HF</i>	Blue Transparent
171	Yellow Transparent	570 <i>HF</i>	Deep Blue
213	Orange (not available in U.S.A.)	669	Green Transparent
308	Red	812	Brown
318 <i>HF</i>	Red Transparent	945 <i>HF</i>	White
320	Bright Red	952 <i>HF</i>	Black
412 <i>HF</i>	Pink Transparent	093 <i>HF</i>	Colorless

HF = halogen free

^{1,2} PLEXIGLAS® and Triple AIM® are registered trade names of Röhm GmbH & Co. KG, Germany

Special Inks**Noricryl®**

770 HF Silver
780 HF Silver Coarse
790 HF Silver Glossy (Press Ready)
HF = halogen free

Silver inks may be used to mix gold and other metallic colors.

Effect Pigment Colors

Additional metallic, color-flop, pearl effect, daylight and other pigments are available on request.

Achtung

The peel strength (bonding) of the silver and effect inks is lower than that of the basic colors.
Back molding the special effect colors may alter the orientation of the pigment particles.

Mesh

We recommend yellow polyester fabric. NoriPET® standard colors: 90 – 150 threads/cm (230 – 380 threads/inch).

The following mesh counts are recommended for standard silver:

NoriPET® 770 – max. 120 threads/cm (305 threads/inch)
NoriPET® 780 – max. 77 threads/cm (195 threads/inch)
NoriPET® 790 – max. 100 threads/cm (255 threads/inch)

Stencil

Solvent resistant emulsions must be used. Excellent results during long production runs are achieved by using Pröll emulsion Norikop 8 HR.

Auxiliaries**Thinner**

Thinner Noricryl® 090 (fast)

Retarder

Retarder Noricryl® 097 (medium)
Retarder Noricryl® 097/001 (slow)

Retarder Paste

Retarder Paste Noricryl® 097/002 (slow)

Auxiliaries can be mixed in any ratio to achieve an optimized printing and drying result.

Recommended addition of thinner: approx. 15 – 20 %.

To print fine details, Retarder Noricryl® 097/001 can be used alone or in combination with Retarder Paste Noricryl 097/002.

Cleaning	Clean screens and equipment with Retarder Noricryl® 097 or UNI-REIN A III.
Important	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 before performing 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 contain sliding agents, antistatics or other additives which may impair the adhesion of the inks.
Drying	Noricryl® dries by evaporation of solvents in a jet dryer.
Hints on Drying	<p>To achieve optimum results, drying in a jet-dryer should be done immediately after printing.</p> <p>Drying speed can be increased by:</p> <ol style="list-style-type: none"> 1.) drying at higher temperatures 2.) using dryers with good air exchange to remove the solvents. <p>When using a jet dryer with different sections, recommendations can be given as below:</p> <ul style="list-style-type: none"> - The temperatures of the heating sections should be around 70 – 75 °C (158 – 167 °F). - The temperature of the heating sections should not exceed 75 °C (167 °F), since PMMA is sensitive towards distortion at higher temperatures. - Last section: For cooling at ambient temperature. <p>The drying result depends on a lot of parameters such as ratio of thinner/retarder, thickness of ink film layer and efficiency of dryer.</p>
Post-curing	<p>Complete evaporation of thinner residues in ink and film is necessary for further processing of printed films in the IMD/FIM process.</p> <p>Thinner residues can lead to washout during the back molding process, or damage during the climatic test or use of the end product.</p> <p>Fully benefiting from Noricryl®'s superior properties (adhesion, suitability for back molding, etc.) requires guaranteeing an absolute minimum of solvent residues.</p> <p>Highest efficiency is achieved when printed films are put on drying racks after jet drying to be placed in a box oven having good air circulation as well as sufficient air exchange.</p> <p>Conditions: Post-curing at 75 °C (165 °F) for 5 hours.</p>

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

Safety Precautions Noricryl® inks are inflammable. Smoking or open flames are strictly prohibited during use of these products.

Working with Noricryl® inks requires the same hygienic practice at the work place as any other solvent based ink system. Please follow the advice and the instructions on the label and read the material safety data sheets prior to use.

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

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).

Recommendations for use of

Noricryl®

in IMD/FIM Technology

IMD/FIM Technology

IMD/FIM technology is distinguished by the interaction of several individual technologies:

- ink and printing
- forming
- cutting/punching
- back molding

The steps of the process must be optimized individually, then aligned with each other.

The Noricryl® Ink System

Noricryl® is a solvent-based screen printing ink system expressly developed for use in the IMD/FIM process. Noricryl® is suitable for printing on PMMA films (PLEXIGLAS®). The IMD/FIM screen printing ink is formulated to be compatible with the injection molding process using PMMA (e.g. PLEXIGLAS® resin 8 N).

Each batch of Noricryl® undergoes a specific quality control test. Test results can be made available to customers upon request. This does not constitute a guarantee regarding the long-term stability of back molded parts produced with Noricryl®.

Forming

The result of the forming process is strongly influenced not only by the choice of the forming technology, such as high pressure, thermal, but the geometry of the parts produced as well. Forming requires specific know-how gained through experience.

Cutting

For optimum results in cutting PMMA please follow the instructions of the film manufacturer.

Back Molding

A complex technology which in any case must be mastered to assure the successful application of Noricryl® in IMD/FIM technology.

Specific know-how of the following parameters:

- geometry of injection gate
- temperature of molding resin
- choice of resin
- flow properties of resin
- pressure
- cycle time
- tool temperature
- cooling

are a pre-requisite or must be gained through experience.

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

To assure suitability for its intended use, each part or combination of materials must be systematically examined using proper testing procedures (climatic test, resistance test, etc.) before start of batch production.

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.