Preliminary Technical Information
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Noricryl®

The Ink System for Second Surface IMD 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 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®-solution[2] (Acrylic Insert Molding), the all-acrylic innovation in the IMD-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.

Pigments

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

Basic Colors

Color	***Noricryl®-Color Number***
Varnish	093
Yellow	109, 112 and 171 (Transparent)
Orange	213 (not available in the USA)
Red	308, 318 (Transparent) and 320
Violet	412 (Transparent) and 472
Blue	566 (Transparent) and 570
Green	669 (Transparent)
Brown	812
White	945
Black	952

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

Silver Inks

Noricryl® 770 – Silver
Noricryl® 780 – Silver Coarse
Noricryl® 790 – Silver Glossy

These standard silver colors are intermixable. In combination with transparent Basic Colors Gold and other metallic shades can be mixed (for example: any silver mixed with Yellow Transparent 171 results in Gold).

Effect Pigments

More Metallic, Flip Flop, Pearlescent, Daylight Fluorescent and other special effect colors on request.

Caution

When molding the resin onto films printed with metallic and effect colors, changes in the orientation of the pigments may occur (esp. color flop change).

Please note that silver inks exhibit lower adhesion strength compared to the basic colors. Due to the characteristics of the pigments used in metallic inks there is low adhesion between the ink film and the onmolded resin.

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 sliding agents, antistatics or other additives which may impair the adhesion of the inks.

In general please refer to our technical leaflet "General Information on Screen Printing Inks" which may be downloaded from our website www.proell.de, click Download ⇒ Screen Printing Inks ⇒ General information on screen printing inks.

Auxiliaries

Thinner/ Retarders

Thinner Noricryl® 090 (fast drying)
Retarder Noricryl® 097 (medium drying)
Retarder Noricryl® 097/001 (very slow drying)

Thinner and Retarders can be mixed in any ratio to achieve optimal printing and drying behaviour.

Special Colors: Please refer to label on the can for thinner quantity.

Fine Line Printing

For printing fine details Retarder Noricryl® 097/001 is recommended.

Cleaning

Clean screens and equipment with Retarder Noricryl® 097.
Pröll's Universal Cleaner "Uni-Reiniger" should not be used because of insufficient cleaning result with Noricryl® inks.

Drying

Noricryl® is drying by evaporation of solvents. To speed up this process warm air tunnel dryers are highly recommended!

Drying Hints

Drying speed can be increased by:

1.) drying at higher temperatures
2.) using dryers with good air exchange to remove the solvents.

Please note the following recommendations for Jet-drying:

- The temperature of the heating sections should not exceed 75 °C (167 °F), since PMMA is sensitive towards distortion at higher temperatures.

- The last section is for cooling to room temperature to avoid blocking in the stack.

Post Curing

For maximum heat resistance and a good long term stability of the injection molded parts, Noricryl® must be post cured.

For this reason post curing of the printed films prior to the molding process is highly recommended.

Highest efficiency is achieved when printed films are put on drying racks to be placed in a box oven having good air circulation as well as sufficient air exchange.

Post curing conditions:

75 °C (167 °F) for 1 – 5 hours.

Adhesion Strength

The adhesion strength within film / ink / resin composite depends on many variables and can be increased by different methods such as injection molding at higher temperatures or using adhesive primer.

Safety Precautions

Noricryl® inks are flammable. Do not smoke while using these products.

Do not allow inks, solvents or residues to enter the sewer system. Follow the local waste disposal regulations.

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 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).

Advice for the use of

Noricryl®

for Inmold Decoration (IMD) Technology

IMD-Technology

IMD technology distinguishes itself by the interaction of four systems:

- ink
- forming
- cutting / trimming
- molding

Each individual system must be optimized and coordinated to successfully produce IMD parts.

The Ink System Noricryl®

Noricryl® is a solvent based ink system, which is designed for the IMD process. The ink system is generally suited for printing on PMMA films (PLEXIGLAS®). Noricryl® is formulated to be compatible with the injection molding process using PMMA (PLEXIGLAS®).

Each production batch of Noricryl® is subject to quality control before delivery. Upon request, the customer will receive a copy of the measured values.

Beyond that, certain characteristics regarding the durability of products produced with Noricryl® are not guaranteed by Pröll.

Forming

High-pressure forming can be used as well as thermoforming. Noricryl® has the same excellent forming properties as PMMA film. Specific knowledge of forming technology is necessary and must be gained.

Cutting

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

Molding

Completely mastering the complex individual technologies is essential for the successful use of Noricryl® in the IMD process. Specific knowledge regarding different parameters such as:

- injection gates (number and geometry)
- temperature
- choice of the thermoplastic resin
- mold flow behavior of the thermoplastic resin
- pressure
- time
- molding temperature
- cooling

is necessary and must be gained.

Again, the geometry of the part to be produced is of significant importance.

Not every part can be produced successfully using IMD technology.

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Before starting a production series, it is necessary to check each individual part systematically with tests adapted to such demands as climate, resistance, etc.