



NoriPress® SMK

Solvent-based Screen Printable Adhesion Promoter for
Film Lamination and IMD/FIM Technology (back molding of
screen printed films)

Area of Application and General Characteristics

NoriPress® SMK is a solvent-based screen printing adhesion promoter.

NoriPress® SMK improves bonding during lamination of various plastic films.

NoriPress® SMK is used as an adhesion promoter to bond various molding resins in IMD/FIM.

Color

Milky, viscous liquid

Important

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 starting production. Materials presumed to be identical may vary from producer to producer or from batch to batch. They may also have been treated with additives which impair the adhesive properties of NoriPress® SMK. Systematic testing is, therefore, an absolute must.

Auxiliaries

Hardener

Hardener 004

Recommended amount to be added:

Film lamination	2 %
IMD/FIM Technology	6 %

Adding hardener stabilizes the inner structure of the layer of adhesion promoter, thereby improving the bonding and long-term resistance.

Bonding of laminated films is not further improved by adding proportions of hardener > 2%.
(Please see page 5 "**Temperature**".)

Addition of Hardener:

The hardener is mixed homogeneously with the NoriPress® SMK using a propeller mixer. For this purpose, a speed of 300 rpm is recommended for approx. 5 minutes.

To achieve a homogeneous consistency, the diameter of the mixer should be selected to suit the size of the vessel. Stirring should introduce as little air as possible into the mixture.

Pot Life

12 hours

Thinner

NoriPress® SMK is press-ready, but can be thinned with Thinner M 210 to achieve optimal processing viscosity.

Processing NoriPress® SMK

Thickness of Layer/Fabrics

After drying, a layer of NoriPress® SMK must be at least 10 µm thick to assure sufficient bonding. Hence, a polyester mesh PET 30 to 32 threads/cm (76 to 83 threads/inch) with a thread diameter from 70 to 120 µm is recommended. Finer meshes may require several printings.

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.

Drying

NoriPress® SMK dries by evaporation of solvents in a jet dryer. The chemical curing process of the printed films continuous in stack with no additional supply of oxygen.

To avoid absorption of the solvents of NoriPress® SMK into the pre-printed ink layers or substrate, a jet dryer (drying temperature 80 °C/175 °F) should be used. Rack drying is not recommended.

Post-curing

Before further processing, as much solvent residues as possible must be removed from the entire system (substrate, ink layers, NoriPress® SMK) through post-curing.

Decorating Ink

To offset any possible migration of solvents caused by NoriPress® SMK, an ink layer to be overprinted should have undergone a thorough post-curing, especially when high opacity (e.g. opaque black) is required. Overprints with NoriPress® SMK should be dried as quickly and thoroughly as possible, to avoid redissolving of the ink layers below.

Ideally, the post-curing of printed films should be done in a box oven.

Place sheets on rack separately.

Recommended conditions:

Post curing at 75 – 90 °C (165 – 195 °F) for one to five hours. Optimal conditions for each application should be determined individually.

Cleaning of Screens and Utensils

Thinner M 210 or Thinner F 003

Shelf Life

Exposure of NoriPress® SMK to temperatures below 20 °C (68 °F) may cause flocculation. Heat moderately to approx. 30 °C (86 °F) while stirring to return product to a homogeneous consistency.

Do not store at temperatures below 20 °C (68 °F) to avoid flocculation.

NoriPress® SMK may be stored unopened in its original packaging until date given on label.

Tips on Processing NoriPress® SMK during Lamination

Decoration

NoriPress® SMK adheres to PC, PVC and PA films. If the laminating films are decorated, it is important to verify whether:

- **NoriPress® SMK adheres to the decorating ink**
- **the decoration ink is adversely affected by NoriPress® SMK, which would result in cracking or fading. Thoroughly dried ink layers are more resistant to NoriPress® SMK than ink films containing solvent residues.**

Laminating Temperatures

The dried, hardened layers of NoriPress® SMK adhesion promoter are activated at temperatures above 100 °C (210 °F). The laminating material is bonded by the effects of heat and pressure.

Effect of hardener on lamination:

To achieve good, resistant bonding, process NoriPress® SMK with **2 % Hardener 004**. The hardening of the NoriPress® SMK layers processed with the hardener depends on how long the printed films were stored and at what temperature. For best results, laminate films as soon as possible after printing with NoriPress® SMK.

Solvent residues in the system during subsequent processing causes inconsistent bonding and can be detrimental to long-term resistance or resistance to climate. If printed films cannot be processed immediately, performance of post-curing directly before lamination is recommended.

Laminating Parameters

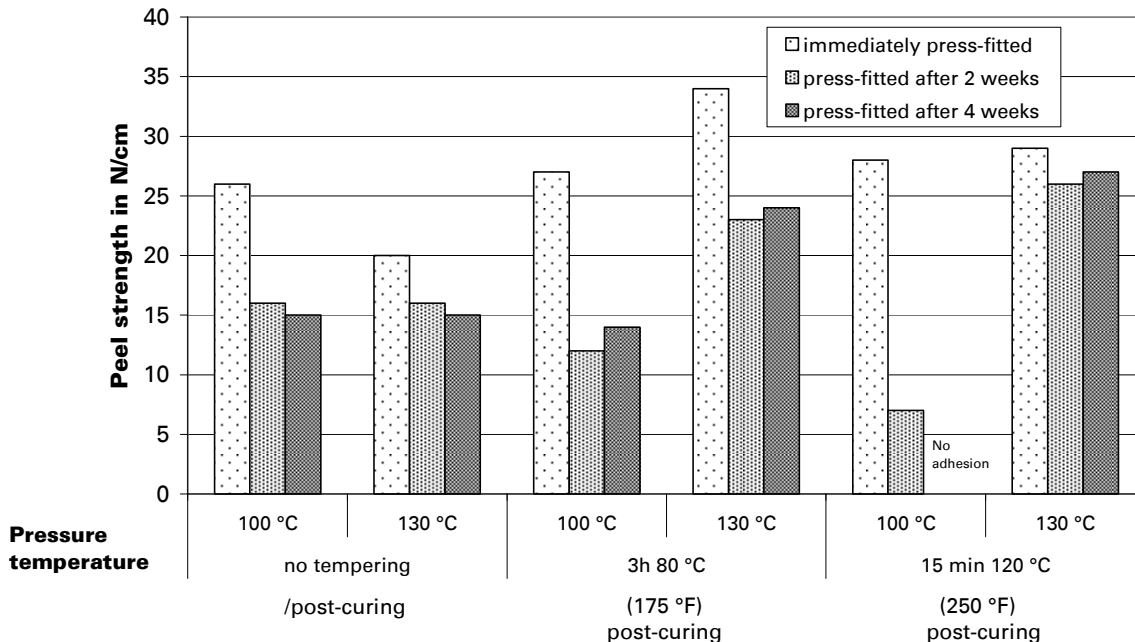
The results of the lamination process depend not only on the laminating temperature and material, but other influences as well, such as:

- duration of laminating process, laminating speed and pressure (approx. 8 bar) in the case of rotary laminators
- thickness of film and thermal transition
- type of decorating ink printed

The compatibility of NoriPress® SMK with given material types must be determined on an individual basis along with the suitable laminating conditions.

The graph below shows how peel strength depends on post-curing, pressure temperature and storage time when printing on Makrofol® DE 1-1 films with NoriPress® SMK (2 % Hardener 004).

**NoriPress® SMK with 2 % Hardener 004
press-fitted at 100 °C (210 ° F) or 130 °C (265 °F)**



Parameter:

- Printing substrate: Makrofol® DE 1-1, 250 µm
- Second film: Makrofol® DE 1-1, 250 µm
- Printing conditions: 2 x NoriPress® SMK – fabric 77-55 threads/cm (195-55 threads/inch)
- Drying: Jet 70 °C (160 °F), 5 m/min.
- Post-curing: immediately after printing and drying
- Pressure: 100 bars, 10 sec.

Tips on Processing NoriPress® SMK during IMD/FIM

Molding Resins

NoriPress® SMK can also be used to promote the adhesion of PC films to a variety of molding resins:

- PC
- ABS
- PMMA
- Polyamide (PA 6, PA 6 GF, PA 11, PA 12)

Decoration

If PC films are printed with decorating inks, such as NORIPHAN® HTR N, **verify whether they will be adversely affected by the solvents contained in NoriPress® SMK.**

Fading can be prevented by:

- adequately drying NORIPHAN® HTR N ink layers before printing with NoriPress® SMK
- printing several ink layers of NORIPHAN® HTR N and drying before printing with NoriPress® SMK
- overprinting with a protective layer of NORIPHAN® N2K onto NORIPHAN® HTR N

Temperature

During the molding process, the resin temperature must be above 240 °C (465 °F) to guarantee the activation of NoriPress® SMK.

Effects of hardener on back molding:

To achieve good, consistent bonding, process NoriPress® SMK with **6 % Hardener 004**. The curing process extends over days or weeks, depending upon the temperature of storage. A completely cured layer requires higher activation temperatures. For best results, backmold as soon as possible after printing with NoriPress® SMK. After longer periods of storage (of the printed films), increase melting temperature of injection molding resin (at least 260 – 290 °C / 500 – 555 °F).

The suitability of NoriPress® SMK and processing conditions for back molding must be determined individually for each combination of film, decorating ink and molding resin.

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