

IMD/FIM Technology

Film insert molding enables one-step fabrication of plastic components with a decorated or functional surface. In this process, a polycarbonate film, decorated by screen printing on the reverse side, is high pressure formed and trimmed before being placed in an injection mold and back-injected or over-molded with a thermoplastic resin. Many radio bezels, climate control panels, displays and touch pads are manufactured in film insert molding technology. Now, the produced automotive interior parts are getting bigger, formed deeper and designed more individually. Center stacks, dash boards and door trims of many new cars are produced by using the IMD/FIM process. Due to the development of highly resistant and formable dual cure lacquers, such as **Norilux® DC**, an abrasion and chemical resistant first surface decoration even with haptic structures is possible.



The new BMW 1 Series contains new door trims showing fascinating 3D-optic designs and haptic surface finishes realized by screen printing.

Non-conductive black color shades for printed electronic applications

The back-moldable NORIPHAN® IMD/FIM ink systems are perfectly suited for the manufacture of functional parts with integrated printed electronics.

The newly developed one-component color shade **NORIPHAN® HTR N 990/010 NC** has a deep black appearance and is non-conductive due to its formulation without carbon black.

The deep black and opaquely formulated color shade **NORIPHAN® N2K 953** is processed as two-component system. This screen printing ink shows high electrical resistance in capacitive applications.

Both black color shades can be used for overprinting of metallic and polymeric conductive pastes and resist the increased requirements regarding thermal resistance, interlayer cohesion and the demanding hydrolysis test in the automotive industry.



screen printed film



formed film



trimmed film



back molded part

Mercedes-Benz C + E-Class HVAC panel

Ink System:

NORIPHAN® HTR N
NORIPHAN® PCI N
NORIPHAN® N2K
NORIPHAN® XWR
NORIPHAN® XMR
NoriAmid®
Noricryl®
NoriPET®
NORIPHAN® XWR
NoriCure® IMS (UV)

Adhesion Promoter:

NORIPHAN® HTR N
NORIPHAN® HTR N
NoriAmid® APM

NoriPress® PP
AquaPress® or
NORIPHAN® XMR + HTR N

Substrate:

Makrofol®/Bayfol® films
Makrofol®/Bayfol® films
PC (<125µm) and PET films
PC and PET films
PC and PET films
PA films
PLEXIGLAS® films
PET films
PP films
PC films

Injection Resin:

PC/ABS/PMMA
PC/ABS/PMMA
PC/ABS
PC/ABS
PC/ABS
PA/PMMA/PC/ABS
PMMA/ABS
ABS
PP
PC



**Innovative Inks &
Functional Lacquers**



Norilux® DC – formable, abrasion and chemical resistant protective lacquer

Norilux® DC is a formable, abrasion and chemical resistant dual-cure screen printing lacquer, which can be used as a protective lacquer or hard coat for first surface protection of products manufactured in IMD/FIM technology using PC, PMMA, ABS, and PP films.

Even aluminum and metal plates can be decorated and protected with Norilux® DC.

Versions

The glossy version of the dual-cure lacquer can be printed on textured film surfaces to produce abrasion resistant and transparent display windows.

The matt version of Norilux® DC can be printed on uncured transparent hard coat films such as Makrofol® HF 312 to create matt and gloss effects on one printed film.

Besides the high gloss version, various satin gloss, textured and matt grades as well as pigmented and UV stabilized versions are available.

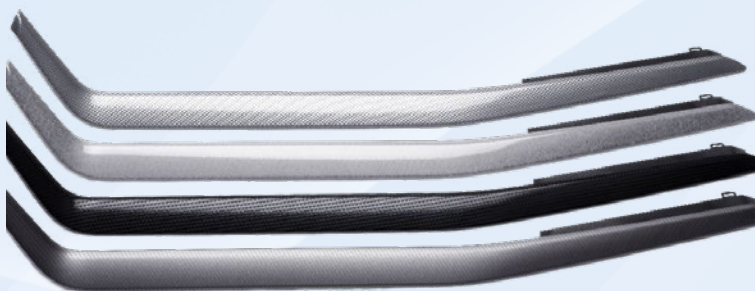
Tactile surface structures, such as brushed metal effects, 3D patterns, wood and stone designs can be printed with the highly resistant lacquer.

The dual-cure screen printing lacquer can be used for overprinting silicone-free UV curing, solvent and water-based screen printing inks as well.

Processing

Norilux® DC must be dried in jet/tunnel dryers followed by box oven drying. Before further processing of the printed films, it is necessary to remove nearly all solvent residues from the layer of lacquer and substrate.

Films decorated with Norilux® DC can be 3D formed after the drying process by high pressure forming or thermoforming. Afterwards, the formed films must be UV cured.



Resistances

The cured lacquer layer shows excellent resistances to abrasion, chemicals and cleaning agents and passes various creme tests of the automobile industry.

Applications

Norilux® DC can be used for numerous applications including, but not limited to, center stacks, touch panels, and decorative trims in automotive interiors. Even mobile phone covers are overprinted with the highly resistant lacquer.

