



niebling

DEEP DIVE INTO FILM TECHNOLOGY



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Director Sales & Marketing

Preforming for Film Insert Molding (FIM): Fundamentals and Industrial Boundaries

Agenda



Preforming for Film Insert Molding (FIM): Fundamentals and Industrial Boundaries

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Who is Niebling?



Global SME

Worldwide operating, headquartered in Penzberg, south of Munich

Manufacturing Excellence

High-pressure forming machine manufacturer with own tool shop

Solution Provider

Innovative interior/exterior components for automotive industry

Tier Partner

Supplier to well-known automotive Tier-1 to Tier-3

FIM Ecosystem

Films, inks, integrators, injection molders

Innovation Partner

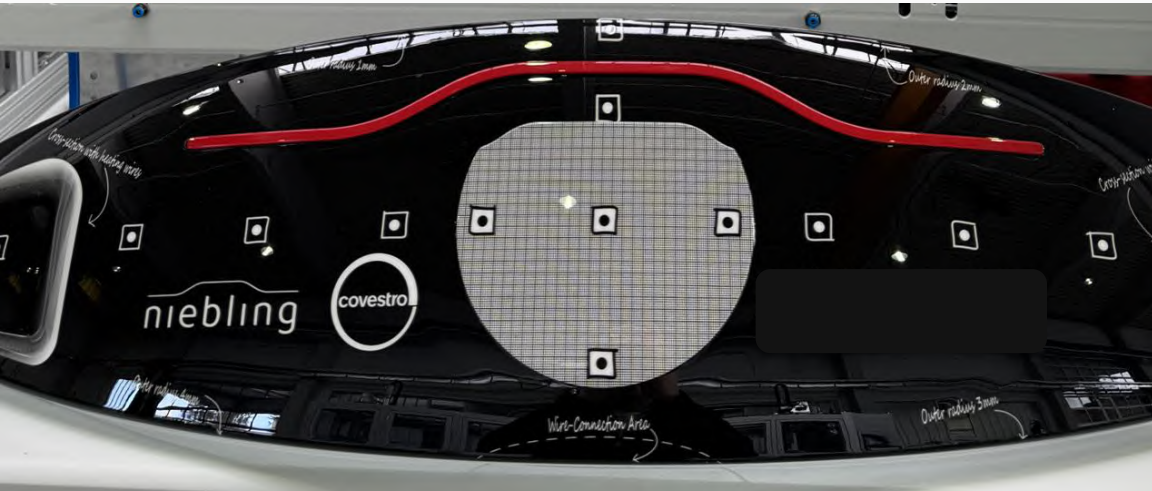
From idea to SOP for automotive industry



Why FIM?



Why FIM?



The Foundation for Innovation

Plastic film as technology carrier for headlight solutions, front panels, rear modules, and countless possibilities



High-precision 3D components

Complex component geometries

Why FIM?



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Customized Decoration Options

Flexible design and branding possibilities

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Smart Functionality Integration

Embedded electronics and sensors = IME / IMSE®

Why FIM?



The Foundation for Innovation

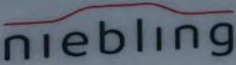
Plastic film as technology carrier for headlight solutions, front panels, rear modules, and countless possibilities



Up to 3C Injection Molding

Empowering the designs of the next generation seamlessly combine design and functionality

Why Preforming?

The logo for Niebling, featuring the brand name in a lowercase, sans-serif font with a thin red horizontal line above the letters.

HPF 1400 Video





Why Preforming?

Real 3D Geometries

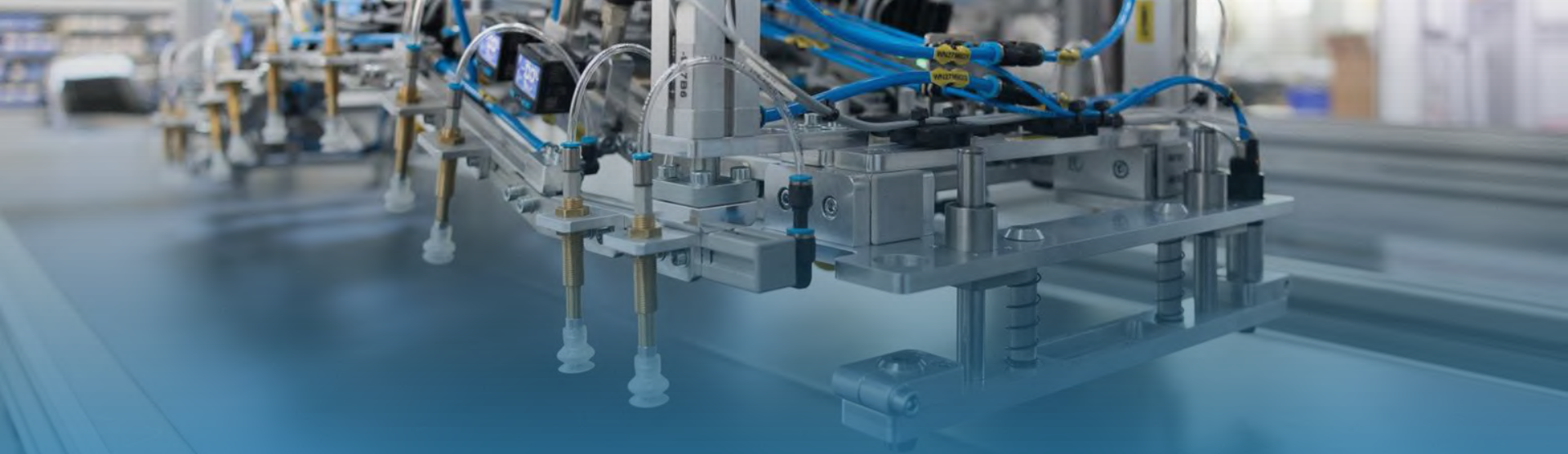
Deep side walls with
complex shapes

Exact Fitting

Precise positioning into
injection tool cavity

Precise Graphics

Accurate alignment of
decorative elements



More pressure
force

+

Less forming
temperature

=

More precise
results



Niebling - high pressure forming technology

+

Forming Size

Up to 1500 x 500 x 200 mm

+

Positioning accuracy

Around $\pm 0,5$ mm

+

Substrate thickness

Usually 375 - 500 μ m

+

Forming of polycarbonate

Up to 10 mm possible



Industrial Boundaries for part sizes over 1500 mm

- Size limitations of screen printing equipment
- Challenges in handling large-format films
- Trimmability after 3D forming
- 3C injection tools with FIM specialties

Summary – Take aways



**Knowledge of
FIM design**

Guidelines at OEM
and TIER side



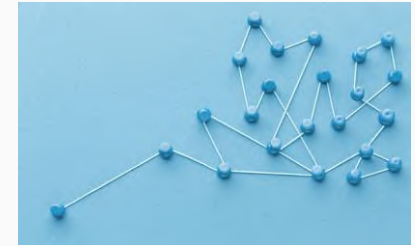
**Proven material
+ ink formulation**

No development status
for serial production



**Less is
sometimes more**

= Less size + more
functionality



**Realistic time to
market**

Practical planning and
execution timelines

Thank you for your attention

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We welcome the opportunity to discuss how Niebling's high-pressure preforming technology can enable your next-generation film insert molding applications.

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