



Thermoplastic Film Adhesives For Rear Injection Molding

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Collano Milestones





Presentation Overview

1. History Of Rear Injection Molding
2. Today's Technology For Metal Surfaces
3. Possible Disadvantages
4. Innovative Features (Film)
5. Process Steps



Presentation Overview Cont.

6. Cross Section / Processing Profile (Today)
7. Cross Section / Processing Profile (Future)
8. Primer Issues
9. Outlook

History Of Rear Injection Molding

- Plastic Parts (Textile - Fabric / Nonwovens)
- Surface Improvement / Better Finishing
- Wood, Foils (PVC, TPO, ABS, PC)
Metal - Galvanize (Chromizing). High Waste,
Up To 40%



History Of Rear Injection Molding Cont.

- Lacquer - Transparent And Flexible For 3D Forming
Normally Melamine, Acrylic, Epoxy, PUR
Printing - Gravure or Screen Printing
- Design Issues
- Bonding Technology



Today's Technology For Metal Surfaces

- Metal (e.g. Al, Cu / Stainless Steel)
- Powder Coatings
- Spraying (3D Parts, Expensive)
- Coil Coating (Surface Finishing)
Coating Done At Metal Producer
- Metal Foils
- Metalized Films (Very Expensive)

Possible Disadvantages

- Complicated Technology / Application
- Various Process Steps (Low Flexibility)
- High Costs In Buildings, Machinery, Staff
- Complexibility (Design, Logistics, Production)



Possible Disadvantages Cont.

- Environment / Health Concerns (Spraying)
- Recycling
- Fire Hazard Aspects (Regulatory Compliance, Insurance, Appropriate Equipment, Structural Measures)



Innovative Features (Film)

- Combination With A Variety Of Substrates
Textiles / Nonwovens / Plastics / Metal /
Rubber
- Adhesive Film (Single Layer)
Direct Application To Part



Innovative Features (Film) Cont.

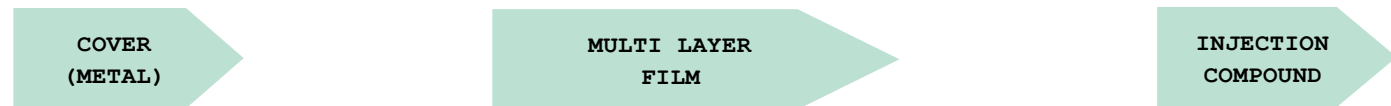
- Adhesive Film (Multi Layer)
Direct Application / Pre-Applied Application
- Multi Layer Film Production (Up To 5 Films)
- ACP (Aluminum Covered Part) - Hybrid
Technology

Process Steps

Today



Future



Cross Section / Processing Profile (Today)

Lacquer (Mel., Acry., Epoxy, PUR)

Press Forming

Metal Cover (Al)

Primer

Storage / Aging

Adhesive

Nonwovens (Adhesion Promoter)

Part (ABS / PC, PP)

Logistic

Lacquer (Mel., Acry., Epoxy, PUR)

Press Forming

Metal Cover (Al)

Single Or Multi Layer Film

Nonwovens (Plain Or Resin Coated)

Part (ABS / PC, PP)

Logistic



Cross Section / Processing Profile (Future)

Lacquer (Mel., Acry., Epoxy, PUR)

Rear Injection Molding

Multi Layer Film

Pre-Applied Application

Metal Cover



Primer Issues

- Solvent Based Products (Phenolics / Melamines)
- Expensive
- Smell And Emission (Formaldehyde)
- Applied With Knife (Variances In Coat Weight And Possible Cluster Forming. Consequence Varying Adhesion)
- Tendency To Blister When Being Applied



Primer Issues Cont.

- Application In A Clean Room (Dust And Moisture Free)
- Long Drying Times
- Heat Resistance To Low (Test 2 000 Hours / 100°C). At 70°C Emission
- When Exposed To Pressure And Or Heat Adhesion Failure



Outlook

- Cost (Good ROI)
- Logistic (Parts) Benefits
- Specialized As Well As Mass Production
- Easy Production / Better Control / Lower Reject Rate / Higher Yield
- Low Capital Cost
- Wide Use Of Substrates And Plastics (e.g. PA, ABS, ABS/PC, PP, PC)



Outlook Cont.

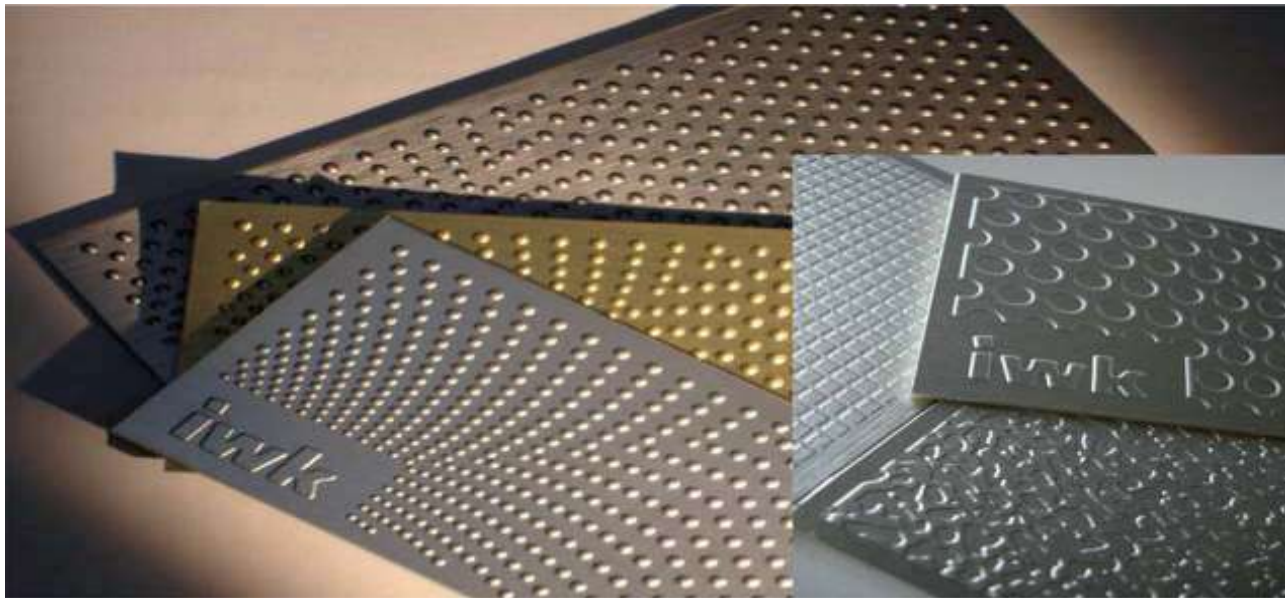
- Complex Shapes And Structures Possible
- Design / Design Features / Individuality / Exclusivity
- Environmental Process (No Solvents / Hazardous Substances / Recycable)



Your Value

- New And Safe Technology
- High End Components
- Simple Process
- Good Value
- Satisfied Customers
- New Possibilities / Markets

Embossing (Molding Tool) – Picture 1



(Pictures 1-3 IWK Rapperswil/Switzerland - Institut für Werkzeugtechnik und Kunststoffverarbeitung).

Structure of Al surface is shaped directly into tool (incl. clips). Either with a structured tool surface or substrate transmitters (Textiles/Nonwovens) to Al backside.

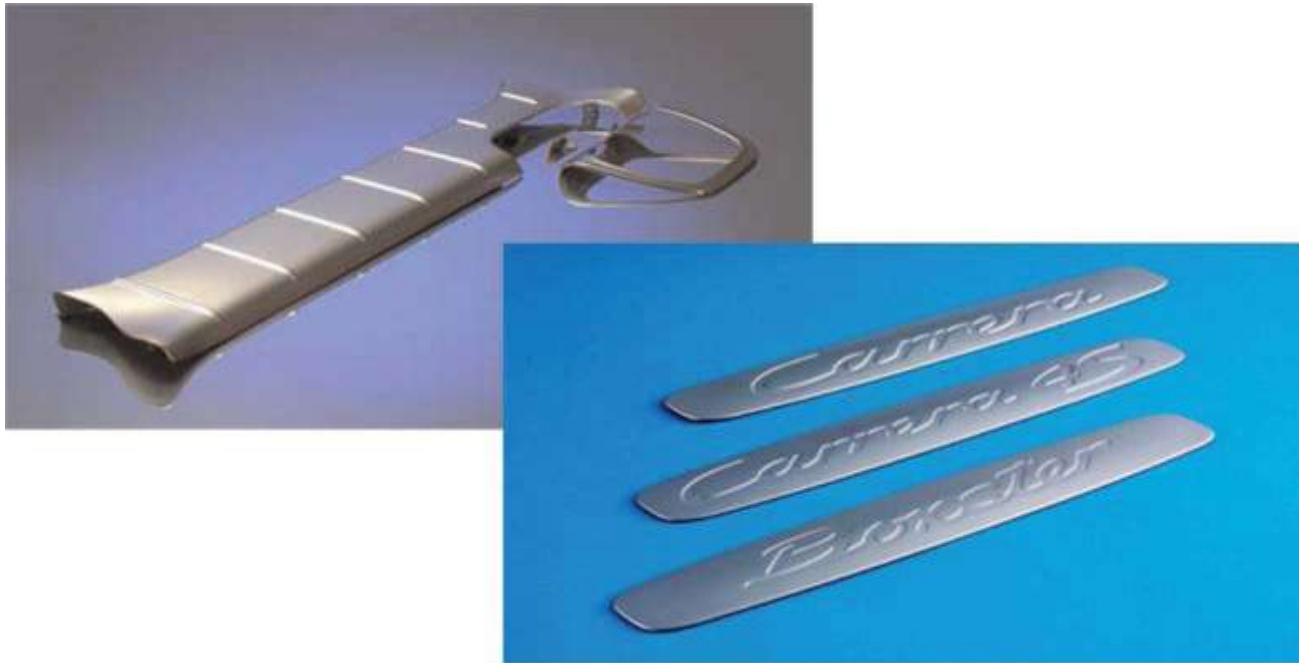
Crimping Technology (Emblem) – Picture 2



Al stamped into shape of the part and secured on the plastic by crimping.

Distortion of the Al sheet is difficult. Metal films are prone to breakage and tend to tear in deep drawn angles and edges due to their low elongation values. Single process steps are cost intensive, require high production and energy input.

Side Body Part And Door Sill – Picture 3





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Thank you for your attention!

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