

MIC White Application on Ford Commercial Vehicles

Tuncer Atan

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FORD OTOSAN

MIC WHITE APPLICATIONS ON FORD COMMERCIAL VEHICLES



Tuncer Atan

Ford

Tuncer is working in the Exterior Plastic Applications of Commercial Vehicles as a Chapter Leader (Supervisor). Experienced mainly on development & modifications for Exterior Trim components for Trucks (F-Max), Passenger Vehicles (Ford Puma), Light Commercial (Ford Courier) and Medium Commercial Vehicles (Transit Custom). Also he has been working on lightweight activities in Ford Otosan Exterior Trim commodities since 2020.



Halil İbrahim Bal

Ford

Halil is working as Manufacturing and Tooling Feasibility Engineer of the plastic trim applications, 4 years in Ford Otosan, 10 years as a mold designer and tooling engineer at plastic injection suppliers. He primarily worked on feasibility of plastic products for Trucks (F-Max), Passenger Vehicles (Ford Puma), Light Commercial (Ford Courier, Ford Connect) and Medium Commercial Vehicles (Transit Custom). Additionally, he has been working on Lightweight & Sustainability studies, and advanced manufacturing Technologies.

CONTENT

What is the content?

- General overview of MIC white application
- Advantages of MIC white application
- Disadvantages of MIC white application
- What needs to be considered during part and tool design
- Q&A

What is NOT the content?

- Details of material properties (Lyondell Basell expertise)
- Cost & timing details

WHAT IS MIC WHITE (HIGH GLOSS)



- MIC Gray
- Low Gloss
- Can not replace paint process



- MIC White
- High Gloss
- Replaces the paint process

- MIC white high gloss is an application which helps to remove the paint process.
- Material has color pigments in it to ensure color match with the vehicle body color.

RAW MATERIAL EXPECTATION



Density



Melt Flow Rate



Tensile Strength



Impact Strength



Flexural Modulus



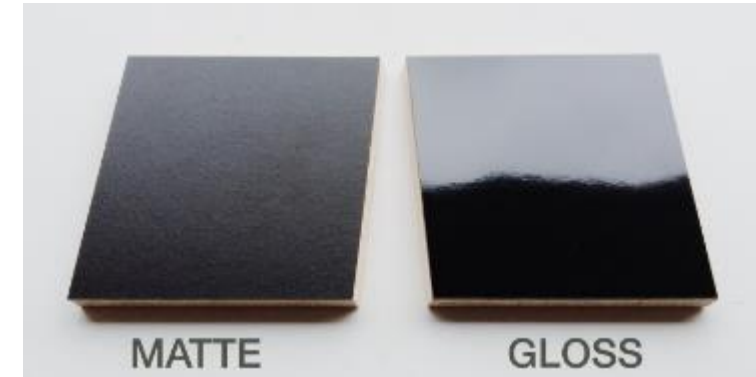
Heat Deflection under Load



- Material properties are important for vehicle engineering and injection process
- Talc rate is another critical point which effects the functionality and gloss level

GLOSS

- Commercial and passenger vehicles require certain amount of gloss levels.
- Painted parts have coating, primer, paint and varnish processes which provides high gloss results.
- Traditionally, MIC applications are lacking gloss to replace painted parts in vehicles
- Contrary to MIC, MIC white provides paint-like gloss levels.



ADVANTAGES



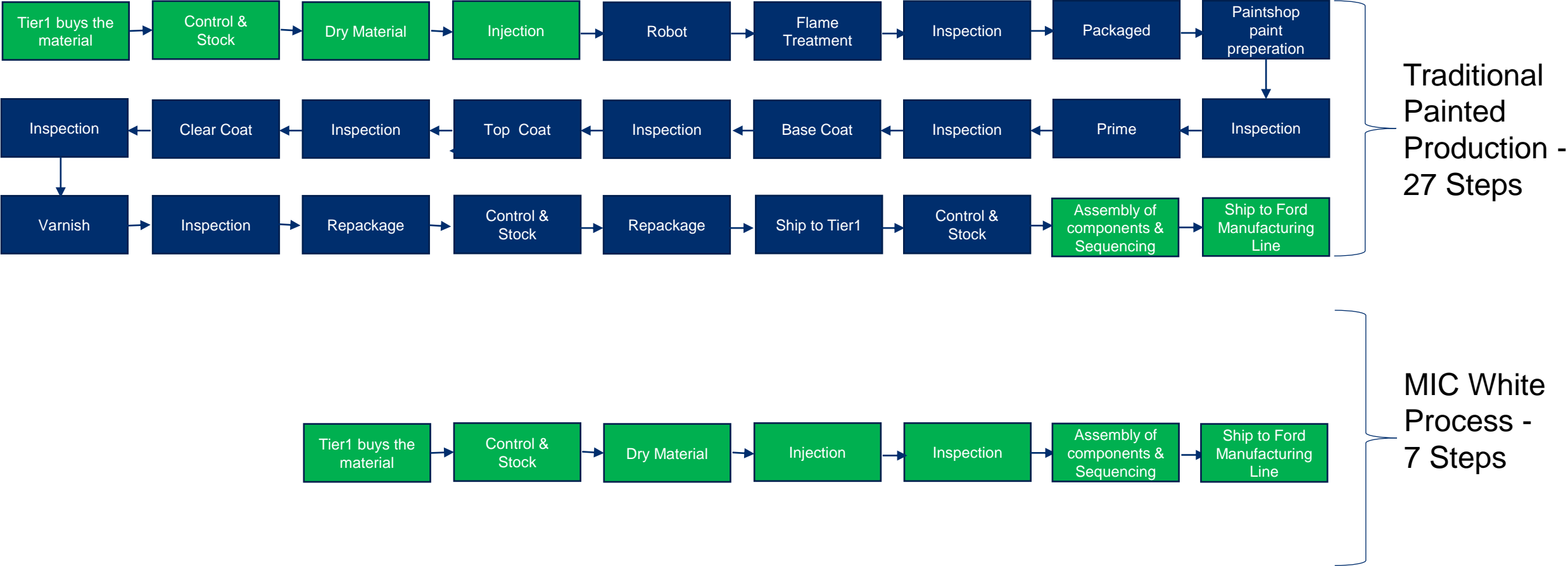
Removal of Paint Related Processes – Reduced Consumable Costs

- Painted parts are 2-3 times more expensive than MIC parts depending on;
 - painted surface area
 - amount of parts that can be painted in one operation
- MIC White parts don't require consumables such as primer, coating, paint.
- MIC White part costs significantly less than painted part (depending on in-house or outsource painting process)



ADVANTAGES

Removal of paint related processes – Reduced Operation Costs



ADVANTAGES

Sustainability



Reduced carbon emission & toxicity



Low paint particul emission



Minimized operations and energy consumption

ADVANTAGES

Improved Customer Quality Perception Against Scratches

MIC White materials are less resistant to scratching due to;

- Reduced mineral content
- Lack of grain on surface
- Lack of primer, coating and paint to protect the surface.

Even though material is less resistant, the color underneath the surface is still white, that's why scratches are less visible to human eye.



Painted



MIC White

DISADVANTAGES

Low Resistance to Scratch

MIC White materials are less resistant to scratching due to;

- Reduced mineral content
- Lack of grain on surface
- Lack of primer, coating and paint to protect the surface.

Parts need to be transported with extra care.

Additional measurements are needed for production & assembly lines.



DISADVANTAGES

Design Restraints

MIC White material limits design flexibility.

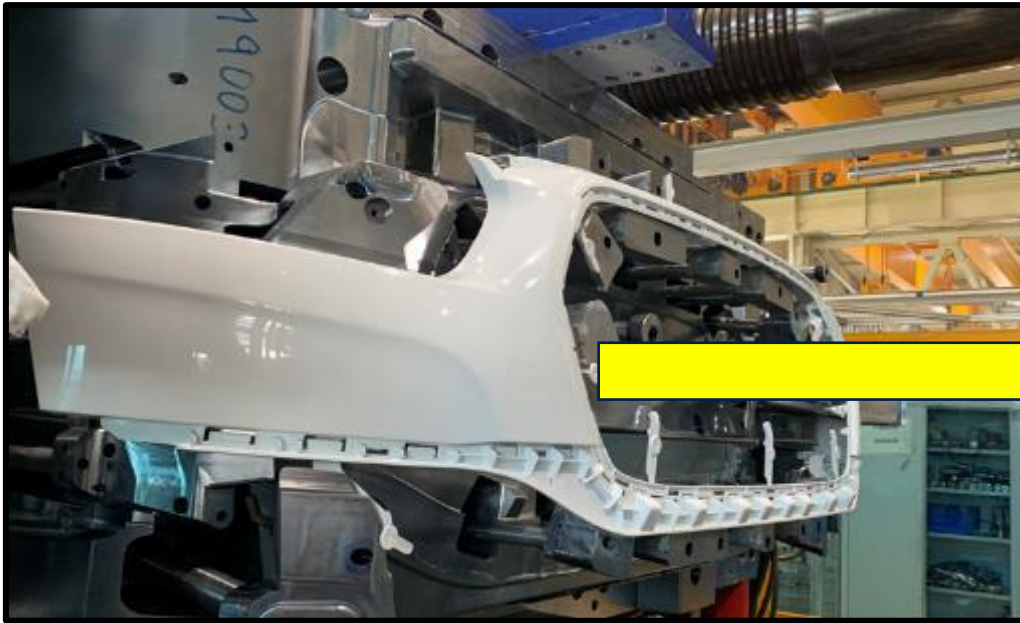
Sink marks are seen on A surface due to B surface feature as dog house, ribs etc.



DISADVANTAGES

MIC White Tools

- Requires special tool steel
- Advanced tool runners— precise injection
- The take rate of the color must be high enough to compensate the new tool.



DISADVANTAGES

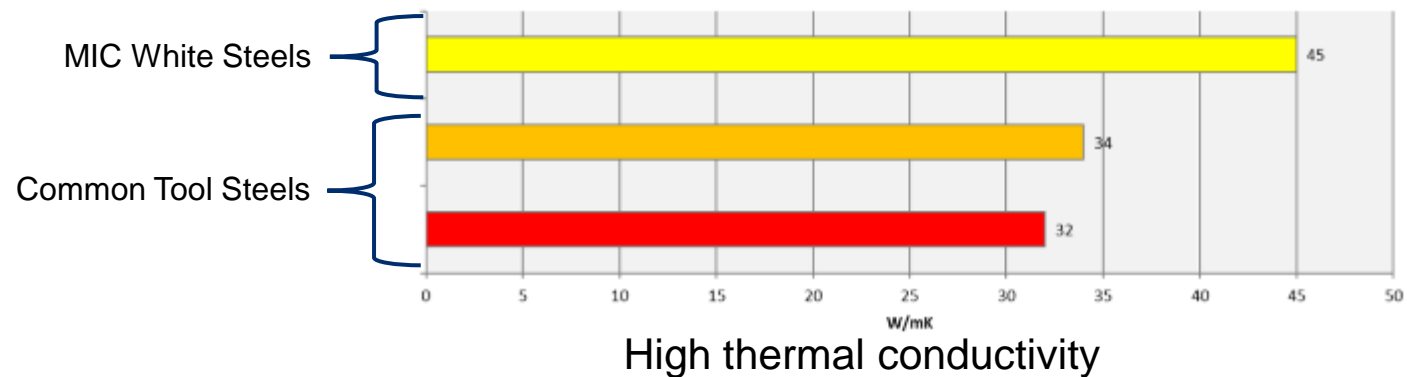
MIC White Tools



High polished in mirror quality



High & homogeneous hardness



DISADVANTAGES

Color Harmony

MIC white applications have high gloss but not as much as painted surfaces.
Color shades (Blue-ish, Yellow-ish, red-ish) can be different.
Color & gloss harmony is harder to achieve.

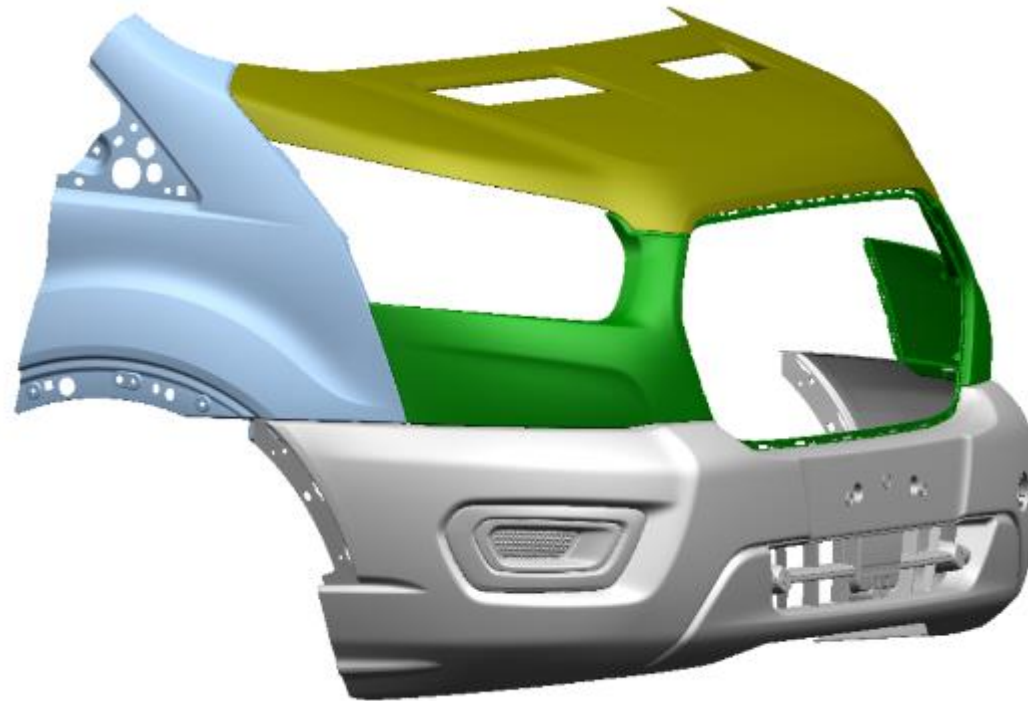
■ Inhouse Painted – Sheet Metal

■ Inhouse Painted – Plastic

■ Outsource Painted – Plastic

■ MIC White

Color representation is exemplary



DESIGN CONSIDERATIONS

Which parts are suitable?

MIC white parts are not suitable for areas that customer steps, puts stuff etc (due to low scratch resistance).

Visible underbody parts where stone chipping is critical (due to low chip resistance).

Interior applications where customers / drivers tend to identify color and gloss differences easily. (due to gloss level)

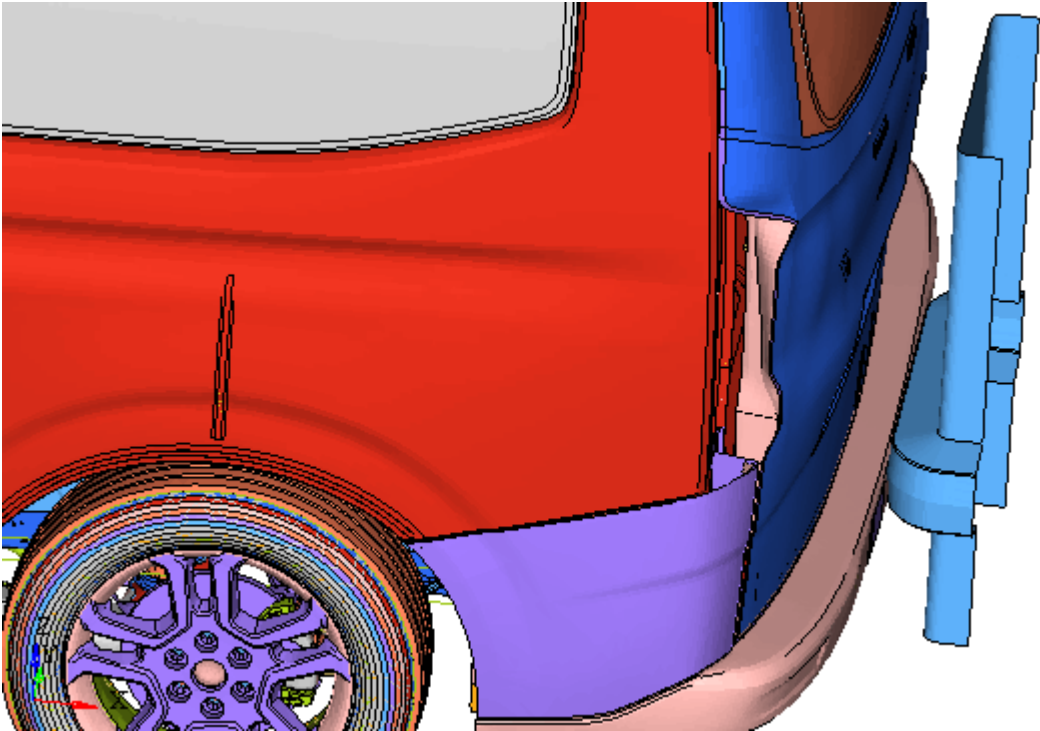


DESIGN CONSIDERATIONS

Stiffness expectations

MIC white application (compared to MIC black-grained) has lower stiffness due to reduced talc content.

Parts that require high stiffness are not suitable.



QUESTIONS

