



TOOLPLACE & GKC

AUGUST 2023

www.gkconcept.de



Engineering Factory.

FAKTEN

FOUNDED 2012 IN DRESDEN

14 EMPLOYEES

EXPERTISE IN PLASTIC

TISAX CERTIFIED

Process

BACK INJECTION

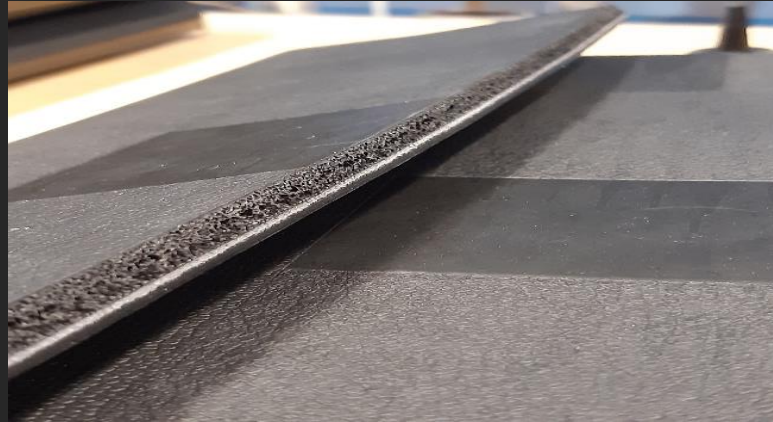
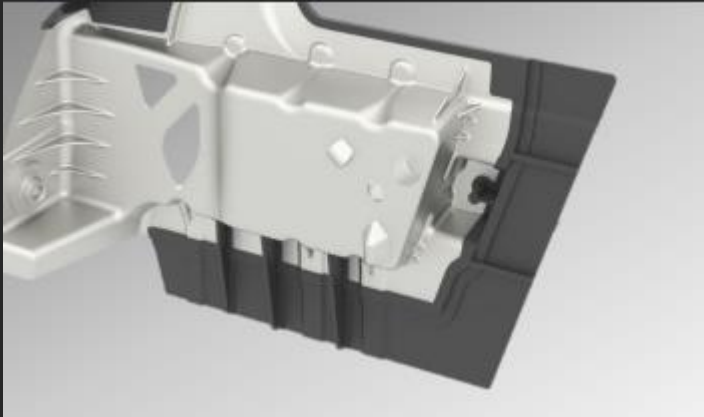


INJECTION MOLDING & PU

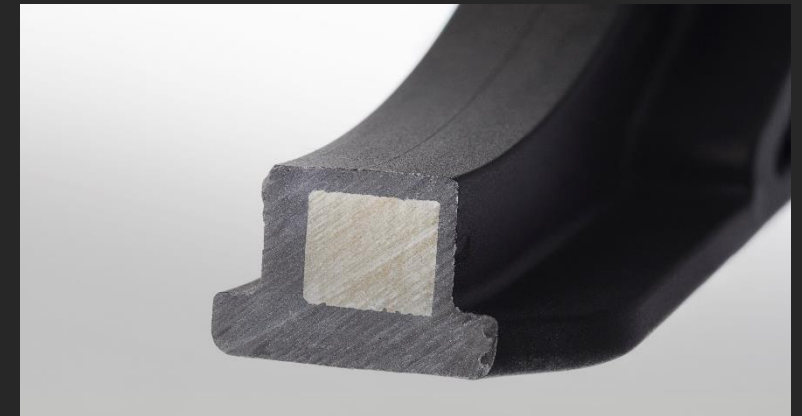
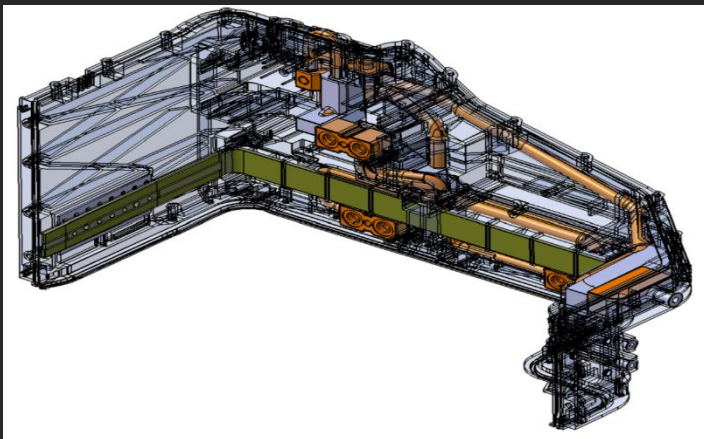


Process

MULTI MATERIAL PROCESS

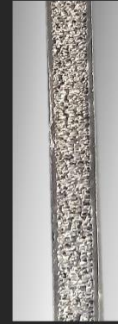


LIGHTWEIGHT APPLICATION

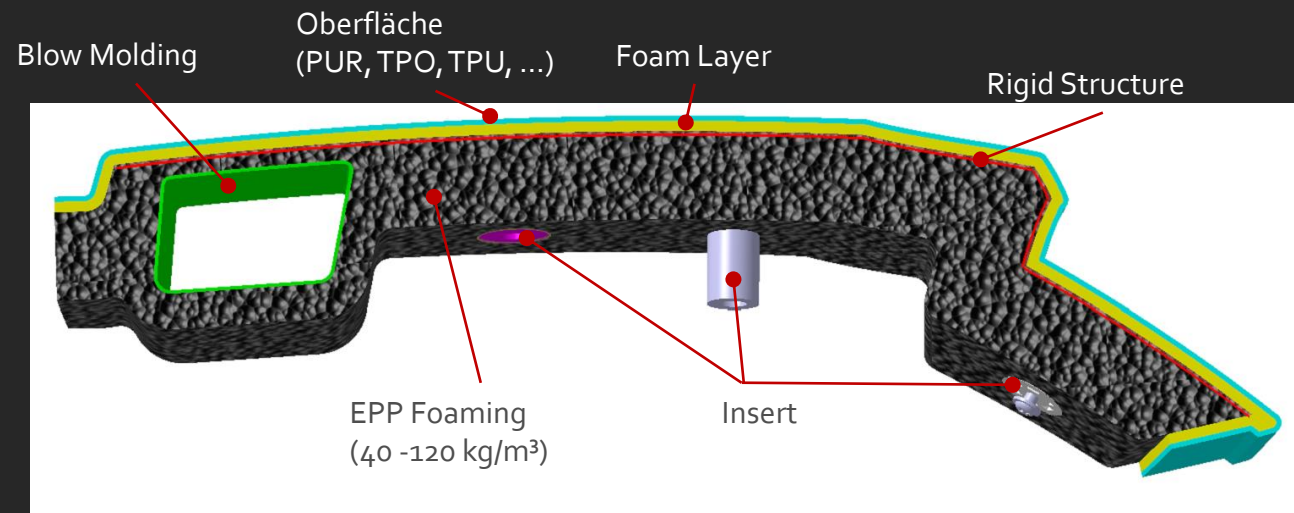


Prozesse

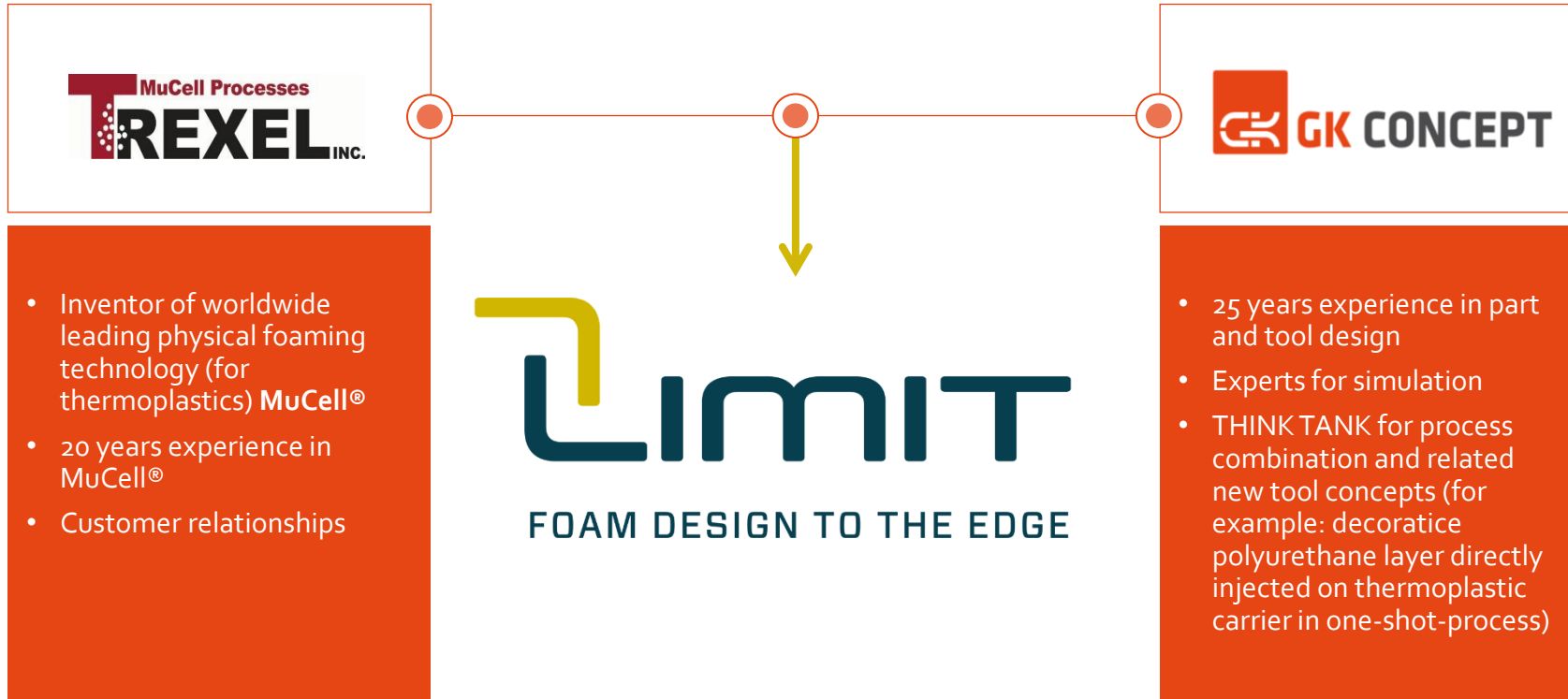
THERMOPLASTIC FOAMING



MULTI MATERIAL

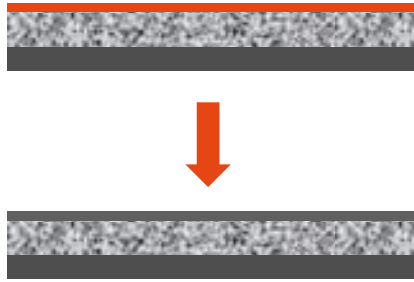


JV with Trexel for Foaming Applications



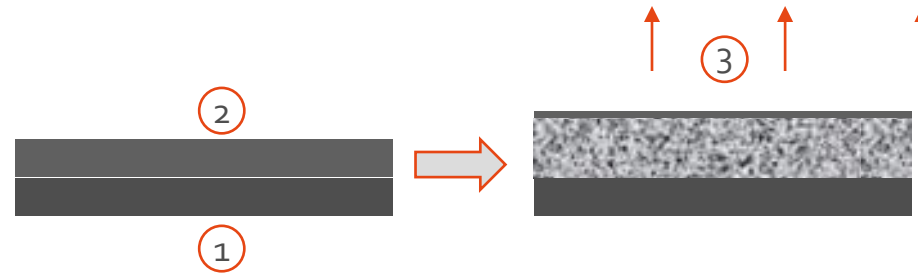
Core Back

Replacement of 3 layer Parts



- Top layer & foam layer same material
- Base layer same material group
- No semi-product

Thermoplastic foam injection molding with decompression stroke

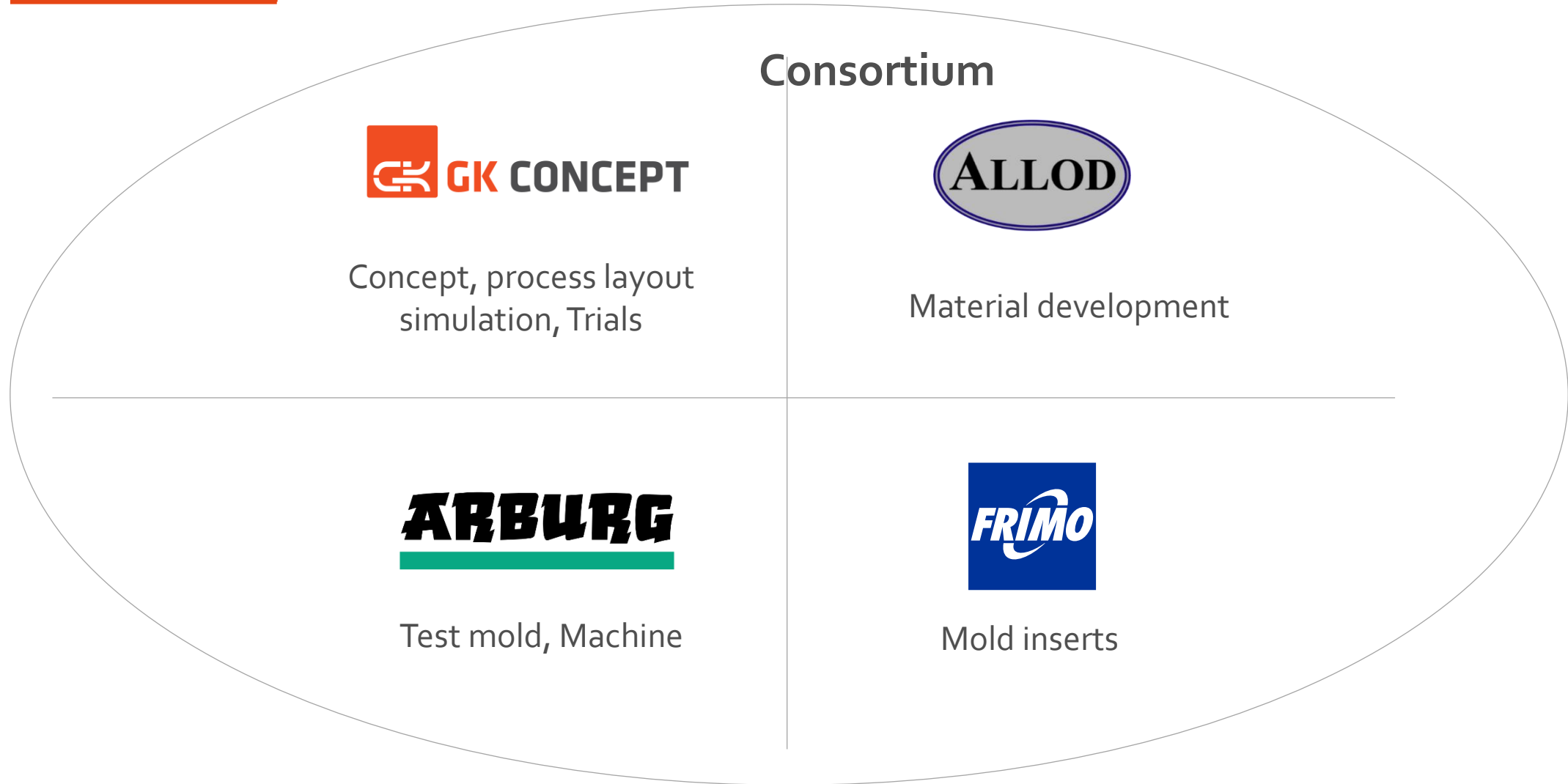


1. Inject base layer
2. Overmold second layer with gas-loaded melt
3. Opening stroke of mold starts nucleation

Target: Recyclable soft touch layer for interior parts with visible surfaces

Challenge: The softer the material the worse the foam structure and the surface!

Consortium



Material Development

Requirements



Process Influences

Material

- Base hardness
- Filler content
- Composition
- Melt strength

Foaming Agent

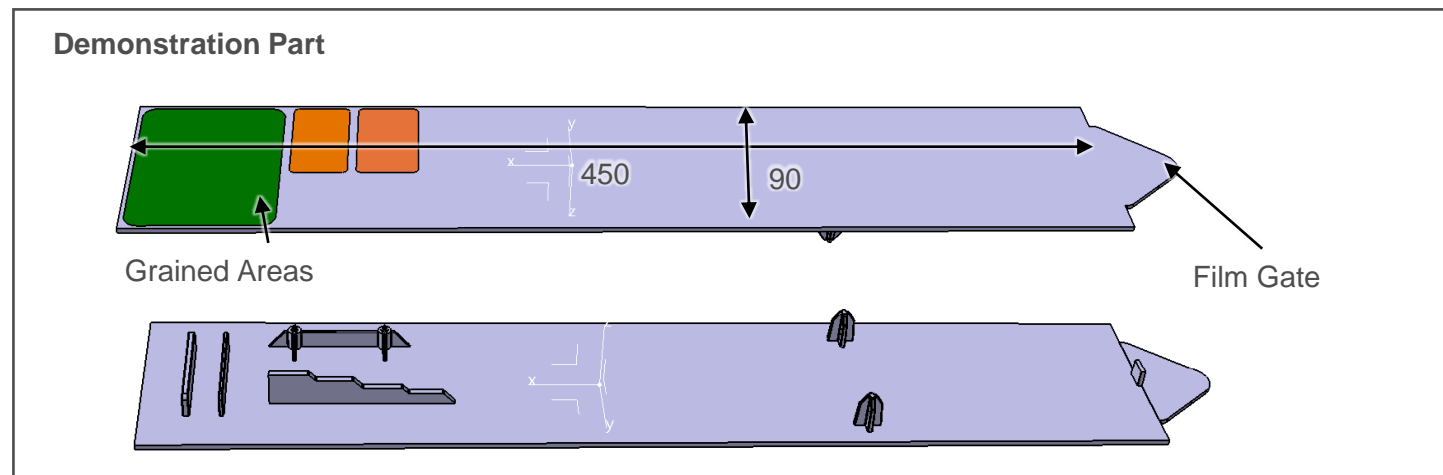
- Physical: N_2 / CO_2
- Chemical: CBA
- Amount

Part & Mold Design

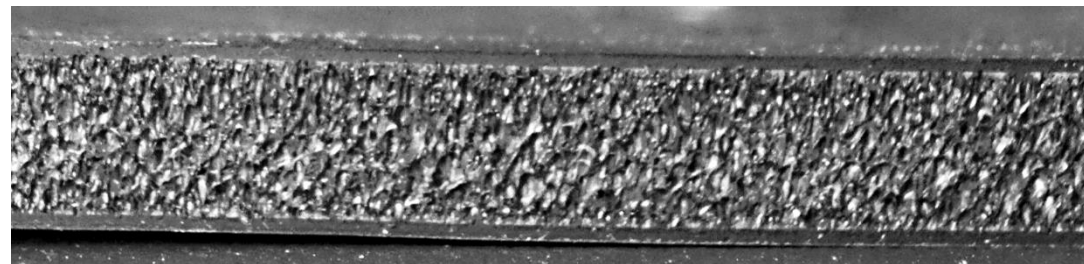
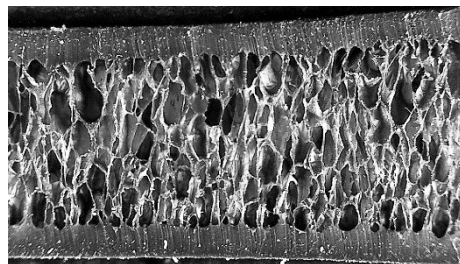
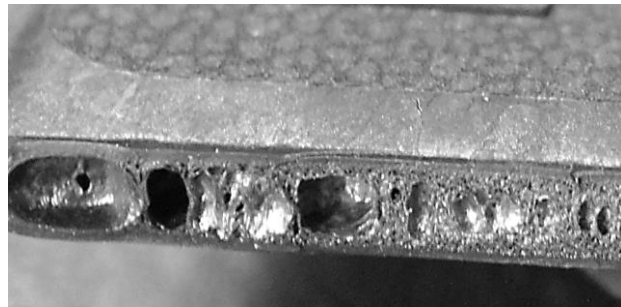
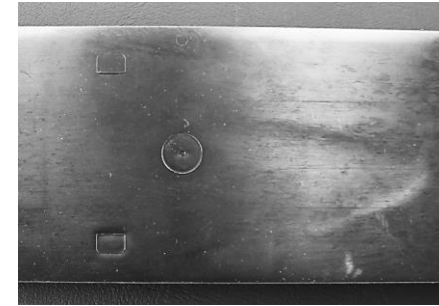
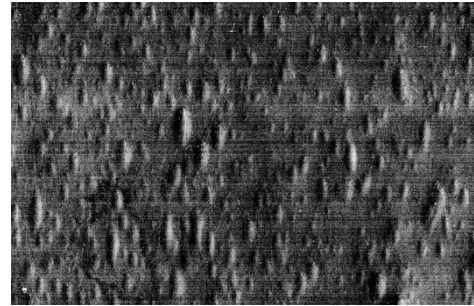
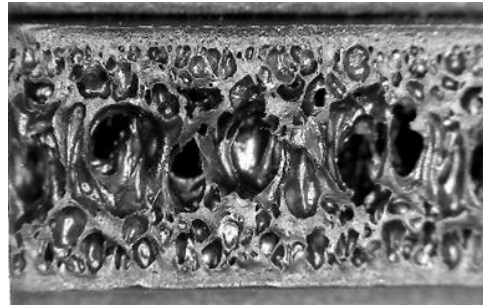
- Wall thickness
- Flow length
- Surface structure

Process

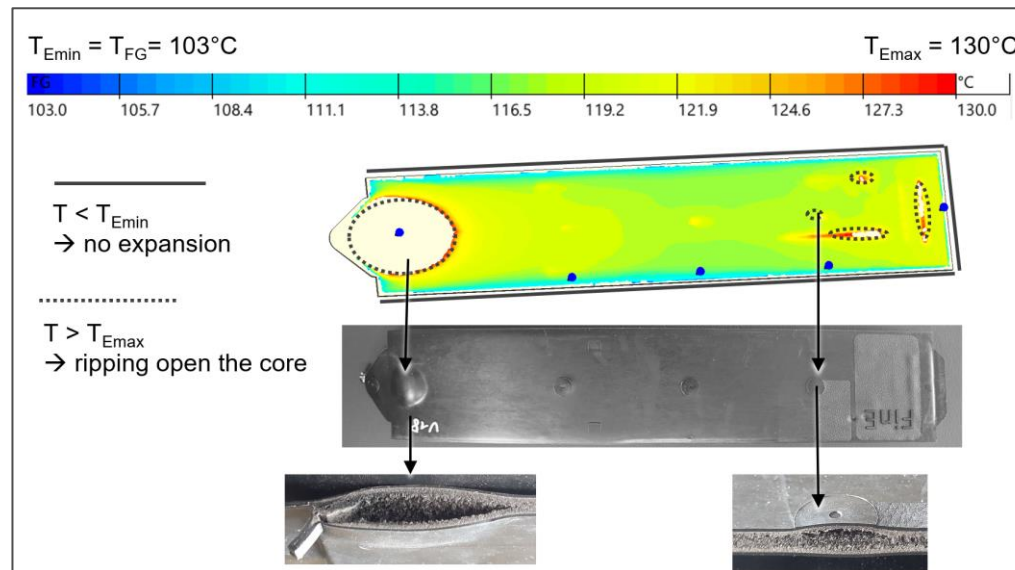
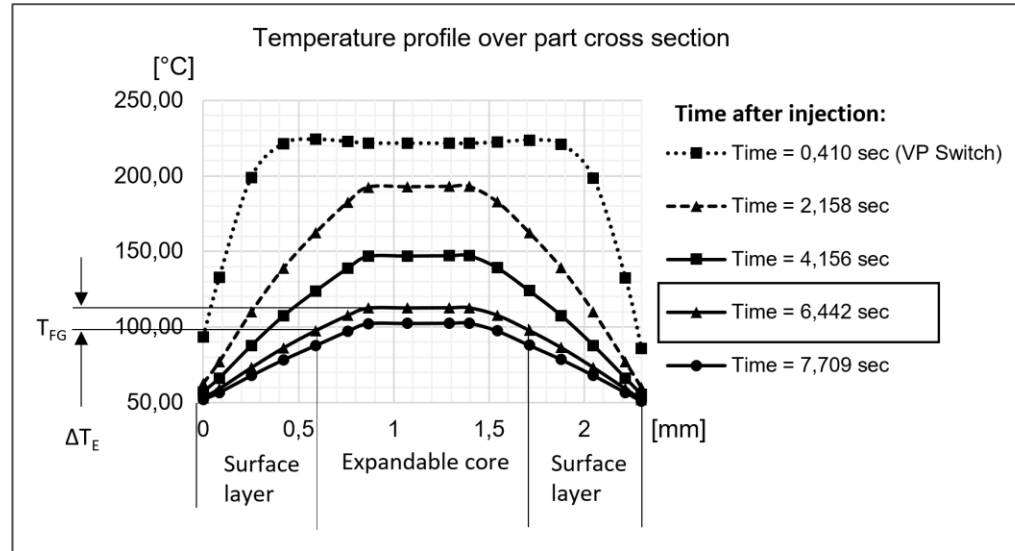
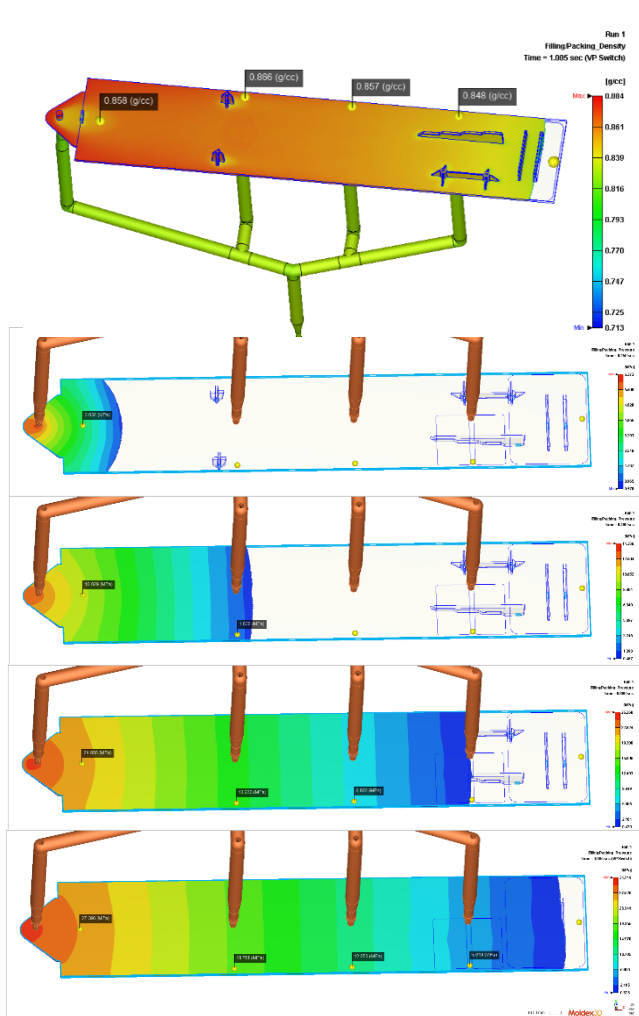
- Injection speed
- Melt temperature
- Mold temperature
- Holding pressure
- Opening speed



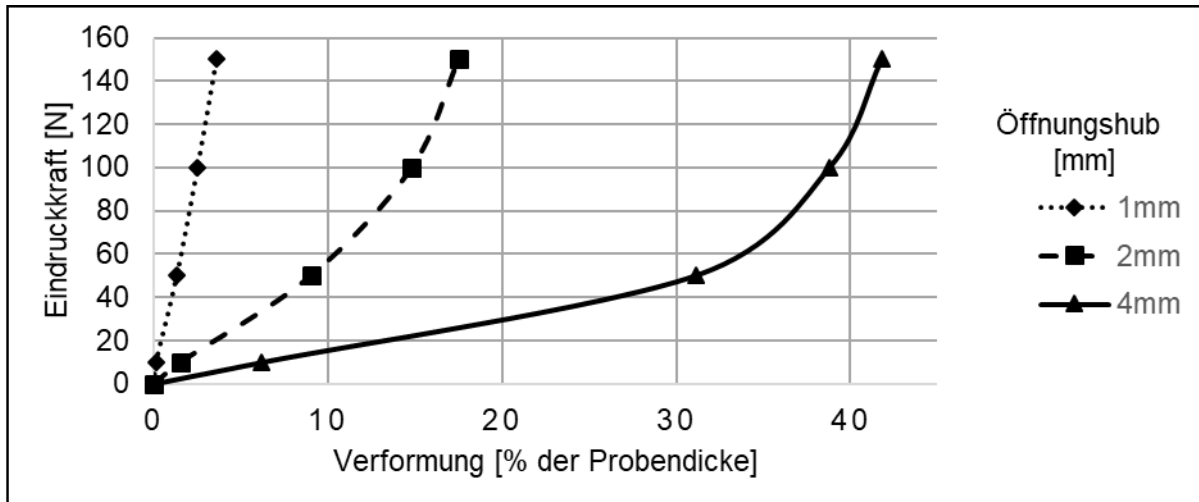
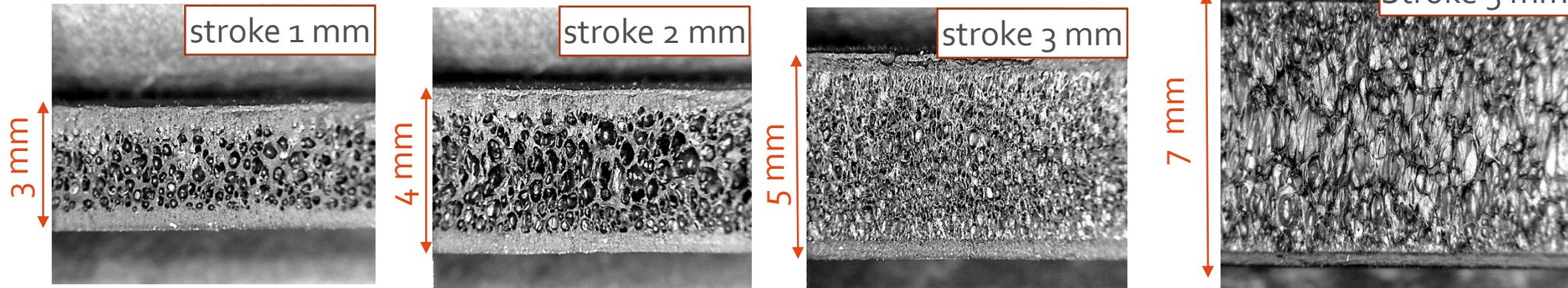
First Results



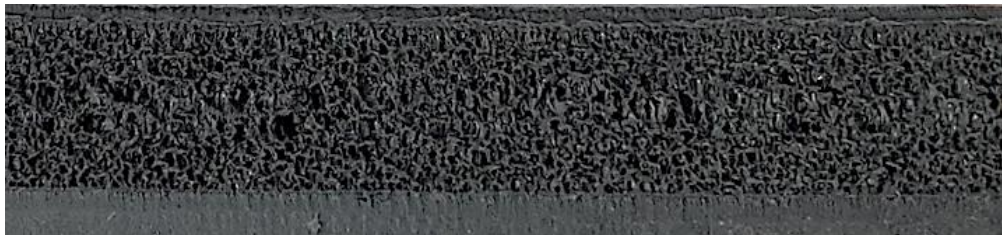
Simulation



Results



Results

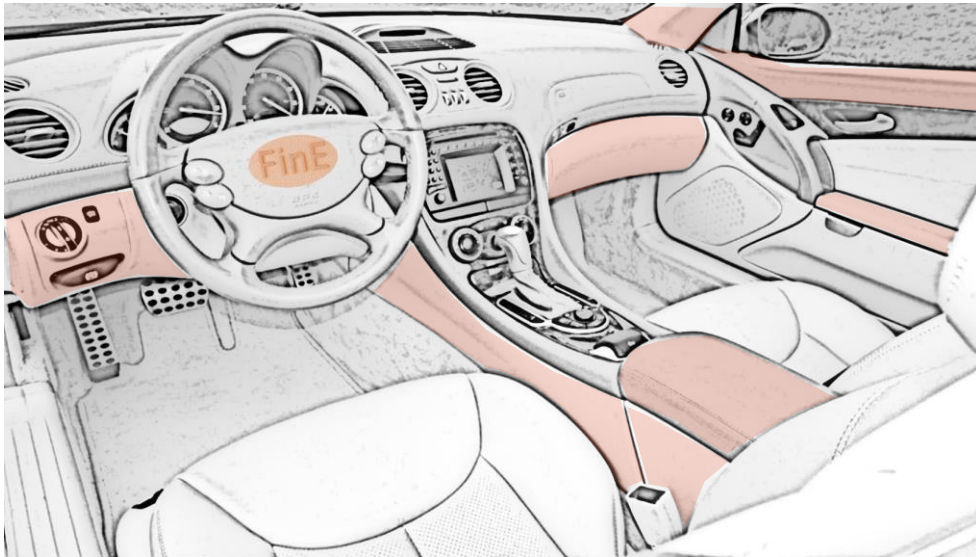


compact layer (0.6 mm)

foam layer (1.5 – 10 mm)

carrier

Potential Applications

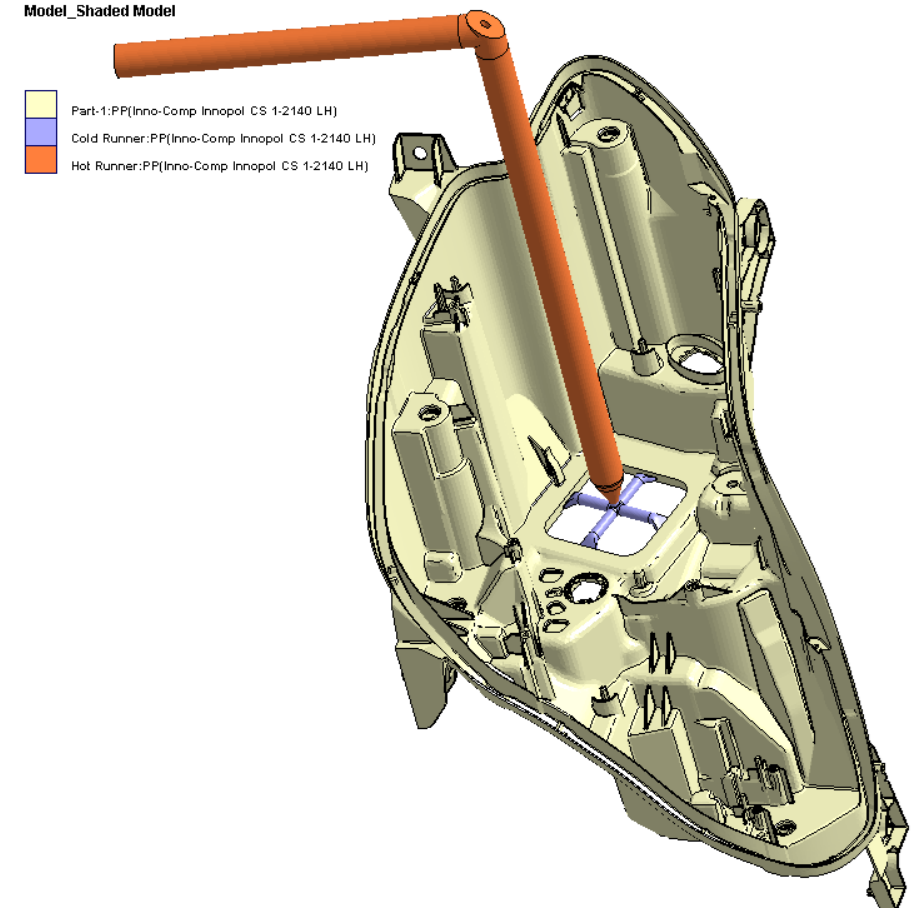


- Armrest
- Pillar Trim
- Door Rail
- Door Trim
- Glove Box
- Dashboard
- Center Console

Project Housing with Re-Design (2-Limit)

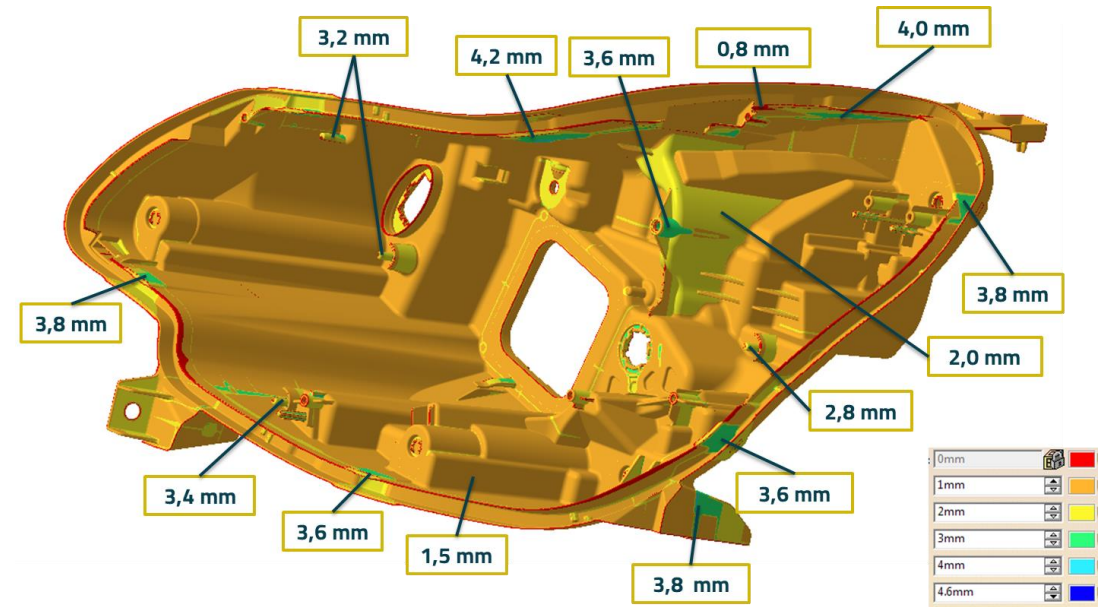
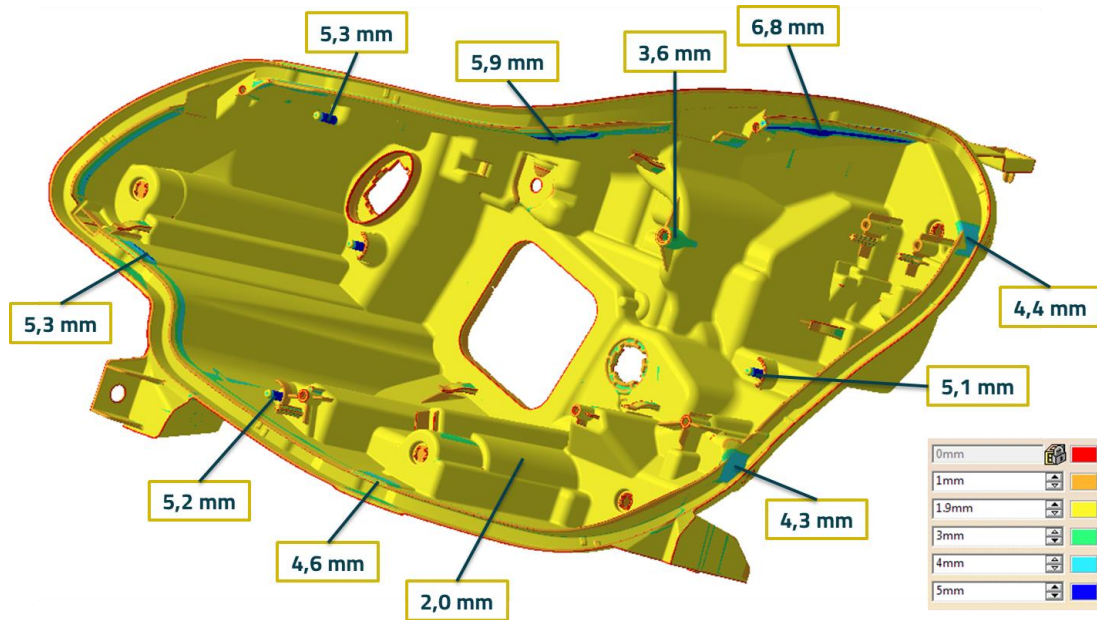
Part Information	Normal	MuCell
Wall Thickness	2,0mm	1,5 mm
Proj. Area	673 cm ²	674,4 cm ²
Teile Volumen	691 cm ³	558,2 cm ³
Material	Innopol CS 1-2140	Innopol CS 1-2140
Gates	4x film gate 1,5 mm	4x film gate 1,5 mm

Model_Shaded Model



Project Housing (2-Limit)

WALL THICKNESS REDUCTION



Project Housing (2-Limit)

PROCESS

Resultat	Normal	MuCell
Tool Material	Stahl	Alu
Wall Thickness	2,0 mm	1,5 mm
Pivot Point	Ca. 96 %	99 %
Injection Time	4,6 s	1,8 s
Holding Pressure	650 bar	35 bar
Holding Pressure Time	6 s	0,5 s
Holding Pressure at Pivot Point	389 bar	779 bar
Clamp Force	410 t	312 t
Part Weigth	827 g	610,4 g
Cycle Time	56,6s	26 s
Max Warpage	0,86mm	0,34 mm

Advantage

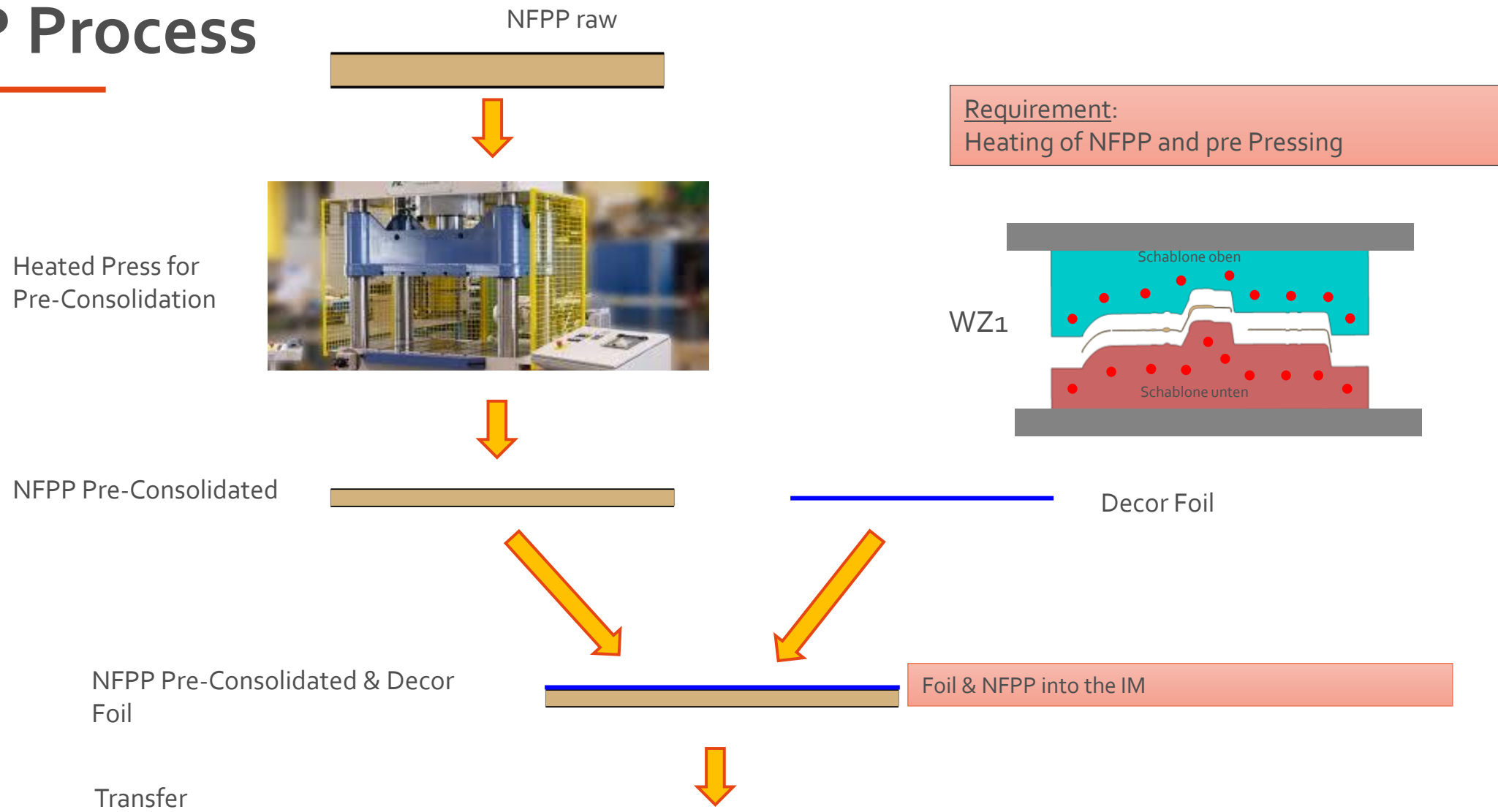
← - 24%

← - 26%

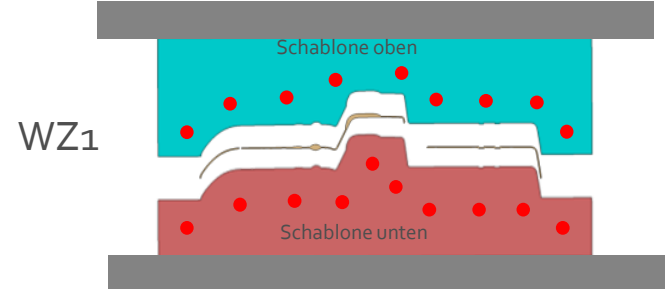
← - 54%

← - 60%

NFPP Process



Requirement:
Heating of NFPP and pre Pressing



Foil & NFPP into the IM

NFPP





THANK YOU FOR YOUR ATTENTION!

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