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Simulation software for rotational molding process

A KEY TOOL FOR THE DESIGN AND DEVELOPMENT OF ROTOMOLDED PRODUCTS

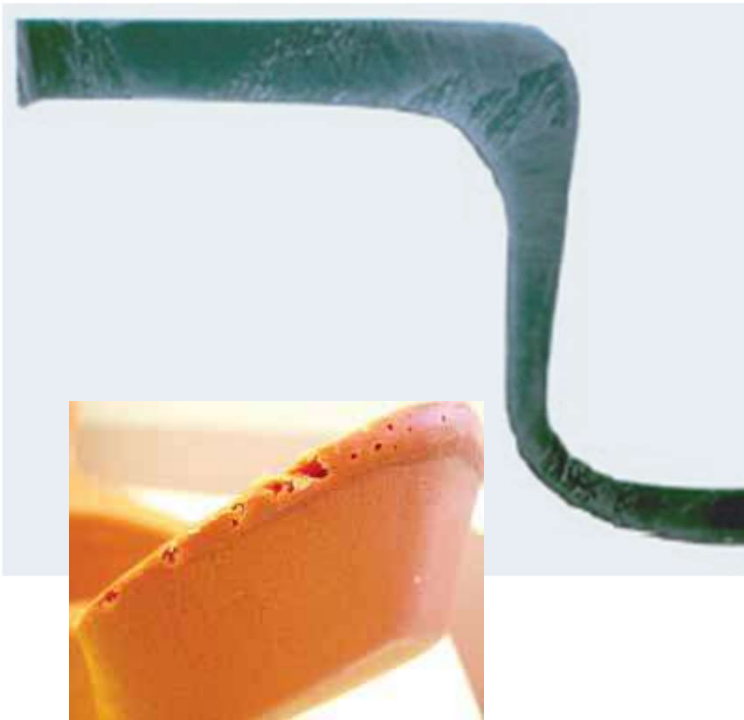
Created by Eng. Diego D'Amico
Presented by Dr Gareth McDowell

Mar del Plata - Argentina

Wall Thickness Variations

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- Very uneven wall thicknesses ... +/-20%



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ROTOMOLDING SIMULATION

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- Minimize process uncertainties
- Address proper thickness distribution.
- Optimize the amount of material used.
- Avoid products that do not meet requirements.
- Avoid corrections and modifications to moulds.
- Avoid delays in launching the product to market.

ACHIEVE MORE COMPETITIVE PRODUCTS

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WHAT IS NEEDED TO USE SIMOLDING?

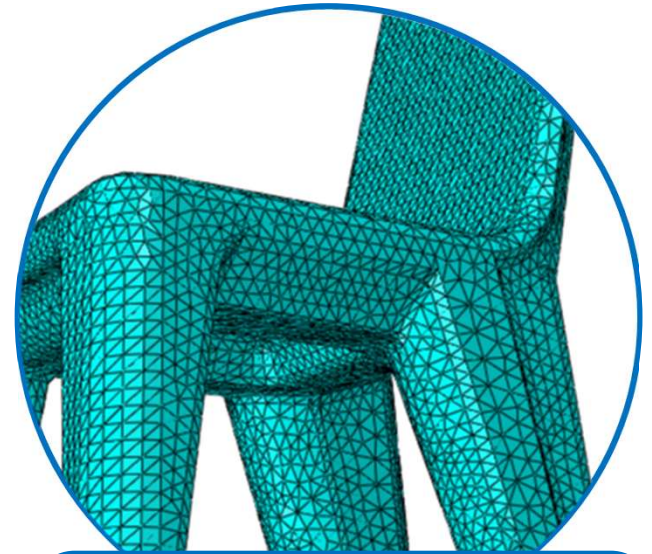
OBJECT MESH FEM

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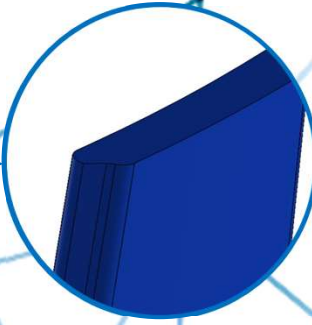
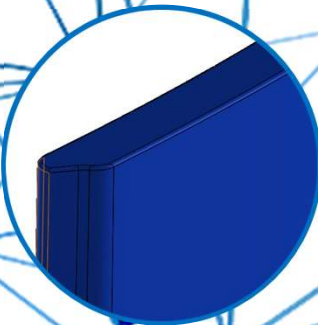


Solid volume

or



3D Mesh
Volume Elements
(Tetrahedrons)



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HOW DOES SIMOLDING WORK?


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PROCESS FLOW



- ### Calculations
- Material Quantity
 - External Shell Mesh
 - h_{conv} Calculation
 - Powder Movement Inside the Mold
 - Temperature Calculation in the Mold
 - Temperature Transfer to the Material
 - Material Transfer to the Mold

- ### Output Data
- Thickness distribution
 - Material residence time distribution on the mold
 - Temperature distribution in the mold
 - Temperature distribution in the part
- Deliverables
- Maximum and minimum results file with images (PDF)
 - Shell mesh file with results for visualization and FEM post-analysis.

- ### Input Data
- 
- 3D volume mesh
- Mold Data
- Material
 - Thickness
 - Position on Machine
- Process data
- Oven Temperature
 - Heating Curve
 - Heating Time
- Part data
- Material data
 - Target thickness

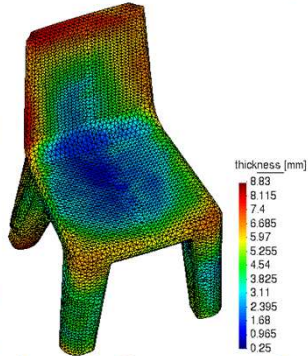
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APPLICATION EXAMPLE

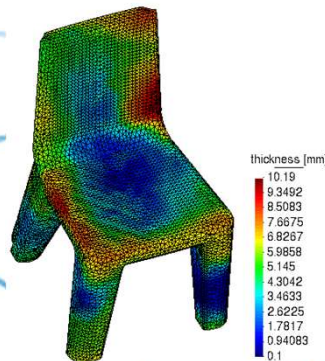
SUCCESS STORY

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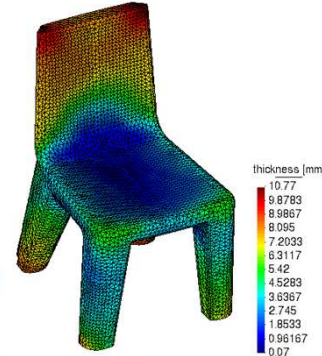
Several runs are made with Simolding



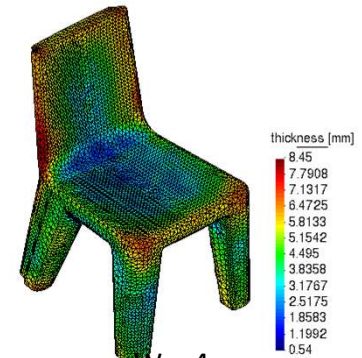
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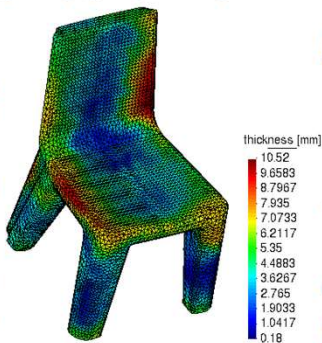
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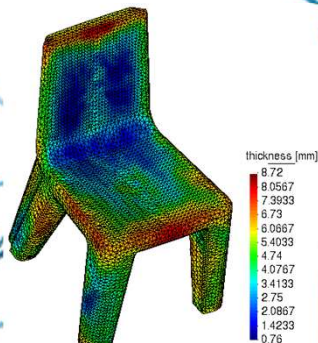
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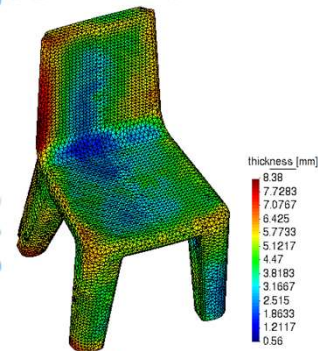
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Wx=5
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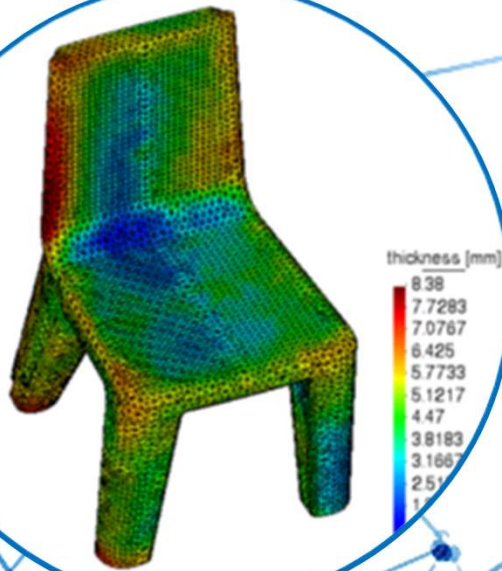
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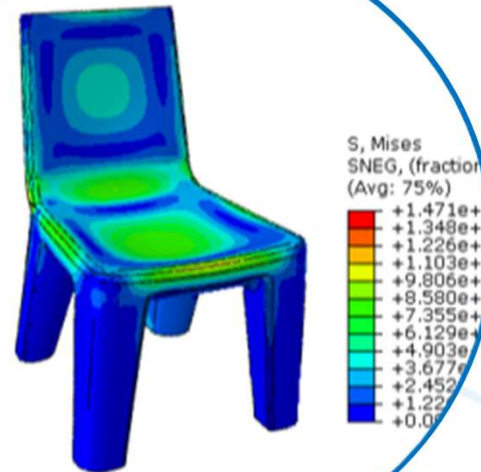
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The best result is chosen for a structural simulation



Simolding result



FEM result