

Mechanical Stage 1: Effect of part wall thickness and processing conditions

Applications beyond unidirectionally oriented test specimens with a wall thickness of 4 mm



Question: How are mechanical properties affected by processing parameters and wall thickness?

Mechanical Stage 2: Entering part and presentation parameters

Click on "Mechanical"

Mechanical Properties

Property	Parameter	Min.	Max.	Auto
Property 1	Tensile modulus II	308264	326805	<input checked="" type="checkbox"/>
Parameter 1	Wall thickness	0.0591	0.1575	<input checked="" type="checkbox"/>
Parameter 2	Mold temperature	140.00	176.00	<input checked="" type="checkbox"/>

Processing Conditions for molded parts

Wall thickness: 0.0591 to 0.1575, **0.0945** in

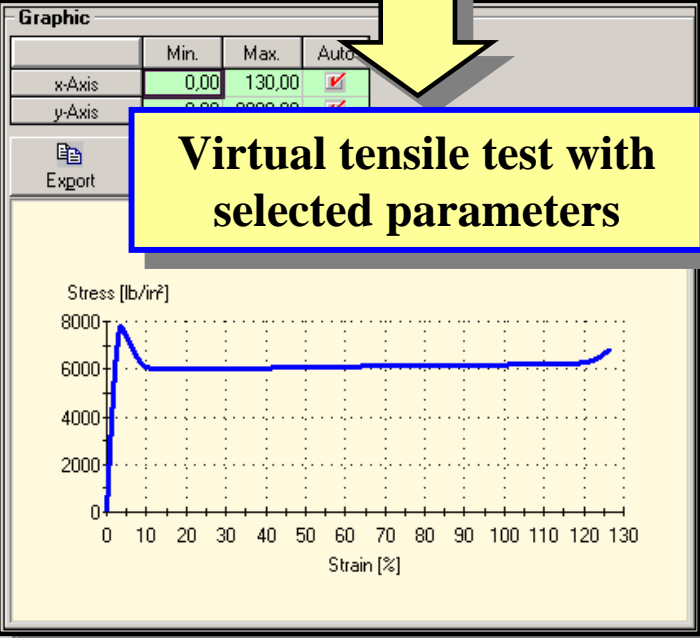
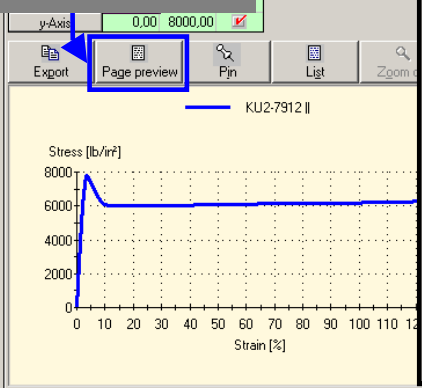
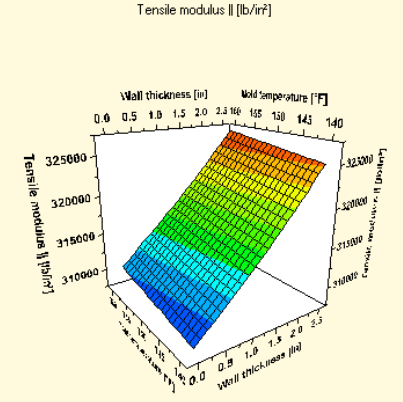
Melt temperature: 500.00 to 536.00, **500.00** °F

Mold temperature: 140.00 to 176.00, **174.20** °F

Specify parameters

Print preview

Virtual tensile test with selected parameters



Mechanical Stage 3: Output: calculated mechanical properties

The screenshot displays the 'Design and Processing Properties' interface. The 'Mechanical Properties' section is active, showing a table of properties and their values across different parameters (Wall thickness and Mold temperature). A 3D surface plot visualizes the 'Tensile modulus II [lb/ir²]' as a function of wall thickness and mold temperature. A 2D stress-strain plot for 'KU2-7912 II' shows a sharp yield point followed by a plateau. A 'Property- and target profile' table is overlaid on the right, listing current values and target ranges for various mechanical properties. Callout boxes provide instructions: 'Enter target profile' points to the table, 'Calculated properties' points to the stress-strain plot, and 'Export stress-strain data e.g. to Excel' points to the 'Export' button in the graphic window.

Property	Current Value	Min.	Max.	Reset
Tensile modulus II [lb/ir²]	315769	145038	1160302	
Yield stress II [lb/ir²]	7860	1450	14504	
Yield strain II [%]	3,9	1,0	10,0	
Stress at break II [lb/ir²]	6816	1450	21756	
Strain at break II [%]	130,3	2,0	500,0	
Tensile modulus _L [lb/ir²]	315769	145038	1160302	
Yield stress _L [lb/ir²]	7860	1450	21756	

The mechanical properties of Makroblend KU2-7912 are relatively constant.

Mechanical Stage 4: Comparing anchored stress-strain curves for Makroblend KU 2-7912 with S 7916

Anchoring list

Scale of axis

Makroblend S 7916 is not a suitable option for this application.

The image displays a software interface for material analysis. On the left, the 'Design and Processing Properties' panel shows material selection options including Appec®, Bayblend®, Makroblend®, and Makrolon®, with S 7916 selected. Below this, the 'Mechanical Properties' section includes a 'Graphic' table with columns for Parameter, Min., Max., and Auto, and a 'Display' section with options like Contour Plot, Set of curves, and 3d-Plot. A contour plot shows 'Tensile modulus II [lb/ir²]' as a function of 'Wall thickness [in]' and 'Mold temperature [°F]'. The main window features a 'Graphic' panel with a table for axis scaling and a 'Pin' button. The 'Graphic' table shows the following data:

	Min.	Max.	Auto
x-Axis	0,00	6,20	<input type="checkbox"/>
y-Axis	0,00	8697,79	<input type="checkbox"/>

The 'Pin' button is highlighted in a yellow box. Below the table, a stress-strain graph plots 'Stress [lb/ir²]' on the y-axis (0 to 8000) against 'Strain [%]' on the x-axis (0 to 6). Two curves are shown: S 7916 (grey) and KU2-7912 (magenta). The KU2-7912 curve shows a higher yield stress (approximately 618 lb/ir²) and a higher tensile strength (approximately 7000 lb/ir²) compared to the S 7916 curve (yield stress approximately 529 lb/ir², tensile strength approximately 618 lb/ir²). A yellow box at the bottom of the image contains the text: 'Makroblend S 7916 is not a suitable option for this application.'