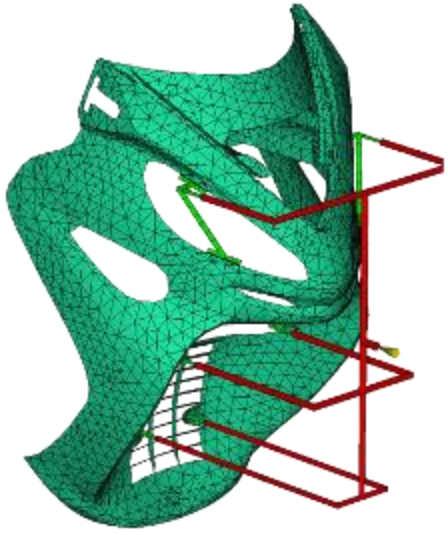
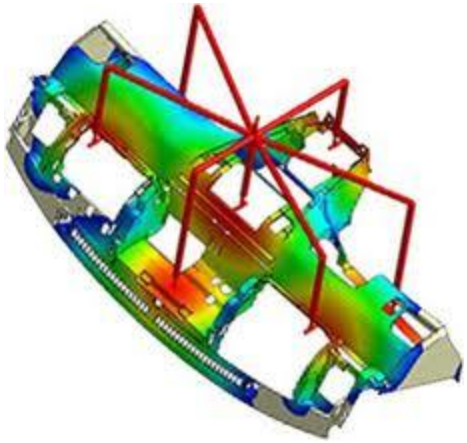
Rotomolding Simulation Software

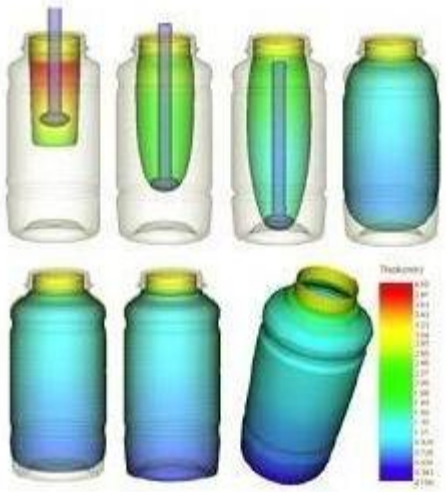
ARM Fall Meeting

Cleveland, Ohio

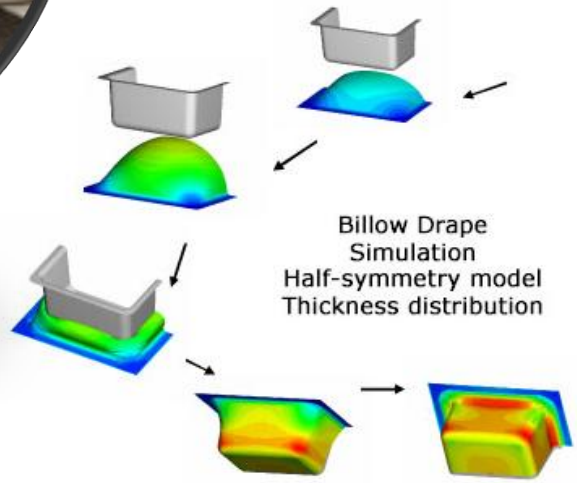
September 30, 2013



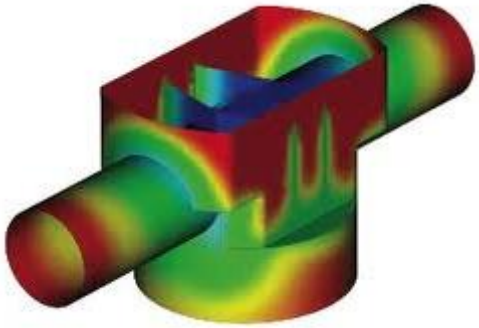




Stretch blow moulding simulation



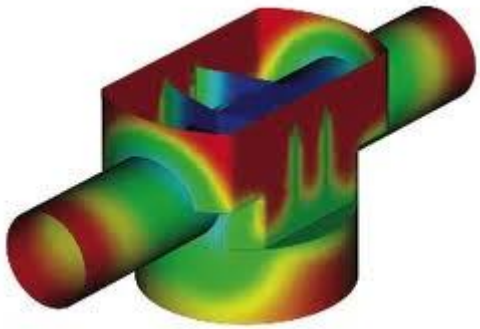
Why Use Simulators?



Design of Part

- Identify Potential molding Problem areas during the design stage
- Where is thickness critical?
- Better basis for quoting

Why Use Simulators?



Design of Process

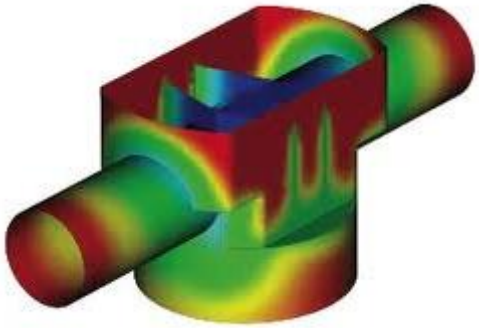
- Effect of shielding
- Effect of enhanced heating
- Effects of changing cooling techniques and timing
- Effects of changing arm rotation without interfering with other molds on the same arm.

Why Use Simulators?

Saving Costs

- Saves Machine time – Gas, Electrical
- Saves material needed to run trials
- Productivity – Less time running tests

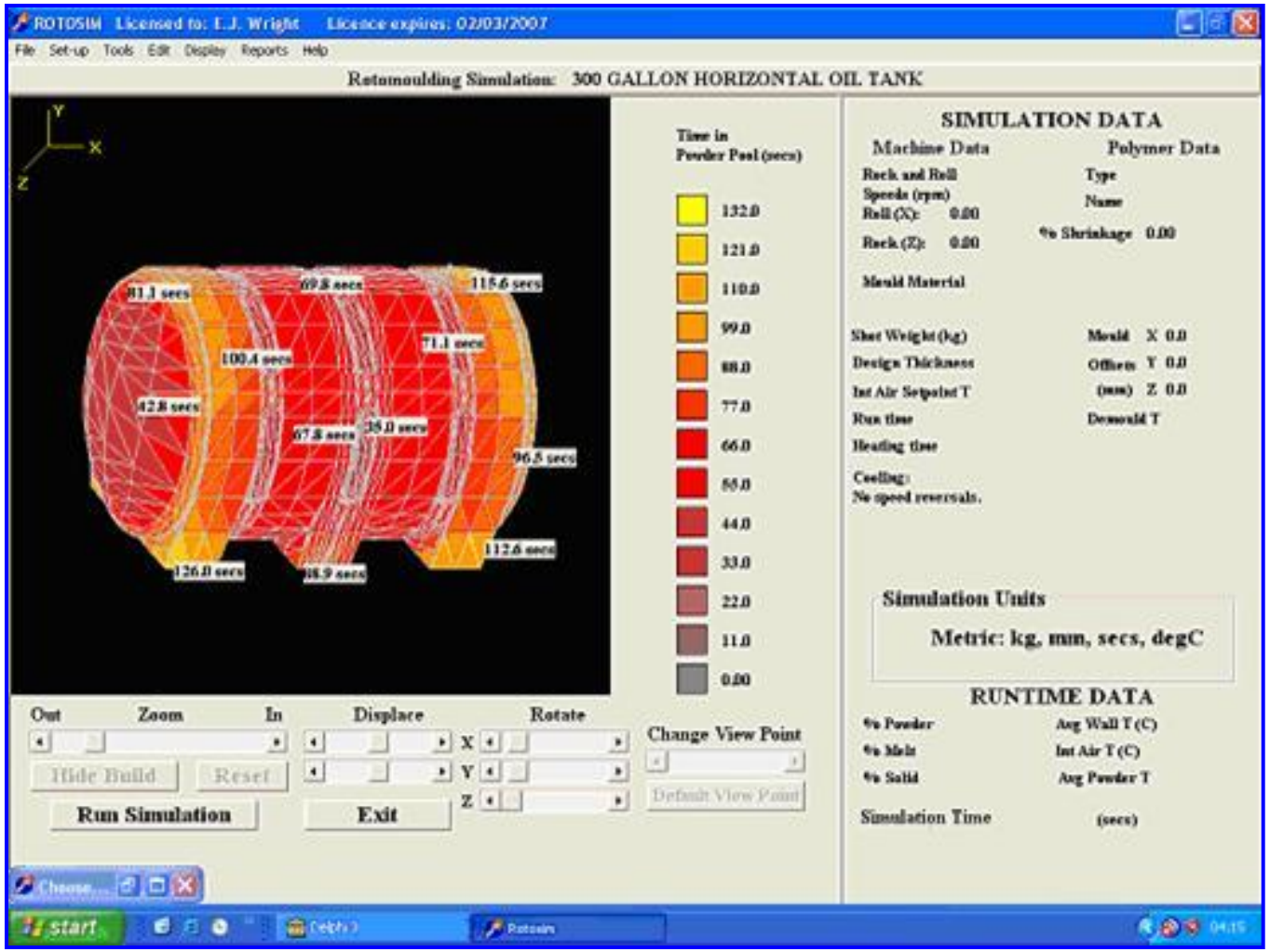
Simulation in Rotomolding



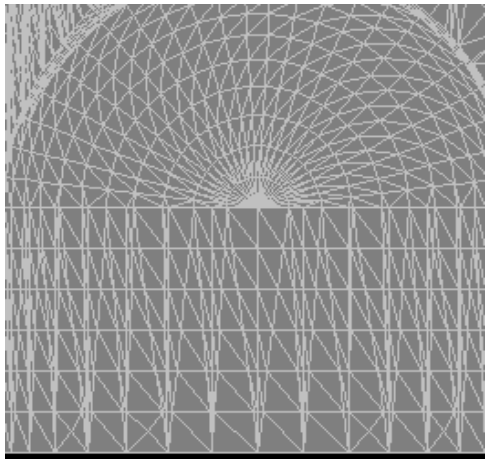
Training

New employees can be trained on setting up molds and cycles and see the effect of their work without risk or damage to production.

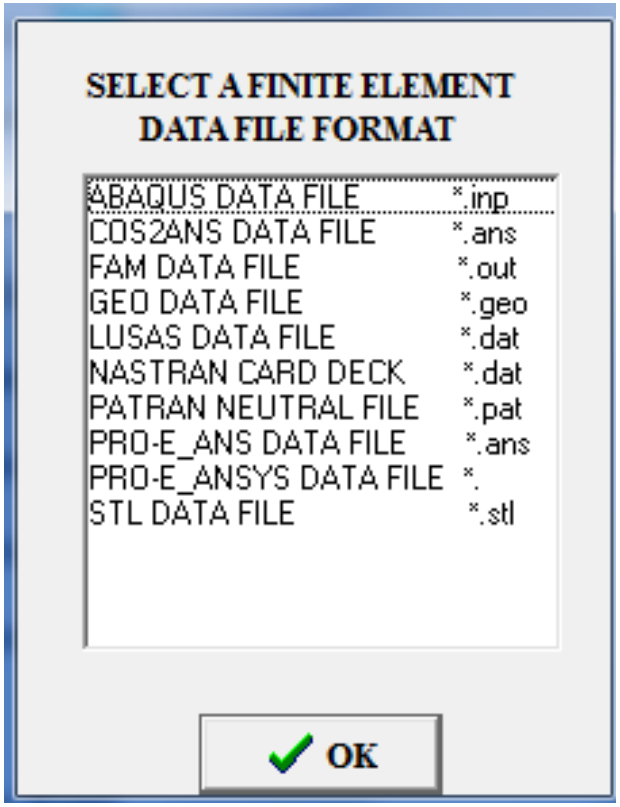
Simulation Software for Rotomolding



File Import Format



- All Starts with 3D CAD data.
  - SolidWorks™
  - ProE ™
- Must be able to export .stl or comparable format files into RotoSim



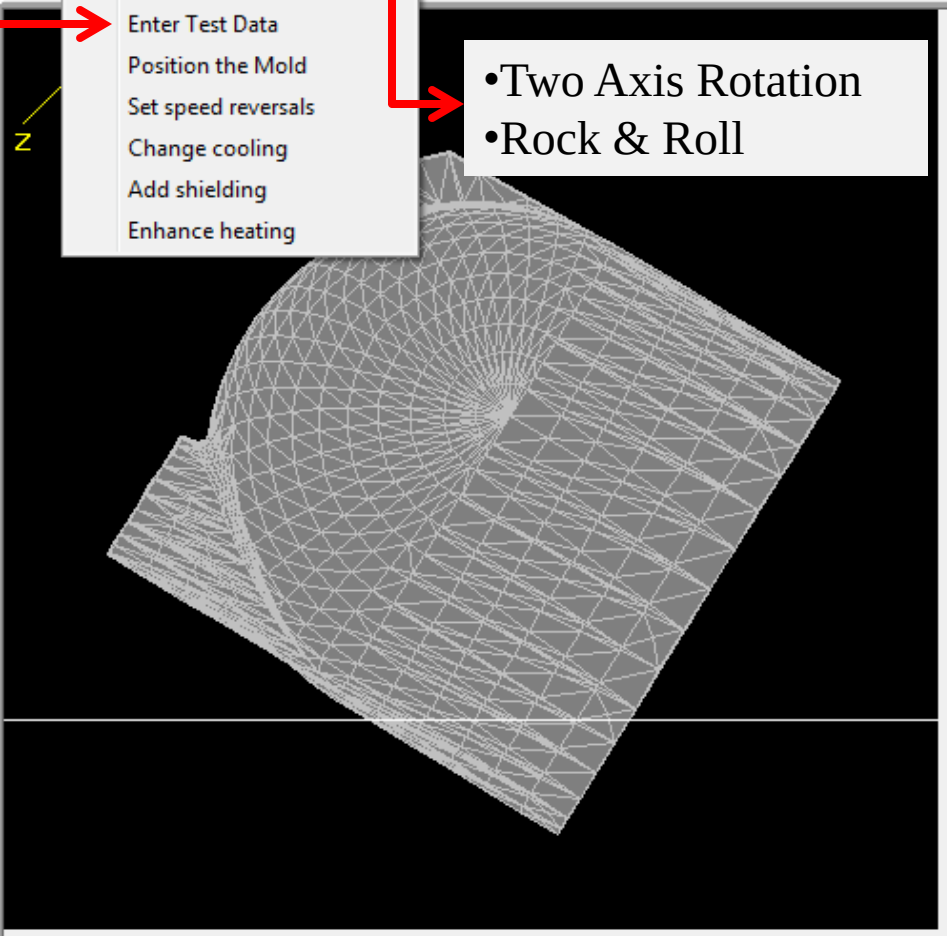
ROTOSIM Licensed to: Norstar Molds Licence expires: 4/18/2015

File | Set-up | Tools | Edit | Display | Reports | Help

- Select drive type
- Enter Test Data
- Position the Mold
- Set speed reversals
- Change cooling
- Add shielding
- Enhance heating

Rotomoulding Simulation: 2000lt_tank

- Two Axis Rotation
- Rock & Roll



Polymer Thickness (ins)

Melt		Solid
	0.360	
	0.330	
	0.300	
	0.270	
	0.240	
	0.210	
	0.180	
	0.150	
	0.120	
	0.090	
	0.060	
	0.030	
	0.000	

Out Zoom In

Displace

Rotate

X

Y

Z

Change View Point

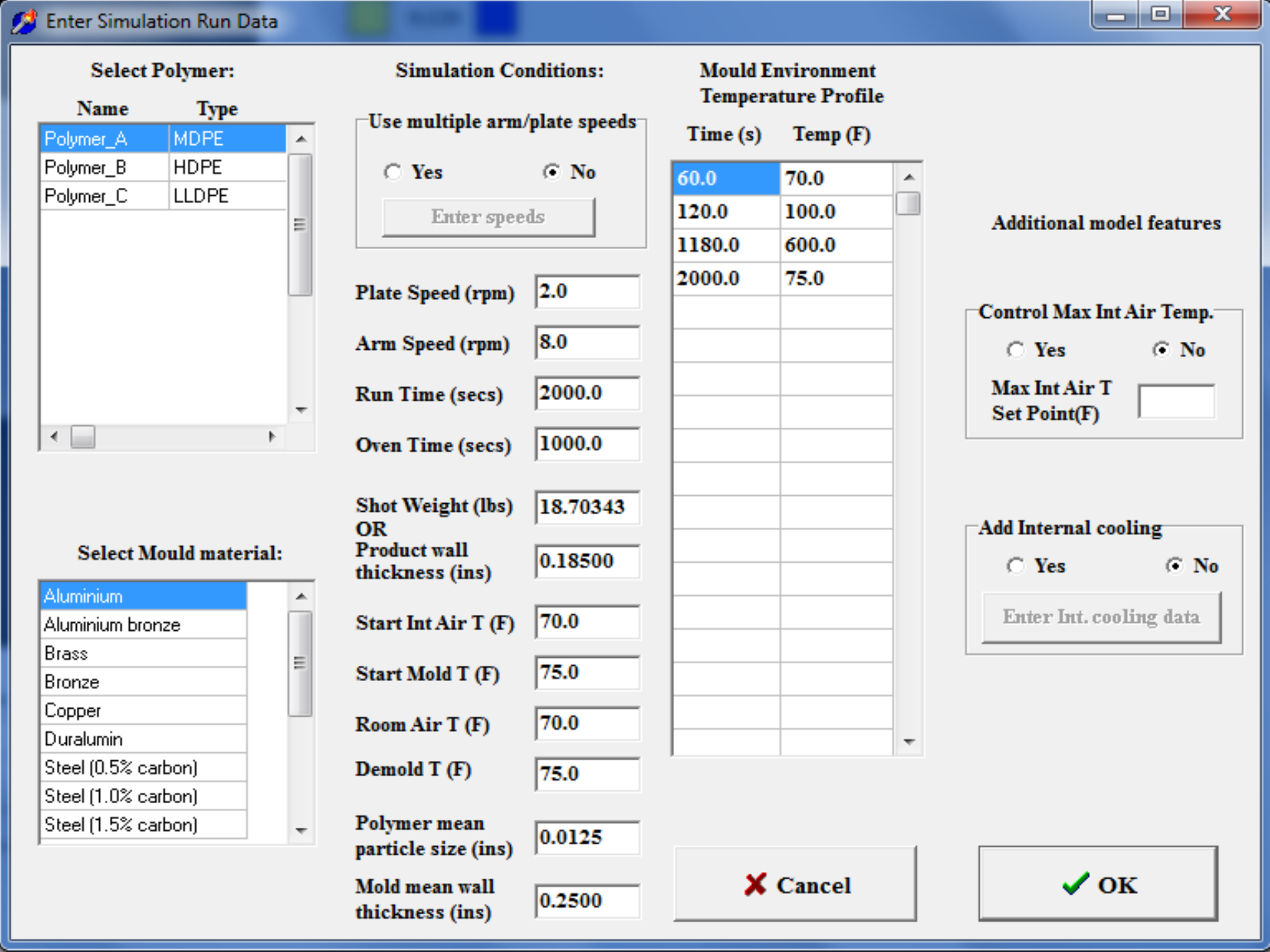
Hide Build

Reset

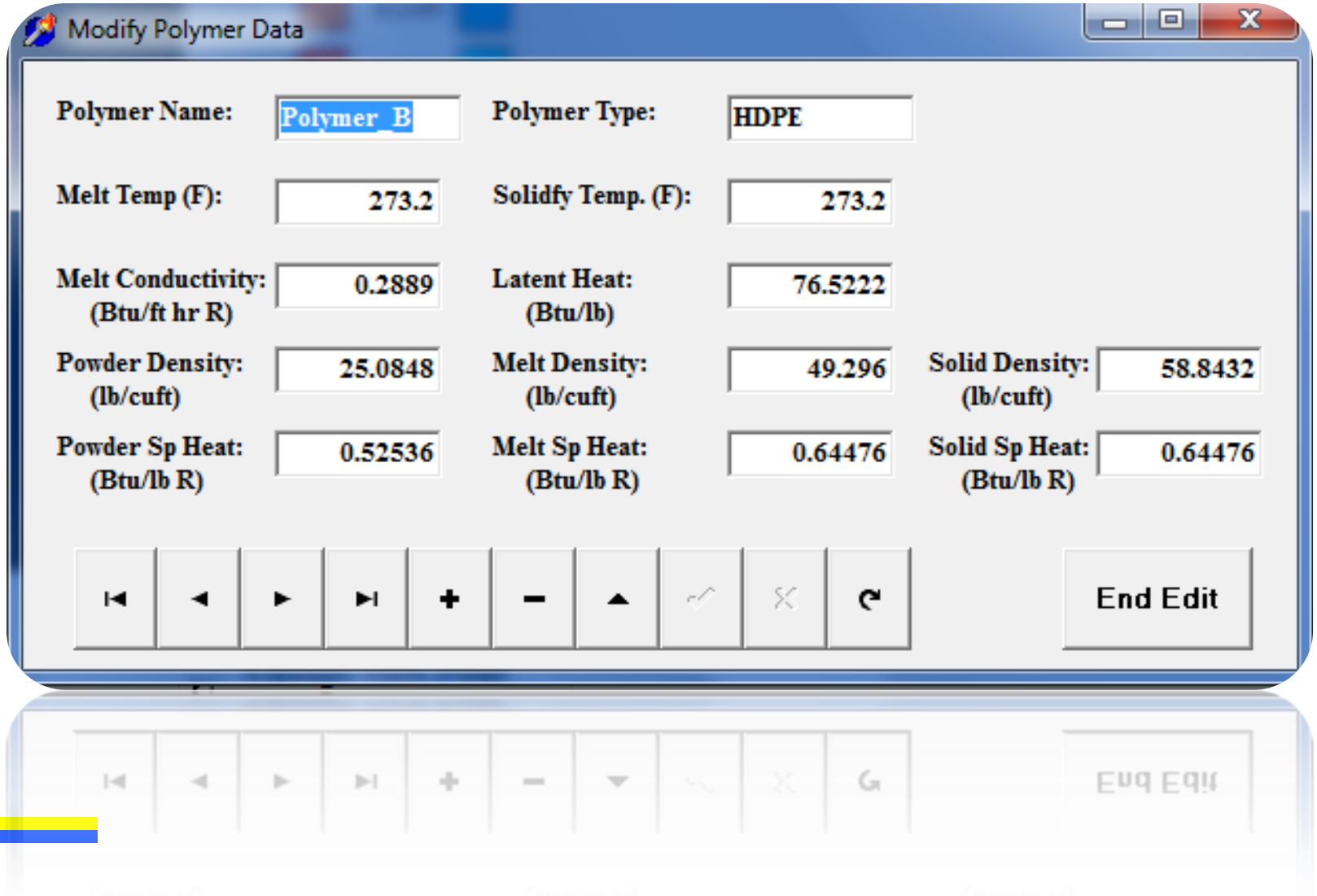
Default View Point

Run Simulation

Exit


Enter Simulation Run Data
Select Polymer:
Name
Type
Polymer_A
MDPE
Polymer_B
HDPE
Polymer_C
LLDPE
Select Mould material:
Aluminium
Aluminium bronze
Brass
Bronze
Copper
Duralumin
Steel (0.5% carbon)
Steel (1.0% carbon)
Steel (1.5% carbon)
Simulation Conditions:
Use multiple arm/plate speeds
Yes
No
Enter speeds
Plate Speed (rpm)
2.0
Arm Speed (rpm)
8.0
Run Time (secs)
2000.0
Oven Time (secs)
1000.0
Shot Weight (lbs)
OR
Product wall thickness (ins)
18.70343
0.18500
Start Int Air T (F)
70.0
Start Mold T (F)
75.0
Room Air T (F)
70.0
Demold T (F)
75.0
Polymer mean particle size (ins)
0.0125
Mold mean wall thickness (ins)
0.2500
Mould Environment Temperature Profile
Time (s)
Temp (F)
60.0
70.0
120.0
100.0
1180.0
600.0
2000.0
75.0
Cancel
Additional model features
Control Max Int Air Temp.
Yes
No
Max Int Air T Set Point(F)
Add Internal cooling
Yes
No
Enter Int. cooling data
OK

New Resin Input



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- Add shielding
- Enhance heating

Rotomoulding Simulation: 2000lt_tank

Set Mould Offsets:

X Offset (ins) 0

Y Offset (ins) 0

Z Offset (ins) 0

Change Orientation about:

XAxis

YAxis

ZAxis

Restore Defaults

Cancel | OK

Out Zoom In

Displace

Rotate X Y Z

Hide Build | Reset

Run Simulation

Exit

Programme Speed Reversals

Arm Rotation: 97%

0 Oven Period (%) 100

Plate Rotation: 97%

Forward

Initialise Directions

Reverse

Change Direction

Together

Separately

Reset

OK

0.120

0.090

Programme Coolant Sequence

Oven Time 75% Run Time

0 % of Cooling Time 100

Cooling Methods

Still Air

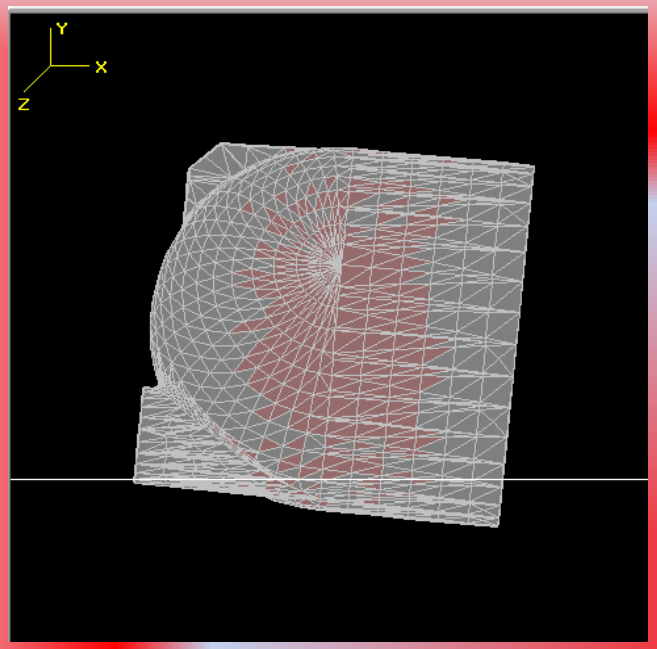
Forced Air

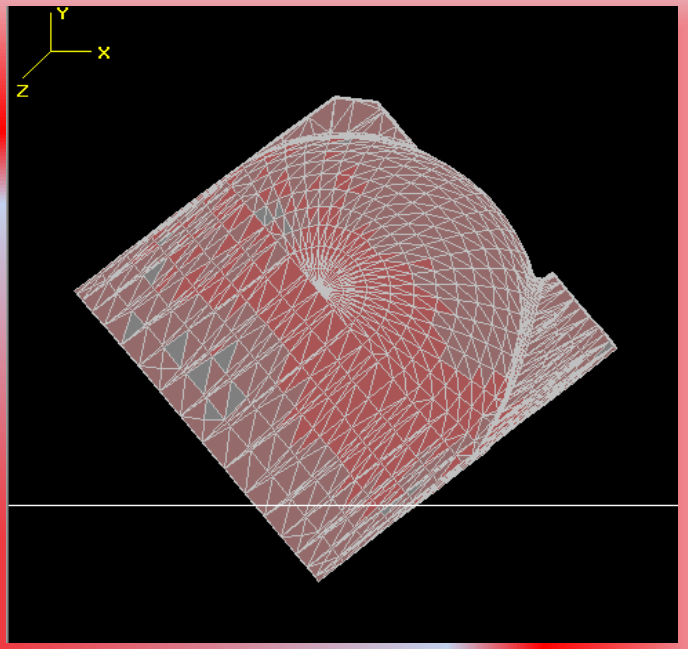
Water Spray

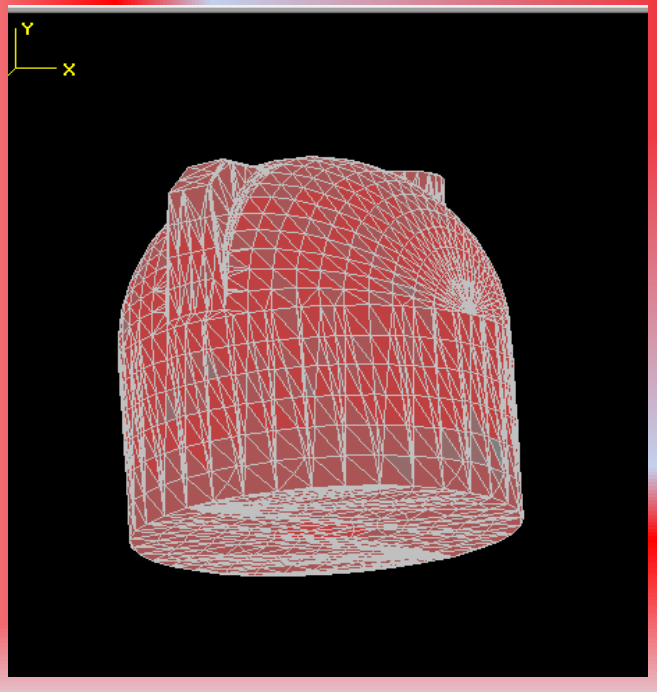
Water Stream

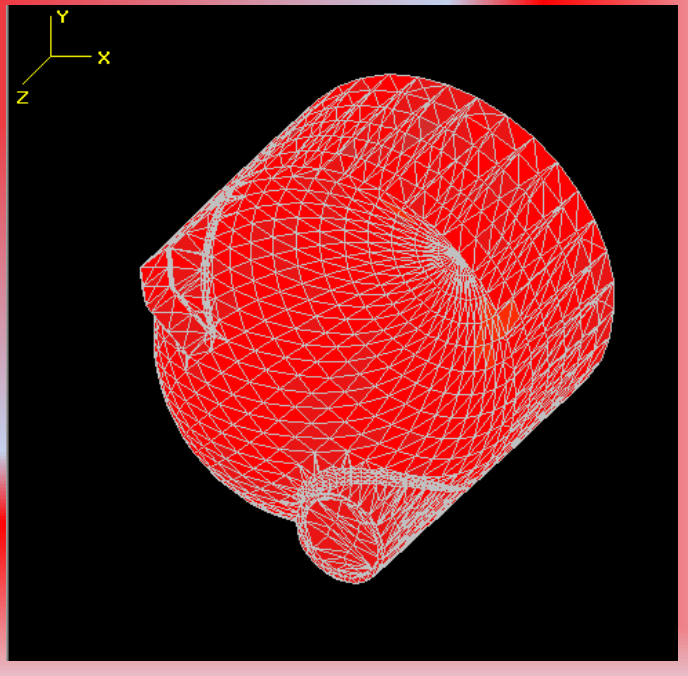
Reset

OK









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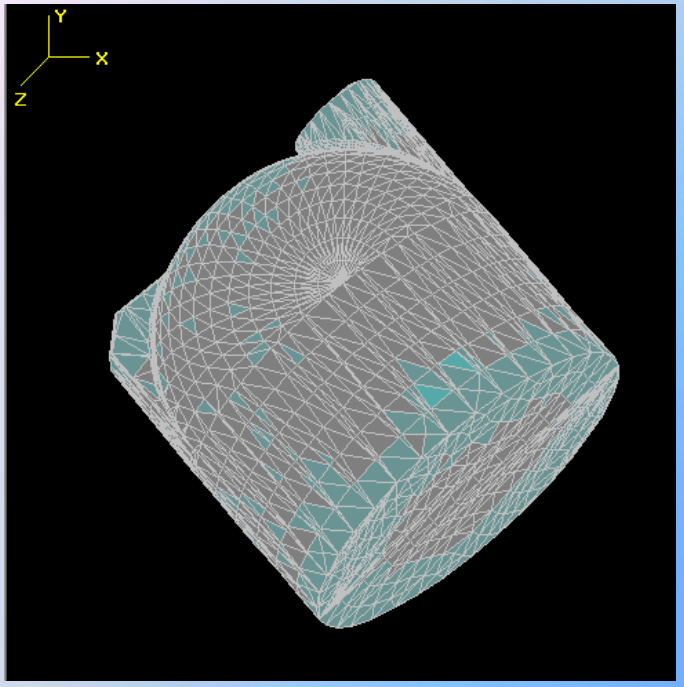
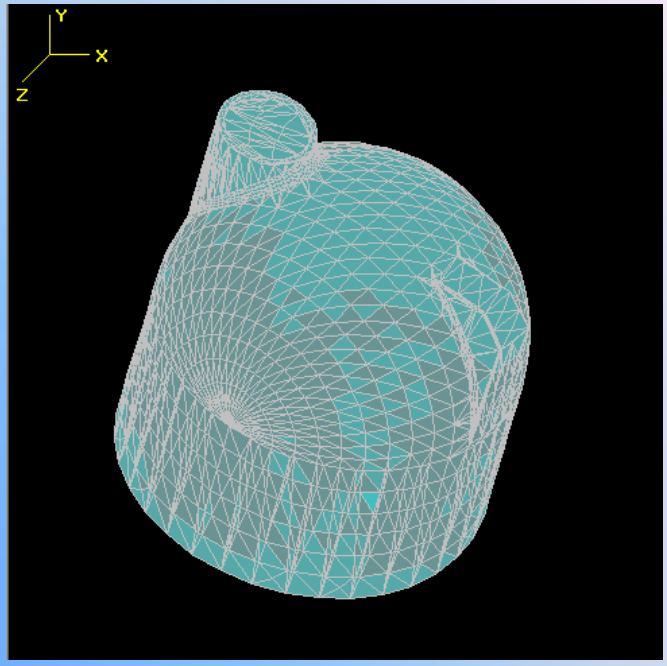
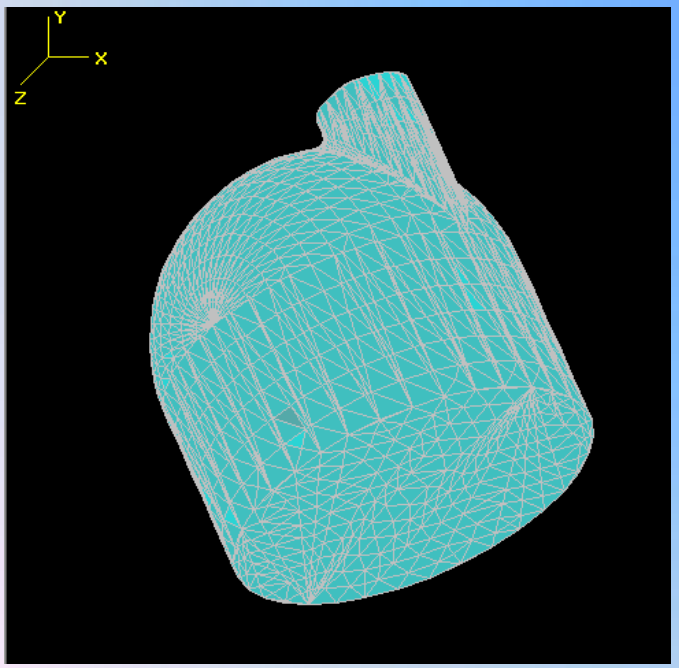
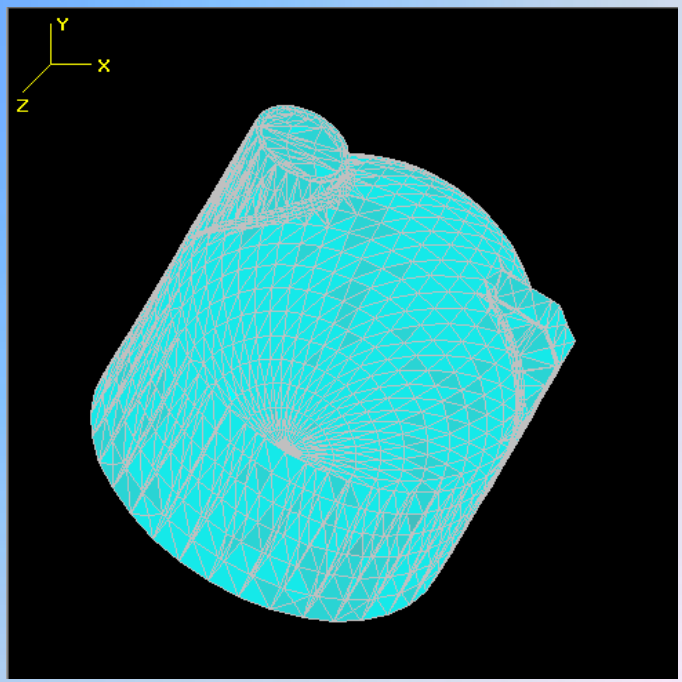
	0.060	
	0.030	
	0.000	









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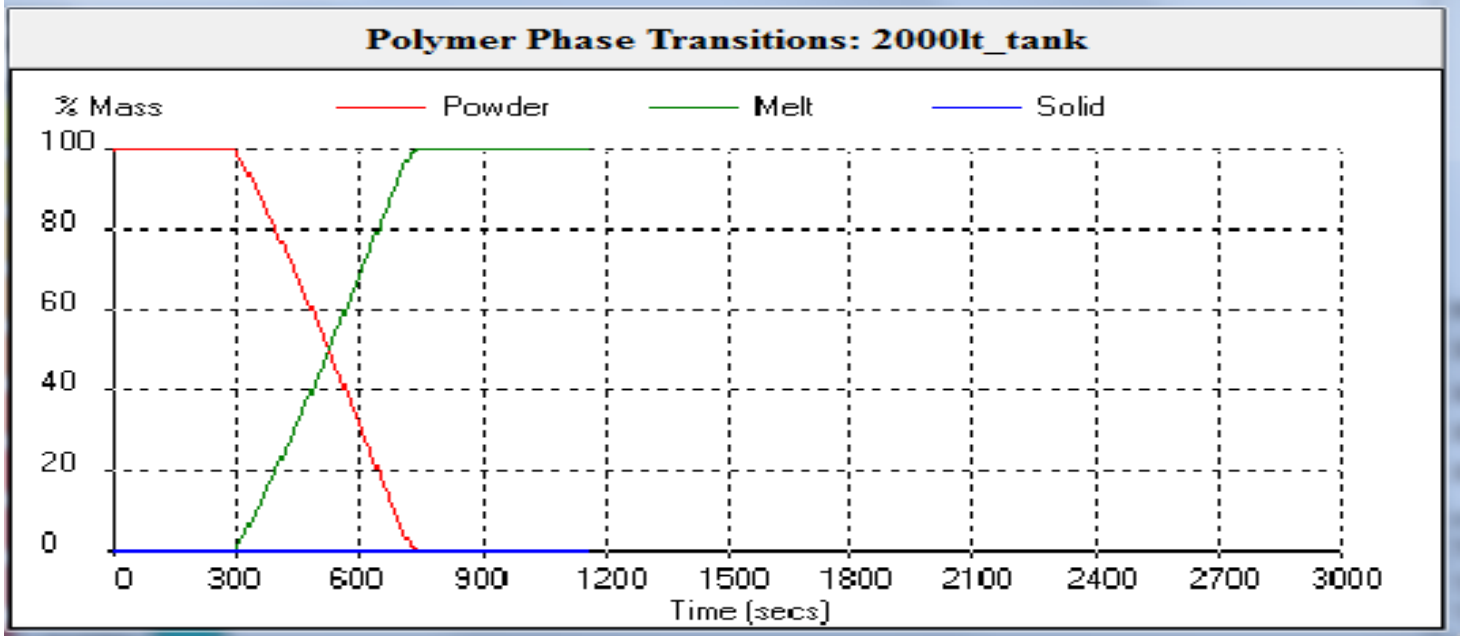
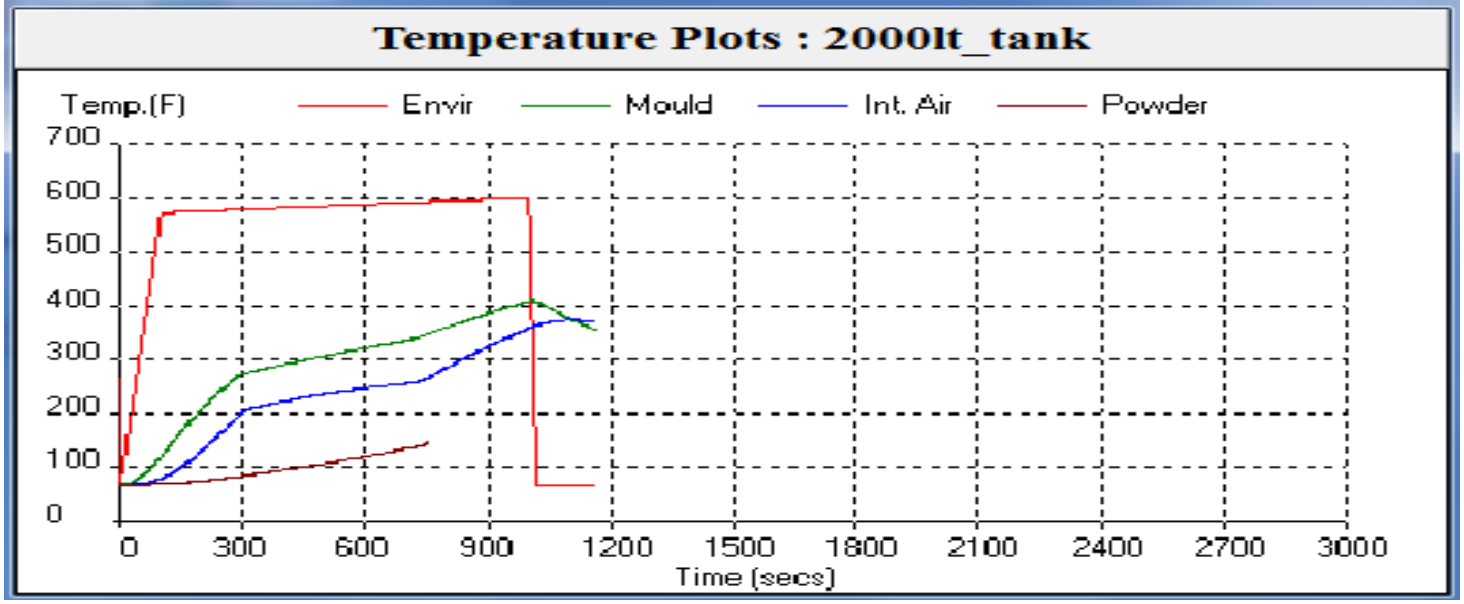
Polymer Phase Plots



Temperature Plots



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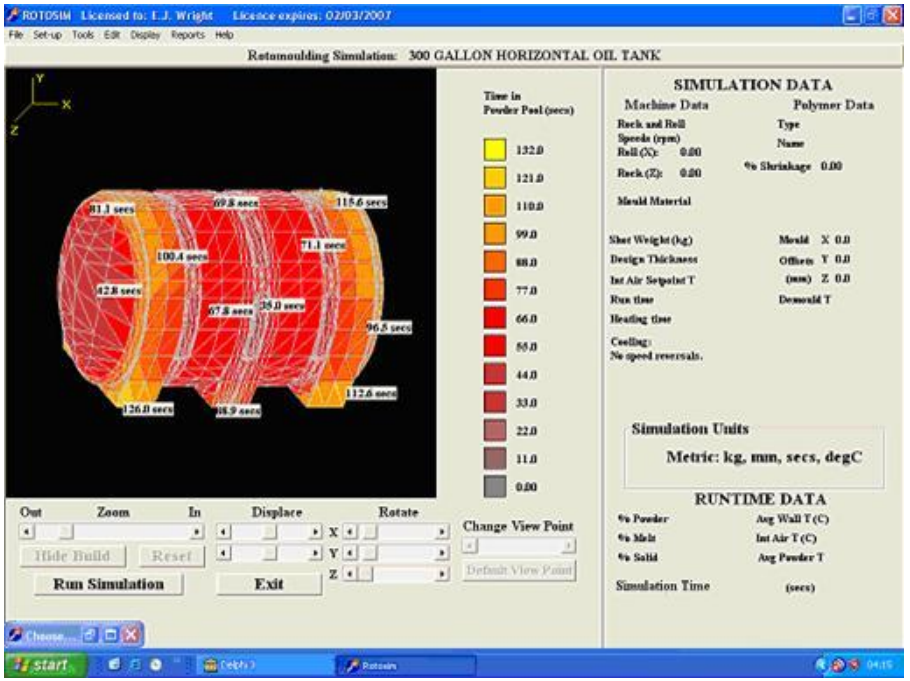
- Save Time
- Save Costs
- Training



Rotomolding Simulation

Affordable to buy

Rent to Try

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Online Rotational Molding Supplies