



SimTech™

Student Tutorial Workbook

Getting Started

I. Introduction

This workbook is designed to be used with the Paulson fill rate controlled SimTech™ injection molding simulator. The Student Workbook Tutorial should be taken by all users who are not familiar with how SimTech™ works. If you are already familiar with SimTech™ and how it operates, you can move directly to the SimTech™ lab lessons located at the end of this manual.

The Student Workbook Tutorial is designed to show you how to navigate through the SimTech™ control panel and the effects of each molding machine control on the plastic behavior and on the molded part properties. You will be directed to make specific control changes and then asked to record and explain the results. Provided in the Student section of this manual, is a Student Answer Sheet which you can make copies of for students to write their answers in.

By the end of this tutorial, you should be familiar with how to:

- Make machine control changes
- Cycle the machine
- Read the cycle results
- Identify part problem
- Identify machine alarms
- Will have observed the effects of each control and each alarm

The Student Tutorial Lesson is taken through FreeMold which allows you to pick your machine size, plastic and part. This tutorial lesson uses a 300 ton machine, molding the “cover” using Polystyrene. After completing this tutorial, you can change the type of machine, plastic, or part using the **New Session** button and do a similar evaluation for this new setup.

Note: All pressures shown on the SimTech™ control panel are plastic pressures, not hydraulic oil pressures.

Intentionally left blank

II. Starting Instructions

1. To access SimTech “FreeMold” go to www.paulsonskillbuilder.com
2. Login with your email and password.

3. This will take you to your Skillbuilder Home page.
 - On this page, you will see all the Skillbuilder and SimTech Lab lessons assigned to you. In addition, you will see FreeMold. (You may have to go to page 2 or 3 in the bottom right-hand corner to see FreeMold)

Skillbuilder Home

My Student Report Change My Password

43 records found

Lesson	Assigned	Finished	% Done		
Simtech Lab 12 (Level 2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0%	Continue	Start Over
Simtech Lab 13 (Level 3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0%	Continue	Start Over
FreeMold	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0%	Continue	Start Over

1 2 3

4. Find FreeMold in your list and click on either Continue or Start Over.
 - For FreeMold, clicking on Continue or Start Over are exactly the same.

FreeMold	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0%	Continue	Start Over
----------	-------------------------------------	--------------------------	----	--------------------------	----------------------------

5. You will now be on your User Sessions page.

- Any sessions you created will be listed here
- You can run or edit an existing session, or create a new session

User Sessions

Back New Session

Search Clear 3 records found

Session Name	Updated On	Units	Tolerance	Machine	Part	Plastic					
Test Lesson	2019-10-16 20:22:07	english	precision	300tn	bracket	ABS	Edit Setup	Run	Copy	View History	Delete
Flash lesson	2019-10-15 20:21:40	english	standard	100tn	cover	ABS	Edit Setup	Run	Copy	View History	Delete
Warp & Short Shots Lesson	2019-10-15 20:21:29	english	precision	150tn	bracket	Polypropylene	Edit Setup	Run	Copy	View History	Delete

6. To create a new session, click on New Session.

User Sessions

Back **New Session**

Search Clear 3 records found

Session Name	Updated On	Units	Tolerance	Machine	Part	Plastic					
Test Lesson	2019-10-16 20:22:07	english	precision	300tn	bracket	ABS	Edit Setup	Run	Copy	View History	Delete
Flash lesson	2019-10-15 20:21:40	english	standard	100tn	cover	ABS	Edit Setup	Run	Copy	View History	Delete
Warp & Short Shots Lesson	2019-10-15 20:21:29	english	precision	150tn	bracket	Polypropylene	Edit Setup	Run	Copy	View History	Delete

7. Type in a “Session Name” (we’re using SimTech User Manual) and click “Save And Exit”.


New Session

Exit Without Saving

Session Name:

Setup: NOTE: Machine, Part, and Plastic will be selected on next screen.

Save And Exit



- You will now be on the Setup page. Configure your setup page to match the setup below. When you have finished, click Save and Exit.

Setup

Name

SimTech User M

Enter a name for this session

Standard Cycle Time

30.00

Standard Cycle Time used for Score

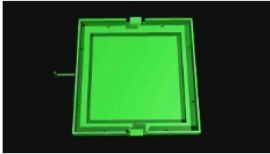
Tolerance

loose

loose	in	+/- 0.01
-------	----	----------

Part

cover



Part Length	in	6.500
Part Width	in	6.500
Part Thickness	in	0.080
Part Volume	in^3	5.330
Number of Cavities		2

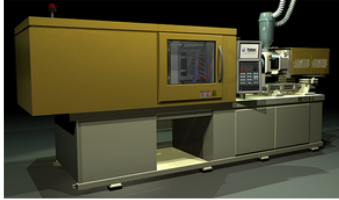
Units

english

Choose the units to work in

Machine


300tn



Max Injection Press	psi	25000
Max Clamp Force	tons	300
Max Shot Size	in^3	39.300
Max Flow Rate	in^3	25.000

Plastic

Polystyrene



Plastic Type		PS
Low Melt Temp	F	379
High Melt Temp	F	471

- Now Click the Run button and you will see the machine controls page.

User Sessions

Back New Session

Search Clear

5 records found

Session Name	Updated On	Units	Tolerance	Machine	Part	Plastic					
SimTech User Manual	2019-10-23 21:00:34	english	loose	300tn	cover	Polystyrene	Edit Setup	Run	Copy	View History	Delete

10. Enter the process data just as you see below.

- You can type in number values or use the up and down arrows to change the values.

Machine Control Settings

Name	Units	Value	Name	Units	Value
Barrel Temperatures			Fill Rates		
Rear Zone Temp	F	450	Fill Rate 1	in/s	2
Middle Zone Temp	F	450	Fill Rate 2	in/s	2
Front Zone Temp	F	450	Fill Rate 3	in/s	2
Nozzle Temp	F	450	Fill Rate 4	in/s	2
Injection Unit			Pressures/Time		
Screw Rotation	rpm	35	Max Injection Pressure	psi	25000
Screw Back Pressure	psi	500	Ramp Time	s	0
Screw Back Distance	in	2.48	Pack/Hold Pressure	psi	3500
VPT Setpoint	in	0.35	Pack/Hold Time	s	5
Mold and Clamp			Cooling Time	s	30
Mold Moveable Temp	F	70	Mold Open Time	s	1
Mold Stationary Temp	F	70			
Clamp Force	tons	300			

11. Click on the **Cycle** button. Wait for the molding cycle to end.

- You are molding a part with no defects.

Session Name: SimTech User Manual Machine: 300tn Part: cover Plastic: Polystyrene Tolerance: +/- 0.01 in Standard Cycle Time: 30.0 SCORE: 0.00

Machine Control Settings

Name	Units	Value
Barrel Temperatures		
Rear Zone Temp	F	450
Middle Zone Temp	F	450
Front Zone Temp	F	450
Nozzle Temp	F	450
Injection Unit		
Screw Rotation	rpm	35
Screw Back Pressure	psi	500
Screw Back Distance	in	2.48
VPT Setpoint	in	0.35
Mold and Clamp		
Mold Moveable Temp	F	70
Mold Stationary Temp	F	70
Clamp Force	tons	300

Cycle Results

Name	Units	Value
Fill Rates		
Fill Rate 1	in/s	2
Fill Rate 2	in/s	2
Fill Rate 3	in/s	2
Fill Rate 4	in/s	2
Fill Rate 5	in/s	2
Pressures/Time		
Max Injection Pressure	psi	25000
Ramp Time	s	0
Pack/Hold Pressure	psi	3500
Pack/Hold Time	s	5
Cooling Time	s	30
Mold Open Time	s	1

Name	Units	Value
Melt Temp	F	445.7
Fill Time	s	1.08
Cycle Time	s	37.08
Mold Full at VPT	%	94.90
Cushion Size	in	0.231
Part Length	in	6.510
Part Weight	oz	3.149
Screw Run Time	s	8.36

Part Problems (most recent cycle to the left)

Flash	
Burn Mark	
Size (+/- 0.01 in)	
Weld Lines	
Short Shot	
Warp	
Sink Marks	
Voids	

Machine Alarms

Screw Recovery	●
Max Pressure	●
No Cushion	●
Low Melt	●
High Melt	●

Cycle Graphs

Cycle
History
Edit Setup
Change Units
User Sessions Page