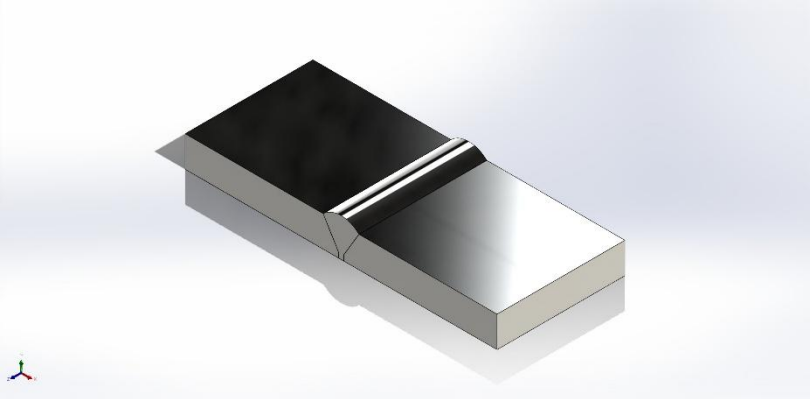


Simulation of Lab5-b22me052

Date: 15 February 2025
Designer: Solidworks
Study name: Static 1
Analysis type: Static

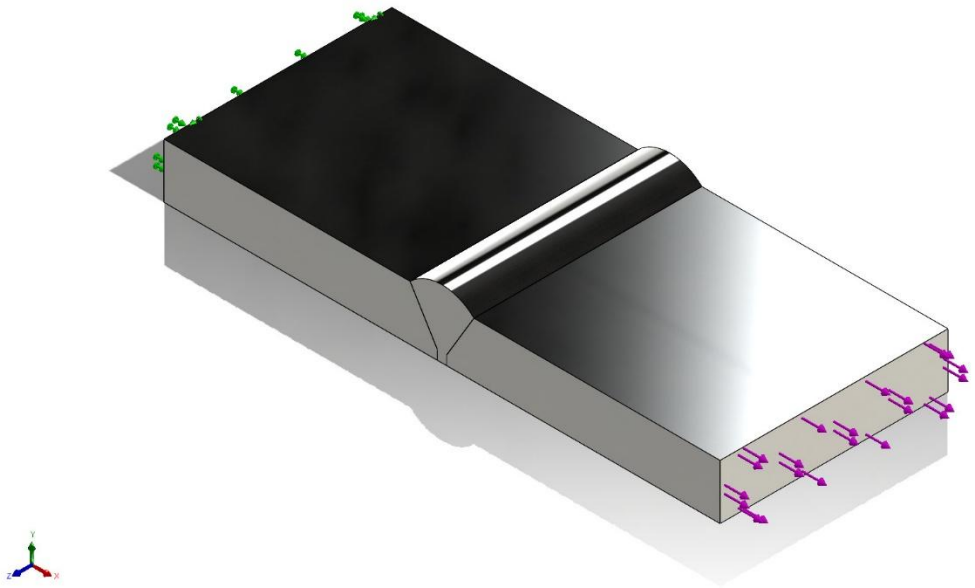
Table of Contents

Description

No Data

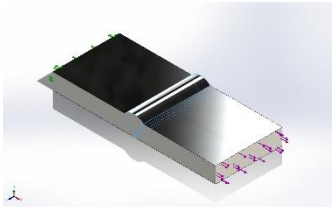
Assumptions

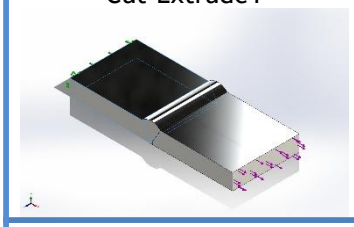
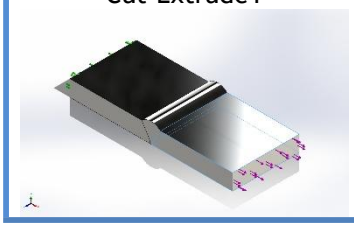
Model Information



Model name: Lab5-b22me052
Current Configuration: Default

Solid Bodies

Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
Boss-Extrude2 	Solid Body	**Mass:0.0435044 kg** **Volume:5.57749e-06 m^3** **Density:7,800 kg/m^3** **Weight:0.426343 N**	**C:\Users\pushk\Documents\DME-Lab\Lab5-buttweld_b22me052.SLDPRT** Feb 15 15:42:14 2025

Cut-Extrude1 	Solid Body	**Mass:0.2691 kg Volume:3.45e-05 m^3 Density:7,800 kg/m^3 Weight:2.63718 N**	**C:\Users\pushk\Documents\DME-Lab\Lab5-leftweld_b22me052.SLDPRT** Feb 15 15:42:13 2025
Cut-Extrude1 	Solid Body	**Mass:0.2691 kg Volume:3.45e-05 m^3 Density:7,800 kg/m^3 Weight:2.63718 N**	**C:\Users\pushk\Documents\DME-Lab\Lab5-righttweld_b22me052.SLDPRT** Feb 15 15:42:11 2025

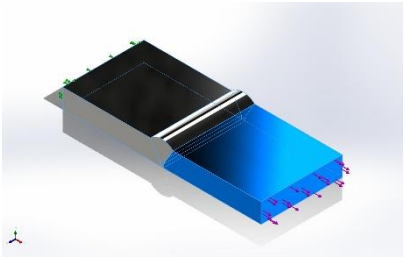
Study Properties

Study name	Static 1
Analysis type	Static
Mesh type	Solid Mesh
Thermal Effect:	On
Thermal option	Include temperature loads
Zero strain temperature	298 Kelvin
Include fluid pressure effects from SOLIDWORKS Flow Simulation	Off
Solver type	Automatic
Inplane Effect:	Off
Soft Spring:	Off
Inertial Relief:	Off
Incompatible bonding options	Automatic
Large displacement	Off
Compute free body forces	On
Friction	Off
Use Adaptive Method:	Off
Result folder	SOLIDWORKS document (C:\Users\pushk\Documents\DME-Lab)

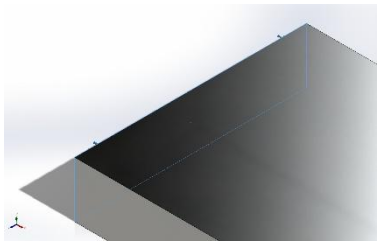
Units

Unit system:	SI (MKS)
Length/Displacement	mm
Temperature	Kelvin
Angular velocity	Rad/sec
Pressure/Stress	N/m^2

Material Properties

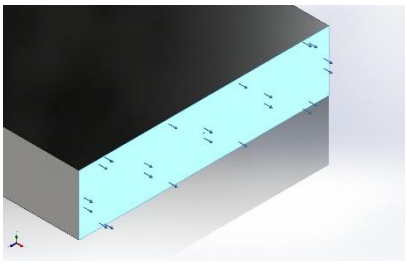
Model Reference	Properties		Components
	**Name:**	Plain Carbon Steel	SolidBody 1(Boss-Extrude2)(Lab5-buttweld_b22me052-1), SolidBody 1(Cut-Extrude1)(Lab5-leftweld_b22me052-1), SolidBody 1(Cut-Extrude1)(Lab5-righttweld_b22me052-1)
	Model type:	Linear Elastic Isotropic	
	Default failure criterion:	Max von Mises Stress	
	Yield strength:	2.20594e+08 N/m^2	
	Tensile strength:	3.99826e+08 N/m^2	
	Elastic modulus:	2.1e+11 N/m^2	
	Poisson's ratio:	0.28	
	Mass density:	7,800 kg/m^3	
	Shear modulus:	7.9e+10 N/m^2	
	Thermal expansion coefficient:	1.3e-05 /Kelvin	
Curve Data:N/A			

Loads and Fixtures

Fixture name	Fixture Image	Fixture Details
Fixed-1		**Entities:** 1 face(s) **Type:** Fixed Geometry

Resultant Forces

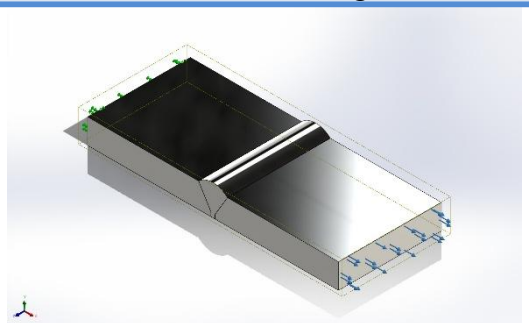
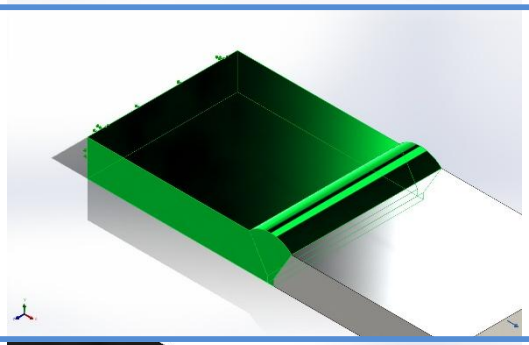
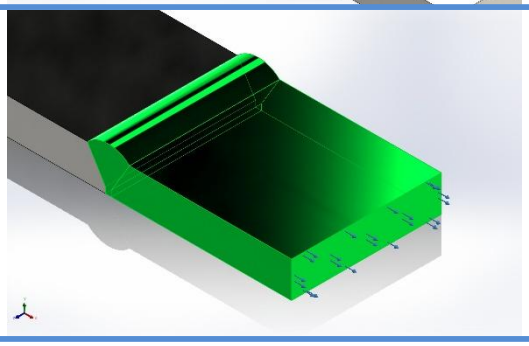
Components	X	Y	Z	Resultant
Reaction force(N)	-20,000	-0.0162468	-0.0332325	20,000
Reaction Moment(N.m)	0	0	0	0

Load name	Load Image	Load Details
Force-1		**Entities:** 1 face(s) **Type:** Apply normal force **Value:** -20,000 N

Connector Definitions

No Data

Interaction Information

Interaction	Interaction Image	Interaction Properties
Global Interaction		**Type:** Bonded **Components:** 1 component(s) **Options:** Independent mesh
Component Interaction-1		**Type:** Bonded **Components:** 2 Solid Body (s) **Options:** Independent mesh
Component Interaction-2		**Type:** Bonded **Components:** 2 Solid Body (s) **Options:** Independent mesh

Mesh information

Mesh type	Solid Mesh
Mesher Used:	Blended curvature-based mesh
Jacobian points for High quality mesh	16 Points
Maximum element size	4.21056 mm
Minimum element size	4.21056 mm
Mesh Quality	High
Remesh failed parts independently	Off

Mesh information - Details

Total Nodes	13360
Total Elements	8080
Maximum Aspect Ratio	3.943
% of elements with Aspect Ratio < 3	99.6
Percentage of elements with Aspect Ratio > 10	0
Percentage of distorted elements	0
Time to complete mesh(hh;mm;ss):	00:00:02
Computer name:	PUSHKIN

Sensor Details

No Data

Resultant Forces

Reaction forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	-20,000	-0.0162468	-0.0332325	20,000

Reaction Moments

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	0

Free body forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	-0.668751	0.25987	-1.48232	1.64683

Free body moments

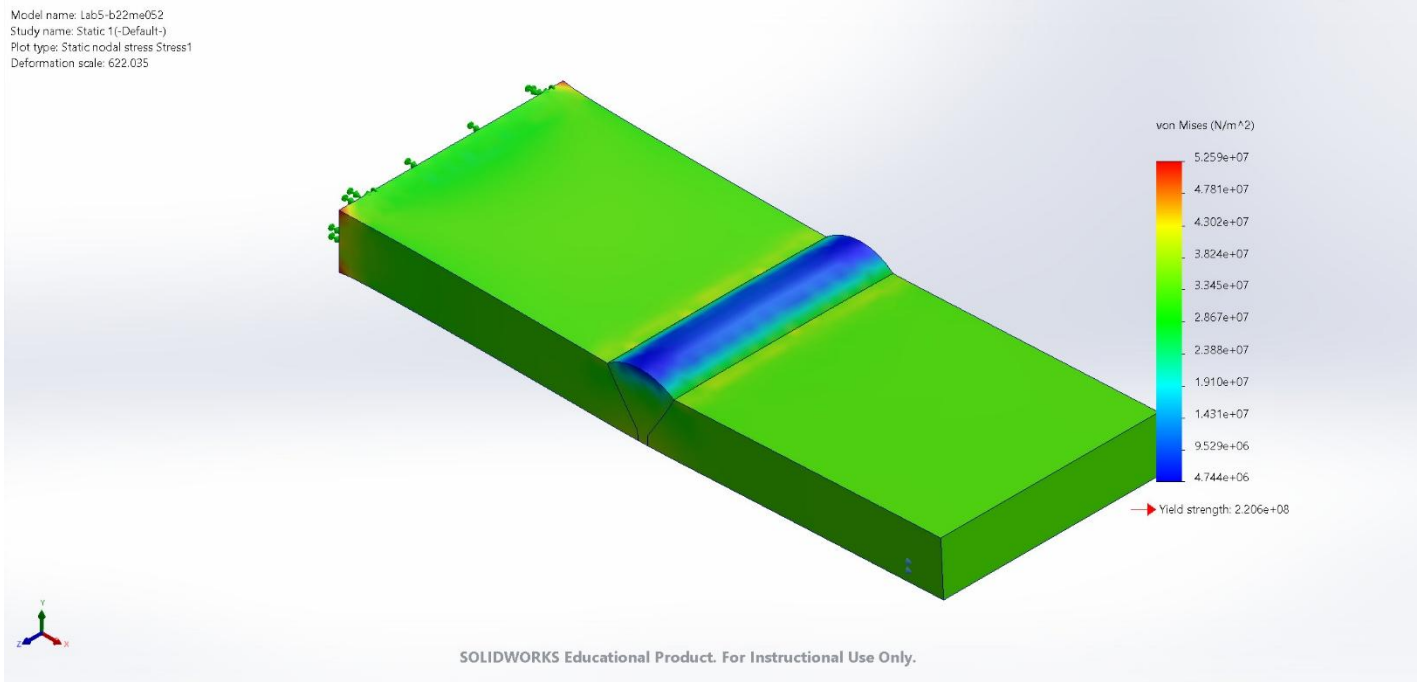
Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	1e-33

Beams

No Data

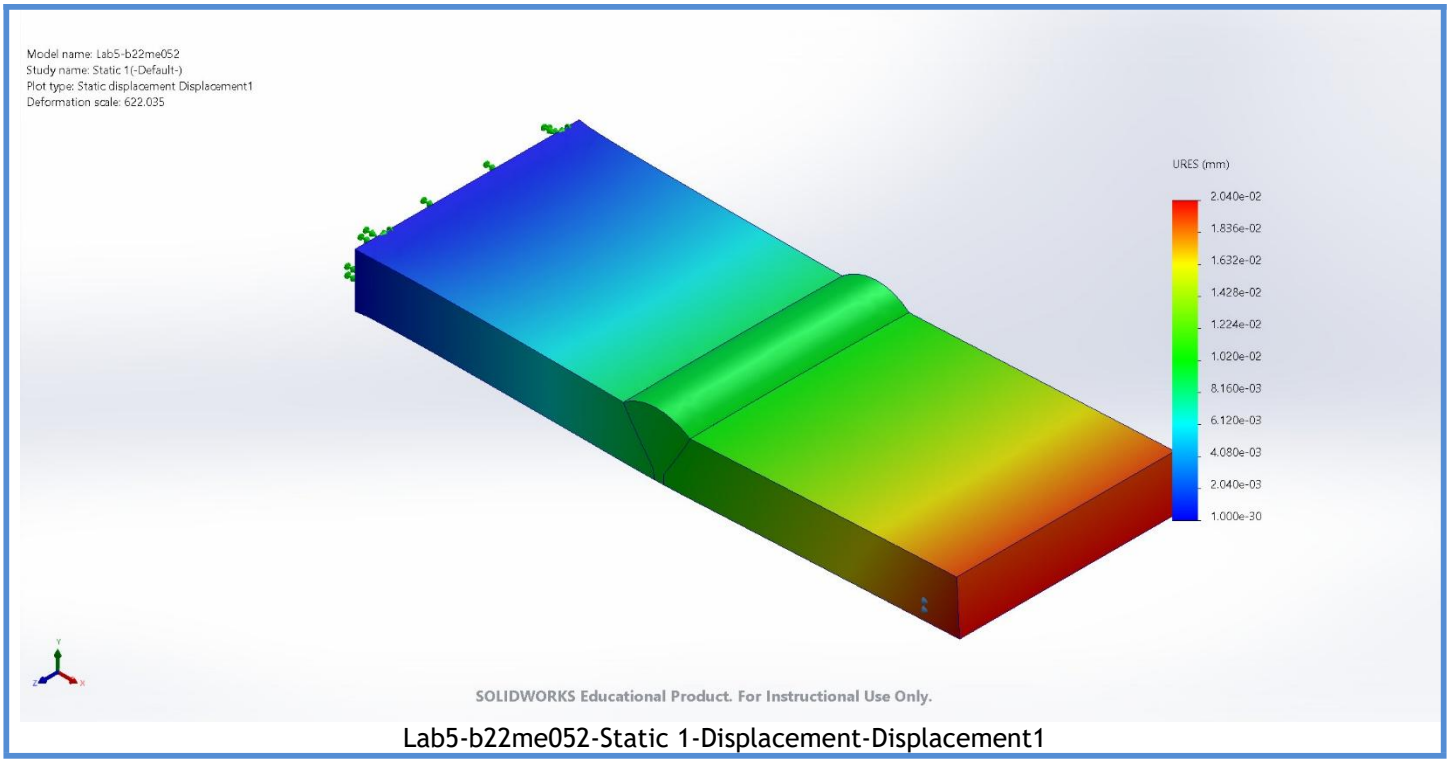
Study Results

Name	Type	Min	Max
Stress1	VON: von Mises Stress	4.744e+06N/m^2 Node: 929	5.259e+07N/m^2 Node: 1367



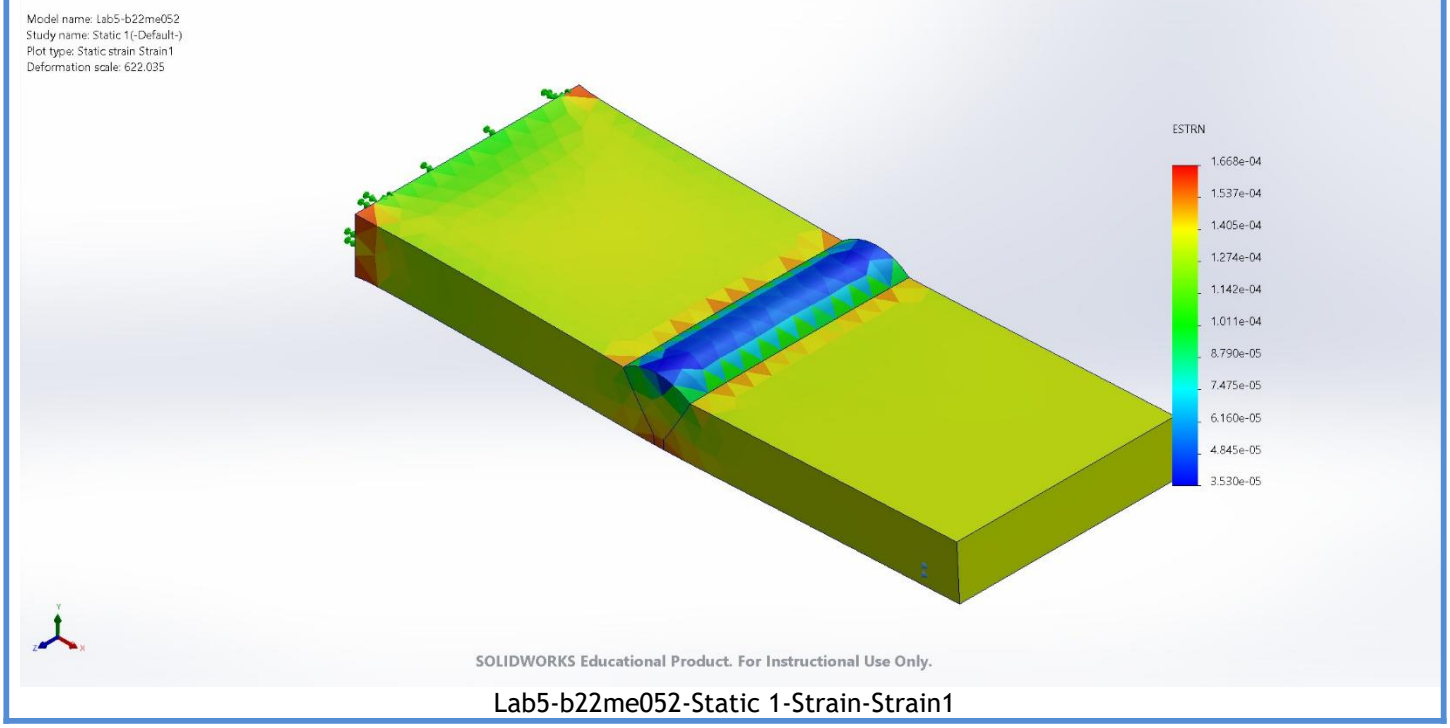
Lab5-b22me052-Static 1-Stress-Stress1

Name	Type	Min	Max
Displacement1	URES: Resultant Displacement	0.000e+00mm Node: 1367	2.040e-02mm Node: 7335



Lab5-b22me052-Static 1-Displacement-Displacement1

Name	Type	Min	Max
Strain1	ESTRN: Equivalent Strain	3.530e-05 Element: 270	1.668e-04 Element: 1369



Lab5-b22me052-Static 1-Strain-Strain1

Conclusion