

Simulation Study 1



Analyzed File	Air Cylinder Assembly - PE v3
Version	Autodesk Fusion 360 (2.0.8950)
Creation Date	2020-09-26, 02:14:32
Author	Sterling James Richard
Summary	In this lesson, Fusion360 was utilized to create simulations and G-code for CNC machining. These integrated tools help complete the design for manufacturing process using the design, engineering and manufacturing tools in Fusion 360.

Project Properties

Title	Studies
Author	J

Simulation Model 1:1

Study 1 - Static Stress

Study Properties

Study Type	Static Stress
Last Modification Date	2020-09-14, 00:56:49

Settings

General

Contact Tolerance	0.1 mm
Remove Rigid Body Modes	No

Damping

Mesh

Average Element Size (% of model size)	
Solids	10
Scale Mesh Size Per Part	No
Average Element Size (absolute value)	-
Element Order	Parabolic
Create Curved Mesh Elements	Yes
Max. Turn Angle on Curves (Deg.)	60
Max. Adjacent Mesh Size Ratio	1.5
Max. Aspect Ratio	10
Minimum Element Size (% of average size)	20

Adaptive Mesh Refinement

Number of Refinement Steps	0
Results Convergence Tolerance (%)	20
Portion of Elements to Refine (%)	10
Results for Baseline Accuracy	Von Mises Stress

Materials

Component	Material	Safety Factor
Link:1	ABS Plastic	Yield Strength
Gripper:1	ABS Plastic	Yield Strength

ABS Plastic

Density	1.06E-06 kg / mm^3
Young's Modulus	2240 MPa
Poisson's Ratio	0.38
Yield Strength	20 MPa
Ultimate Tensile Strength	29.6 MPa
Thermal Conductivity	1.6E-04 W / (mm C)
Thermal Expansion Coefficient	8.57E-05 / C
Specific Heat	1500 J / (kg C)

Contacts

Bonded

Name		
[S]	Bonded1	[Link:1][Gripper:1]
[S]	Bonded2	[Link:1][Gripper:1]
[S]	Bonded3	[Link:1][Gripper:1]
[S]	Bonded4	[Link:1][Gripper:1]

Mesh

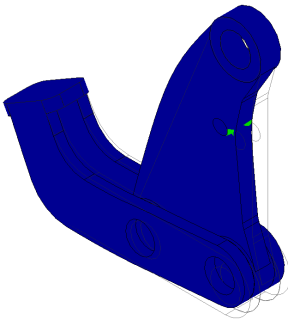
Type	Nodes	Elements
Solids	6943	3568

Load Case1

Results

Safety Factor

Safety Factor (Per Body)



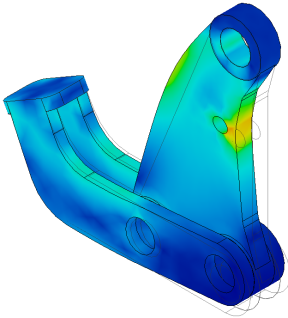
Stress

Von Mises



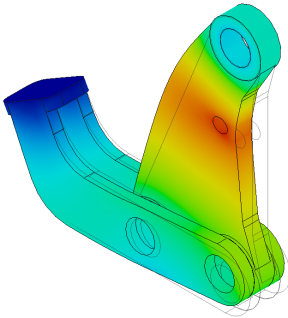
Displacement

Total



Reaction Force

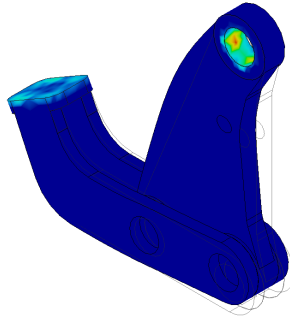
Total



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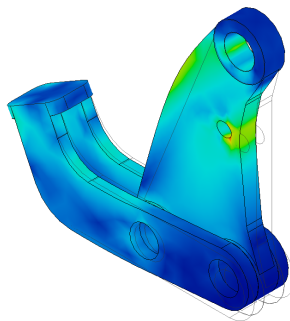
[N] 0 8.801



Strain

Equivalent

0.000001 0.002319



Contact Pressure

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Total  
[MPa] 0 1.023

