

Stress Analysis Report



Analyzed File:	FEA Load Test - Round Shaft.ipt
Autodesk Inventor Version:	2020.4 (Build 244396000, 396)
Creation Date:	4/19/2021, 8:37 AM
Study Author:	
Summary:	

Project Info (iProperties)

Summary

Company Franklin Manufacturing Inc.

Project

Part Number	FEA Load Test - Round Shaft
Description	PL 1/4 x 1 1/2
Cost	\$0.00
Date Created	4/19/2021

Status

Design Status WorkInProgress

Physical

Material	Steel, AISI CR1018
Density	0.283599 lbmass/in ³
Mass	3.34423 lbmass
Area	34.3959 in ²
Volume	11.7921 in ³
Center of Gravity	x=2.10087 in y=-0.000000000935869 in z=0 in

Note: Physical values could be different from Physical values used by FEA reported below.

Static Analysis:1

General objective and settings:

Design Objective	Single Point
Study Type	Static Analysis
Last Modification Date	4/19/2021, 8:24 AM
Detect and Eliminate Rigid Body Modes	No

Mesh settings:

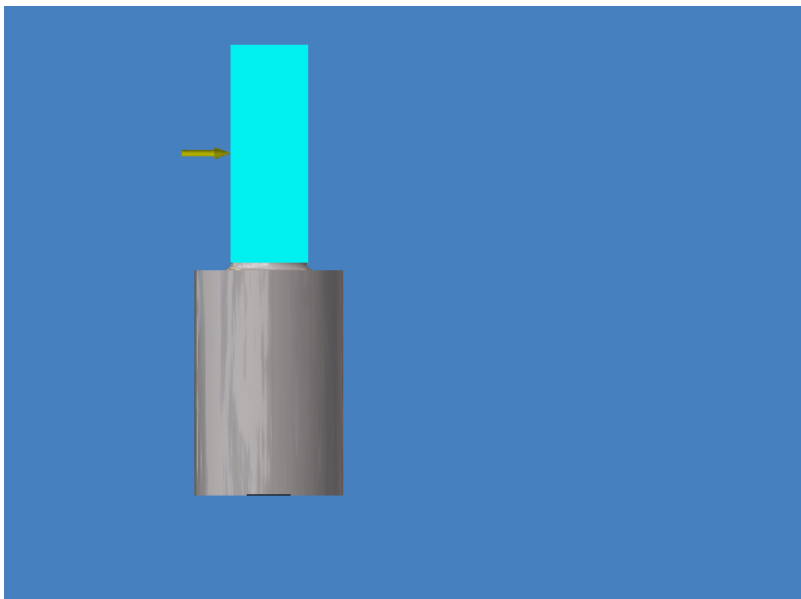
Avg. Element Size (fraction of model diameter)	0.1
Min. Element Size (fraction of avg. size)	0.2
Grading Factor	1.5
Max. Turn Angle	60 deg
Create Curved Mesh Elements	Yes

Operating conditions

Force:1

Load Type	Force
Magnitude	500.000 lbf
Vector X	-500.000 lbf
Vector Y	0.000 lbf
Vector Z	0.000 lbf

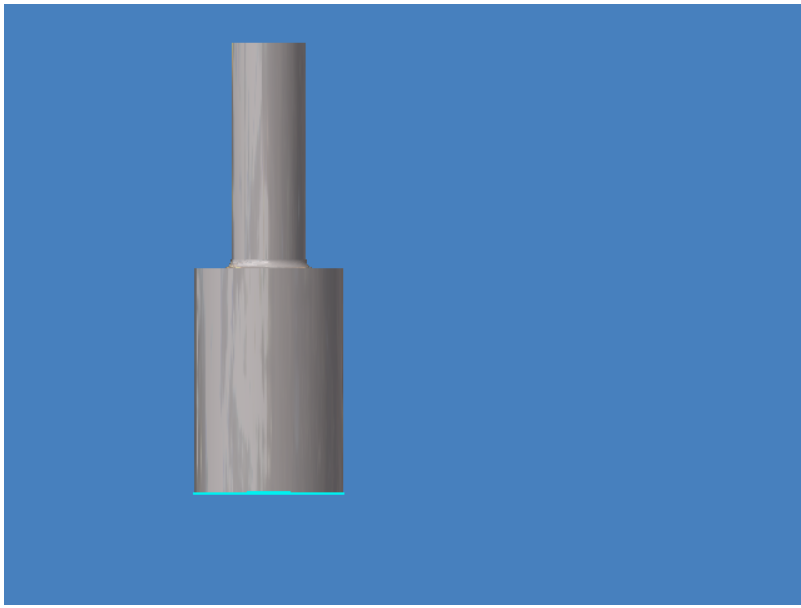
Selected Face(s)



Fixed Constraint:1

Constraint Type Fixed Constraint

☐ Selected Face(s)



☐ Results

☐ Reaction Force and Moment on Constraints

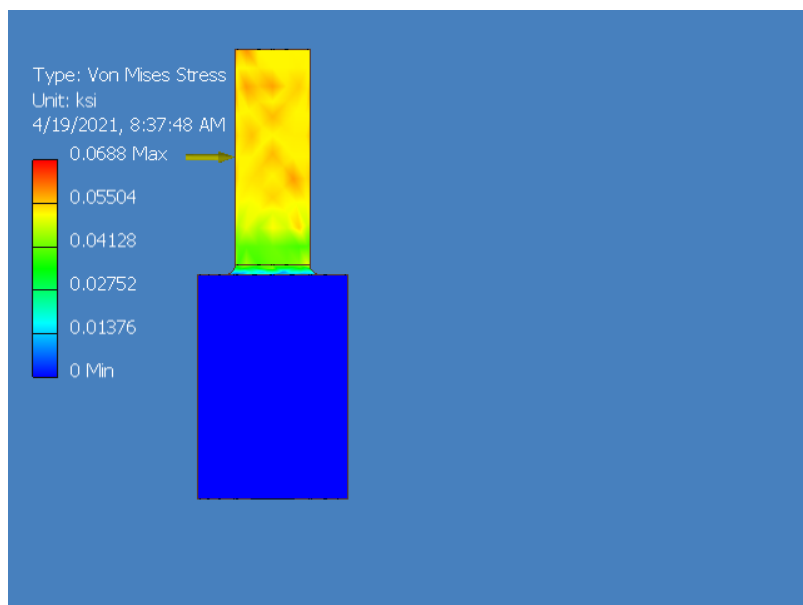
Constraint Name	Reaction Force		Reaction Moment	
	Magnitude	Component (X,Y,Z)	Magnitude	Component (X,Y,Z)
Fixed Constraint:1	0.0000406753 lbforce	0.0000319223 lbforce	0.00000464615 lbforce ft	-0.00000132989 lbforce ft
		0.000025208 lbforce		-0.00000209686 lbforce ft
		0 lbforce		0.000003927 lbforce ft

☐ Result Summary

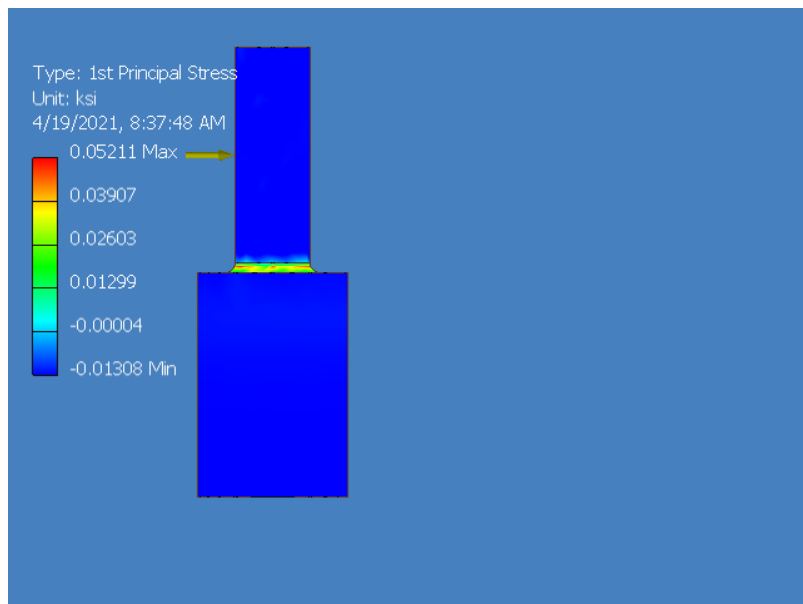
Name	Minimum	Maximum
Volume	11.7921 in ³	
Mass	3.34423 lbmass	
Von Mises Stress	0.00000125542 ksi	0.0687981 ksi
1st Principal Stress	-0.0130797 ksi	0.0521054 ksi
3rd Principal Stress	-0.0801885 ksi	0.00917315 ksi
Displacement	0 in	0.00000304729 in
Safety Factor	15 ul	15 ul

☐ Figures

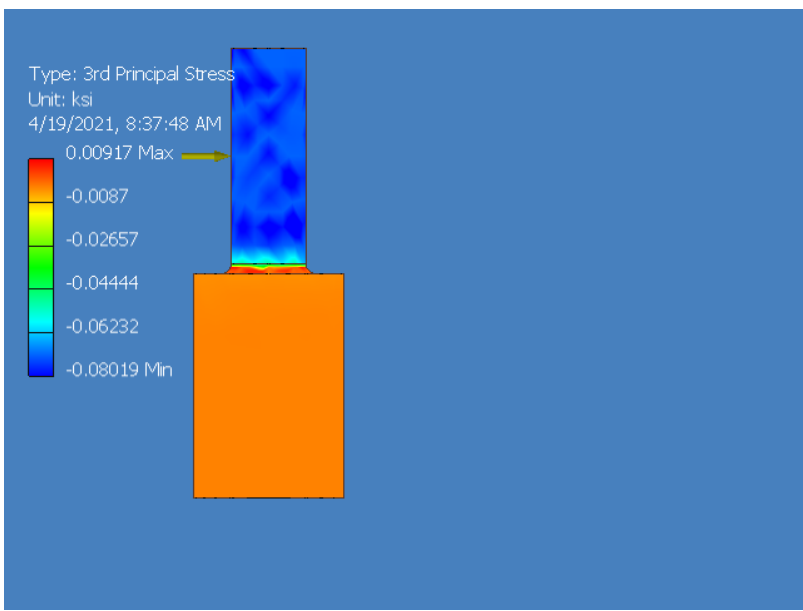
☐ Von Mises Stress



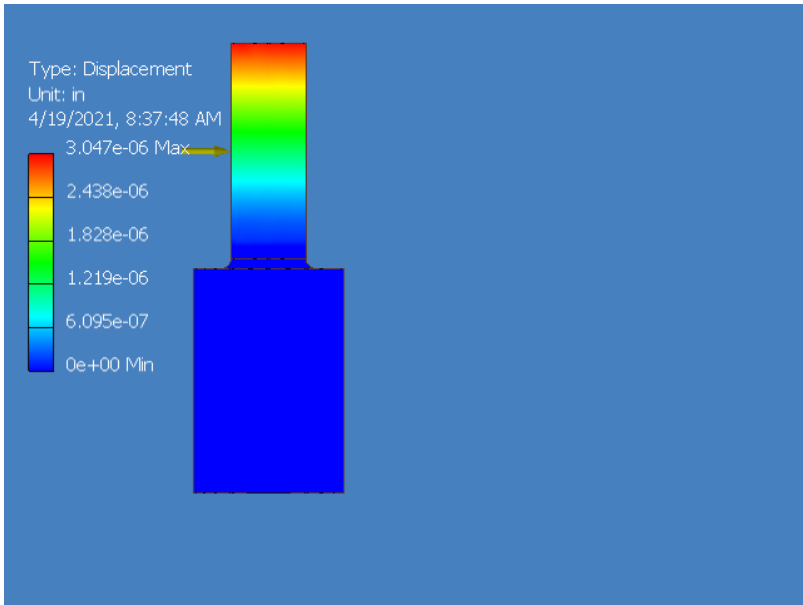
☐ 1st Principal Stress



☐ 3rd Principal Stress



☐ **Displacement**



☐ **Safety Factor**

