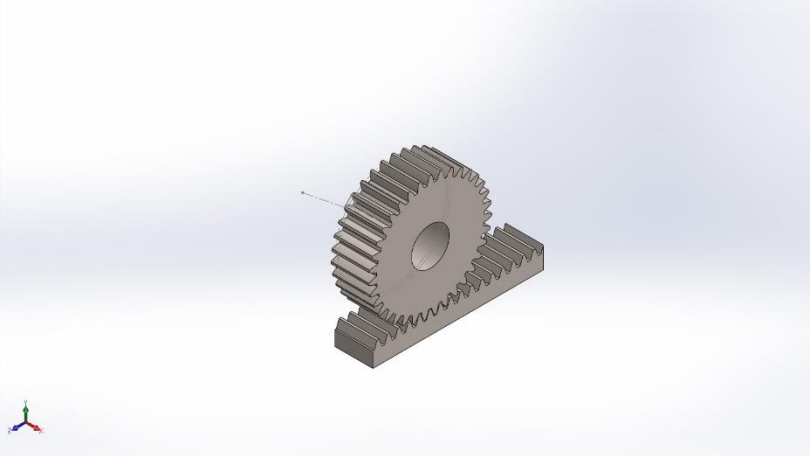


Simulation of Assem5

Date: 20 October 2020
Designer: Solidworks
Study name: Static 1
Analysis type: Static

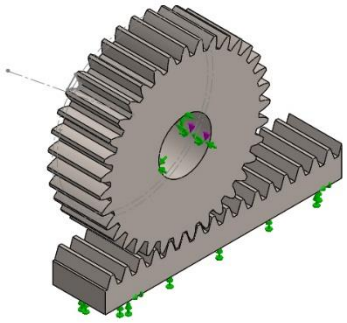
Table of Contents

Description

No Data

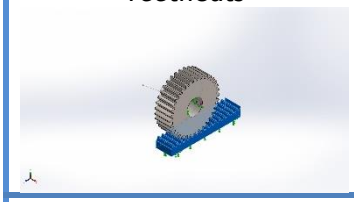
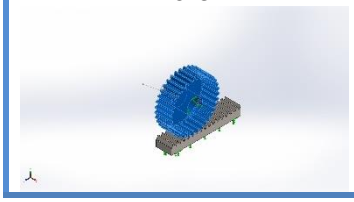
Assumptions

Model Information



Model name: Assem5
Current Configuration: Default

Solid Bodies

Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
TeethCuts 	Solid Body	**Mass:8.54291 kg** **Volume:0.00110947 m^3** **Density:7700 kg/m^3** **Weight:83.7205 N**	**C:\SOLIDWORKS Data\browser\ISO\power transmission\gears\rack spur rectangular_iso.sldprt** Oct 20 00:09:49 2020
Bore 	Solid Body	**Mass:25.4221 kg** **Volume:0.00330157 m^3** **Density:7700 kg/m^3** **Weight:249.137 N**	**c:\solidworks data\browser\iso\power transmission\gears\spur gear_iso.sldprt** Oct 19 23:49:17 2020

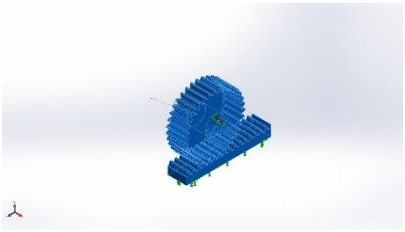
Study Properties

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	FFEPlus
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\ashiss~1\appdata\local\temp)

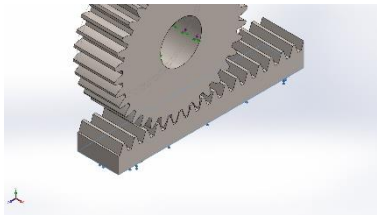
Units

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

Material Properties

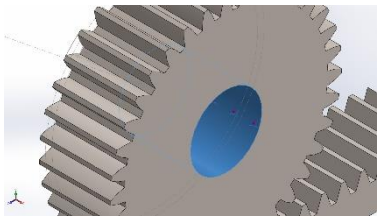
Model Reference	Properties		Components
	**Name:**	Alloy Steel	SolidBody 1(TeethCuts)(rack spur rectangular_iso-2), SolidBody 1(Bore)(spur gear_iso-1)
	Model type:	Linear Elastic Isotropic	
	Default failure criterion:	Max von Mises Stress	
	Yield strength:	6.20422e+008 N/m^2	
	Tensile strength:	7.23826e+008 N/m^2	
	Elastic modulus:	2.1e+011 N/m^2	
	Poisson's ratio:	0.28	
	Mass density:	7700 kg/m^3	
	Shear modulus:	7.9e+010 N/m^2	
	Thermal expansion coefficient:	1.3e-005 /Kelvin	
Curve Data:N/A			

Loads and Fixtures

Fixture name	Fixture Image	Fixture Details
Fixed-2		**Entities:** 1 face(s) **Type:** Fixed Geometry

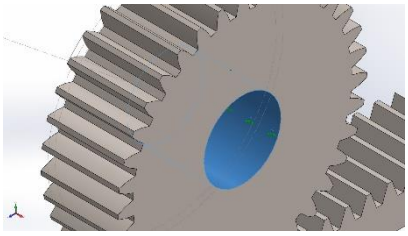
Resultant Forces

Components	X	Y	Z	Resultant
Reaction force(N)	16478.3	-292630	1451.94	293097
Reaction Moment(N.m)	0	0	0	0

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

Resultant Forces

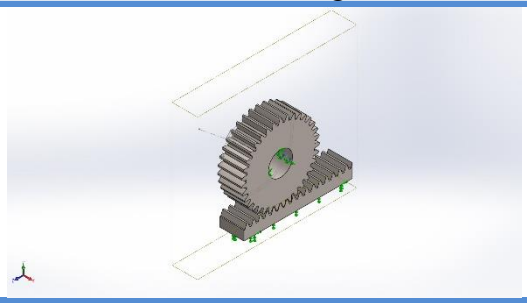
Components	X	Y	Z	Resultant
Reaction force(N)	46179	261516	-44235.8	269221
Reaction Moment(N.m)	0	0	0	0

Load name	Load Image	Load Details
Torque-1		**Entities:** 1 face(s) **Type:** Apply torque **Value:** 17.955 N.m

Connector Definitions

No Data

Contact Information

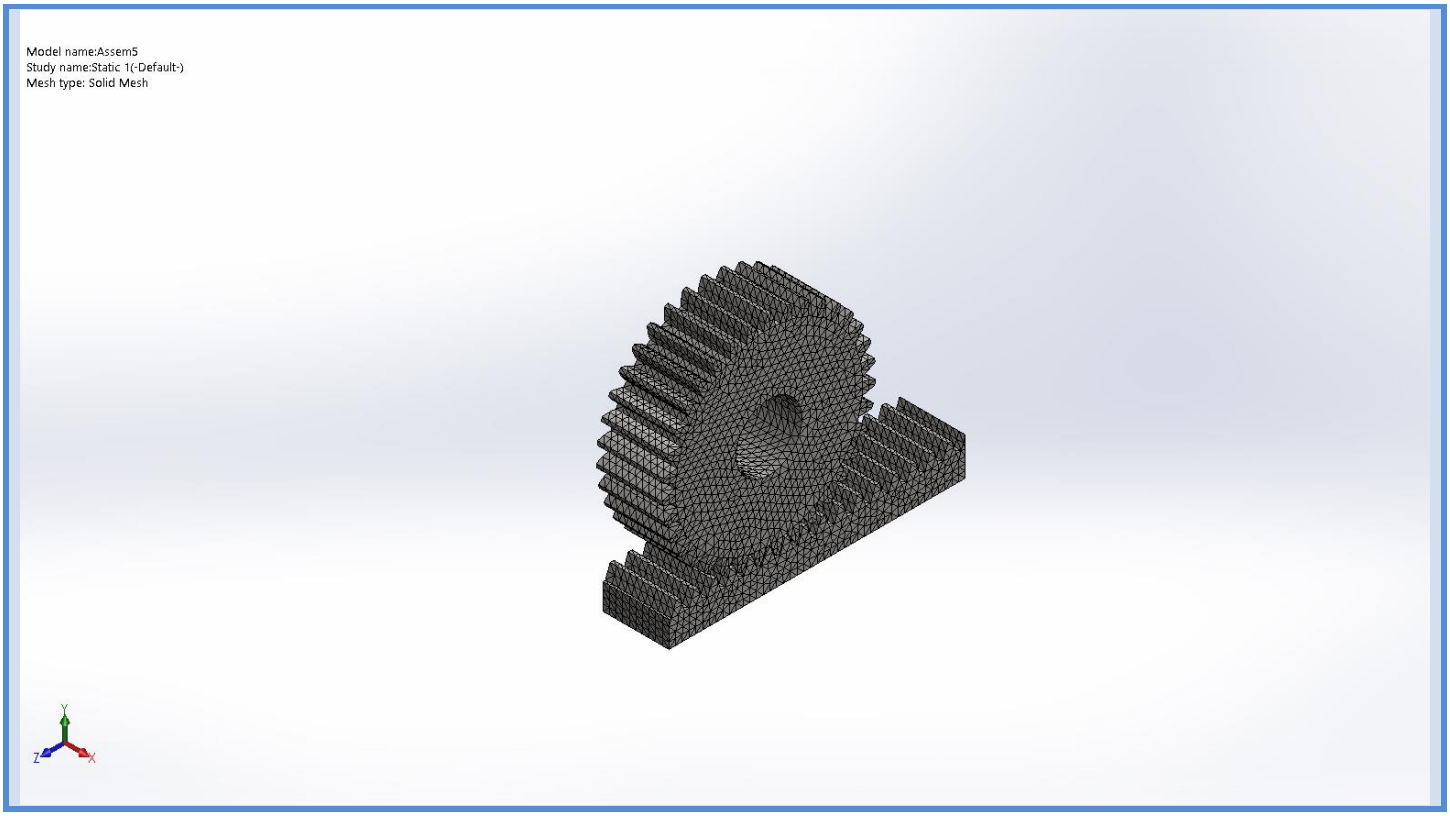
Contact	Contact Image	Contact Properties
Global Contact		**Type:** No penetration (Surface to surface) **Components:** 1 component(s)

Mesh information

Mesh type	Solid Mesh
Mesher Used:	Standard mesh
Automatic Transition:	Off
Include Mesh Auto Loops:	Off
Jacobian points	4 Points
Element Size	0.322895 in
Tolerance	0.0161448 in
Mesh Quality Plot	High
Remesh failed parts with incompatible mesh	Off

Mesh information - Details

Total Nodes	87694
Total Elements	57088
Maximum Aspect Ratio	14.447
% of elements with Aspect Ratio < 3	98.3
% of elements with Aspect Ratio > 10	0.00701
% of distorted elements(Jacobian)	0
Time to complete mesh(hh;mm;ss):	00:00:11
Computer name:	



Sensor Details

No Data

Resultant Forces

Reaction forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	62657.2	-31114.1	-42783.9	82002.9

Reaction Moments

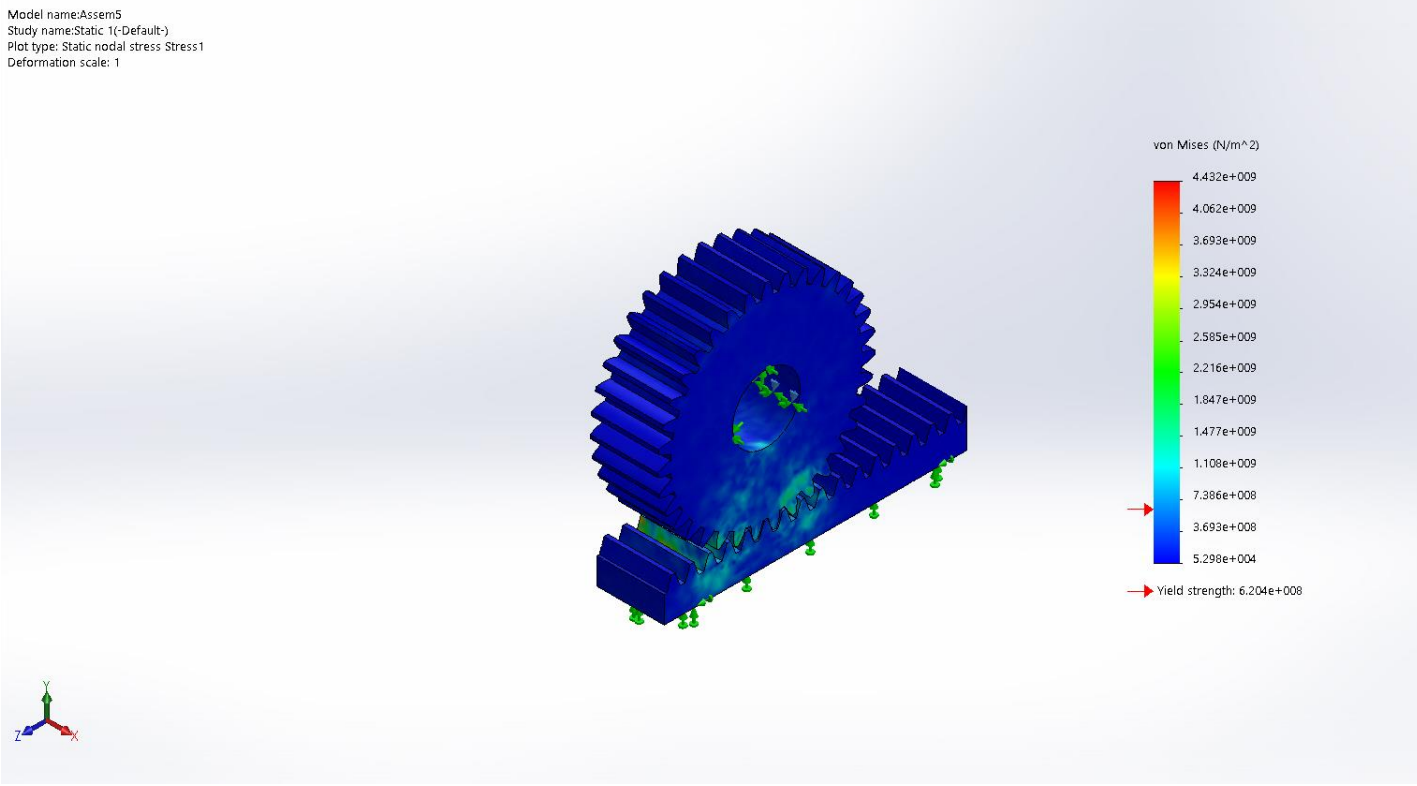
Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	0

Beams

No Data

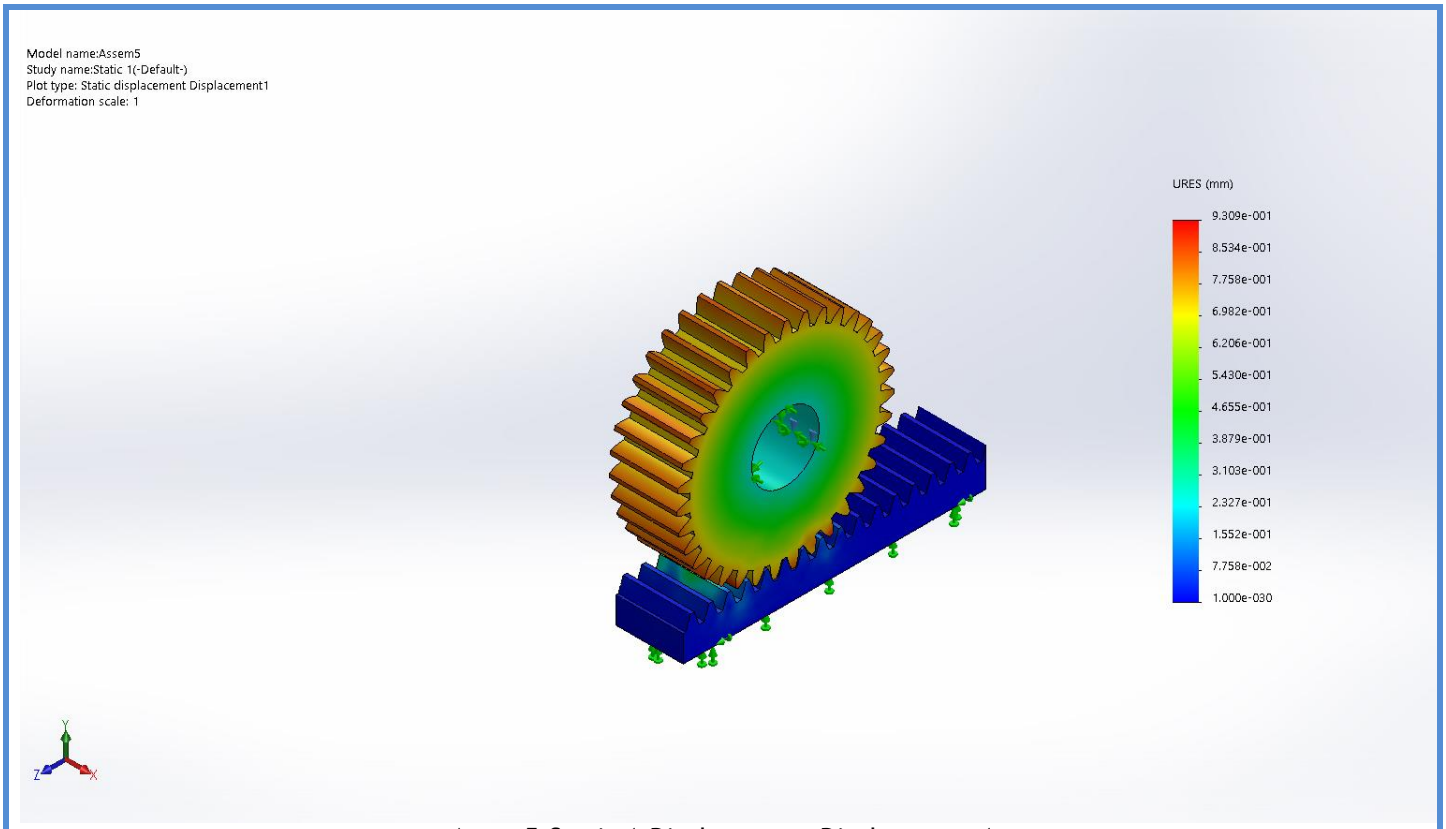
Study Results

Name	Type	Min	Max
Stress1	VON: von Mises Stress	5.298e+004N/m^2 Node: 18270	4.432e+009N/m^2 Node: 15059



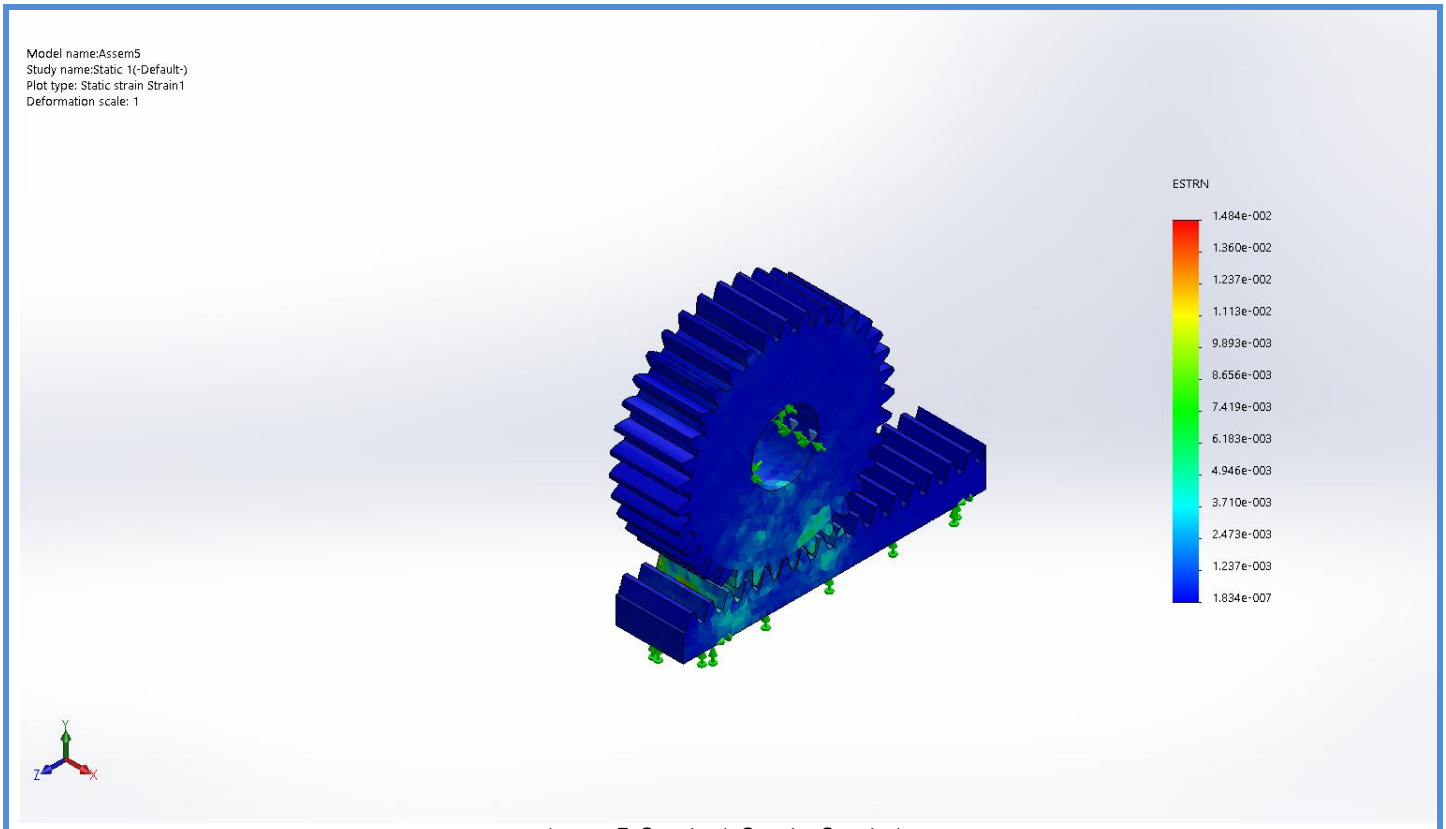
Assem5-Static 1-Stress-Stress1

Name	Type	Min	Max
Displacement1	URES: Resultant Displacement	0.000e+000mm Node: 345	9.309e-001mm Node: 79123



Assem5-Static 1-Displacement-Displacement1

Name	Type	Min	Max
Strain1	ESTRN: Equivalent Strain	1.834e-007 Element: 4629	1.484e-002 Element: 12875



Assem5-Static 1-Strain-Strain1

Conclusion