

Study Report



Analyzed File	LEGO_3648(gear 24) v2 v6
Version	Autodesk Fusion 360 (2.0.8609)
Creation Date	2020-07-01, 22:40:05
Author	Grędys Przemysław

Project Properties

Title	Studies
Author	przem

Simulation Model 1:1

Study 1 - Event Simulation

Study Properties

Study Type	Event Simulation
Last Modification Date	2020-07-01, 22:21:55

Settings

General

Movement	Dynamic (considers inertia)
Total Event Duration	0.001 s

Number of Result Intervals	25
Solve Status Information Interval (Heartbeat)	50
Intermediate Results Update	No
Allow Element Deletion	No

Damping

Rayleigh Damping	No
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Mesh

Average Element Size (% of model size)	
Solids	7
Scale Mesh Size Per Part	Yes
Average Element Size (absolute value)	-
Element Order	Parabolic
Create Curved Mesh Elements	No
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

Materials

Component	Material	Safety Factor
Body1	ABS Plastic	Ultimate Tensile 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)

Mesh

Type	Nodes	Elements
Solids	45650	26082

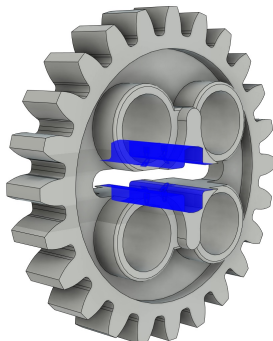
Load Case1

Constraints

Fixed3

Type	Fixed
Ux	Yes
Uy	Yes
Uz	Yes

Selected Entities

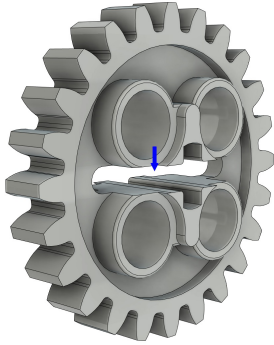


Loads

Gravity

Type	Gravity
Magnitude	9.807 m / s ²
X Value	0 m / s ²
Y Value	0 m / s ²
Z Value	-9.807 m / s ²

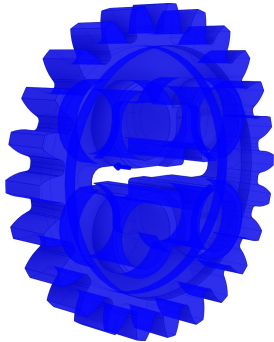
Selected Entities



Initial Linear Velocity:2

Type	Initial Linear Velocity
Velocity	
Magnitude	10 m / s
X Angle	0 deg
Y Angle	0 deg
Z Angle	0 deg

Selected Entities



Results

Result Summary

Name	Minimum	Maximum
Stress		
Von Mises	0 MPa	103.9 MPa
Normal XX	-42.92 MPa	41.72 MPa
Normal YY	-105 MPa	96.7 MPa
Normal ZZ	-59.98 MPa	63.13 MPa
Shear XY	-35.82 MPa	35.01 MPa
Shear YZ	-50.07 MPa	49.86 MPa
Shear ZX	-23.28 MPa	22.8 MPa
1st Principal	-26.14 MPa	118 MPa
2nd Principal	-38.23 MPa	36.52 MPa
3rd Principal	-129.8 MPa	24.92 MPa
Displacement		
Total	0 mm	0.6213 mm
X	-0.5958 mm	0.5686 mm
Y	-0.202 mm	0.2024 mm
Z	-0.222 mm	0.2233 mm
Reaction Force		
Total	0 N	156.4 N
X	-9.571 N	156.4 N
Y	-14.2 N	15.47 N
Z	-18.41 N	18.32 N

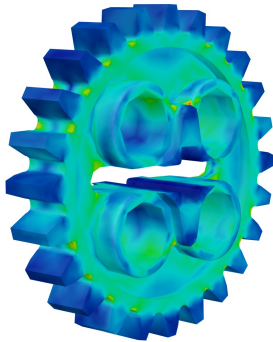
Strain		
Equivalent	0	0.04366
Normal XX	-0.01533	0.01506
Normal YY	-0.03917	0.03625
Normal ZZ	-0.02376	0.02526
Shear XY	-0.02207	0.02157
Shear YZ	-0.03085	0.03072
Shear ZX	-0.01434	0.01404
1st Principal	-4.523E-04	0.04603
2nd Principal	-0.01459	0.01438
3rd Principal	-0.04906	1.981E-04
Acceleration		
Total	0 m / s ²	3.885E+08 m / s ²
X	-4.743E+07 m / s ²	3.885E+08 m / s ²
Y	-2.242E+07 m / s ²	1.822E+07 m / s ²
Z	-3.957E+07 m / s ²	4.78E+07 m / s ²
Velocity		
Total	0 m / s	39.14 m / s
X	-32.07 m / s	30.13 m / s
Y	-17.05 m / s	18.75 m / s
Z	-17.71 m / s	37.58 m / s

Stress

Von Mises

Step 26

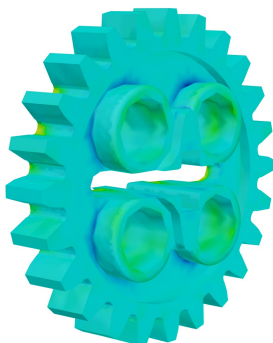
[MPa] 0.02  65.36



1st Principal

Step 26

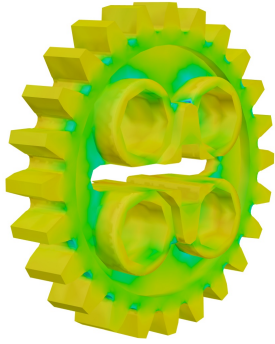
[MPa] -26.14  78.16



3rd Principal

Step 26

[MPa] -81.48  22.95



☐ Displacement

☐ Total

☐ Step 26

[mm] 0  0.3938

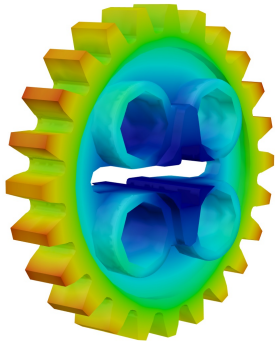


Image Width (pixels):