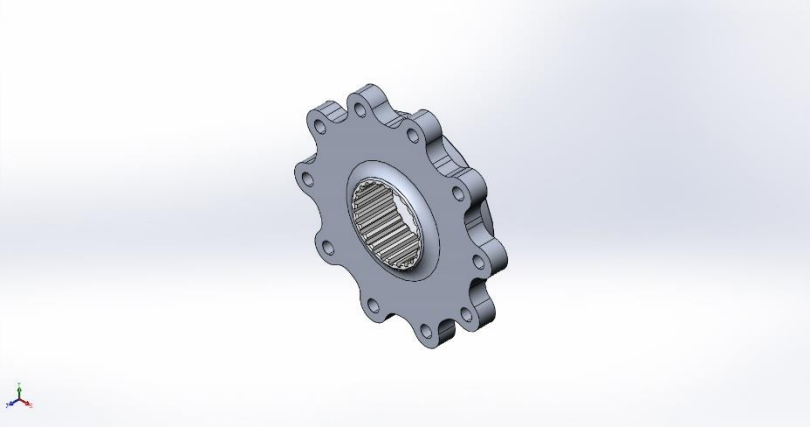
FORMULE POLYTECHNIQUE MONTRÉAL



Simulation of EN-20602-Drexler-Sprocket Adapter

Date: 13 novembre 2016
Designer: Christophe Besson
Study name: Static 1
Analysis type: Static

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Description

No Data

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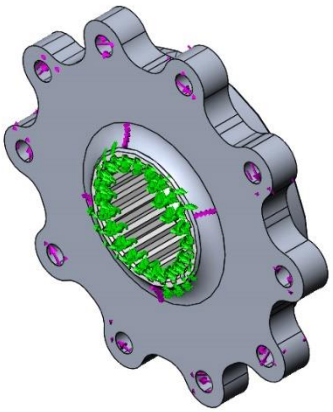
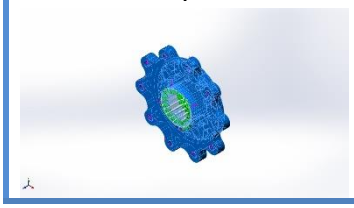
Model Information



Model name: EN-20602-Drexler-Sprocket Adapter
Current Configuration: Default

Solid Bodies

Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
1 	Solid Body	**Mass:0.528904 kg** **Volume:0.000188222 m^3** **Density:2810 kg/m^3** **Weight:5.18325 N**	**Z:\0005 - CAD\2017\EN-20602-Drexler-Sprocket Adapter.SLDPRT** Nov 13 13:24:24 2016

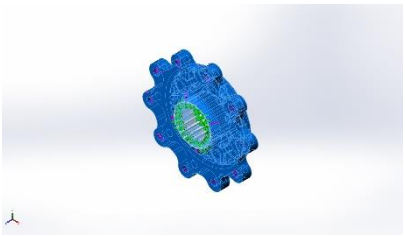
Study Properties

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 (Z:\0005 - CAD\2017)

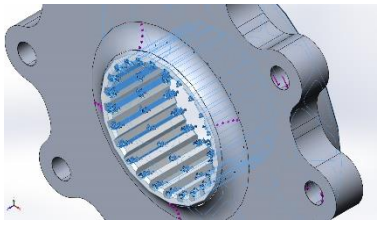
Units

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

Material Properties

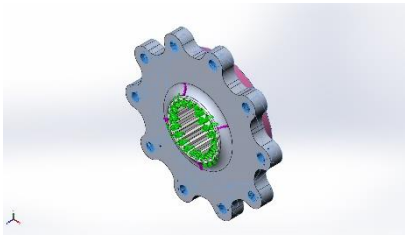
Model Reference	Properties		Components
	**Name:**	7075-T6, Plate (SS)	SolidBody 1(1)(EN-20602-Drexler-Sprocket Adapter)
	Model type:	Linear Elastic Isotropic	
	Default failure criterion:	Unknown	
	Yield strength:	5.05e+008 N/m^2	
	Tensile strength:	5.7e+008 N/m^2	
	Elastic modulus:	7.2e+010 N/m^2	
	Poisson's ratio:	0.33	
	Mass density:	2810 kg/m^3	
	Shear modulus:	2.69e+010 N/m^2	
	Thermal expansion coefficient:	2.4e-005 /Kelvin	
Curve Data:N/A			

Loads and Fixtures

Fixture name	Fixture Image	Fixture Details
Fixed-1		**Entities:** 24 face(s) **Type:** Fixed Geometry

Resultant Forces

Components	X	Y	Z	Resultant
Reaction force(N)	0.166092	25.4735	-1.42836	25.5141
Reaction Moment(N.m)	0	0	0	0

Load name	Load Image	Load Details
Torque-1		**Entities:** 10 face(s) **Reference:** Face< 1 > **Type:** Apply torque **Value:** 1200 N.m

Connector Definitions

No Data

Contact Information

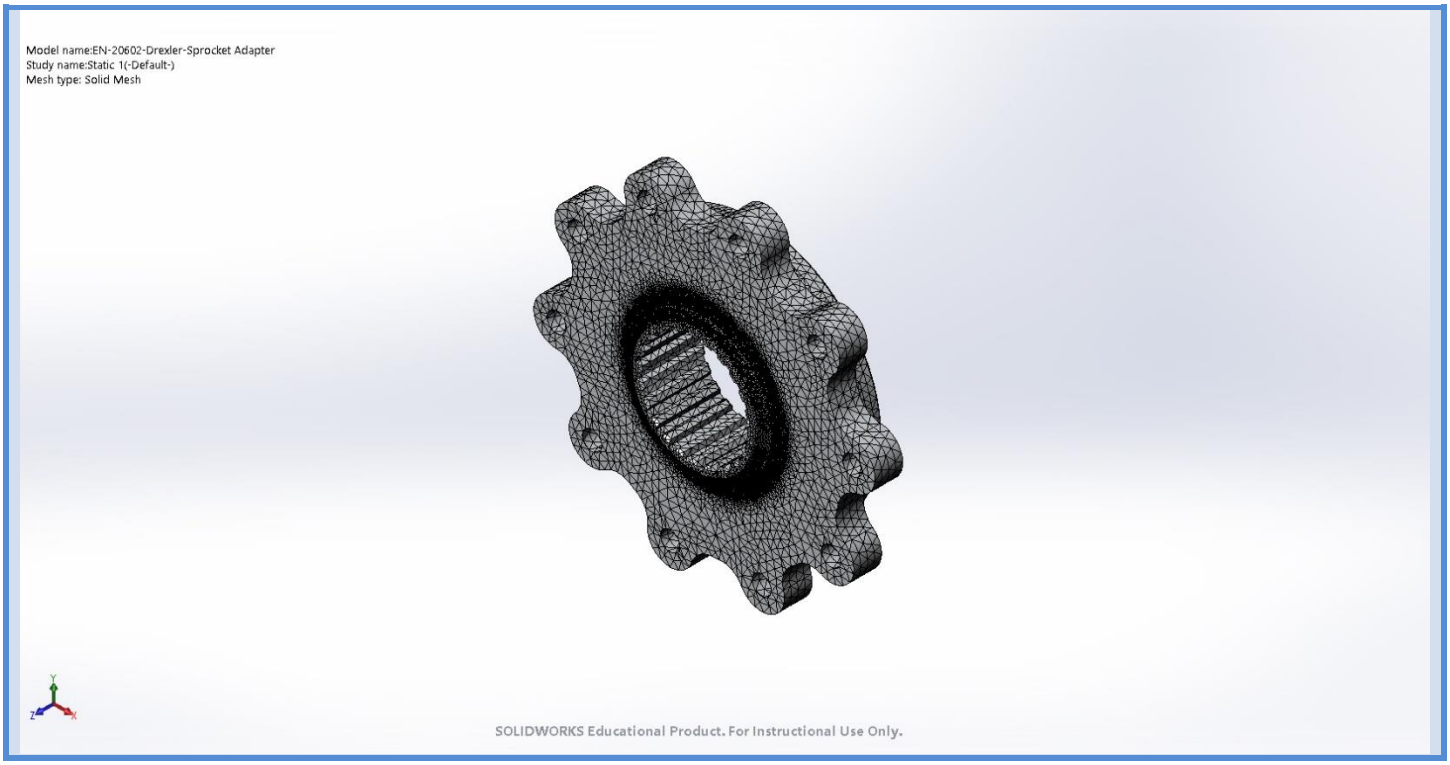
No Data

Mesh information

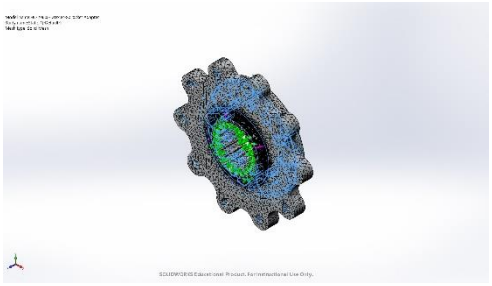
Mesh type	Solid Mesh
Mesher Used:	Curvature-based mesh
Jacobian points	4 Points
Maximum element size	3.65748 mm
Minimum element size	0.731496 mm
Mesh Quality	High

Mesh information - Details

Total Nodes	482063
Total Elements	326329
Maximum Aspect Ratio	131.91
% of elements with Aspect Ratio < 3	98.9
% of elements with Aspect Ratio > 10	0.0996
% of distorted elements(Jacobian)	0
Time to complete mesh(hh;mm;ss):	00:00:44
Computer name:	DELL



Mesh Control Information:

Mesh Control Name	Mesh Control Image	Mesh Control Details
Control-4		**Entities:** 1 edge(s), 7 face(s) **Units:** mm **Size:** 0.571481 **Ratio:** 3

Sensor Details

No Data

Resultant Forces

Reaction forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	0.166092	25.4735	-1.42836	25.5141

Reaction Moments

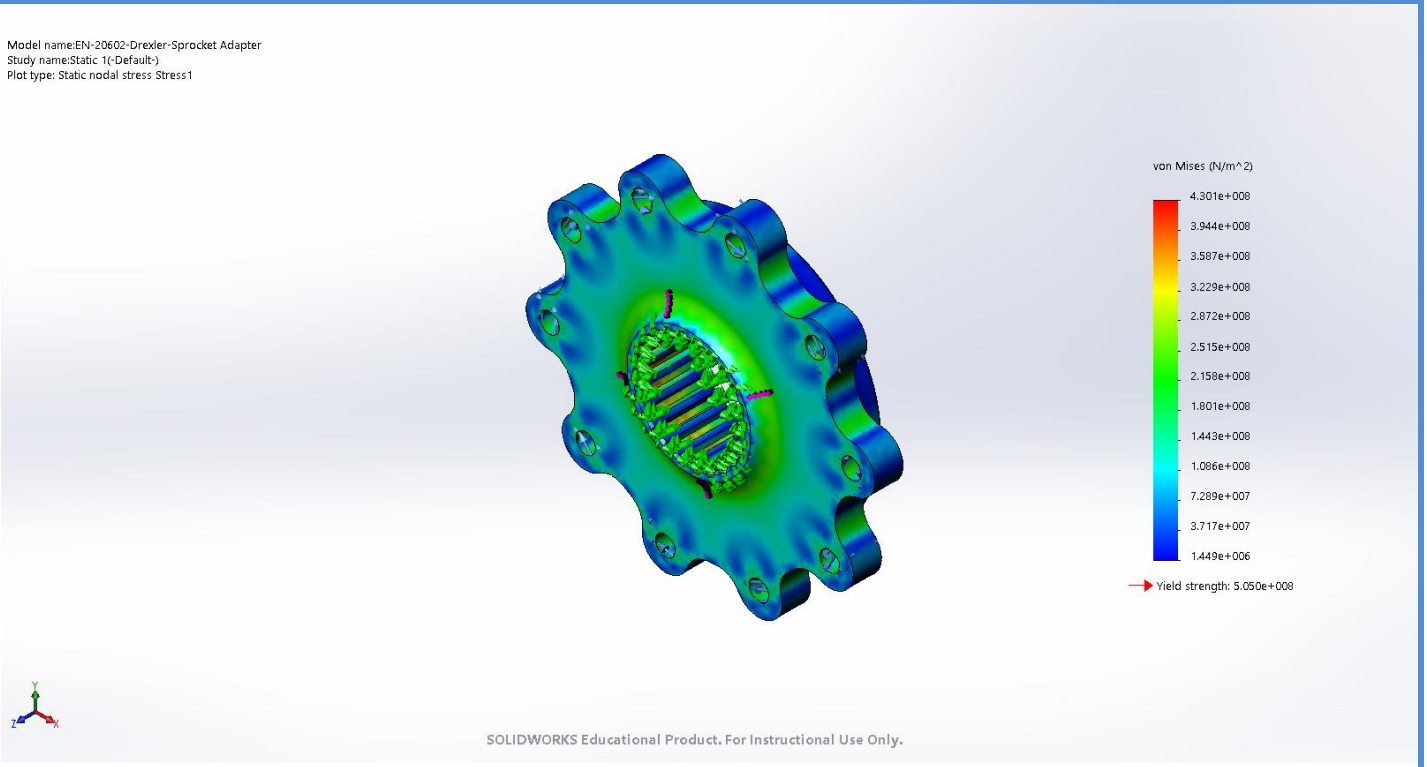
Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	0

Beams

No Data

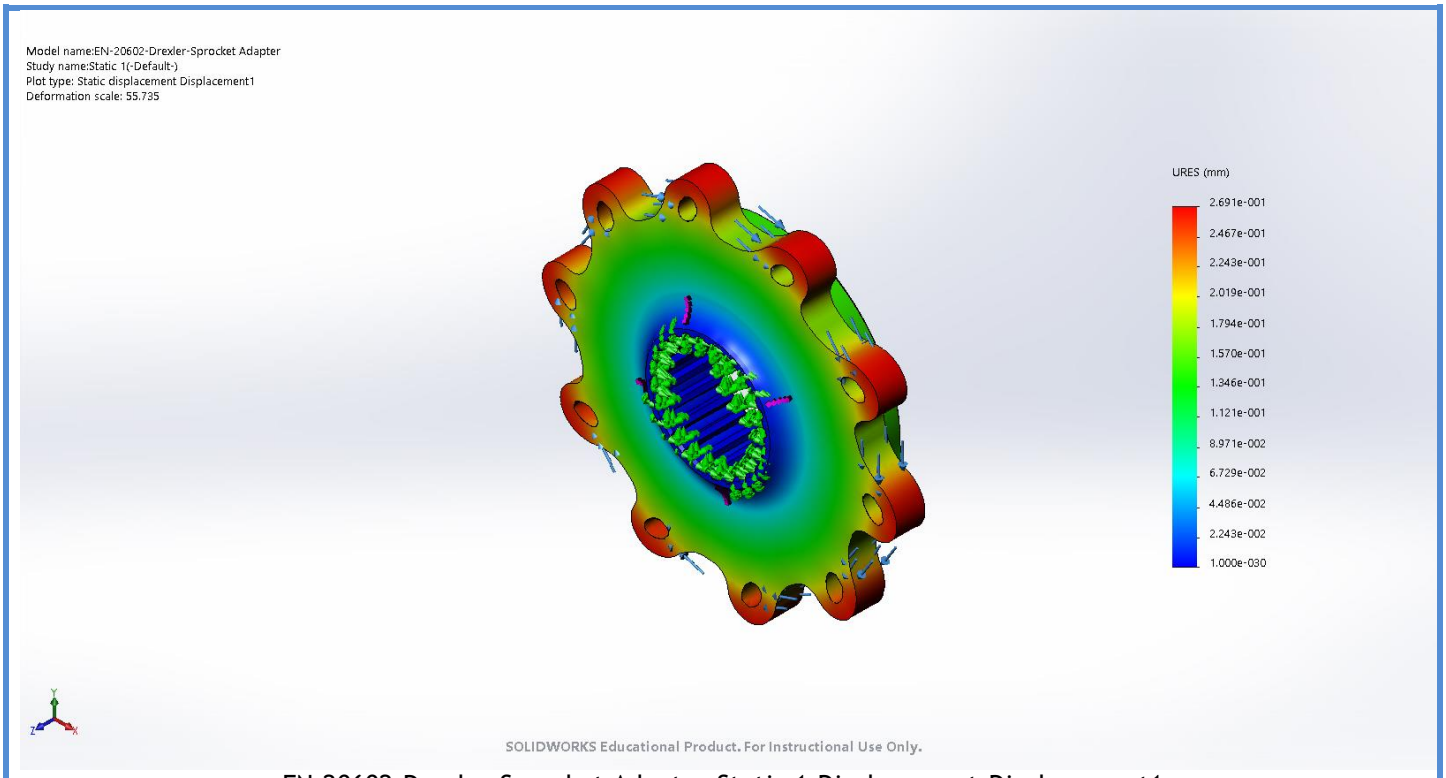
Study Results

Name	Type	Min	Max
Stress1	VON: von Mises Stress	1.44932e+006 N/m^2 Node: 11694	4.30103e+008 N/m^2 Node: 87851



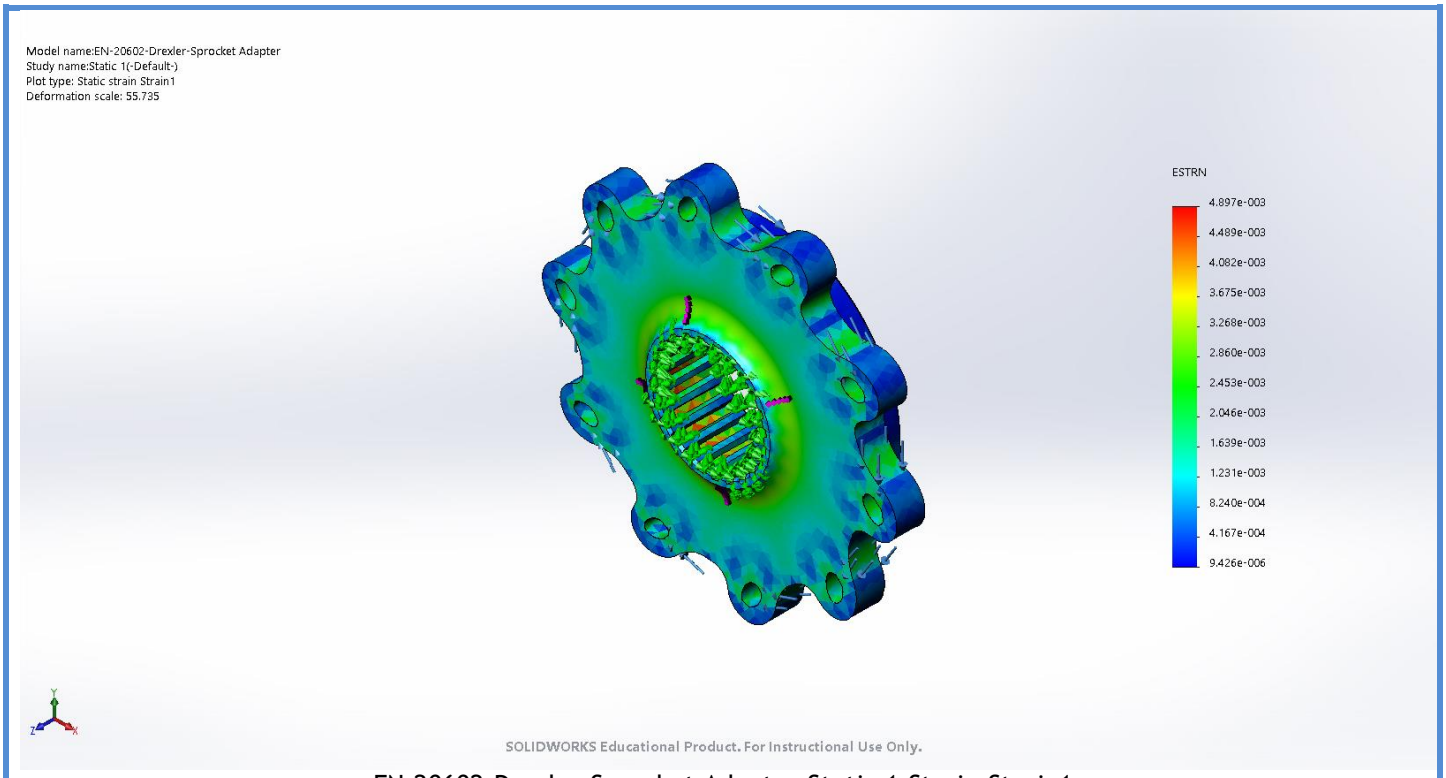
EN-20602-Drexler-Sprocket Adapter-Static 1-Stress-Stress1

Name	Type	Min	Max
Displacement1	URES: Resultant Displacement	0 mm Node: 663	0.269142 mm Node: 72207



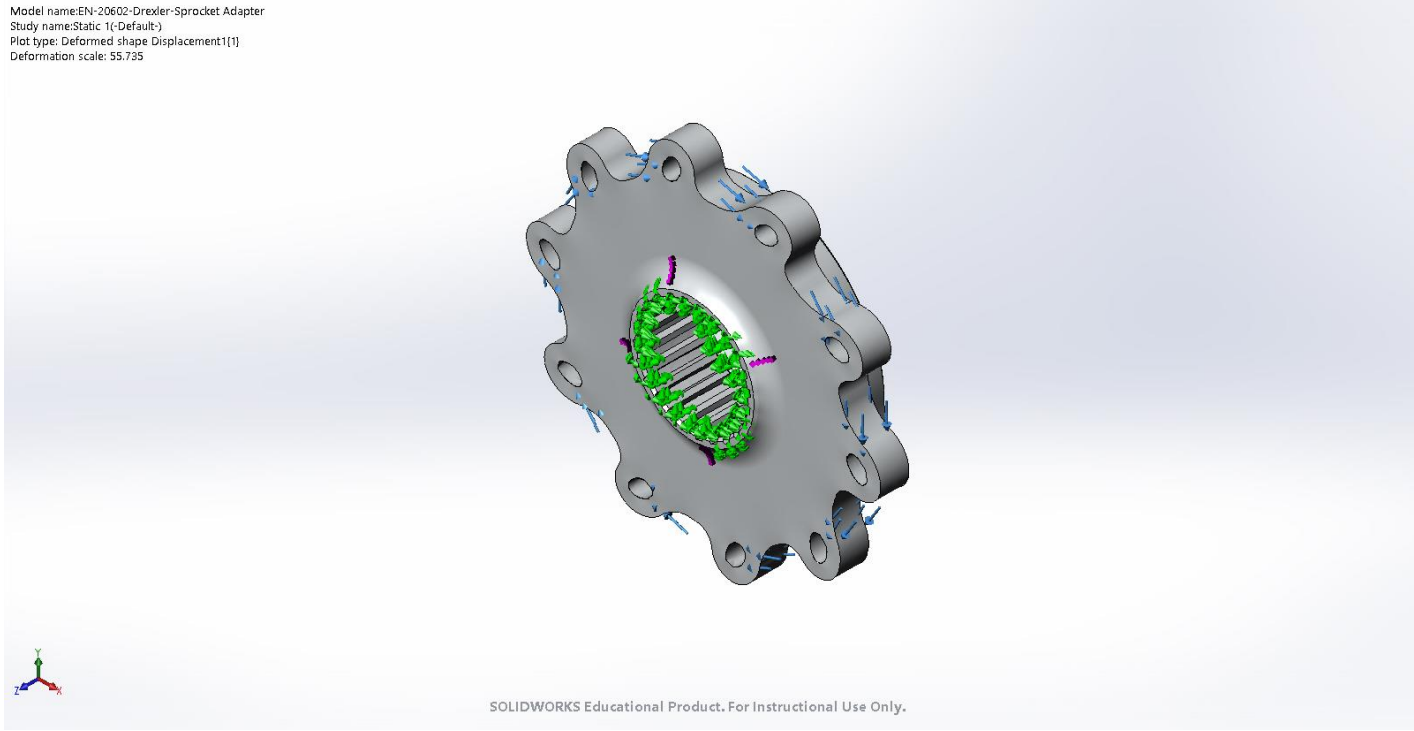
EN-20602-Drexler-Sprocket Adapter-Static 1-Displacement-Displacement1

Name	Type	Min	Max
Strain1	ESTRN: Equivalent Strain	9.4261e-006 Element: 188562	0.00489668 Element: 181092



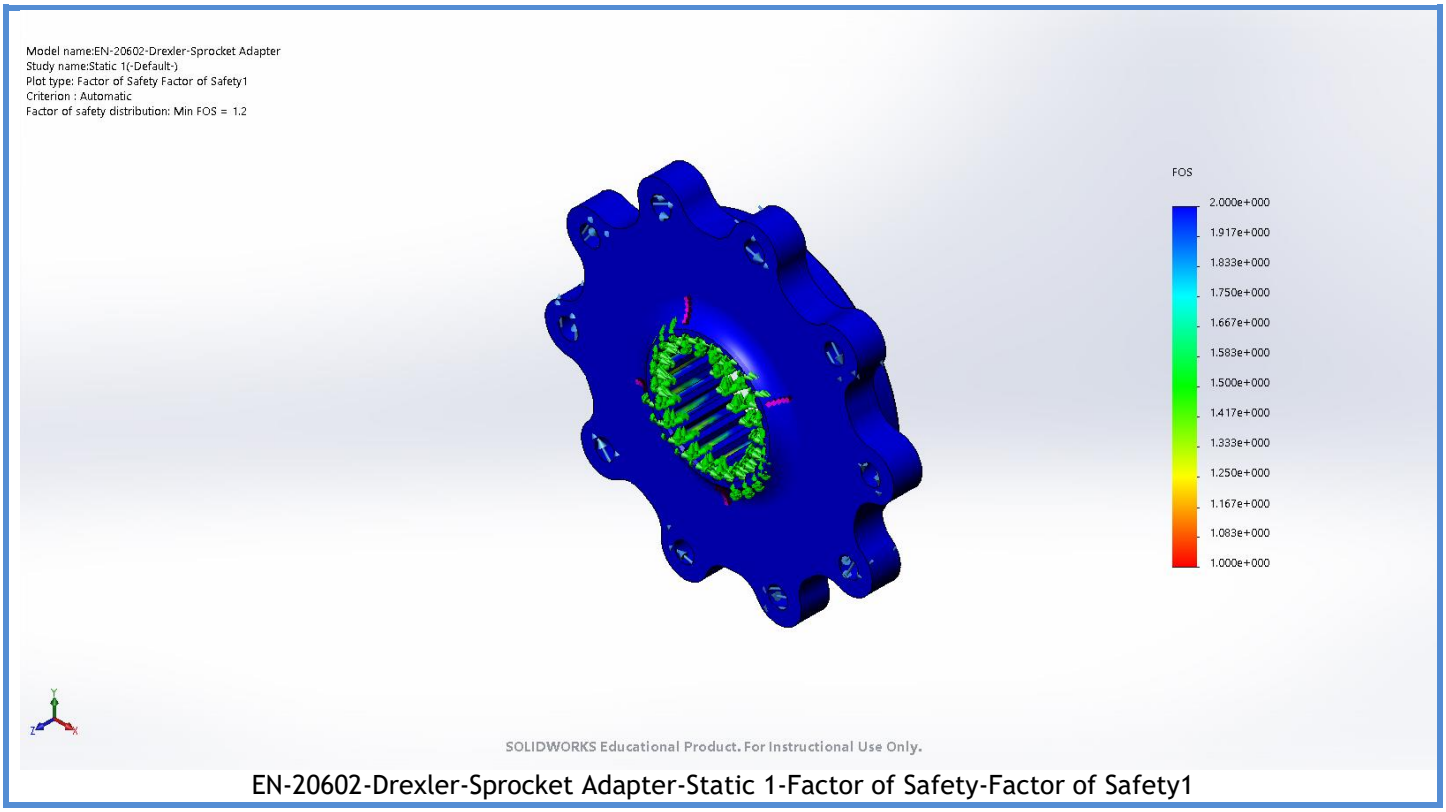
EN-20602-Drexler-Sprocket Adapter-Static 1-Strain-Strain1

Name	Type
Displacement1{1}	Deformed shape



EN-20602-Drexler-Sprocket Adapter-Static 1-Displacement-Displacement1{1}

Name	Type	Min	Max
Factor of Safety1	Automatic	1.17414 Node: 87851	2 Node: 1



EN-20602-Drexler-Sprocket Adapter-Static 1-Factor of Safety-Factor of Safety1

Conclusion

Facteur de sécurité de 1.17 au niveau de la spline le reste 2 et plus partout sauf dans les congées (1.53)