

Simulation of 2007-Wal

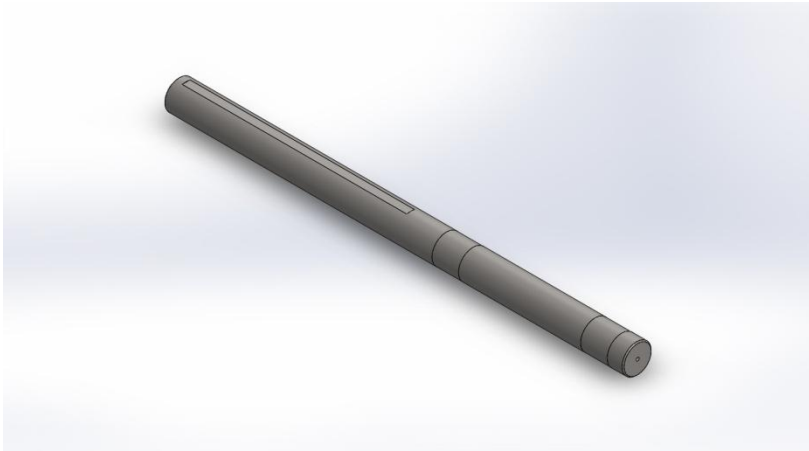
Date: 24 września 2020
Designer: Kaszowski Group LLC
Study name: SimulationXpress Study
Analysis type: Static

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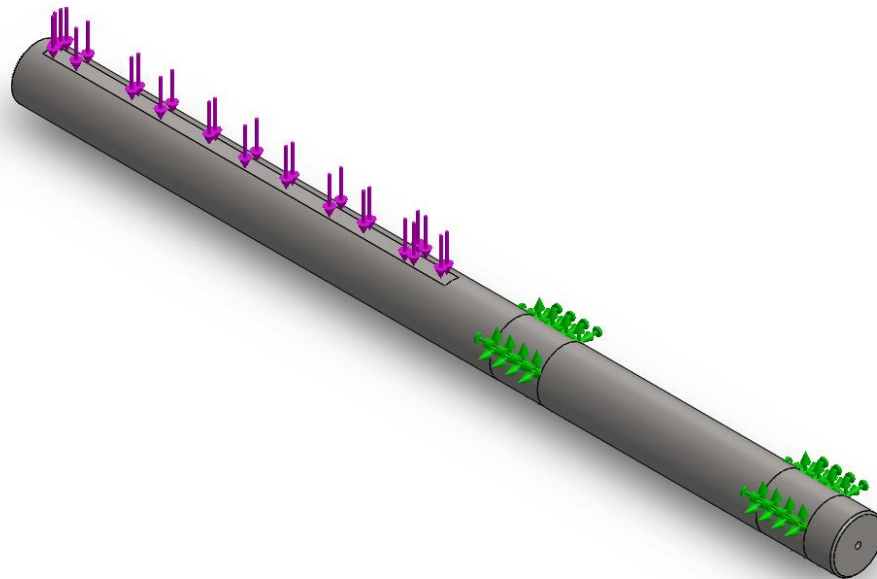
Description

Main shaft load analysis 800 [lb]



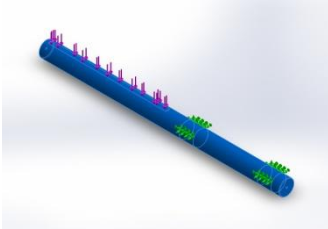
Assumptions

Model Information

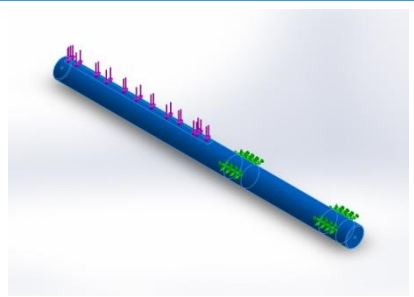


Model name: 2007-Wal
Current Configuration: Domyślna

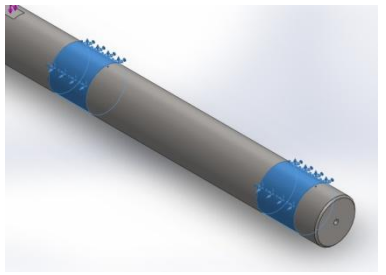
Solid Bodies

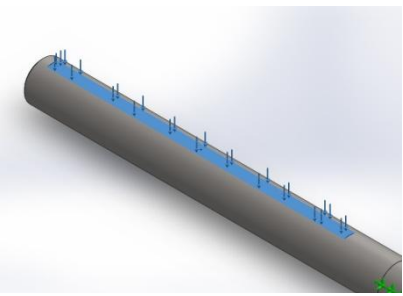
Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
Wytnij-wyciągnięcie1 	Solid Body	Mass: 15.9647 kg Volume: 0.00204676 m ³ Density: 7800 kg/m ³ Weight: 156.454 N	C:\Users\ASIA\Desktop\2007-Wal.sldprt Sep 24 20:00:53 2020

Material Properties

Model Reference	Properties	Components
	<p>Name: 1.0045 (S355JR) Model type: Linear Elastic Isotropic Default failure criterion: Unknown Yield strength: 2.75e+08 N/m² Tensile strength: 4.5e+08 N/m²</p>	SolidBody 1(Wytnij-wyciągnięcie1)(2007-Wal)

Loads and Fixtures

Fixture name	Fixture Image	Fixture Details
Fixed-1		<p>Entities: 2 face(s) Type: Fixed Geometry</p>

Load name	Load Image	Load Details
Force-1		<p>Entities: 1 face(s) Type: Apply normal force Value: 360 N (800 lb)</p>

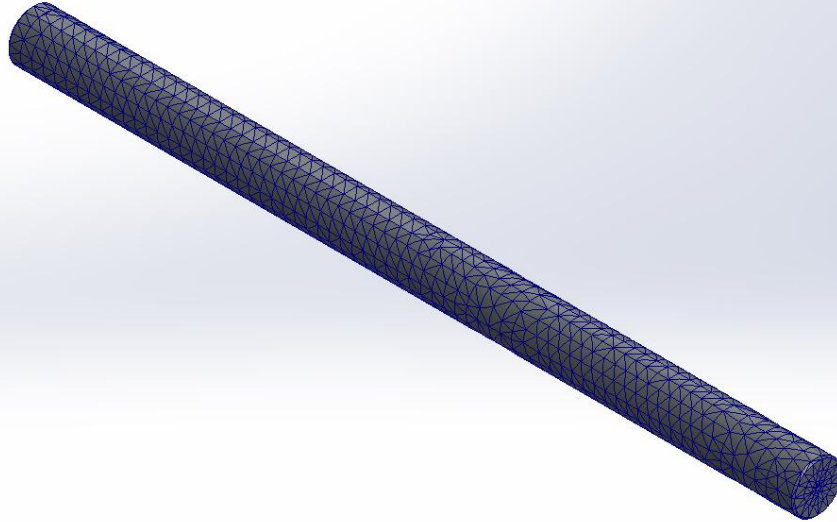
Mesh information

Mesh type	Solid Mesh
Mesher Used:	Standard mesh
Automatic Transition:	Off
Include Mesh Auto Loops:	Off
Jacobian points	4 Points
Element Size	12.6993 mm
Tolerance	0.634963 mm
Mesh Quality Plot	High

Mesh information - Details

Total Nodes	14251
Total Elements	8864
Maximum Aspect Ratio	12.159
% of elements with Aspect Ratio < 3	98.8
% of elements with Aspect Ratio > 10	0.0226
% of distorted elements(Jacobian)	0
Time to complete mesh(hh:mm:ss):	00:00:01
Computer name:	PC

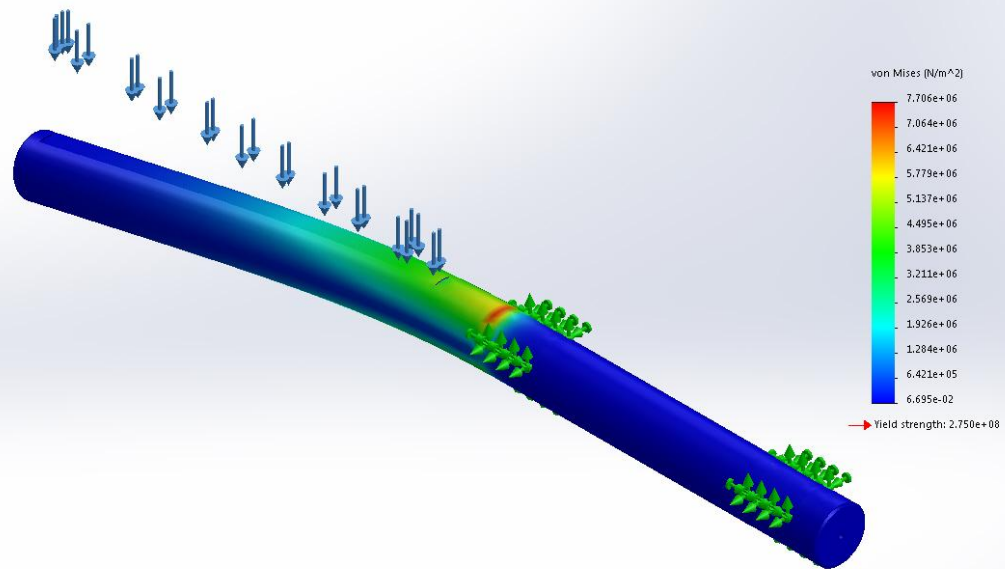
Model name: 2007-Wal
Study name: SimulationXpress Study-(Domyšina-)
Mesh type: Solid Mesh



Study Results

Name	Type	Min	Max
Stress	VON: von Mises Stress	6.695e-02 N/m ² Node: 8912	7.706e+06 N/m ² Node: 12201

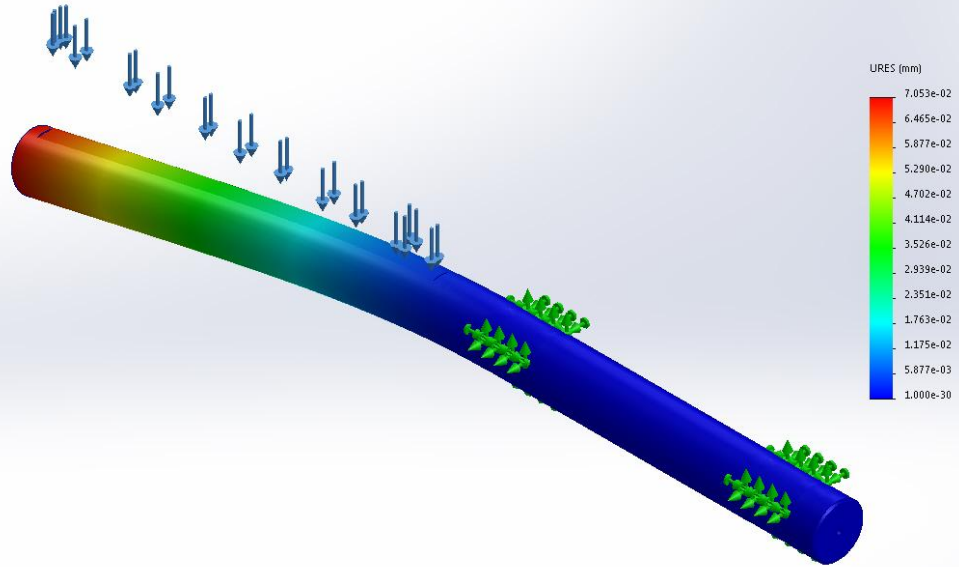
Model name: 2007-Wal
Study name: SimulationXpress Study(-Domyšina)
Plot type: Static nodal stress Stress
Deformation scale: 1.229.16



2007-Wal-SimulationXpress Study-Stress-Stress

Name	Type	Min	Max
Displacement	URES: Resultant Displacement	0.000e+00 mm Node: 73	7.053e-02 mm Node: 468

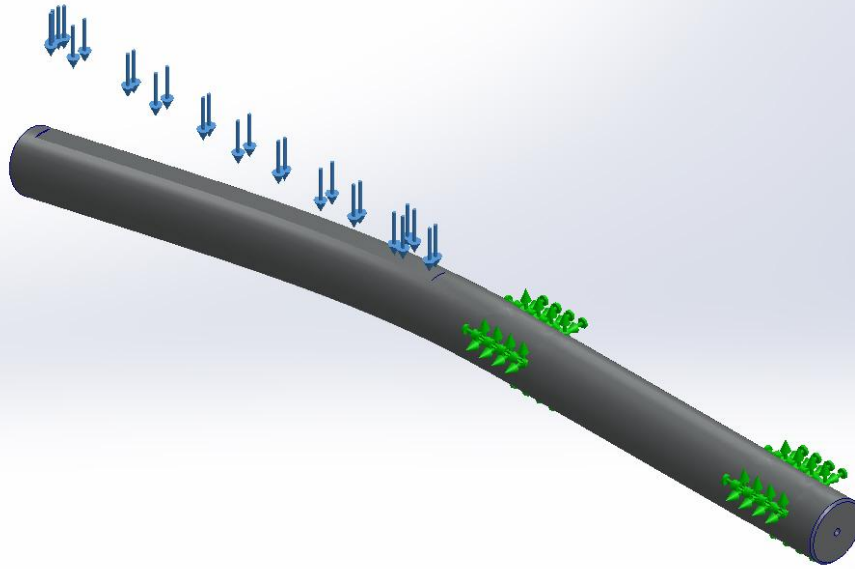
Model name: 2007-Wal
Study name: SimulationXpress Study(-Domyšina-)
Plot type: Static displacement Displacement
Deformation scale: 1229.16



2007-Wal-SimulationXpress Study-Displacement-Displacement

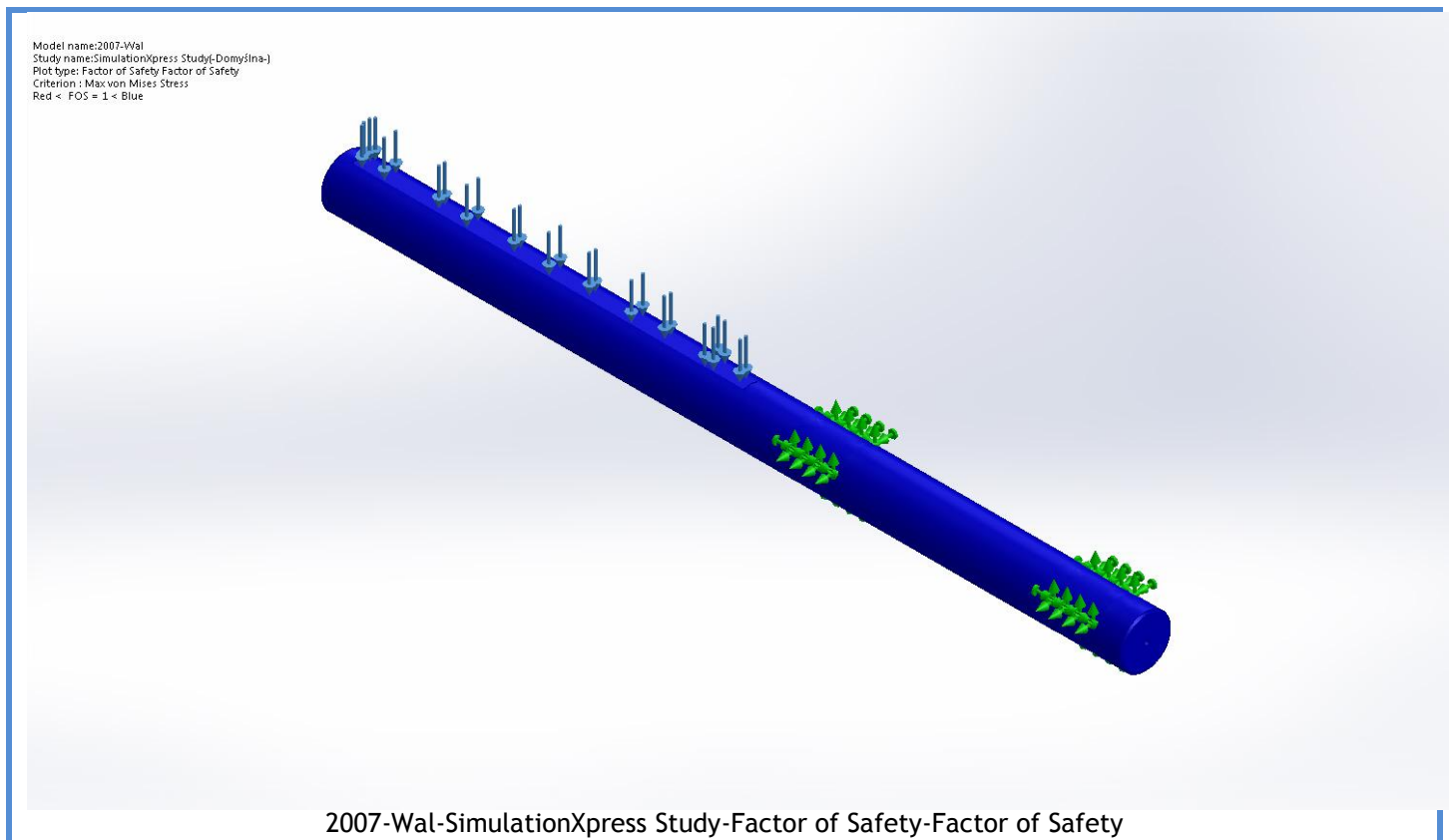
Name	Type
Deformation	Deformed shape

Model name: 2007-Wal
Study name: SimulationXpress Study(-Domyšina-)
Plot type: Deformed shape Deformation
Deformation scale: 1229.16



2007-Wal-SimulationXpress Study-Displacement-Deformation

Name	Type	Min	Max
Factor of Safety	Max von Mises Stress	3.569e+01 Node: 12201	4.107e+09 Node: 8912



Conclusion

Main shaft after applying load of 800 LBS deforms only 0.04 mm of its nominal position.

All the calculations are based on values specific for the material used, which is Steel S355 JR.