Simulation of Shaft_4

Date: Freitag, 2. Mai 2025
Designer: Solidworks
Study name: Статический 1
Analysis type: Static

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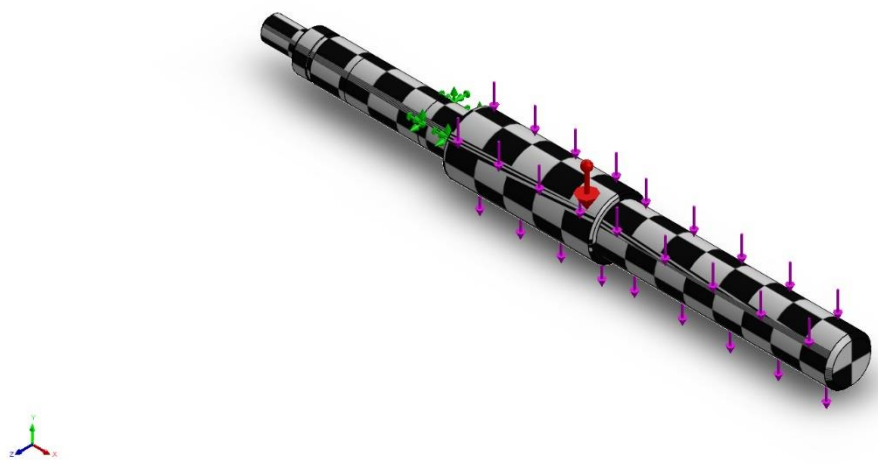
Description

No Data

Assumptions

Model Information



Model name: Shaft_4
Current Configuration: Default

Solid Bodies

Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
Разделяющая линия1 	Solid Body	**Mass:0,133354 kg** **Volume:1,70398e-05 m^3** **Density:7.826 kg/m^3** **Weight:1,30687 N**	**T:\Аспирантура\Стенд_026\Shaft_4.SLDPRT**

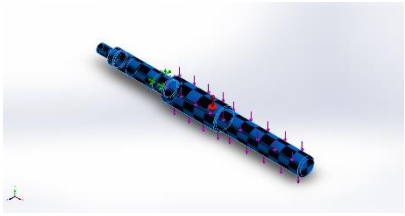
Study Properties

Study name	Статический 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 (T:\Аспирантура\Стенд_020)

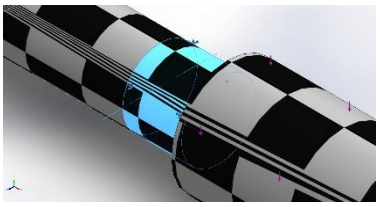
Units

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:**	Сталь 45 ГОСТ 1050-88	Твердое тело 1(Разделяющая линия1)(Shaft_4)
	Model type:	Linear Elastic Isotropic	
	Default failure criterion:	Max von Mises Stress	
	Yield strength:	8,3e+08 N/m^2	
	Tensile strength:	9,8e+08 N/m^2	
	Elastic modulus:	2,04e+11 N/m^2	
	Poisson's ratio:	0,3	
	Mass density:	7.826 kg/m^3	
	Shear modulus:	7,8e+10 N/m^2	
	Thermal expansion coefficient:	1,19e-05 /Kelvin	
Curve Data:N/A			

Loads and Fixtures

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

Resultant Forces

Components	X	Y	Z	Resultant
Reaction force(N)	0,00165558	137,295	0,00244856	137,295
Reaction Moment(N.m)	0	0	0	0

Load name	Load Image	Load Details
Сила-1		**Entities:** 1 face(s), 1 plane(s) **Reference:** Top Plane **Type:** Apply force **Values:** ---; ---; -50 N
Schwerkraft-1		**Reference:** Top Plane **Values:** 0 0 -9,81 **Units:** m/s^2
Kraft-2		**Entities:** 1 face(s), 1 plane(s) **Reference:** Top Plane **Type:** Apply force **Values:** ---; ---; -86 N

Connector Definitions

No Data

Contact Information

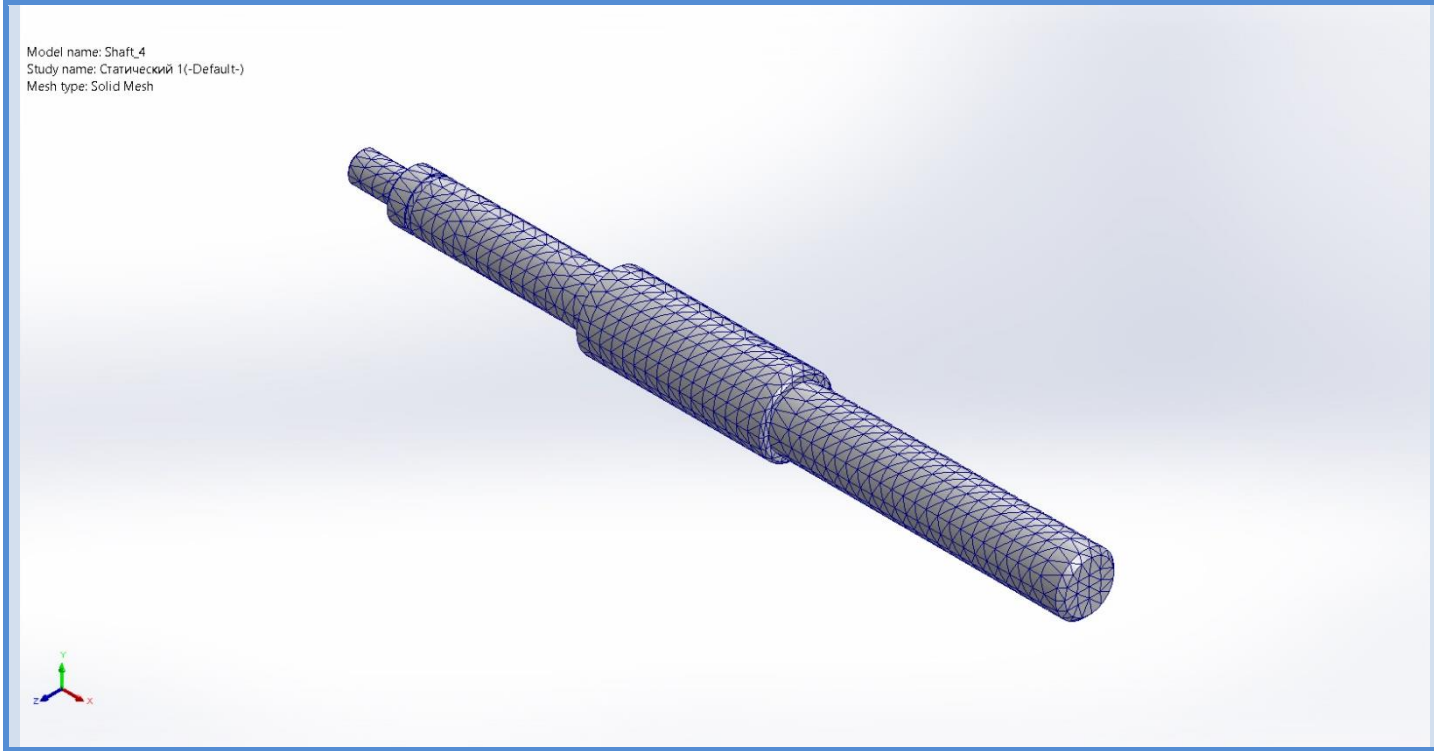
No Data

Mesh information

Mesh type	Solid Mesh
Mesher Used:	Standard mesh
Automatic Transition:	Off
Include Mesh Auto Loops:	Off
Jacobian points for High quality mesh	4 Points
Element Size	2,44475 mm
Tolerance	0,122238 mm
Mesh Quality	High

Mesh information - Details

Total Nodes	14635
Total Elements	9182
Maximum Aspect Ratio	12,964
% of elements with Aspect Ratio < 3	95,6
Percentage of elements with Aspect Ratio > 10	0,436
Percentage of distorted elements	0
Time to complete mesh(hh;mm;ss):	00:00:02
Computer name:	RUSLANPC



Sensor Details
No Data

Resultant Forces

Reaction forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	0,00165558	137,295	0,00244856	137,295

Reaction Moments

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

Free body forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	0,0292069	1,11478	-0,0287723	1,11554

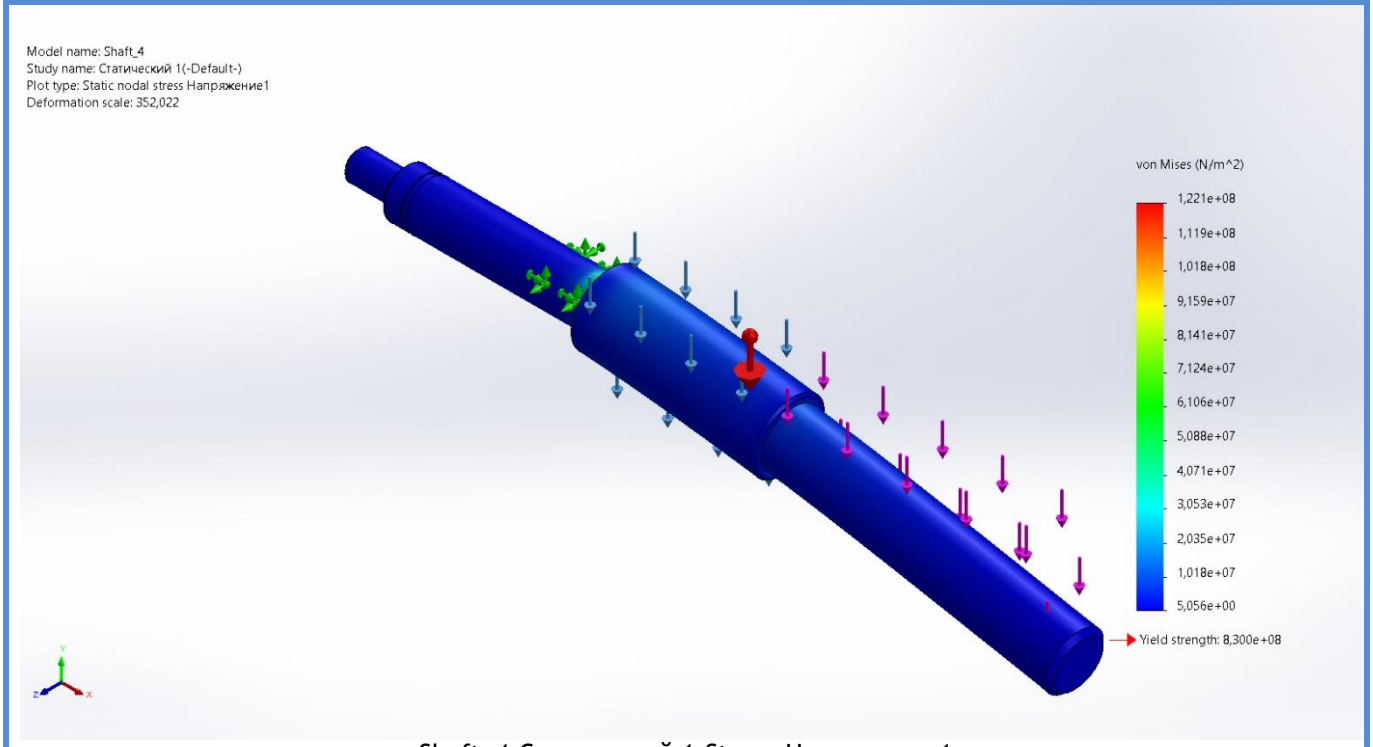
Free body moments

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	1e-33

Beams
No Data

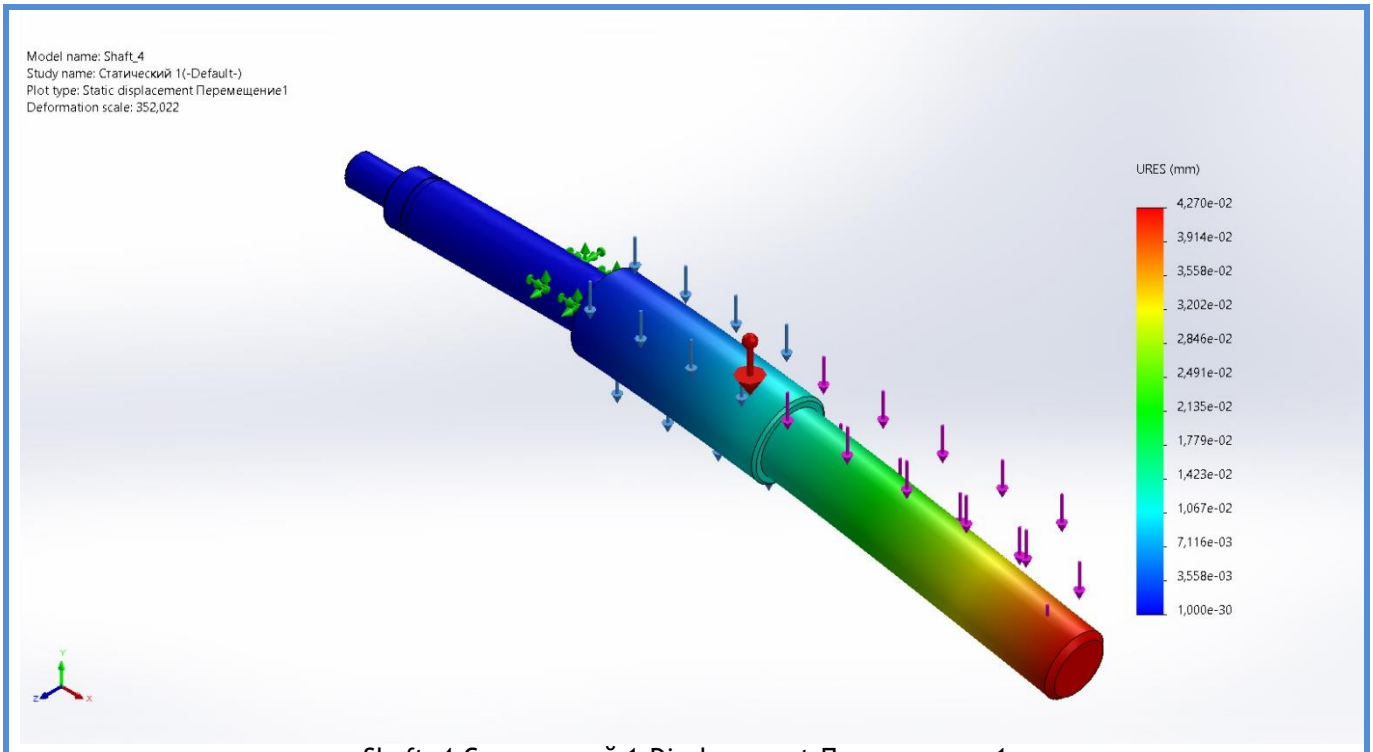
Study Results

Name	Type	Min	Max
Напряжение1	VON: von Mises Stress	5,056e+00N/m^2 Node: 750	1,221e+08N/m^2 Node: 13549



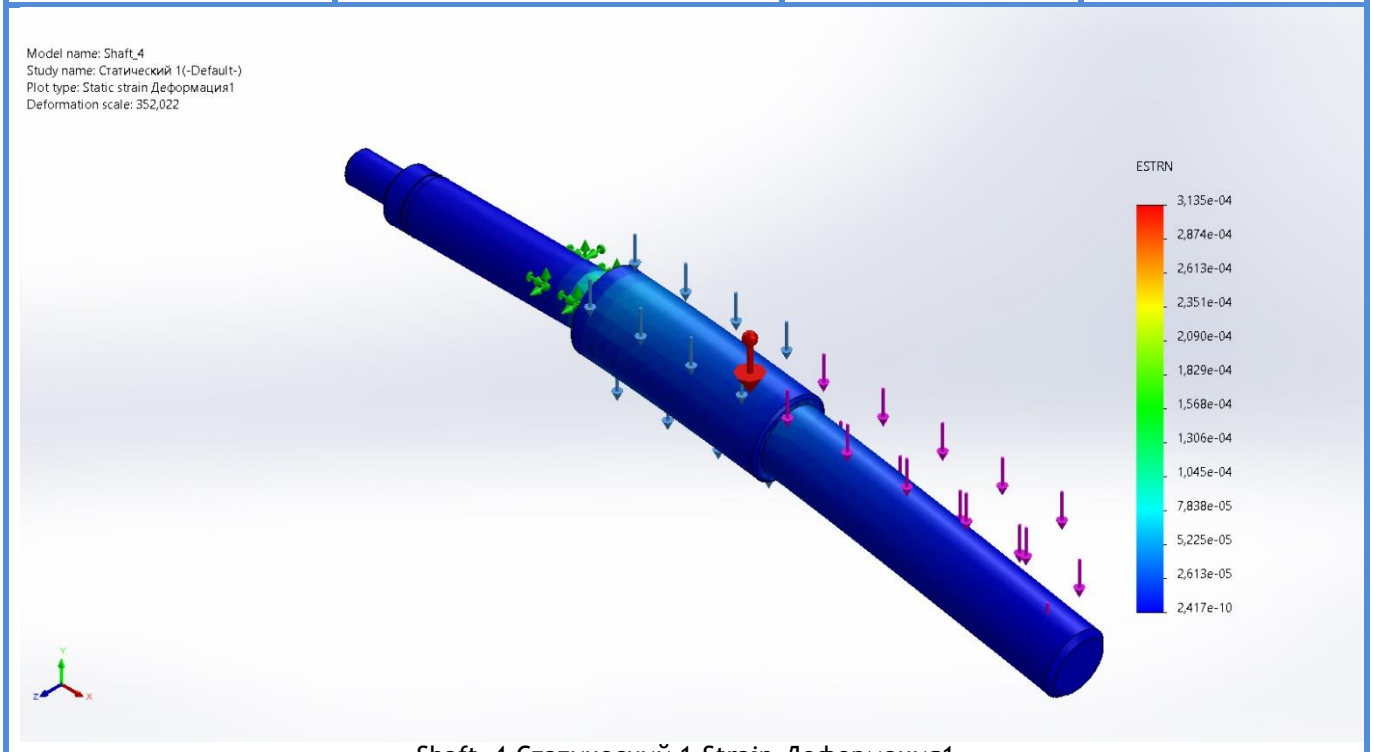
Shaft_4-Статический 1-Stress-Напряжение1

Name	Type	Min	Max
Перемещение1	URES: Resultant Displacement	0,000e+00mm Node: 154	4,270e-02mm Node: 743



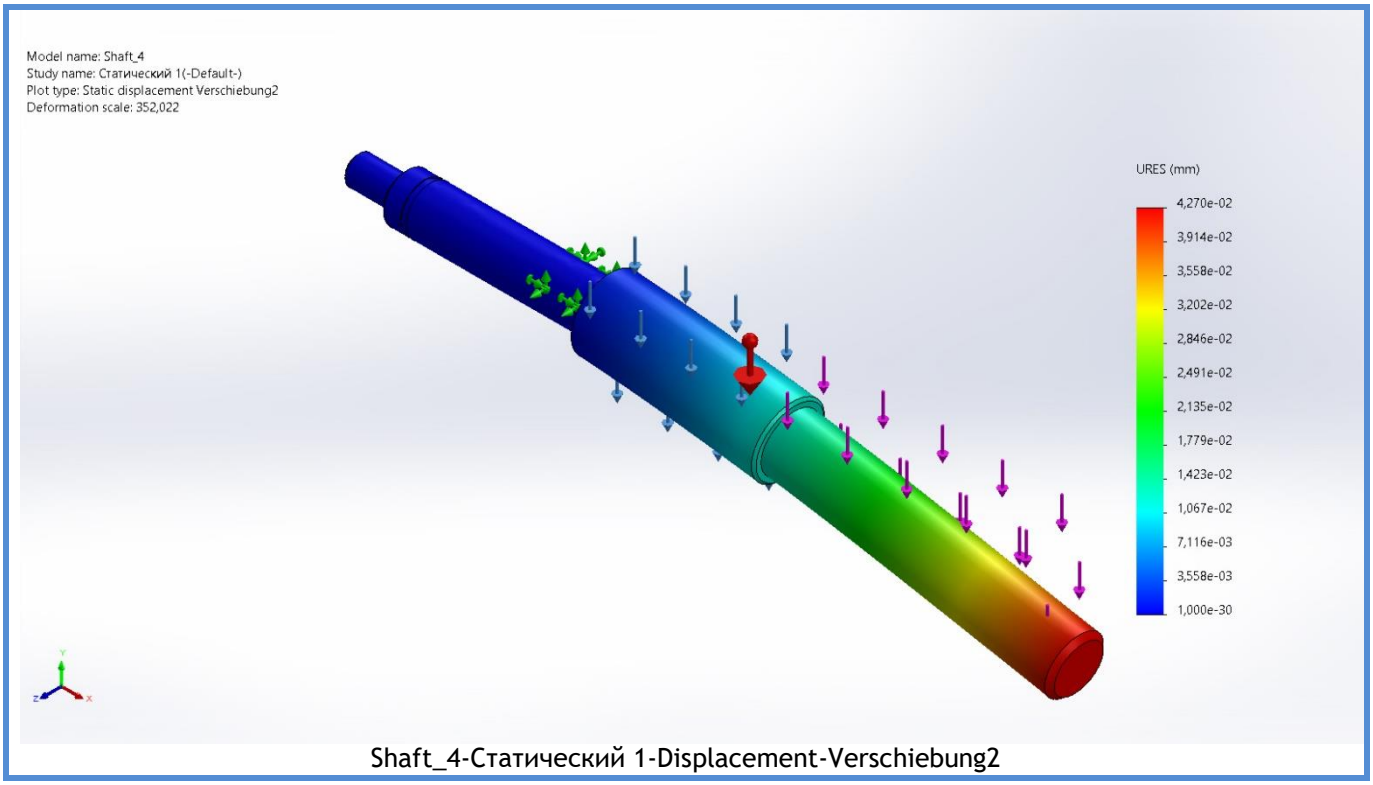
Shaft_4-Статический 1-Displacement-Перемещение1

Name	Type	Min	Max
Деформация1	ESTRN: Equivalent Strain	2,417e-10 Element: 3381	3,135e-04 Element: 4053



Shaft_4-Статический 1-Strain-Деформация1

Name	Type	Min	Max
Verschiebung2	URES: Resultant Displacement	0,000e+00mm Node: 154	4,270e-02mm Node: 743



Shaft_4-Статический 1-Displacement-Verschiebung2

Conclusion