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|  | |  | | --- | | **Simulation of Shaft\_4**  **Date: Freitag, 2. Mai 2025 Designer: Solidworks**  **Study name: Статический 1**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc197045410)  [Assumptions 2](#_Toc197045411)  [Model Information 2](#_Toc197045412)  [Study Properties 3](#_Toc197045413)  [Units 3](#_Toc197045414)  [Material Properties 4](#_Toc197045415)  [Loads and Fixtures 5](#_Toc197045416)  [Connector Definitions 5](#_Toc197045417)  [Contact Information 6](#_Toc197045418)  [Mesh information 7](#_Toc197045419)  [Sensor Details 8](#_Toc197045420)  [Resultant Forces 8](#_Toc197045421)  [Beams 8](#_Toc197045422)  [Study Results 9](#_Toc197045423)  [Conclusion 11](#_Toc197045424) | |
| Description No Data |

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| Assumptions |

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| 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**** | |

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| 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) | |

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

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| Material Properties  |  |  |  | | --- | --- | --- | | ****Model Reference**** | ****Properties**** | ****Components**** | |  | |  |  | | --- | --- | | ****Name:**** | **Сталь 45 ГОСТ 1050-88** | | ****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** | | **Твердое тело 1(Разделяющая линия1)(Shaft\_4)** | | **Curve Data:N/A** | | | |

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| **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** | | |

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| Connector Definitions No Data |

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| Contact Information No Data |

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| 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 | |  | | |

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| Sensor Details No Data |

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| Resultant ForcesReaction 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 | |

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| Beams No Data |

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| 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** | | | | |

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| Conclusion |