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|  | |  | | --- | | **Simulation of Gear\_small\_2**  **Date: Freitag, 2. Mai 2025 Designer: Solidworks**  **Study name: Statisch 1**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc197045203)  [Assumptions 2](#_Toc197045204)  [Model Information 2](#_Toc197045205)  [Study Properties 3](#_Toc197045206)  [Units 3](#_Toc197045207)  [Material Properties 4](#_Toc197045208)  [Loads and Fixtures 4](#_Toc197045209)  [Connector Definitions 5](#_Toc197045210)  [Contact Information 5](#_Toc197045211)  [Mesh information 6](#_Toc197045212)  [Sensor Details 7](#_Toc197045213)  [Resultant Forces 7](#_Toc197045214)  [Beams 7](#_Toc197045215)  [Study Results 8](#_Toc197045216)  [Conclusion 10](#_Toc197045217) | |
| Description No Data |

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| Assumptions |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** Gear\_small\_2**  ****Current Configuration:** Default** | | | | | ****Solid Bodies**** | | | | | ****Document Name and Reference**** | ****Treated As**** | ****Volumetric Properties**** | ****Document Path/Date Modified**** | | **Fase1** | **Solid Body** | ****Mass:3,64406 kg****  ****Volume:0,000465635 m^3****  ****Density:7.826 kg/m^3****  ****Weight:35,7118 N**** | ****T:\Аспирантура\Стенд\_026\Gear\_small\_2.SLDPRT**** | |

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| Study Properties  |  |  | | --- | --- | | Study name | Statisch 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\_016) | |

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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** | | **Volumenkörper 1(Fase1)(Gear\_small\_2)** | | **Curve Data:N/A** | | | |

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| **Loads and Fixtures**  | ****Fixture name**** | ****Fixture Image**** | ****Fixture Details**** | | --- | --- | --- | | **Fixiert-1** |  | |  |  | | --- | --- | | Entities: | **1 face(s)** | | Type: | **Fixed Geometry** | | | ****Resultant Forces****   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Components** | **X** | **Y** | **Z** | **Resultant** | | **Reaction force(N)** | **-10,0001** | **-6,90967e-05** | **-3,47374e-05** | **10,0001** | | **Reaction Moment(N.m)** | **0** | **0** | **0** | **0** | | | |  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Kraft-1** |  | |  |  | | --- | --- | | Entities: | **1 edge(s), 1 plane(s)** | | Reference: | **Top Plane** | | Type: | **Apply force** | | Values: | **10; ---; --- 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 | 3,86424 mm | | Tolerance | 0,193212 mm | | Mesh Quality | High |  Mesh information - Details  |  |  | | --- | --- | | Total Nodes | 142014 | | Total Elements | 92180 | | Maximum Aspect Ratio | 11,853 | | % of elements with Aspect Ratio < 3 | 89,8 | | Percentage of elements with Aspect Ratio > 10 | 0,00651 | | Percentage of distorted elements | 0 | | Time to complete mesh(hh;mm;ss): | 00:00:13 | | Computer name: | RUSLANPC | |  | |  Mesh Control Information:  | **Mesh Control Name** | **Mesh Control Image** | **Mesh Control Details** | | --- | --- | --- | | **Steuerung-1** |  | |  |  | | --- | --- | | Entities: | **5 face(s)** | | Units: | **m** | | Size: | **0,00193212** | | Ratio: | **0,00193212** | | |

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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 | -10,0001 | -6,90967e-05 | -3,47374e-05 | 10,0001 |  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 | 0,00152464 | -0,000450421 | -0,000115219 | 0,00159396 |  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 | | --- | --- | --- | --- | | Spannung1 | VON: von Mises Stress | 7,276e-01N/m^2  Node: 110299 | 1,743e+06N/m^2  Node: 1015 | | **Gear\_small\_2-Statisch 1-Stress-Spannung1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Verschiebung1 | URES: Resultant Displacement | 0,000e+00mm  Node: 110 | 7,696e-05mm  Node: 1014 | | **Gear\_small\_2-Statisch 1-Displacement-Verschiebung1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Dehnung1 | ESTRN: Equivalent Strain | 3,408e-12  Element: 37708 | 4,538e-06  Element: 37788 | | **Gear\_small\_2-Statisch 1-Strain-Dehnung1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Verschiebung2 | UX: X Displacement | -3,761e-05mm  Node: 138155 | 7,686e-05mm  Node: 1014 | | **Gear\_small\_2-Statisch 1-Displacement-Verschiebung2** | | | | |

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| Conclusion |