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|  | |  | | --- | | **Simulation of Gear\_001\_i=10\_small\_z=20**  **Date: Freitag, 2. Mai 2025 Designer: Solidworks**  **Study name: Statisch 1**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc197044252)  [Assumptions 2](#_Toc197044253)  [Model Information 2](#_Toc197044254)  [Study Properties 3](#_Toc197044255)  [Units 3](#_Toc197044256)  [Material Properties 4](#_Toc197044257)  [Loads and Fixtures 4](#_Toc197044258)  [Connector Definitions 5](#_Toc197044259)  [Contact Information 5](#_Toc197044260)  [Mesh information 6](#_Toc197044261)  [Sensor Details 7](#_Toc197044262)  [Resultant Forces 7](#_Toc197044263)  [Beams 7](#_Toc197044264)  [Study Results 8](#_Toc197044265)  [Conclusion 10](#_Toc197044266) | |
| Description No Data |

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| Assumptions |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** Gear\_001\_i=10\_small\_z=20**  ****Current Configuration:** Default** | | | | | ****Solid Bodies**** | | | | | ****Document Name and Reference**** | ****Treated As**** | ****Volumetric Properties**** | ****Document Path/Date Modified**** | | **Fase1** | **Solid Body** | ****Mass:0,0487717 kg****  ****Volume:6,23201e-06 m^3****  ****Density:7.826 kg/m^3****  ****Weight:0,477963 N**** | ****T:\Аспирантура\Стенд\_026\Gear\_001\_i=10\_small\_z=20.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:**** | **Unknown** | | ****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:**** | **1,2e-05 /Kelvin** | | **Volumenkörper 1(Fase1)(Gear\_001\_i=10\_small\_z=20)** | | **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)** | **-96,4579** | **26,3802** | **3,41688e-05** | **100** | | **Reaction Moment(N.m)** | **0** | **0** | **0** | **0** | | | |  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Kraft-1** |  | |  |  | | --- | --- | | Entities: | **1 edge(s)** | | Reference: | **Face< 1 >** | | Type: | **Apply force** | | Values: | **-100; ---; --- 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 | 0,000879107 m | | Tolerance | 4,39553e-05 m | | Mesh Quality | High |  Mesh information - Details  |  |  | | --- | --- | | Total Nodes | 95780 | | Total Elements | 64586 | | Maximum Aspect Ratio | 4,3985 | | % of elements with Aspect Ratio < 3 | 99,9 | | Percentage of elements with Aspect Ratio > 10 | 0 | | Percentage of distorted elements | 0 | | Time to complete mesh(hh;mm;ss): | 00:00:05 | | Computer name: | RUSLANPC | |  | |  Mesh Control Information:  | **Mesh Control Name** | **Mesh Control Image** | **Mesh Control Details** | | --- | --- | --- | | **Steuerung-1** |  | |  |  | | --- | --- | | Entities: | **4 face(s)** | | Units: | **m** | | Size: | **0,000439553** | | Ratio: | **0,000439553** | | |

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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 | -96,4579 | 26,3802 | 3,41688e-05 | 100 |  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 | -0,00162449 | -0,000243527 | -0,00218159 | 0,00273086 |  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 | 1,732e+03N/m^2  Node: 2932 | 4,807e+07N/m^2  Node: 413 | | **Gear\_001\_i=10\_small\_z=20-Statisch 1-Stress-Spannung1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Verschiebung1 | URES: Resultant Displacement | 0,000e+00mm  Node: 14 | 7,765e-04mm  Node: 538 | | **Gear\_001\_i=10\_small\_z=20-Statisch 1-Displacement-Verschiebung1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Dehnung1 | ESTRN: Equivalent Strain | 8,339e-09  Element: 10541 | 9,427e-05  Element: 51570 | | **Gear\_001\_i=10\_small\_z=20-Statisch 1-Strain-Dehnung1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Verschiebung2 | UX: X Displacement | -9,545e-05mm  Node: 79330 | 7,617e-04mm  Node: 538 | | **Gear\_001\_i=10\_small\_z=20-Statisch 1-Displacement-Verschiebung2** | | | | |

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| Conclusion |