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|  | |  | | --- | | **Simulation of subassem1**  **Date: 11 December 2023 Designer: Solidworks**  **Study name: Static 1**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc153194594)  [Assumptions 2](#_Toc153194595)  [Model Information 2](#_Toc153194596)  [Study Properties 3](#_Toc153194597)  [Units 3](#_Toc153194598)  [Material Properties 4](#_Toc153194599)  [Loads and Fixtures 4](#_Toc153194600)  [Connector Definitions 5](#_Toc153194601)  [Interaction Information 5](#_Toc153194602)  [Mesh information 6](#_Toc153194603)  [Sensor Details 6](#_Toc153194604)  [Resultant Forces 7](#_Toc153194605)  [Beams 7](#_Toc153194606)  [Study Results 8](#_Toc153194607)  [Conclusion 10](#_Toc153194608) | |
| Description No Data |

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| Assumptions |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** subassem1**  ****Current Configuration:** Default** | | | | | ****Solid Bodies**** | | | | | ****Document Name and Reference**** | ****Treated As**** | ****Volumetric Properties**** | ****Document Path/Date Modified**** | | **Chamfer4** | **Solid Body** | ****Mass:0.00321255 kg****  ****Volume:7.10741e-07 m^3****  ****Density:4,520 kg/m^3****  ****Weight:0.031483 N**** | ****C:\Users\2450027\OneDrive - University of Dundee\Desktop\Research and devlopment skills\Prosthetics\Luke\Solidworks\Bottoomclip.SLDPRT****  **Dec 10 00:11:07 2023** | | **Boss-Extrude2** | **Solid Body** | ****Mass:0.000356278 kg****  ****Volume:7.88226e-08 m^3****  ****Density:4,520 kg/m^3****  ****Weight:0.00349152 N**** | ****C:\Users\2450027\OneDrive - University of Dundee\Desktop\Research and devlopment skills\Prosthetics\Luke\Solidworks\Screw.SLDPRT****  **Dec 10 00:11:43 2023** | |

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| Study Properties  |  |  | | --- | --- | | Study name | Static 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 | Automatic | | 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 (C:\Users\2450027\OneDrive - University of Dundee\Desktop\Research and devlopment skills\Prosthetics\Luke\Solidworks) | |

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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:**** | **Ti-6Al-7Nb** | | ****Model type:**** | **Linear Elastic Isotropic** | | ****Default failure criterion:**** | **Unknown** | | ****Yield strength:**** | **9e+08 N/m^2** | | ****Elastic modulus:**** | **1.05e+11 N/m^2** | | ****Poisson's ratio:**** | **0.34** | | ****Mass density:**** | **4,520 kg/m^3** | | ****Shear modulus:**** | **3.91791e+10 N/m^2** | | **SolidBody 1(Chamfer4)(Bottoomclip-1),**  **SolidBody 1(Boss-Extrude2)(Screw-2)** | | **Curve Data:N/A** | | | |

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| **Loads and Fixtures**  | ****Fixture name**** | ****Fixture Image**** | ****Fixture Details**** | | --- | --- | --- | | **Fixed-1** |  | |  |  | | --- | --- | | Entities: | **1 face(s)** | | Type: | **Fixed Geometry** | | | ****Resultant Forces****   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Components** | **X** | **Y** | **Z** | **Resultant** | | **Reaction force(N)** | **-3.96263e-06** | **1.33855** | **0.724231** | **1.52191** | | **Reaction Moment(N.m)** | **0** | **0** | **0** | **0** | | | |  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Force-1** |  | |  |  | | --- | --- | | Entities: | **2 face(s)** | | Type: | **Apply normal force** | | Value: | **1 N** | | |

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| Connector Definitions No Data |

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| Interaction Information  | Interaction | Interaction Image | Interaction Properties | | --- | --- | --- | | Global Interaction |  | |  |  | | --- | --- | | Type: | **Bonded** | | Components: | **1 component(s)** | | Options: | **Independent mesh** | | |

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| Mesh information  |  |  | | --- | --- | | Mesh type | Solid Mesh | | Mesher Used: | Blended curvature-based mesh | | Jacobian points for High quality mesh | 16 Points | | Maximum element size | 0.531719 mm | | Minimum element size | 0.531719 mm | | Mesh Quality | High | | Remesh failed parts independently | Off |  Mesh information - Details  |  |  | | --- | --- | | Total Nodes | 68428 | | Total Elements | 43023 | | Maximum Aspect Ratio | 31.117 | | % of elements with Aspect Ratio < 3 | 99.8 | | Percentage of elements with Aspect Ratio > 10 | 0.0349 | | Percentage of distorted elements | 0 | | Time to complete mesh(hh;mm;ss): | 00:00:03 | | Computer name: | W-011323 | |

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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 | -3.96263e-06 | 1.33855 | 0.724231 | 1.52191 |  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 | -0.000817936 | 0.000818153 | -0.000191296 | 0.0011726 |  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 | | --- | --- | --- | --- | | Stress1 | VON: von Mises Stress | 1.065e-01N/m^2  Node: 58240 | 1.720e+07N/m^2  Node: 10870 | | **subassem1-Static 1-Stress-Stress1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Displacement1 | URES: Resultant Displacement | 0.000e+00mm  Node: 14 | 2.594e-02mm  Node: 4211 | | **subassem1-Static 1-Displacement-Displacement1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Strain1 | ESTRN: Equivalent Strain | 1.801e-12  Element: 20894 | 1.202e-04  Element: 20918 | | **subassem1-Static 1-Strain-Strain1** | | | | |

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| Conclusion |