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|  | |  | | --- | | **Simulation of Thigh540540\_Aluminium**  **Date: 6 September 2019 Designer: Solidworks**  **Study name: Static 1**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc18656427)  [Assumptions 2](#_Toc18656428)  [Model Information 2](#_Toc18656429)  [Study Properties 3](#_Toc18656430)  [Units 3](#_Toc18656431)  [Material Properties 4](#_Toc18656432)  [Loads and Fixtures 4](#_Toc18656433)  [Connector Definitions 5](#_Toc18656434)  [Contact Information 5](#_Toc18656435)  [Mesh information 6](#_Toc18656436)  [Sensor Details 7](#_Toc18656437)  [Resultant Forces 7](#_Toc18656438)  [Beams 7](#_Toc18656439)  [Study Results 8](#_Toc18656440)  [Conclusion 10](#_Toc18656441) | |
| Description No Data |

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| Assumptions |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** Thigh540540\_Aluminium**  ****Current Configuration:** Default** | | | | | ****Solid Bodies**** | | | | | ****Document Name and Reference**** | ****Treated As**** | ****Volumetric Properties**** | ****Document Path/Date Modified**** | | **Fillet2** | **Solid Body** | ****Mass:0.0918867 kg****  ****Volume:3.40321e-005 m^3****  ****Density:2700 kg/m^3****  ****Weight:0.900489 N**** | ****E:\dTrans\Rev\_humanoidDesign\Mod\_humanoidDesign\final\Thigh540540\_Aluminium.SLDPRT****  **Sep 06 09:23:12 2019** | |

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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 | 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 (E:\dTrans\Rev\_humanoidDesign\Mod\_humanoidDesign\final) | |

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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:**** | **6061-O (SS)** | | ****Model type:**** | **Linear Elastic Isotropic** | | ****Default failure criterion:**** | **Max von Mises Stress** | | ****Yield strength:**** | **6.20528e+007 N/m^2** | | ****Tensile strength:**** | **1.25e+008 N/m^2** | | ****Elastic modulus:**** | **6.9e+010 N/m^2** | | ****Poisson's ratio:**** | **0.33** | | ****Mass density:**** | **2700 kg/m^3** | | ****Shear modulus:**** | **2.6e+010 N/m^2** | | ****Thermal expansion coefficient:**** | **2.4e-005 /Kelvin** | | **SolidBody 1(Fillet2)(Thigh540540\_Aluminium)** | | **Curve Data:N/A** | | | |

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| **Loads and Fixtures**  | ****Fixture name**** | ****Fixture Image**** | ****Fixture Details**** | | --- | --- | --- | | **Fixed-1** |  | |  |  | | --- | --- | | Entities: | **12 face(s)** | | Type: | **Fixed Geometry** | | | ****Resultant Forces****   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Components** | **X** | **Y** | **Z** | **Resultant** | | **Reaction force(N)** | **0.00878525** | **-233.364** | **0.0480728** | **233.364** | | **Reaction Moment(N.m)** | **0** | **0** | **0** | **0** | | | |  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Force-1** |  | |  |  | | --- | --- | | Entities: | **12 face(s)** | | Type: | **Apply normal force** | | Value: | **1000 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 | 4 Points | | Element Size | 3.24174 mm | | Tolerance | 0.162087 mm | | Mesh Quality | High |  Mesh information - Details  |  |  | | --- | --- | | Total Nodes | 16625 | | Total Elements | 8284 | | Maximum Aspect Ratio | 11.243 | | % of elements with Aspect Ratio < 3 | 97.3 | | % of elements with Aspect Ratio > 10 | 0.0724 | | % of distorted elements(Jacobian) | 0 | | Time to complete mesh(hh;mm;ss): | 00:00:02 | | Computer name: |  | |  | | |

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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 | 0.00878525 | -233.364 | 0.0480728 | 233.364 |  Reaction Moments  | Selection set | Units | Sum X | Sum Y | Sum Z | Resultant | | --- | --- | --- | --- | --- | --- | | Entire Model | N.m | 0 | 0 | 0 | 0 | |
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| Beams No Data |

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| Study Results  | Name | Type | Min | Max | | --- | --- | --- | --- | | Stress1 | VON: von Mises Stress | 112208 N/m^2  Node: 131 | 2.60977e+008 N/m^2  Node: 16106 | | **Thigh540540\_Aluminium-Static 1-Stress-Stress1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Displacement1 | URES: Resultant Displacement | 0 mm  Node: 57 | 2.26677 mm  Node: 11924 | | **Thigh540540\_Aluminium-Static 1-Displacement-Displacement1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Strain1 | ESTRN: Equivalent Strain | 2.71239e-006  Element: 8090 | 0.00259391  Element: 537 | | **Thigh540540\_Aluminium-Static 1-Strain-Strain1** | | | |  | Name | Type | | --- | --- | | Displacement1{1} | Deformed shape | | **Thigh540540\_Aluminium-Static 1-Displacement-Displacement1{1}** | | |

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| Conclusion |