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|  | |  | | --- | | **Simulation of Tendon**  **Date: Thursday, June 24, 2021 Designer: Solidworks**  **Study name: Tendon simulation**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc75464655)  [Assumptions 2](#_Toc75464656)  [Model Information 2](#_Toc75464657)  [Study Properties 3](#_Toc75464658)  [Units 3](#_Toc75464659)  [Material Properties 4](#_Toc75464660)  [Loads and Fixtures 4](#_Toc75464661)  [Connector Definitions 5](#_Toc75464662)  [Contact Information 5](#_Toc75464663)  [Mesh information 6](#_Toc75464664)  [Sensor Details 7](#_Toc75464665)  [Resultant Forces 7](#_Toc75464666)  [Beams 7](#_Toc75464667)  [Study Results 8](#_Toc75464668)  [Conclusion 10](#_Toc75464669) | |
| Description No Data |

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| Assumptions |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** Tendon**  ****Current Configuration:** Default** | | | | | ****Solid Bodies**** | | | | | ****Document Name and Reference**** | ****Treated As**** | ****Volumetric Properties**** | ****Document Path/Date Modified**** | | **Boss-Extrude1** | **Solid Body** | ****Mass:4.39433e-005 kg****  ****Volume:5.49292e-009 m^3****  ****Density:8000 kg/m^3****  ****Weight:0.000430645 N**** | ****C:\Users\INTEKHAB AZAM\Desktop\simulation\Tendon.SLDPRT****  **Jun 24 21:50:50 2021** | |

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| Study Properties  |  |  | | --- | --- | | Study name | Tendon simulation | | 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 (C:\Users\INTEKHAB AZAM\Desktop\simulation) | |

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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:**** | **AISI 304** | | ****Model type:**** | **Linear Elastic Isotropic** | | ****Default failure criterion:**** | **Max von Mises Stress** | | ****Yield strength:**** | **2.06807e+008 N/m^2** | | ****Tensile strength:**** | **5.17017e+008 N/m^2** | | ****Elastic modulus:**** | **1.9e+011 N/m^2** | | ****Poisson's ratio:**** | **0.29** | | ****Mass density:**** | **8000 kg/m^3** | | ****Shear modulus:**** | **7.5e+010 N/m^2** | | ****Thermal expansion coefficient:**** | **1.8e-005 /Kelvin** | | **SolidBody 1(Boss-Extrude1)(Tendon)** | | **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)** | **-11.8101** | **-5.61774e-005** | **3.19332e-005** | **11.8101** | | **Reaction Moment(N.m)** | **0** | **0** | **0** | **0** | | | |  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Force-1** |  | |  |  | | --- | --- | | Entities: | **1 face(s)** | | Type: | **Apply normal force** | | Value: | **-11.81 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 | 0.176554 mm | | Tolerance | 0.00882768 mm | | Mesh Quality | High |  Mesh information - Details  |  |  | | --- | --- | | Total Nodes | 10956 | | Total Elements | 5209 | | Maximum Aspect Ratio | 3.6597 | | % of elements with Aspect Ratio < 3 | 99.8 | | % of elements with Aspect Ratio > 10 | 0 | | % of distorted elements(Jacobian) | 0 | | Time to complete mesh(hh;mm;ss): | 00:00:01 | | 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 | -11.8101 | -5.61774e-005 | 3.19332e-005 | 11.8101 |  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 | 67.4229 N/mm^2 (MPa)  Node: 1718 | 115.78 N/mm^2 (MPa)  Node: 287 | | **Tendon-Tendon simulation-Stress-Stress1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Displacement1 | URES: Resultant Displacement | 0 mm  Node: 288 | 0.0283523 mm  Node: 10943 | | **Tendon-Tendon simulation-Displacement-Displacement1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Strain1 | ESTRN: Equivalent Strain | 0.000387687  Element: 2994 | 0.000492252  Element: 539 | | **Tendon-Tendon simulation-Strain-Strain1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Factor of Safety1 | Automatic | 1.7862  Node: 287 | 3.06731  Node: 1718 | | **Tendon-Tendon simulation-Factor of Safety-Factor of Safety1** | | | | |

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| Conclusion |