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|  | |  | | --- | | **Simulation of shell\_medium\_material**  **Date: 27 May 2024 Designer: Solidworks**  **Study name: Static 1**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc167737670)  [Assumptions 2](#_Toc167737671)  [Model Information 3](#_Toc167737672)  [Study Properties 4](#_Toc167737673)  [Units 4](#_Toc167737674)  [Material Properties 5](#_Toc167737675)  [Loads and Fixtures 5](#_Toc167737676)  [Connector Definitions 6](#_Toc167737677)  [Interaction Information 6](#_Toc167737678)  [Mesh information 7](#_Toc167737679)  [Sensor Details 7](#_Toc167737680)  [Resultant Forces 8](#_Toc167737681)  [Beams 8](#_Toc167737682)  [Study Results 9](#_Toc167737683)  [Conclusion 11](#_Toc167737684) | |
| Description No Data |

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| Assumptions  |  |  | | --- | --- | | Original Model | Model Analyzed | |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** shell\_medium\_material**  ****Current Configuration:** Default** | | | | | ****Solid Bodies**** | | | | | ****Document Name and Reference**** | ****Treated As**** | ****Volumetric Properties**** | ****Document Path/Date Modified**** | | **shell\_medium.step<1>[4]** | **Solid Body** | ****Mass:0.0139134 kg****  ****Volume:1.15905e-05 m^3****  ****Density:1,200.41 kg/m^3****  ****Weight:0.136351 N**** | ****C:\Users\cinta\Downloads\IER\_Shell\Medium Shell\shell\_medium\_material.SLDPRT****  **May 27 21:22:04 2024** | | **shell\_medium.step<1>[3]** | **Solid Body** | ****Mass:0.0102444 kg****  ****Volume:8.53698e-06 m^3****  ****Density:1,200 kg/m^3****  ****Weight:0.100395 N**** | ****C:\Users\cinta\Downloads\IER\_Shell\Medium Shell\shell\_medium\_material.SLDPRT****  **May 27 21:22:04 2024** | |

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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 | On | | Compute free body forces | On | | Friction | Off | | Use Adaptive Method: | Off | | Result folder | SOLIDWORKS document (C:\Users\cinta\Downloads) | |

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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:**** | **TPU** | | ****Model type:**** | **Linear Elastic Isotropic** | | ****Default failure criterion:**** | **Unknown** | | ****Yield strength:**** | **1.6e+07 N/m^2** | | ****Compressive strength:**** | **4e+07 N/m^2** | | ****Elastic modulus:**** | **4e+07 N/m^2** | | ****Poisson's ratio:**** | **0.394** | | ****Mass density:**** | **1,200 kg/m^3** | | ****Shear modulus:**** | **3.189e+08 N/m^2** | | **SolidBody 3(shell\_medium.step<1>[4])(shell\_medium),**  **SolidBody 4(shell\_medium.step<1>[3])(shell\_medium)** | | **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)** | **-9.16924** | **-0.00230289** | **1.44816** | **9.28289** | | **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: | **15 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 | 8.55334 mm | | Minimum element size | 0.427667 mm | | Mesh Quality | High |  Mesh information - Details  |  |  | | --- | --- | | Total Nodes | 16040 | | Total Elements | 8352 | | Maximum Aspect Ratio | 60.145 | | % of elements with Aspect Ratio < 3 | 62.9 | | Percentage of elements with Aspect Ratio > 10 | 18.5 | | Percentage of distorted elements | 0 | | Time to complete mesh(hh;mm;ss): | 00:00:04 | | 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 | -9.16924 | -0.00230289 | 1.44816 | 9.28289 |  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 | 0 | 0 | 0 |  Free body 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 | 7.514e+01N/m^2  Node: 14696 | 7.844e+06N/m^2  Node: 12475 | | **shell\_medium\_material-Static 1-Stress-Stress1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Displacement1 | URES: Resultant Displacement | 0.000e+00mm  Node: 5 | 1.328e+02mm  Node: 4 | | **shell\_medium\_material-Static 1-Displacement-Displacement1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Strain1 | ESTRN: Equivalent Strain | 1.561e-06  Element: 8250 | 8.087e-02  Element: 7431 | | **shell\_medium\_material-Static 1-Strain-Strain1** | | | |  | Name | Type | | --- | --- | | Displacement1{1} | Deformed shape | | **shell\_medium\_material-Static 1-Displacement-Displacement1{1}** | | |

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| Conclusion |