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|  | |  | | --- | | **Simulation of Part1**  **Date: Friday, July 12, 2024 Designer: Solidworks**  **Study name: Internal pressure**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc171691572)  [Assumptions 2](#_Toc171691573)  [Model Information 2](#_Toc171691574)  [Study Properties 3](#_Toc171691575)  [Units 3](#_Toc171691576)  [Material Properties 4](#_Toc171691577)  [Loads and Fixtures 4](#_Toc171691578)  [Connector Definitions 5](#_Toc171691579)  [Interaction Information 5](#_Toc171691580)  [Mesh information 5](#_Toc171691581)  [Sensor Details 6](#_Toc171691582)  [Resultant Forces 6](#_Toc171691583)  [Beams 6](#_Toc171691584)  [Study Results 7](#_Toc171691585)  [Conclusion 9](#_Toc171691586) | |
| Description No Data |

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| Assumptions |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** Part1**  ****Current Configuration:** Default** | | | | | ****Solid Bodies**** | | | | | ****Document Name and Reference**** | ****Treated As**** | ****Volumetric Properties**** | ****Document Path/Date Modified**** | | **Boss-Extrude3** | **Solid Body** | ****Mass:2.76629 kg****  ****Volume:0.00102455 m^3****  ****Density:2,700 kg/m^3****  ****Weight:27.1096 N**** |  | |

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| Study Properties  |  |  | | --- | --- | | Study name | Internal pressure | | 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\hp\appdata\local\temp) | |

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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 Alloy** | | ****Model type:**** | **Linear Elastic Isotropic** | | ****Default failure criterion:**** | **Max von Mises Stress** | | ****Yield strength:**** | **5.51485e+07 N/m^2** | | ****Tensile strength:**** | **1.24084e+08 N/m^2** | | ****Elastic modulus:**** | **6.9e+10 N/m^2** | | ****Poisson's ratio:**** | **0.33** | | ****Mass density:**** | **2,700 kg/m^3** | | ****Shear modulus:**** | **2.6e+10 N/m^2** | | ****Thermal expansion coefficient:**** | **2.4e-05 /Kelvin** | | **SolidBody 1(Boss-Extrude3)(Part1)** | | **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)** | **0.00198722** | **-0.000856847** | **-0.00424206** | **0.00476218** | | **Reaction Moment(N.m)** | **0** | **0** | **0** | **0** | | | |  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Pressure-1** |  | |  |  | | --- | --- | | Entities: | **1 face(s)** | | Type: | **Normal to selected face** | | Value: | **26,000** | | Units: | **N/m^2** | | Phase Angle: | **0** | | Units: | **deg** | | |

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| Connector Definitions No Data |

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| Interaction Information No Data |

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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 | 11.3107 mm | | Minimum element size | 11.3107 mm | | Mesh Quality | High |  Mesh information - Details  |  |  | | --- | --- | | Total Nodes | 22298 | | Total Elements | 12411 | | Maximum Aspect Ratio | 11.618 | | % of elements with Aspect Ratio < 3 | 43.9 | | Percentage of elements with Aspect Ratio > 10 | 0.113 | | Percentage of distorted elements | 0 | | Time to complete mesh(hh;mm;ss): | 00:00:04 | | Computer name: | CYCLOTRON | |

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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 | 0.00198722 | -0.000856847 | -0.00424206 | 0.00476218 |  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 | 0.725418 | -0.164213 | 0.217702 | 0.774978 |  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 | 5.334e+02N/m^2  Node: 3890 | 1.008e+06N/m^2  Node: 2013 | | **Part1-Internal pressure-Stress-Stress1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Displacement1 | URES: Resultant Displacement | 0.000e+00mm  Node: 3 | 1.698e-03mm  Node: 18154 | | **Part1-Internal pressure-Displacement-Displacement1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Strain1 | ESTRN: Equivalent Strain | 1.026e-08  Element: 531 | 1.232e-05  Element: 10891 | | **Part1-Internal pressure-Strain-Strain1** | | | |  |  | | --- | |  | | **Image-1** | |

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| Conclusion |