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|  | |  | | --- | | **Simulation of NASA RASC-AL Pressure Wall with Window**  **Date: Friday, October 29, 2021 Designer: Keerthi S. Gopi-Nagaruri**  **Study name: SimulationXpress Study**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc86419241)  [Assumptions 2](#_Toc86419242)  [Model Information 2](#_Toc86419243)  [Material Properties 3](#_Toc86419244)  [Loads and Fixtures 3](#_Toc86419245)  [Mesh information 4](#_Toc86419246)  [Study Results 6](#_Toc86419247)  [Conclusion 9](#_Toc86419248) | |
| Description No Data |

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| Assumptions |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** NASA RASC-AL Pressure Wall with Window**  ****Current Configuration:** Default** | | | | | ****Solid Bodies**** | | | | | ****Document Name and Reference**** | ****Treated As**** | ****Volumetric Properties**** | ****Document Path/Date Modified**** | | **Boss-Extrude1** | **Solid Body** | ****Mass:20,568.5 kg****  ****Volume:7.61796 m^3****  ****Density:2,700 kg/m^3****  ****Weight:201,571 N**** | ****E:\NAU\Spring 2021\CAPSTONE\Design Concepts\NASA RASC-AL Fall 2021 EDU\NASA RASC-AL Pressure Wall with Window.SLDPRT****  **Oct 28 03:17:19 2021** | |

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| Material Properties  |  |  |  | | --- | --- | --- | | ****Model Reference**** | ****Properties**** | ****Components**** | |  | |  |  | | --- | --- | | ****Name:**** | **6061-T6 (SS)** | | ****Model type:**** | **Linear Elastic Isotropic** | | ****Default failure criterion:**** | **Max von Mises Stress** | | ****Yield strength:**** | **2.75e+08 N/m^2** | | ****Tensile strength:**** | **3.1e+08 N/m^2** | | **SolidBody 1(Boss-Extrude1)(NASA RASC-AL Pressure Wall with Window)** | |

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| **Loads and Fixtures**  | ****Fixture name**** | ****Fixture Image**** | ****Fixture Details**** | | --- | --- | --- | | **Fixed-1** |  | |  |  | | --- | --- | | Entities: | **2 face(s)** | | Type: | **Fixed Geometry** | |  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Pressure-1** |  | |  |  | | --- | --- | | Entities: | **4 face(s)** | | Type: | **Normal to selected face** | | Value: | **101,300** | | Units: | **N/m^2** | | |

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| Mesh information  |  |  | | --- | --- | | Mesh type | Solid Mesh | | Mesher Used: | Standard mesh | | Automatic Transition: | Off | | Include Mesh Auto Loops: | Off | | Jacobian points for High quality mesh | 16 Points | | Element Size | 271.703 mm | | Tolerance | 13.5852 mm | | Mesh Quality | High |  Mesh information - Details  |  |  | | --- | --- | | Total Nodes | 15892 | | Total Elements | 8111 | | Maximum Aspect Ratio | 34.622 | | % of elements with Aspect Ratio < 3 | 29.8 | | Percentage of elements with Aspect Ratio > 10 | 51.2 | | Percentage of distorted elements | 0 | | Time to complete mesh(hh;mm;ss): | 00:00:04 | | Computer name: | RYAN-PC | |  | | |

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| Study Results  | Name | Type | Min | Max | | --- | --- | --- | --- | | Stress | VON: von Mises Stress | 2.549e+04N/m^2  Node: 5721 | 8.671e+06N/m^2  Node: 9990 | | **NASA RASC-AL Pressure Wall with Window-SimulationXpress Study-Stress-Stress** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Displacement | URES: Resultant Displacement | 0.000e+00mm  Node: 1278 | 3.738e-01mm  Node: 775 | | **NASA RASC-AL Pressure Wall with Window-SimulationXpress Study-Displacement-Displacement** | | | |  | Name | Type | | --- | --- | | Deformation | Deformed shape | | **NASA RASC-AL Pressure Wall with Window-SimulationXpress Study-Displacement-Deformation** | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Factor of Safety | Max von Mises Stress | 3.171e+01  Node: 9990 | 1.079e+04  Node: 5721 | | **NASA RASC-AL Pressure Wall with Window-SimulationXpress Study-Factor of Safety-Factor of Safety** | | | | |

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| Conclusion |