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|  | |  | | --- | | **Simulation of Plataforma**  **Date: May 16, 2016 Designer: Solidworks**  **Study name: Static 1**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc451176915)  [Assumptions 2](#_Toc451176916)  [Model Information 2](#_Toc451176917)  [Study Properties 4](#_Toc451176918)  [Units 4](#_Toc451176919)  [Material Properties 5](#_Toc451176920)  [Loads and Fixtures 6](#_Toc451176921)  [Connector Definitions 7](#_Toc451176922)  [Contact Information 7](#_Toc451176923)  [Mesh information 8](#_Toc451176924)  [Sensor Details 9](#_Toc451176925)  [Resultant Forces 9](#_Toc451176926)  [Beams 9](#_Toc451176927)  [Study Results 10](#_Toc451176928)  [Conclusion 14](#_Toc451176929) | |
| Description No Data |

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| Assumptions |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** Plataforma**  ****Current Configuration:** Default** | | | | | ****Solid Bodies**** | | | | | ****Document Name and Reference**** | ****Treated As**** | ****Volumetric Properties**** | ****Document Path/Date Modified**** | | **Boss-Extrude3** | **Solid Body** | ****Mass:3.44736 kg****  ****Volume:0.0012768 m^3****  ****Density:2700 kg/m^3****  ****Weight:33.7841 N**** | ****\\Mac\Home\Documents\GitHub\ufrgs-instrumentacao-lab6\Resources\SOLIDWORKS\Célula.SLDPRT****  **May 16 11:46:38 2016** | | **Boss-Extrude3** | **Solid Body** | ****Mass:3.44736 kg****  ****Volume:0.0012768 m^3****  ****Density:2700 kg/m^3****  ****Weight:33.7841 N**** | ****\\Mac\Home\Documents\GitHub\ufrgs-instrumentacao-lab6\Resources\SOLIDWORKS\Célula.SLDPRT****  **May 16 11:46:38 2016** | | **Boss-Extrude3** | **Solid Body** | ****Mass:3.44736 kg****  ****Volume:0.0012768 m^3****  ****Density:2700 kg/m^3****  ****Weight:33.7841 N**** | ****\\Mac\Home\Documents\GitHub\ufrgs-instrumentacao-lab6\Resources\SOLIDWORKS\Célula.SLDPRT****  **May 16 11:46:38 2016** | | **Boss-Extrude3** | **Solid Body** | ****Mass:3.44736 kg****  ****Volume:0.0012768 m^3****  ****Density:2700 kg/m^3****  ****Weight:33.7841 N**** | ****\\Mac\Home\Documents\GitHub\ufrgs-instrumentacao-lab6\Resources\SOLIDWORKS\Célula.SLDPRT****  **May 16 11:46:38 2016** | | **Boss-Extrude2** | **Solid Body** | ****Mass:7.04277 kg****  ****Volume:0.00260843 m^3****  ****Density:2700 kg/m^3****  ****Weight:69.0192 N**** | ****\\Mac\Home\Documents\GitHub\ufrgs-instrumentacao-lab6\Resources\SOLIDWORKS\Superfície.SLDPRT****  **May 16 15:11:59 2016** | |

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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 | Off | | Friction | Off | | Use Adaptive Method: | Off | | Result folder | SOLIDWORKS document (\\Mac\Home\Documents\GitHub\ufrgs-instrumentacao-lab6\Resources\SOLIDWORKS) | |

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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+007 N/m^2** | | ****Tensile strength:**** | **1.24084e+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(Boss-Extrude3)(Célula-1),**  **SolidBody 1(Boss-Extrude3)(Célula-2),**  **SolidBody 1(Boss-Extrude3)(Célula-3),**  **SolidBody 1(Boss-Extrude3)(Célula-4)** | | **Curve Data:N/A** | | | |  | |  |  | | --- | --- | | ****Name:**** | **3.0205 (EN-AW 1200)** | | ****Model type:**** | **Linear Elastic Isotropic** | | ****Default failure criterion:**** | **Max von Mises Stress** | | ****Yield strength:**** | **2.5e+007 N/m^2** | | ****Tensile strength:**** | **7.5e+007 N/m^2** | | ****Elastic modulus:**** | **7e+010 N/m^2** | | ****Poisson's ratio:**** | **0.3897** | | ****Mass density:**** | **2700 kg/m^3** | | ****Shear modulus:**** | **2.7e+010 N/m^2** | | ****Thermal expansion coefficient:**** | **2.4e-005 /Kelvin** | | **SolidBody 1(Boss-Extrude2)(Superfície-1)** | | **Curve Data:N/A** | | | |

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| **Loads and Fixtures**  | ****Fixture name**** | ****Fixture Image**** | ****Fixture Details**** | | --- | --- | --- | | **Fixed-1** |  | |  |  | | --- | --- | | Entities: | **4 face(s)** | | Type: | **Fixed Geometry** | | | ****Resultant Forces****   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Components** | **X** | **Y** | **Z** | **Resultant** | | **Reaction force(N)** | **3.52809e-007** | **100** | **-4.32636e-008** | **100** | | **Reaction Moment(N.m)** | **0** | **0** | **0** | **0** | | | |  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Force-4** |  | |  |  | | --- | --- | | Entities: | **1 face(s)** | | Type: | **Apply normal force** | | Value: | **100 N** | | |

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| Connector Definitions  | ****Connector Name**** | ****Connector Details**** | ****Connector Image**** | | --- | --- | --- | | **Rigid Connector-1** | |  |  | | --- | --- | | Entities: | **5 face(s)** | | Type: | **Rigid** | | |  | | --- | |  | | **Rigid Connector-1** | | |

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| Contact Information No Data |

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| Mesh information  |  |  | | --- | --- | | Mesh type | Solid Mesh | | Mesher Used: | Curvature-based mesh | | Jacobian points | 4 Points | | Maximum element size | 62.1104 mm | | Minimum element size | 3.10552 mm | | Mesh Quality | High | | Remesh failed parts with incompatible mesh | Off |  Mesh information - Details  |  |  | | --- | --- | | Total Nodes | 24533 | | Total Elements | 11705 | | Maximum Aspect Ratio | 249.48 | | % of elements with Aspect Ratio < 3 | 0.0256 | | % of elements with Aspect Ratio > 10 | 99.2 | | % 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 | 3.52809e-007 | 100 | -4.32636e-008 | 100 |  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 | 9.19751e-013 N/m^2  Node: 12337 | 64056.9 N/m^2  Node: 18762 | | **Plataforma-Static 1-Stress-Stress1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Displacement1 | URES: Resultant Displacement | 0 mm  Node: 3 | 0.000425423 mm  Node: 15272 | | **Plataforma-Static 1-Displacement-Displacement1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Strain1 | ESTRN: Equivalent Strain | 0  Element: 1544 | 5.41924e-007  Element: 1280 | | **Plataforma-Static 1-Strain-Strain1** | | | |  | Name | Type | | --- | --- | | Displacement1{1} | Deformed shape | | **Plataforma-Static 1-Displacement-Displacement1{1}** | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Factor of Safety1 | Automatic | 390.278  Node: 18762 | 1e+016  Node: 13 | | **Plataforma-Static 1-Factor of Safety-Factor of Safety1** | | | |  | Name | Type | | --- | --- | | Displacement2 | Deformed shape | | **Plataforma-Static 1-Displacement-Displacement2** | | |

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| Conclusion |