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|  | |  | | --- | | **Simulation of Braço**  **Date: sexta-feira, 16 de outubro de 2020 Designer: Rafael Giaretta Falcaro**  **Study name: Analise\_Braco**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc53775040)  [Model Information 2](#_Toc53775041)  [Study Properties 3](#_Toc53775042)  [Units 3](#_Toc53775043)  [Material Properties 4](#_Toc53775044)  [Loads and Fixtures 5](#_Toc53775045)  [Contact Information 6](#_Toc53775046)  [Mesh information 7](#_Toc53775047)  [Resultant Forces 9](#_Toc53775048)  [Study Results 10](#_Toc53775049)  [Conclusion 12](#_Toc53775050) | |
| Description Estudo de caso de uma peça do Projeto Integrador |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** Braco**  ****Current Configuration:** Valor predeterminado** | | | | | ****Solid Bodies**** | | | | | ****Document Name and Reference**** | ****Treated As**** | ****Volumetric Properties**** | ****Document Path/Date Modified**** | | **Boss-Extrude3** | **Solid Body** | ****Mass:0,305419 kg****  ****Volume:0,000293677 m^3****  ****Density:1.039,99 kg/m^3****  ****Weight:2,99311 N**** | ****C:\Users\Rafael\Google Drive\SENAI\SENAI 2020\PROJETO INTEGRADOR\MECÂNICA\Projeto Integrador 2020\ANÁLISES\Analise 01\Braco\Braco.SLDPRT****  **Oct 16 21:06:25 2020** | |

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| Study Properties  |  |  | | --- | --- | | Study name | Analise\_Braco | | 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\Rafael\Google Drive\SENAI\SENAI 2020\PROJETO INTEGRADOR\MECÂNICA\Projeto Integrador 2020\ANÁLISES\Analise 01\Braco) | |

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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:**** | **ABS - Impresso** | | ****Model type:**** | **Linear Elastic Isotropic** | | ****Default failure criterion:**** | **Unknown** | | ****Yield strength:**** | **3,8e+07 N/m^2** | | ****Tensile strength:**** | **3e+07 N/m^2** | | ****Elastic modulus:**** | **2,2e+09 N/m^2** | | ****Poisson's ratio:**** | **0,43** | | ****Mass density:**** | **1.040 kg/m^3** | | ****Shear modulus:**** | **3,189e+08 N/m^2** | | **SolidBody 1(Boss-Extrude3)(Braco)** | | **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)** | **0,00102282** | **20,0024** | **-0,00743822** | **20,0024** | | **Reaction Moment(N.m)** | **0** | **0** | **0** | **0** | | | |  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Force-1** |  | |  |  | | --- | --- | | Entities: | **2 face(s), 1 plane(s)** | | Reference: | **Plano superior** | | Type: | **Apply force** | | Values: | **---; ---; -10 N** | |  |  | | --- | |  | | **Image-1** | |

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| Contact Information  | Contact | Contact Image | Contact Properties | | --- | --- | --- | | Component Contact-1 |  | |  |  | | --- | --- | | Type: | **Bonded** | | Components: | **1 Solid Body (s)** | | Options: | **Incompatible mesh** | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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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 | 6,64957 mm | | Tolerance | 0,332479 mm | | Mesh Quality | High |  Mesh information - Details  |  |  | | --- | --- | | Total Nodes | 23878 | | Total Elements | 14048 | | Maximum Aspect Ratio | 38,499 | | % of elements with Aspect Ratio < 3 | 93 | | % of elements with Aspect Ratio > 10 | 0,185 | | % of distorted elements(Jacobian) | 0 | | Time to complete mesh(hh;mm;ss): | 00:00:03 | | Computer name: |  | |  | |  |  | | --- | |  | | **Image-2** | |

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| Resultant ForcesReaction forces  | Selection set | Units | Sum X | Sum Y | Sum Z | Resultant | | --- | --- | --- | --- | --- | --- | | Entire Model | N | 0,00102282 | 20,0024 | -0,00743822 | 20,0024 |  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 | 0,042598 | 0,0433148 | -0,0264729 | 0,066269 |  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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| Study Results  | Name | Type | Min | Max | | --- | --- | --- | --- | | Stress1 | VON: von Mises Stress | 0,000N/mm^2 (MPa)  Node: 11628 | 0,677N/mm^2 (MPa)  Node: 1762 | | **Braco-Analise\_Braco-Stress-Stress1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Displacement1 | URES: Resultant Displacement | 0,000e+00mm  Node: 284 | 2,976e-02mm  Node: 404 | | **Braco-Analise\_Braco-Displacement-Displacement1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Strain1 | ESTRN: Equivalent Strain | 1,474e-07  Element: 9930 | 1,826e-04  Element: 8541 | | **Braco-Analise\_Braco-Strain-Strain1** | | | | |

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| Conclusion |
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| **Image-3** |
| **Image Comments:** |
| Conclui-se que a peça sustentará a carga imposta sobre ela, dado que a tensão máxima encontrada na análise é apenas 1,8% do limite de escoamento. |