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|  | |  | | --- | | **Simulation of main part**  **Date: Friday, February 24, 2023 Designer: Solidworks**  **Study name: Buckling 1**  **Analysis type: Buckling** | | Table of Contents  [Description 1](#_Toc128094663)  [Assumptions 2](#_Toc128094664)  [Model Information 3](#_Toc128094665)  [Study Properties 6](#_Toc128094666)  [Units 6](#_Toc128094667)  [Material Properties 7](#_Toc128094668)  [Loads and Fixtures 7](#_Toc128094669)  [Connector Definitions 7](#_Toc128094670)  [Contact Information 8](#_Toc128094671)  [Mesh information 9](#_Toc128094672)  [Sensor Details 10](#_Toc128094673)  [Study Results 10](#_Toc128094674)  [Conclusion 10](#_Toc128094675) | |
| Description No Data |

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| Assumptions |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** main part**  ****Current Configuration:** Default** | | | | | ****Solid Bodies**** | | | | | ****Document Name and Reference**** | ****Treated As**** | ****Volumetric Properties**** | ****Document Path/Date Modified**** | | **LPattern4** | **Solid Body** | ****Mass:0.128192 kg****  ****Volume:1.66479e-05 m^3****  ****Density:7,700.22 kg/m^3****  ****Weight:1.25629 N**** | ****C:\Users\User\OneDrive\Desktop\solidworks projects\Comfortable chair\main part.SLDPRT****  **Feb 24 01:25:34 2023** | | **Shell7** | **Solid Body** | ****Mass:0.00118594 kg****  ****Volume:1.54018e-07 m^3****  ****Density:7,700 kg/m^3****  ****Weight:0.0116222 N**** | ****C:\Users\User\OneDrive\Desktop\solidworks projects\Comfortable chair\main part.SLDPRT****  **Feb 24 01:25:34 2023** | | **Boss-Extrude6** | **Solid Body** | ****Mass:0.00732485 kg****  ****Volume:9.51279e-07 m^3****  ****Density:7,700 kg/m^3****  ****Weight:0.0717835 N**** | ****C:\Users\User\OneDrive\Desktop\solidworks projects\Comfortable chair\main part.SLDPRT****  **Feb 24 01:25:34 2023** | | **Boss-Extrude12** | **Solid Body** | ****Mass:0.00142303 kg****  ****Volume:1.84809e-07 m^3****  ****Density:7,700 kg/m^3****  ****Weight:0.0139457 N**** | ****C:\Users\User\OneDrive\Desktop\solidworks projects\Comfortable chair\main part.SLDPRT****  **Feb 24 01:25:34 2023** | | **Fillet7** | **Solid Body** | ****Mass:0.00665328 kg****  ****Volume:8.64063e-07 m^3****  ****Density:7,700 kg/m^3****  ****Weight:0.0652022 N**** | ****C:\Users\User\OneDrive\Desktop\solidworks projects\Comfortable chair\main part.SLDPRT****  **Feb 24 01:25:34 2023** | |

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| Study Properties  |  |  | | --- | --- | | Study name | Buckling 1 | | Analysis type | Buckling | | Mesh type | Solid Mesh | | Number of modes | 1 | | Solver type | FFEPlus | | Incompatible bonding options | Automatic | | Thermal Effect: | On | | Thermal option | Include temperature loads | | Zero strain temperature | 298 Kelvin | | Include fluid pressure effects from SOLIDWORKS Flow Simulation | Off | | Soft Spring: | Off | | Result folder | SOLIDWORKS document (C:\Users\User\OneDrive\Desktop\solidworks projects\Comfortable chair) | |

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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:**** | **Alloy Steel** | | ****Model type:**** | **Linear Elastic Isotropic** | | ****Default failure criterion:**** | **Max von Mises Stress** | | ****Yield strength:**** | **6.20422e+08 N/m^2** | | ****Tensile strength:**** | **7.23826e+08 N/m^2** | | ****Mass density:**** | **7,700 kg/m^3** | | ****Elastic modulus:**** | **2.1e+11 N/m^2** | | ****Poisson's ratio:**** | **0.28** | | ****Thermal expansion coefficient:**** | **1.3e-05 /Kelvin** | | **SolidBody 1(LPattern4)(main part),**  **SolidBody 2(Shell7)(main part),**  **SolidBody 3(Boss-Extrude6)(main part),**  **SolidBody 4(Boss-Extrude12)(main part),**  **SolidBody 5(Fillet7)(main part)** | | **Curve Data:N/A** | | | |

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| **Loads and Fixtures**  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Force-1** |  | |  |  | | --- | --- | | Entities: | **2 face(s)** | | Type: | **Apply normal force** | | Value: | **1 N** | | |

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| Connector Definitions No Data |

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| Contact Information  | Contact | Contact Image | Contact Properties | | --- | --- | --- | | Global Interaction |  | |  |  | | --- | --- | | Type: | **Bonded** | | Components: | **1 component(s)** | | Options: | **Independent 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 | 3.13367 mm | | Tolerance | 0.156684 mm | | Mesh Quality | High |  Mesh information - Details  |  |  | | --- | --- | | Total Nodes | 2938 | | Total Elements | 1371 | | Maximum Aspect Ratio | 27.574 | | % of elements with Aspect Ratio < 3 | 51.2 | | Percentage of elements with Aspect Ratio > 10 | 5.47 | | Percentage of distorted elements | 0 | | Time to complete mesh(hh;mm;ss): | 00:00:06 | | Computer name: |  | |  | | |

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| Sensor Details No Data |

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| Study Results No Data |

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| Conclusion |