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|  | |  | | --- | | **Simulation of Stand\_Steps**  **Date: Monday, June 16, 2014 Designer: Solidworks**  **Study name: Study 1**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc390707997)  [Assumptions 2](#_Toc390707998)  [Model Information 2](#_Toc390707999)  [Material Properties 3](#_Toc390708000)  [Loads and Fixtures 3](#_Toc390708001)  [Mesh Information 4](#_Toc390708002)  [Study Results 6](#_Toc390708003)  [Conclusion 8](#_Toc390708004) | |
| Description June\_16\_2014 |

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| Assumptions |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** Stand\_Steps**  ****Current Configuration:** Default** | | | | | ****Solid Bodies**** | | | | | ****Document Name and Reference**** | ****Treated As**** | ****Volumetric Properties**** | ****Document Path/Date Modified**** | | **CrvPattern1** | **Solid Body** | ****Mass:2.50511 kg****  ****Volume:0.000313139 m^3****  ****Density:8000 kg/m^3****  ****Weight:24.5501 N**** | ****C:\Users\sfalcone\Desktop\GitHub\tinyPipes\mechanics\Panel Mount\sfalcone\Simple Mount\Stand\_Steps.SLDPRT****  **Jun 16 14:03:46 2014** | |

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| Material Properties  |  |  |  | | --- | --- | --- | | ****Model Reference**** | ****Properties**** | ****Components**** | |  | |  |  | | --- | --- | | ****Name:**** | **AISI 316 Annealed Stainless Steel Bar (SS)** | | ****Model type:**** | **Linear Elastic Isotropic** | | ****Default failure criterion:**** | **Unknown** | | ****Yield strength:**** | **137.895 N/mm^2** | | ****Tensile strength:**** | **550 N/mm^2** | | **SolidBody 1(CrvPattern1)(Stand\_Steps)** | |

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| **Loads and Fixtures**  | ****Fixture name**** | ****Fixture Image**** | ****Fixture Details**** | | --- | --- | --- | | **Fixed-1** |  | |  |  | | --- | --- | | Entities: | **4 face(s)** | | Type: | **Fixed Geometry** | |  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Force-1** |  | |  |  | | --- | --- | | Entities: | **1 face(s)** | | Type: | **Apply normal force** | | Value: | **2450 N** | | |

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| Mesh Information  |  |  | | --- | --- | | Mesh type | Solid Mesh | | Mesher Used: | Standard mesh | | Automatic Transition: | Off | | Include Mesh Auto Loops: | Off | | Jacobian points | 4 Points | | Element Size | 8.67977 mm | | Tolerance | 0.433989 mm | | Mesh Quality | High |  Mesh Information - Details  |  |  | | --- | --- | | Total Nodes | 16166 | | Total Elements | 7951 | | Maximum Aspect Ratio | 18.903 | | % of elements with Aspect Ratio < 3 | 61.1 | | % of elements with Aspect Ratio > 10 | 0.126 | | % of distorted elements(Jacobian) | 0 | | Time to complete mesh(hh;mm;ss): | 00:00:07 | | Computer name: | SFALCONE-THINK | |  | | |

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| Study Results  | Name | Type | Min | Max | | --- | --- | --- | --- | | Stress | VON: von Mises Stress | 0.0324662 N/mm^2 (MPa)  Node: 15546 | 24.6895 N/mm^2 (MPa)  Node: 12753 | | **Stand\_Steps-Study 1-Stress-Stress** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Displacement | URES: Resultant Displacement | 0 mm  Node: 89 | 0.126967 mm  Node: 1571 | | **Stand\_Steps-Study 1-Displacement-Displacement** | | | |  | Name | Type | | --- | --- | | Deformation | Deformed Shape | | **Stand\_Steps-Study 1-Displacement-Deformation** | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Factor of Safety | Max von Mises Stress | 5.58517  Node: 12753 | 4247.35  Node: 15546 | | **Stand\_Steps-Study 1-Factor of Safety-Factor of Safety** | | | | |

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| Conclusion |

The design is viable.