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|  | |  | | --- | | **Simulation of PipeReducer**  **Date: Wednesday, September 18, 2019 Designer: Solidworks**  **Study name: SimulationXpress Study**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc19705624)  [Assumptions 2](#_Toc19705625)  [Model Information 2](#_Toc19705626)  [Material Properties 3](#_Toc19705627)  [Loads and Fixtures 4](#_Toc19705628)  [Mesh information 6](#_Toc19705629)  [Study Results 8](#_Toc19705630)  [Conclusion 11](#_Toc19705631) | |
| Description No Data |

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| Assumptions |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** PipeReducer**  ****Current Configuration:** Default** | | | | | ****Solid Bodies**** | | | | | ****Document Name and Reference**** | ****Treated As**** | ****Volumetric Properties**** | ****Document Path/Date Modified**** | | **CSK for 5/8 Flat Head Machine Screw (100)1** | **Solid Body** | ****Mass:48.9034 lb****  ****Volume:152.079 in^3****  ****Density:0.321566 lb/in^3****  ****Weight:48.8702 lbf**** | ****E:\Week 4B\Pipe Reducer\PipeReducer.SLDPRT****  **Oct 9 08:18:10 2015** | |

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| Material Properties  |  |  |  | | --- | --- | --- | | ****Model Reference**** | ****Properties**** | ****Components**** | |  | |  |  | | --- | --- | | ****Name:**** | **Copper** | | ****Model type:**** | **Linear Elastic Isotropic** | | ****Default failure criterion:**** | **Max von Mises Stress** | | ****Yield strength:**** | **37,513.4 psi** | | ****Tensile strength:**** | **57,200 psi** | | **SolidBody 1(CSK for 5/8 Flat Head Machine Screw (100)1)(REDUCER-MS)** | |

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| **Loads and Fixtures**  | ****Fixture name**** | ****Fixture Image**** | ****Fixture Details**** | | --- | --- | --- | | **Fixed-1** |  | |  |  | | --- | --- | | Entities: | **5 face(s)** | | Type: | **Fixed Geometry** | | | **Fixed-2** |  | |  |  | | --- | --- | | Entities: | **13 face(s)** | | Type: | **Fixed Geometry** | |  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Pressure-1** |  | |  |  | | --- | --- | | Entities: | **3 face(s)** | | Type: | **Normal to selected face** | | Value: | **1,500** | | Units: | **psi** | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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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 | 0.533579 in | | Tolerance | 0.0266789 in | | Mesh Quality Plot | High |  Mesh information - Details  |  |  | | --- | --- | | Total Nodes | 19418 | | Total Elements | 10327 | | Maximum Aspect Ratio | 6.8623 | | % of elements with Aspect Ratio < 3 | 96.9 | | % of elements with Aspect Ratio > 10 | 0 | | % of distorted elements(Jacobian) | 0 | | Time to complete mesh(hh;mm;ss): | 00:00:02 | | Computer name: |  | |  | | |

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| Study Results  | Name | Type | Min | Max | | --- | --- | --- | --- | | Stress | VON: von Mises Stress | 3.111e-01 psi  Node: 5284 | 1.507e+04 psi  Node: 1943 | | **PipeReducer-SimulationXpress Study-Stress-Stress** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Displacement | URES: Resultant Displacement | 0.000e+00 in  Node: 517 | 2.776e-03 in  Node: 1357 | | **PipeReducer-SimulationXpress Study-Displacement-Displacement** | | | |  | Name | Type | | --- | --- | | Deformation | Deformed shape | | **PipeReducer-SimulationXpress Study-Displacement-Deformation** | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Factor of Safety | Max von Mises Stress | 2.489e+00  Node: 1943 | 1.206e+05  Node: 5284 | | **PipeReducer-SimulationXpress Study-Factor of Safety-Factor of Safety** | | | | |

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| Conclusion |