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|  | |  | | --- | | **Simulation of Stainless Combustion Chamber**  **Date: Saturday, October 19, 2019 Designer: Solidworks**  **Study name: Design Study 1**  **Analysis type: Design Study** | | Table of Contents  [Description 1](#_Toc22345209)  [Assumptions 2](#_Toc22345210)  [Model Information 2](#_Toc22345211)  [Study Properties 2](#_Toc22345212)  [Units 3](#_Toc22345213)  [Design Study Setup 3](#_Toc22345214)  [Study Results 4](#_Toc22345215)  [Conclusion 4](#_Toc22345216) | |
| Description No Data |

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| Assumptions |

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| Model Information  |  |  |  |  | | --- | --- | --- | --- | | Document Name | Configuration | Document Path | Date Modified | | Stainless Combustion Chamber | Default | C:\Users\User\Desktop\UNHSEDS\Engineering\2019-2020\CATO\_HybridRocket\Propulsion\Runaway V2\Combustion Chamber\Material Type\Stainless Combustion Chamber.SLDPRT | Oct 19 02:23:54 2019 | |

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| Study Properties  |  |  | | --- | --- | | Study name | Design Study 1 | | Analysis type | Design Study(Optimization) | | Design Study Quality | High quality (slower) | | Result folder | SOLIDWORKS document(C:\Users\User\Desktop\UNHSEDS\Engineering\2019-2020\CATO\_HybridRocket\Propulsion\Runaway V2\Combustion Chamber\Material Type) | |

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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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| **Design Study Setup** **Design Variables**   | ****Name**** | ****Type**** | ****Value**** | ****Units**** | | --- | --- | --- | --- | | **OD** | **Range with Step** | Min:3.1 Max:3.5 Step:0.1 | in |   **Constraints**   | ****Sensor name**** | ****Condition**** | ****Bounds**** | ****Units**** | ****Study name**** | | --- | --- | --- | --- | --- | | **Minimum Factor of Safety1** | **Monitor Only** | - | - | Static 1 |   **Goals**   | ****Name**** | ****Goal**** | ****Properties**** | ****Weight**** | ****Study name**** | | --- | --- | --- | --- | --- | | **Minimum Factor of Safety2** | Is exactly 3 | Factor of Safety | 10 | Static 1 | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| Study Results 5 of 7 scenarios ran successfully.   | Component name | Units | Current | Initial | Optimal | Scenario1 | Scenario2 | | --- | --- | --- | --- | --- | --- | --- | | OD | in | 3.25 | 3.25 | 3.25 | 3.1 | 3.2 | | Minimum Factor of Safety1 |  | 2.970994 | 2.970994 | 2.970994 | - | - | | Minimum Factor of Safety2 |  | 2.970994 | 2.970994 | 2.970994 | - | - |  | Component name | Units | Scenario3 | Scenario4 | Scenario5 | | --- | --- | --- | --- | --- | | OD | in | 3.3 | 3.4 | 3.5 | | Minimum Factor of Safety1 |  | 3.489137 | 4.483489 | 5.420264 | | Minimum Factor of Safety2 |  | 3.489137 | 4.483489 | 5.420264 | |

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| Conclusion |