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|  | |  | | --- | | **Simulation of Part1 - Copy**  **Date: 04 حزيران, 2023 Designer: Solidworks**  **Study name: Frequency 1**  **Analysis type: Frequency** | | Table of Contents  [Description 1](#_Toc136776822)  [Assumptions 2](#_Toc136776823)  [Model Information 2](#_Toc136776824)  [Study Properties 4](#_Toc136776825)  [Units 4](#_Toc136776826)  [Material Properties 5](#_Toc136776827)  [Loads and Fixtures 6](#_Toc136776828)  [Connector Definitions 6](#_Toc136776829)  [Contact Information 6](#_Toc136776830)  [Mesh information 7](#_Toc136776831)  [Sensor Details 7](#_Toc136776832)  [Study Results 8](#_Toc136776833)  [Conclusion 11](#_Toc136776834) | |
| Description No Data |

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| Assumptions |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** Part1 - Copy**  ****Current Configuration:** Default<As Machined>** | | | | | ****Beam Bodies:**** | | | | | ****Document Name and Reference**** | ****Formulation**** | ****Properties**** | ****Document Path/Date Modified**** | | **Beam-1(Square tube 20 X 20 X 2(1)[4])** | **Beam – Uniform C/S** | ****Section Standard-iso/square tube/20 x 20 x 2****  ****Section Area: 0.000133699m^2****  ****Length:0.03m****  ****Volume:4.01097e-06m^3****  ****Mass Density:7700kg/m^3****  ****Mass:0.0308845kg****  ****Weight:0.302668N**** | ****C:\Users\meexam4\Desktop\Final\_132883\Part1 - Copy.SLDPRT****  **Jun 4 12:29:17 2023** | | **Beam-2(Square tube 20 X 20 X 2(1)[5])** | **Beam – Uniform C/S** | ****Section Standard-iso/square tube/20 x 20 x 2****  ****Section Area: 0.000133699m^2****  ****Length:0.1m****  ****Volume:1.33701e-05m^3****  ****Mass Density:7700kg/m^3****  ****Mass:0.10295kg****  ****Weight:1.00891N**** | ****C:\Users\meexam4\Desktop\Final\_132883\Part1 - Copy.SLDPRT****  **Jun 4 12:29:17 2023** | | **Beam-3(Square tube 20 X 20 X 2(1)[6])** | **Beam – Uniform C/S** | ****Section Standard-iso/square tube/20 x 20 x 2****  ****Section Area: 0.000133699m^2****  ****Length:0.1m****  ****Volume:1.33699e-05m^3****  ****Mass Density:7700kg/m^3****  ****Mass:0.102948kg****  ****Weight:1.00889N**** | ****C:\Users\meexam4\Desktop\Final\_132883\Part1 - Copy.SLDPRT****  **Jun 4 12:29:17 2023** | | **Beam-4(Square tube 20 X 20 X 2(1)[2])** | **Beam – Uniform C/S** | ****Section Standard-iso/square tube/20 x 20 x 2****  ****Section Area: 0.000133699m^2****  ****Length:0.17m****  ****Volume:2.27292e-05m^3****  ****Mass Density:7700kg/m^3****  ****Mass:0.175015kg****  ****Weight:1.71515N**** | ****C:\Users\meexam4\Desktop\Final\_132883\Part1 - Copy.SLDPRT****  **Jun 4 12:29:17 2023** | | **Beam-5(Square tube 20 X 20 X 2(1)[1])** | **Beam – Uniform C/S** | ****Section Standard-iso/square tube/20 x 20 x 2****  ****Section Area: 0.000133699m^2****  ****Length:0.17m****  ****Volume:2.27289e-05m^3****  ****Mass Density:7700kg/m^3****  ****Mass:0.175012kg****  ****Weight:1.71512N**** | ****C:\Users\meexam4\Desktop\Final\_132883\Part1 - Copy.SLDPRT****  **Jun 4 12:29:17 2023** | | **Beam-6(Square tube 20 X 20 X 2(1)[3])** | **Beam – Uniform C/S** | ****Section Standard-iso/square tube/20 x 20 x 2****  ****Section Area: 0.000133699m^2****  ****Length:0.03m****  ****Volume:4.01097e-06m^3****  ****Mass Density:7700kg/m^3****  ****Mass:0.0308845kg****  ****Weight:0.302668N**** | ****C:\Users\meexam4\Desktop\Final\_132883\Part1 - Copy.SLDPRT****  **Jun 4 12:29:17 2023** | |

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| Study Properties  |  |  | | --- | --- | | Study name | Frequency 1 | | Analysis type | Frequency | | Mesh type | Beam Mesh | | Number of frequencies | 5 | | Solver type | Direct sparse solver | | Soft Spring: | Off | | Incompatible bonding options | Automatic | | Thermal option | Include temperature loads | | Zero strain temperature | 298 Kelvin | | Include fluid pressure effects from SOLIDWORKS Flow Simulation | Off | | Result folder | SOLIDWORKS document (C:\Users\meexam4\Desktop\Final\_132883) | |

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| Units  |  |  | | --- | --- | | Unit system: | SI (MKS) | | Length/Displacement | m | | 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:**** | **7700 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(Square tube 20 X 20 X 2(1)[4])(Part1 - Copy),**  **SolidBody 2(Square tube 20 X 20 X 2(1)[5])(Part1 - Copy),**  **SolidBody 3(Square tube 20 X 20 X 2(1)[6])(Part1 - Copy),**  **SolidBody 4(Square tube 20 X 20 X 2(1)[2])(Part1 - Copy),**  **SolidBody 5(Square tube 20 X 20 X 2(1)[1])(Part1 - Copy),**  **SolidBody 6(Square tube 20 X 20 X 2(1)[3])(Part1 - Copy)** | | **Curve Data:N/A** | | | |

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| **Loads and Fixtures**  | ****Fixture name**** | ****Fixture Image**** | ****Fixture Details**** | | --- | --- | --- | | **Fixed-1** |  | |  |  | | --- | --- | | Entities: | **1 Joint(s)** | | Type: | **Fixed Geometry** | |  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Force-1** |  | |  |  | | --- | --- | | Entities: | **1 Beam (s)** | | Reference: | **Edge< 1 >** | | Values: | **Table Driven** | | Non uniform load options: | **Table Driven Load Distribution (Percentage)** | | Values: | **(%, N/m)** | |  | **(0, 0)** | |  | **(100, 1000)** | | | **Force-2** |  | |  |  | | --- | --- | | Entities: | **1 Beam (s)** | | Reference: | **Edge< 1 >** | | Values: | **Table Driven** | | Non uniform load options: | **Table Driven Load Distribution (Percentage)** | | Values: | **(%, N/m)** | |  | **(0, 0)** | |  | **(100, -1000)** | | |

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| Connector Definitions No Data |

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| Contact Information No Data |

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| Mesh information  |  |  | | --- | --- | | Mesh type | Beam Mesh |  Mesh information - Details  |  |  | | --- | --- | | Total Nodes | 111 | | Total Elements | 104 | | Time to complete mesh(hh;mm;ss): | 00:00:01 | | Computer name: |  | |  | | |

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| Sensor Details No Data |

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| Study Results  | Name | Type | Min | Max | | --- | --- | --- | --- | | Amplitude1 | AMPRES: Resultant Amplitude Plot for Mode Shape: 5(Value = 993.881 Hz) | 0.000e+00  Node: 7 | 2.764e+00  Node: 1 | | **Part1 - Copy-Frequency 1-Amplitude-Amplitude1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Amplitude2 | AMPRES: Resultant Amplitude Plot for Mode Shape: 2(Value = 246.878 Hz) | 0.000e+00  Node: 7 | 3.824e+00  Node: 101 | | **Part1 - Copy-Frequency 1-Amplitude-Amplitude2** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Amplitude3 | AMPRES: Resultant Amplitude Plot for Mode Shape: 3(Value = 285.491 Hz) | 0.000e+00  Node: 7 | 3.832e+00  Node: 1 | | **Part1 - Copy-Frequency 1-Amplitude-Amplitude3** | | | |   **Mode List**   | ****Frequency Number**** | ****Rad/sec**** | ****Hertz**** | ****Seconds**** | | --- | --- | --- | --- | | **1** | **1551.2** | **246.88** | **0.0040506** | | **2** | **1551.2** | **246.88** | **0.0040506** | | **3** | **1793.8** | **285.49** | **0.0035027** | | **4** | **1793.8** | **285.49** | **0.0035027** | | **5** | **6244.7** | **993.88** | **0.0010062** |   **Mass Participation (Normalized)**   | ****Mode Number**** | ****Frequency(Hertz)**** | ****X direction**** | ****Y direction**** | ****Z direction**** | | --- | --- | --- | --- | --- | | **1** | **246.88** | **8.3598e-27** | **4.4312e-26** | **0.26438** | | **2** | **246.88** | **2.1575e-28** | **6.4291e-26** | **0.26438** | | **3** | **285.49** | **0.041602** | **0.21224** | **1.2582e-24** | | **4** | **285.49** | **0.041603** | **0.21224** | **2.5596e-25** | | **5** | **993.88** | **0.36633** | **0.0096293** | **2.2087e-19** | |  |  | **Sum X = 0.44954** | **Sum Y = 0.43411** | **Sum Z = 0.52877** | |

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| Conclusion |