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|  | |  | | --- | | **Simulation of WindTurbine**  **Date: Thursday, May 7, 2020 Designer: Solidworks**  **Study name: Static 1**  **Analysis type: Static** | | Table of Contents  [Description 1](#_Toc39747625)  [Assumptions 2](#_Toc39747626)  [Model Information 2](#_Toc39747627)  [Study Properties 3](#_Toc39747628)  [Units 3](#_Toc39747629)  [Material Properties 4](#_Toc39747630)  [Loads and Fixtures 4](#_Toc39747631)  [Connector Definitions 5](#_Toc39747632)  [Contact Information 5](#_Toc39747633)  [Mesh information 6](#_Toc39747634)  [Sensor Details 7](#_Toc39747635)  [Resultant Forces 7](#_Toc39747636)  [Beams 7](#_Toc39747637)  [Study Results 8](#_Toc39747638)  [Conclusion 10](#_Toc39747639) | |
| Description No Data |

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| Assumptions |

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| Model Information  |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | |  |   ****Model name:** WindTurbine**  ****Current Configuration:** Default** | | | | | ****Solid Bodies**** | | | | | ****Document Name and Reference**** | ****Treated As**** | ****Volumetric Properties**** | ****Document Path/Date Modified**** | | **Shell1** | **Solid Body** | ****Mass:0.271115 kg****  ****Volume:0.000265784 m^3****  ****Density:1,020.06 kg/m^3****  ****Weight:2.65693 N**** | ****C:\Users\mzdes\Desktop\E26\WindTurbine.SLDPRT****  **May 4 21:25:35 2020** | |

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| Study Properties  |  |  | | --- | --- | | Study name | Static 1 | | Analysis type | Static | | Mesh type | Solid Mesh | | Thermal Effect: | On | | Thermal option | Include temperature loads | | Zero strain temperature | 298 Kelvin | | Include fluid pressure effects from SOLIDWORKS Flow Simulation | Off | | Solver type | FFEPlus | | Inplane Effect: | Off | | Soft Spring: | Off | | Inertial Relief: | Off | | Incompatible bonding options | Automatic | | Large displacement | Off | | Compute free body forces | On | | Friction | Off | | Use Adaptive Method: | Off | | Result folder | SOLIDWORKS document (C:\Users\mzdes\Desktop\E26) | |

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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:**** | **ABS** | | ****Model type:**** | **Linear Elastic Isotropic** | | ****Default failure criterion:**** | **Unknown** | | ****Tensile strength:**** | **3e+07 N/m^2** | | ****Elastic modulus:**** | **2e+09 N/m^2** | | ****Poisson's ratio:**** | **0.394** | | ****Mass density:**** | **1,020 kg/m^3** | | ****Shear modulus:**** | **3.189e+08 N/m^2** | | **SolidBody 1(Shell1)(WindTurbine)** | | **Curve Data:N/A** | | | |

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| **Loads and Fixtures**  | ****Fixture name**** | ****Fixture Image**** | ****Fixture Details**** | | --- | --- | --- | | **Fixed-1** |  | |  |  | | --- | --- | | Entities: | **1 face(s)** | | Type: | **Fixed Geometry** | | | ****Resultant Forces****   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Components** | **X** | **Y** | **Z** | **Resultant** | | **Reaction force(N)** | **19.6012** | **-0.00601012** | **-0.00010705** | **19.6012** | | **Reaction Moment(N.m)** | **0** | **0** | **0** | **0** | | | |  | ****Load name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Force-1** |  | |  |  | | --- | --- | | Entities: | **1 face(s)** | | Type: | **Apply normal force** | | Value: | **19.6 N** | | |

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| Connector Definitions No Data |

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| Contact Information No Data |

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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 | 0.366841 in | | Tolerance | 0.0183421 in | | Mesh Quality Plot | High |  Mesh information - Details  |  |  | | --- | --- | | Total Nodes | 21675 | | Total Elements | 10984 | | Maximum Aspect Ratio | 176.66 | | % of elements with Aspect Ratio < 3 | 14.5 | | % of elements with Aspect Ratio > 10 | 1.33 | | % of distorted elements(Jacobian) | 0 | | Time to complete mesh(hh;mm;ss): | 00:00:10 | | Computer name: | THINKMAX | |  | | |

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| Sensor Details No Data |

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| Resultant ForcesReaction forces  | Selection set | Units | Sum X | Sum Y | Sum Z | Resultant | | --- | --- | --- | --- | --- | --- | | Entire Model | N | 19.6012 | -0.00601012 | -0.00010705 | 19.6012 |  Reaction Moments  | Selection set | Units | Sum X | Sum Y | Sum Z | Resultant | | --- | --- | --- | --- | --- | --- | | Entire Model | N.m | 0 | 0 | 0 | 0 | |
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| Beams No Data |

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| Study Results  | Name | Type | Min | Max | | --- | --- | --- | --- | | Stress1 | VON: von Mises Stress | 1.646e+03 N/m^2  Node: 12066 | 1.134e+06 N/m^2  Node: 11892 | | **WindTurbine-Static 1-Stress-Stress1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Displacement1 | URES: Resultant Displacement | 0.000e+00 mm  Node: 1595 | 5.721e-01 mm  Node: 693 | | **WindTurbine-Static 1-Displacement-Displacement1** | | | |  | Name | Type | Min | Max | | --- | --- | --- | --- | | Strain1 | ESTRN: Equivalent Strain | 9.494e-07  Element: 1014 | 3.540e-04  Element: 10915 | | **WindTurbine-Static 1-Strain-Strain1** | | | | |

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| Conclusion |