



NARNARAYAN SHASTRI INSTITUTE OF TECHNOLOGY

MECHANICAL DEPARTMENT



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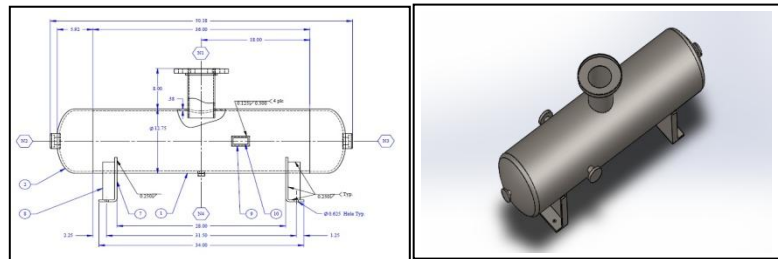
External Guide :- None

Project Title:-

Static and Dynamic Analysis of Pressure Vessel

Project Photo:-

1) SolidWorks design and model :-



Abstract:-

Pressure vessel is one of the most commonly used components in all sectors of day to day industries. There are many types of pressure vessels according to desired purpose of work. A lot of research has been done for improving the efficiency and performance of various vessels. Present model of simple pressure vessel is prepared using Creo Parametric 2.0 and Cyclic stress analysis and Spectrum analysis is carried out using Solid Works analysis software. In this project we have come up with the idea of performing the analysis of simple pressure vessel design with ASME codes and stresses developed within vessel when exposed to static loading condition and Dynamic loading condition using various failure theories. This report consist details of pressure vessel introduction, types, failure theories, Design procedure, FEA analysis, ASME code standards, Material properties, Manufacturing Processes and Costs.

Major Hardware components used:-

NO hardware components used. **Software used:-**

SolidWorks 2014.

Project Application:-

- (1) Industrial work for storage tanks
- (2) Boilers
- (3) High Pressure vessel
- (4) Transportation fuel tanks
- (5) Domestic uses.

Approx. Project Cost:-

Depending on material used, Application, Required Capacity and Manufacturing Cost.

2) Static comparison:-

Vesselbook STATIC ANALYSIS COMPARISON			vandit	yash
			minesh	ravi
STAINLESS STEEL Yield strength: 4.72339e+008 N/m ² Tensile strength: 5.13613e+008 N/m ² Elastic modulus: 2e+011 N/m ² Poisson's ratio: 0.28 Mass density: 7800 kg/m ³ Shear modulus: 7.7e+010 N/m ² Mass: 34.425 kg Volume: 0.00441348 m ³ Weight: 337.365 N	Cast carbon steel Yield strength: 2.48168e+008 N/m ² Tensile strength: 4.82549e+008 N/m ² Elastic modulus: 2e+011 N/m ² Poisson's ratio: 0.32 Mass density: 7800 kg/m ³ Shear modulus: 7.6e+010 N/m ² Mass: 34.425 kg Volume: 0.00441348 m ³ Weight: 337.365 N	cast alloy steel Yield strength: 2.41275e+008 N/m ² Tensile strength: 4.48083e+008 N/m ² Elastic modulus: 1.9e+011 N/m ² Poisson's ratio: 0.34 Mass density: 7300 kg/m ³ Shear modulus: 7.8e+010 N/m ² Mass: 32.2182 kg Volume: 0.00441348 m ³ Weight: 315.739 N		
von Mises Stress: 1.9625 N/mm ² (Min) / 78944.4 N/mm ² (Max)	von Mises Stress: 0.801713 N/mm ² (Min) / 39147.9 N/mm ² (Max)	von Mises Stress: 0.795531 N/mm ² (Min) / 39538.4 N/mm ² (Max)		
Principal Stress: -0.00895006 N/mm ² (Min) / 0.0434951 N/mm ² (Max)	Principal Stress: -0.00998213 N/mm ² (Min) / 0.0460107 N/mm ² (Max)	Principal Stress: -0.00852038 N/mm ² (Min) / 0.0424194 N/mm ² (Max)		

3) Fatigue Comparison :-

Vesselbook FATIGUE ANALYSIS COMPARISON			vandit	yash
			minesh	ravi
Cast alloy S-N curve 				
Alloy steel Type: Damage plot Min: 0.1 Max: 1000				
Cast carbon Type: Life plot Min: 100 cycle Max: 1e+006 cycle				