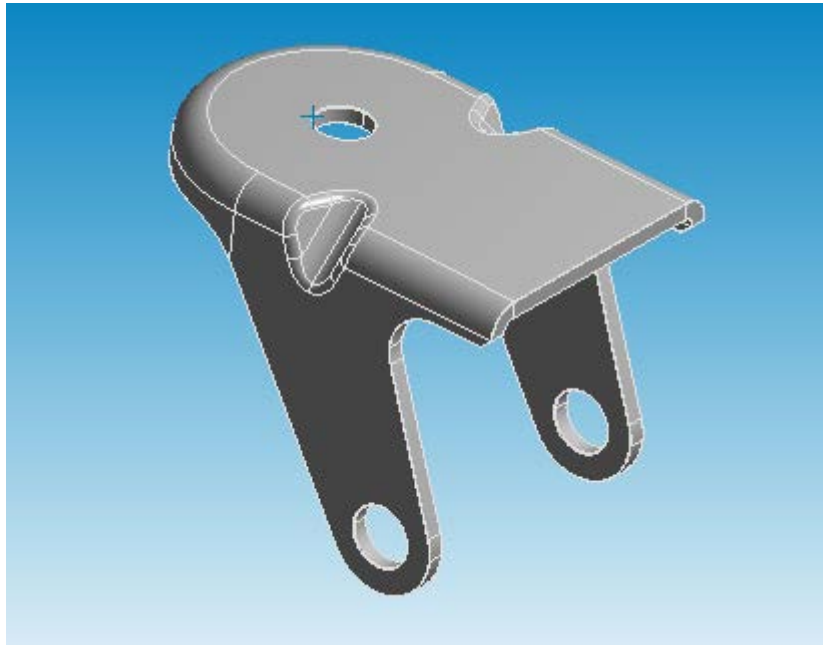


PROBLEM STATEMENT:

8" TROLLEY WHEEL BRACKET : A trolley wheel is an important component in the luggage trolley. During its working conditions it can undergo the static loads and vibrations. Therefore it is important to analyse it by performing static analysis.

**ANALYSIS OF 8" TROLLEY WHEEL BRACKET using ANSYS:**

Perform Static Structural Analysis on trolley wheel bracket.

Input : Mesh the Geometry using HEX elements.

Element Size = 5mm

Defeature the features under 0.5mm.

(Note : This can be achieved by using different options under Mesh in order to achieve HEX elements)

Material Properties :

Graphite Cast Iron	Sand Cast Magnesium Alloy
Density: 7.91g/cc	Density: 1.81g/cc
Young's Modulus: 99GPa	Young's Modulus: 45GPa
Poisson's Ratio: 0.21	Poisson's Ratio: 0.35
Thermal Conductivity: 46 W/mK	Thermal Conductivity: 62 W/m.K
Specific Heat: 490 J/kg	Composition:
	Aluminium 10.7%
	Magnesium 90%
	Zinc 0.3%

(Other material inputs if required can be obtained online or can be assumed with reference to the given material properties/composition)

ANALYSIS :

(Note: All the analysis are to be performed for all the materials specified above)

Case 1:

Static Analysis (for all the types of materials):

1. Apply Force of 100 N on top face of the bracket by constraining the 2 holes at the bottom.

Output :

1. Von- Mises stress
2. Deformation

Case 2:

Static Analysis (for all the types of materials):

1. Apply Pressure of 50 MPa on top face of the bracket by constraining the 2 holes at the bottom.

Case 3:

1. Perform Harmonic analysis (Full and Mode Superposition) according to the static structural Load Case 1 and 2.
2. The component is vibrating at 1000 Hz.
3. The solution intervals should be 50.

Output :

1. Frequency VS Displacement graph.
2. Conclude the result that were obtained from the graph.

Case 4:

1. Fatigue analysis according to the static structural Load Case 1 and 2.

Output :

1. Fatigue Life
2. Damage
3. Safety Factor

Conclusion:

Suggest the best suited material depending on the outputs.

Prepare a Power Point presentation which should include:

Slide 1: Your Name, Mail id, Contact details, College details/Other details.

Slide 2: Problem Statement

Slide 3: Details of the model i.e. Mesh size (with reasoning why did you chose the particular size), Mesh type, Element shape, Total number of nodes and elements.

Slide 4: Inputs and Outputs of Case1 (Pictures of all the outputs and Inputs)

Slide 5: Inputs and Outputs of Case 2 (Pictures of all the outputs and Inputs)

Slide 6: Inputs and Outputs of Case 3 (Pictures of all the outputs and Inputs)

Slide 7: Inputs and Outputs of Case 3 (Pictures of all the outputs and Inputs)

Slide 8: Reference (if any) and Conclusion.

Conclusion should include a comparative study of the materials and outputs. Comparison can be made in the form of graph, bar chart etc. Also mention the best material from the results.