Support Arm Static FEA – Short Report

1. Objective

Evaluate the structural response of an aluminum support arm under a 40 N downward load at the top face, with the base fixed.

2. Geometry and Material

Curved support arm modeled in Fusion 360.

Material: Aluminum 6061

Yield strength: 276 MPa

3. Boundary Conditions and Loading

- Bottom face fixed.
- 40 N downward load on top face.
- Gravity active.

4. Meshing and Solver

- Fusion 360 Static Stress solver.
- Curved parabolic solid elements.
- Mesh refined near curvature transitions.

5. Results

- Max Von Mises stress: 16 MPa
- Max displacement: 0.5 mm
- Safety factor: 16.5

6. Interpretation

Stresses are far below yield; arm is structurally safe. Deflection under load is minimal.

7. Conclusion

The support arm easily withstands the 40 N load with minimal deformation.