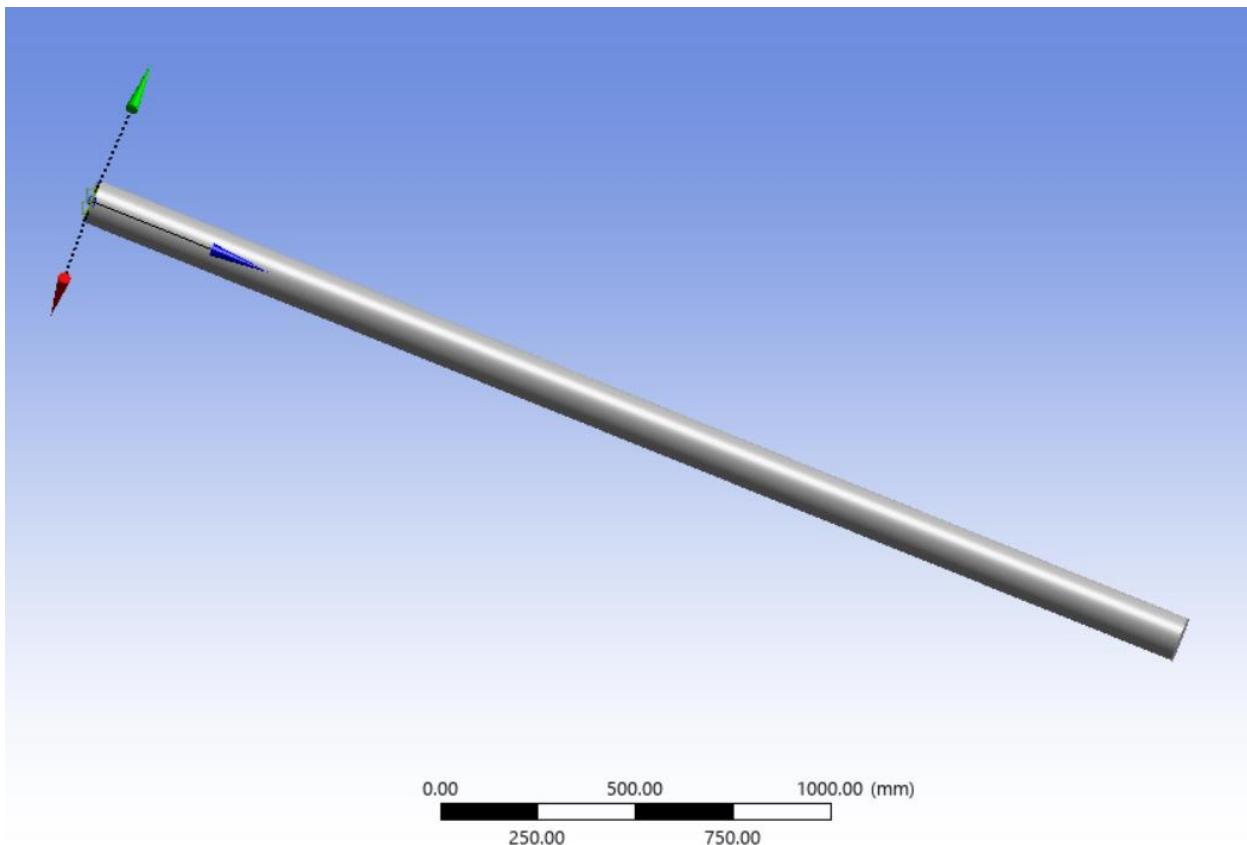


Project 16: ANSYS Modal: Modal analysis of a water pipe

Problem Statement: Calculate the natural frequencies for 6 deformation modes of a water pipe made of stainless steel.

Geometry:

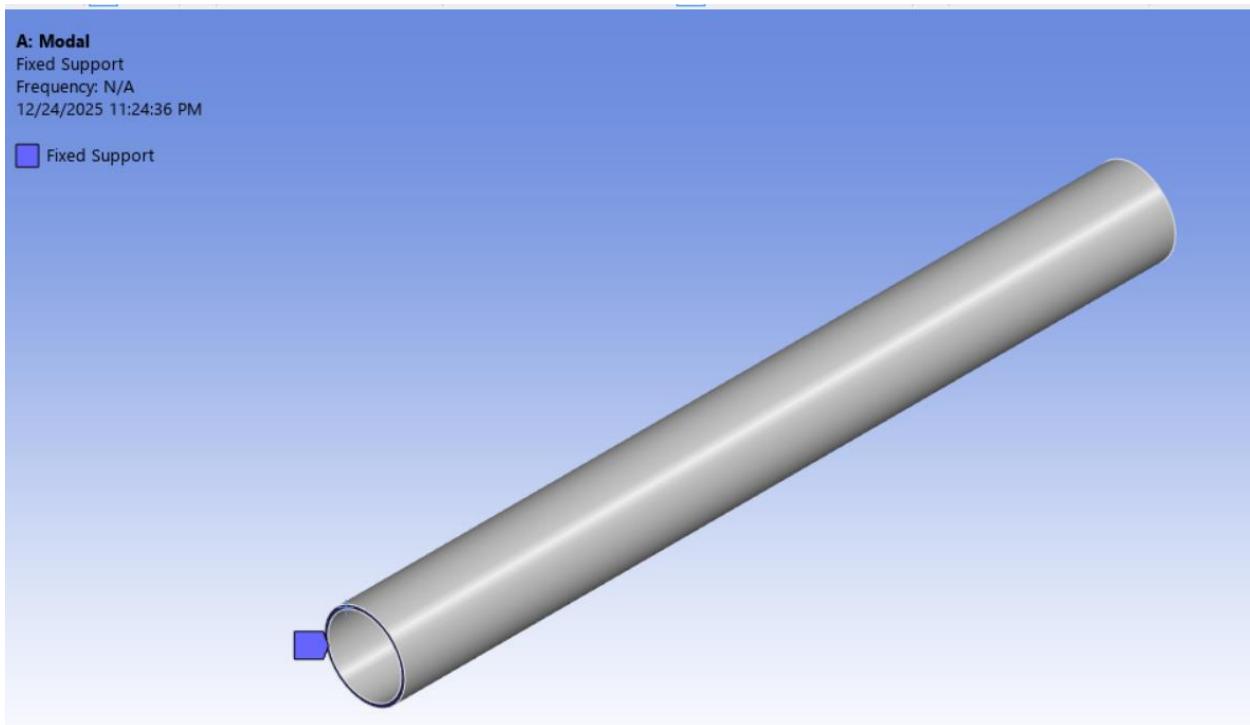


Material Properties:

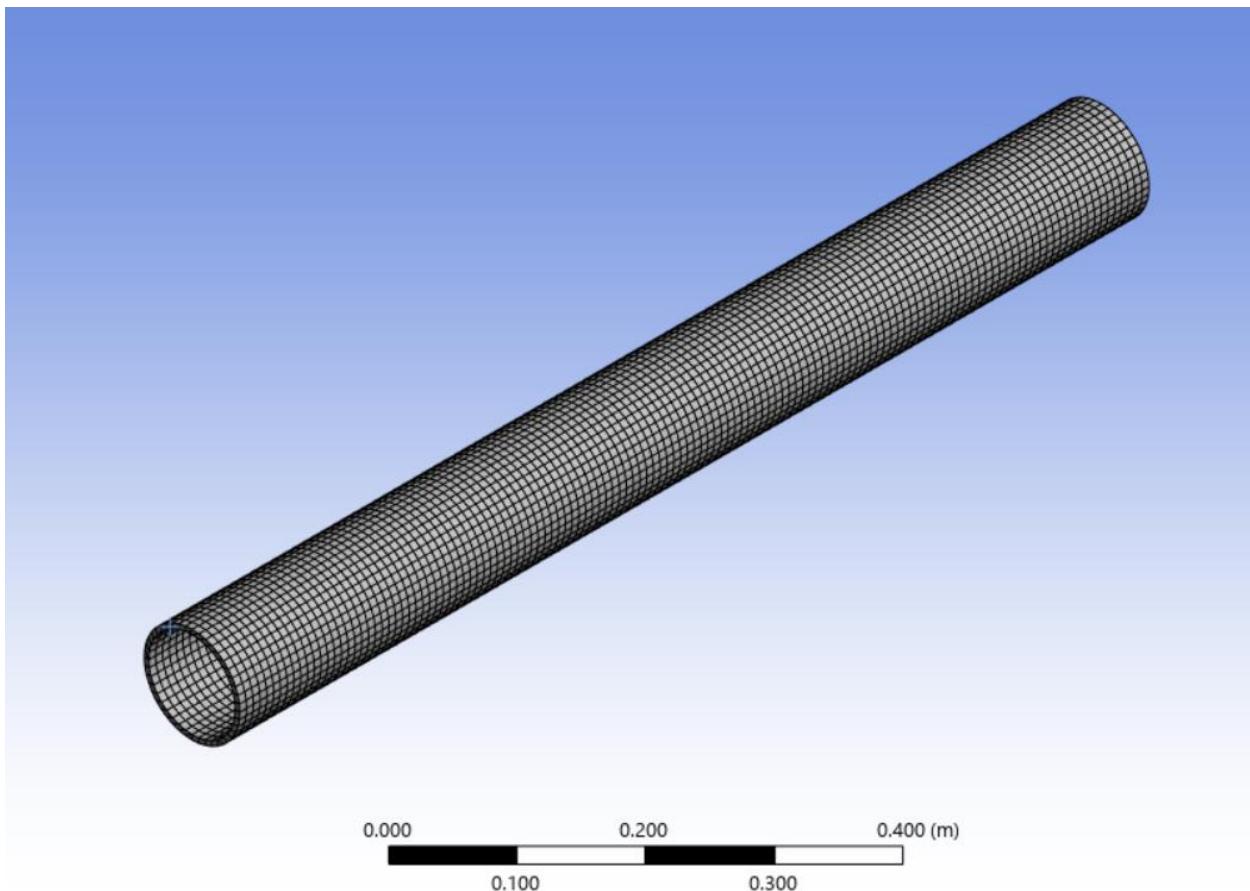
| Properties of Outline Row 4: Stainless Steel | | | | |
|--|---|-----------------------|---|---|
| | A | B | C | D E |
| 1 | Property | Value | Unit | X  |
| 2 |  Material Field Variables | |  Table | |
| 3 |  Density | 7750 | kg m^-3 |   |
| 4 |  Isotropic Secant Coefficient of Thermal Expansion | | |  |
| 6 |  Isotropic Elasticity | | |  |
| 7 | Derive from | Young's Modulus an... | | |
| 8 | Young's Modulus | 1.93E+11 | Pa |   |
| 9 | Poisson's Ratio | 0.31 | |  |
| 10 | Bulk Modulus | 1.693E+11 | Pa |  |
| 11 | Shear Modulus | 7.3664E+10 | Pa |  |

Boundary Conditions:

Left edge is fixed.



Mesh:



Results: Total Deformation for Each Mode

| Tabular Data | | |
|--------------|------|--|
| | Mode | <input checked="" type="checkbox"/> Frequency [Hz] |
| 1 | 1. | 97.349 |
| 2 | 2. | 97.349 |
| 3 | 3. | 557.59 |
| 4 | 4. | 557.6 |
| 5 | 5. | 770.76 |
| 6 | 6. | 1248.8 |

