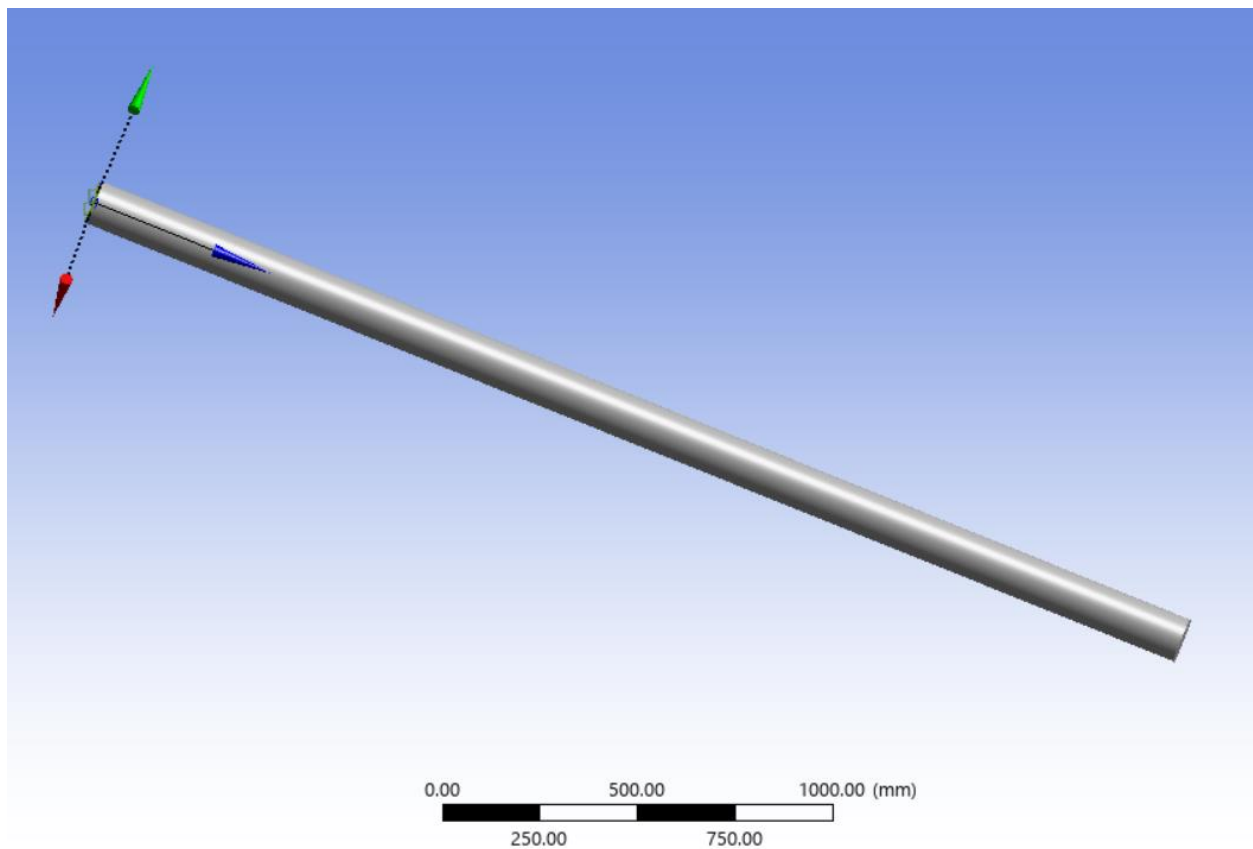


Project 16: ANSYS Modal: Modal analysis of a water pipe

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

Geometry:

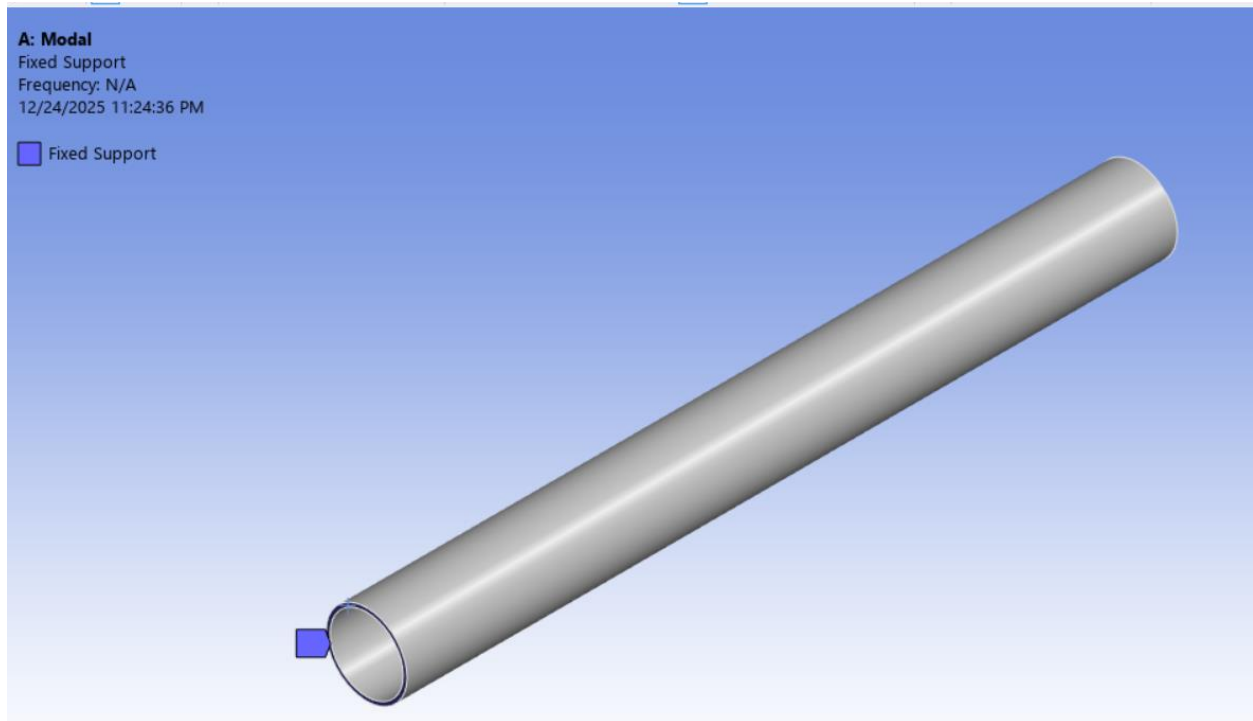


Material Properties:

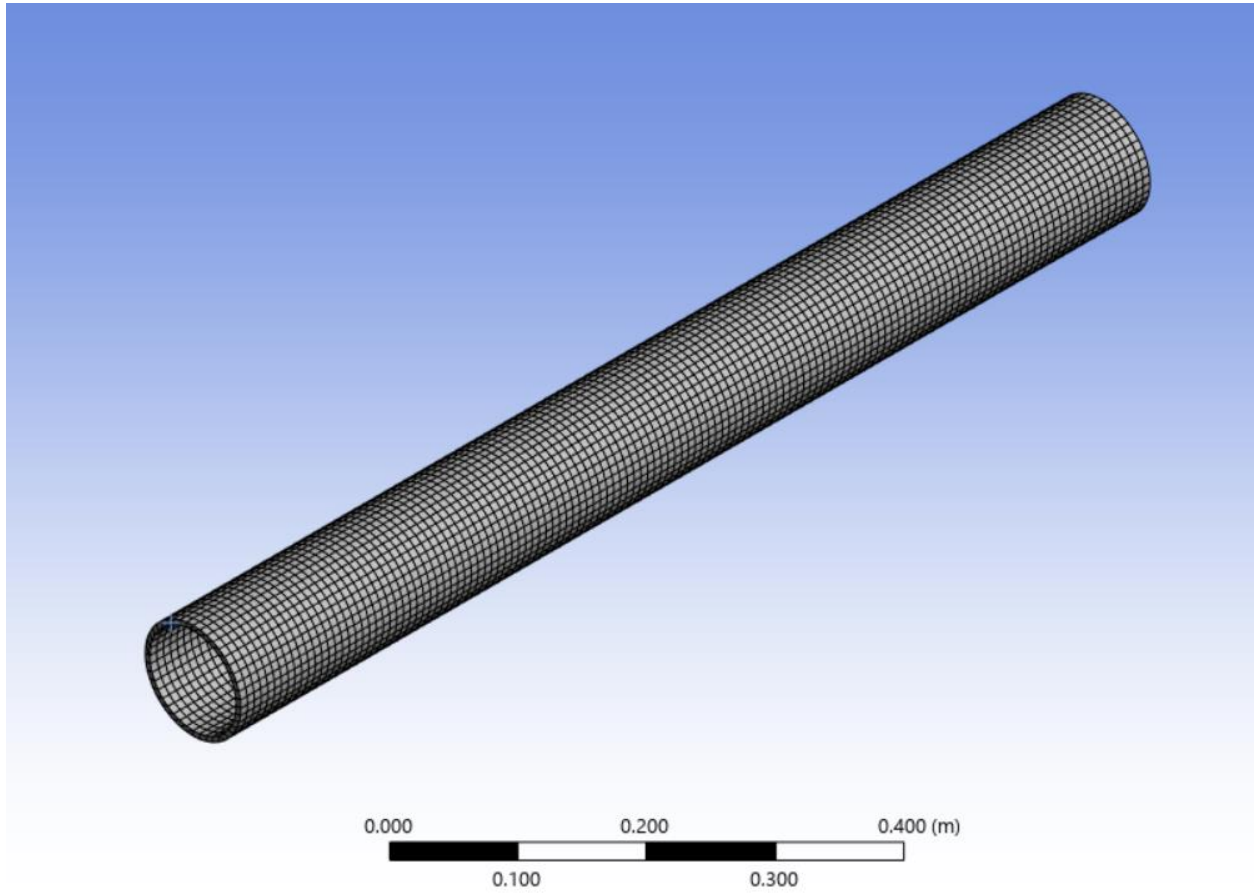
Properties of Outline Row 4: Stainless Steel					
	A	B	C	D	E
1	Property	Value	Unit		
2	Material Field Variables	Table			
3	Density	7750	kg m ⁻³		
4	Isotropic Secant Coefficient of Thermal Expansion				
6	Isotropic Elasticity				
7	Derive from	Young's Modulus an...			
8	Young's Modulus	1.93E+11	Pa		
9	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.

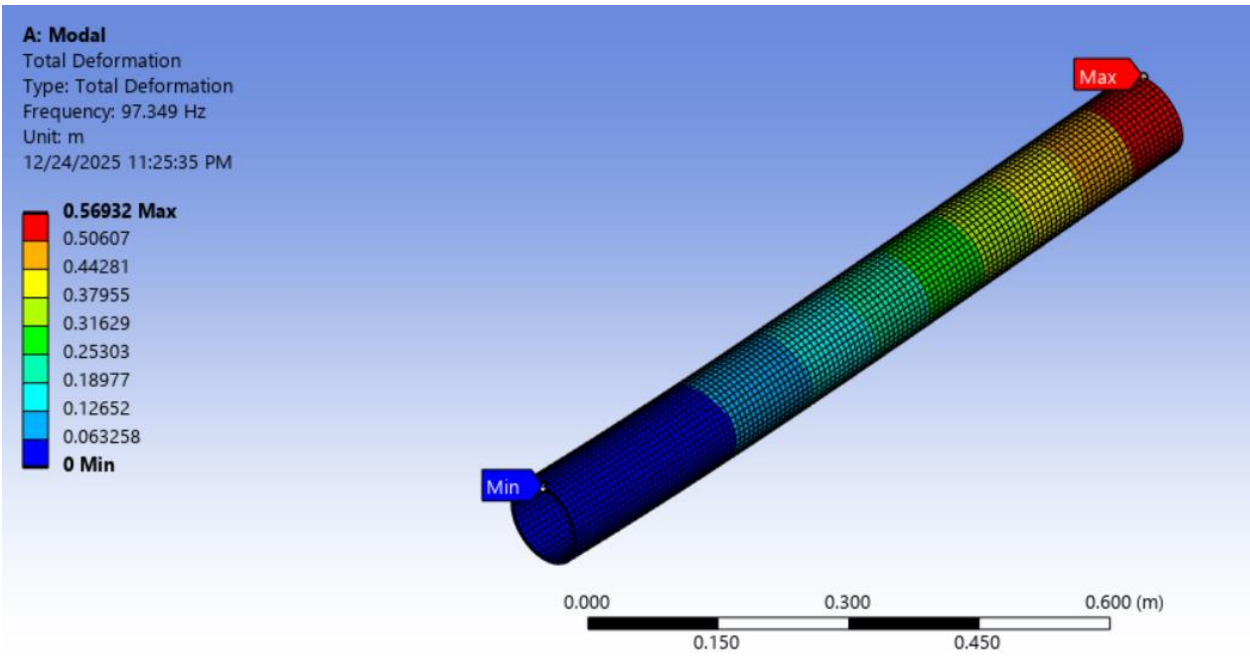


Mesh:



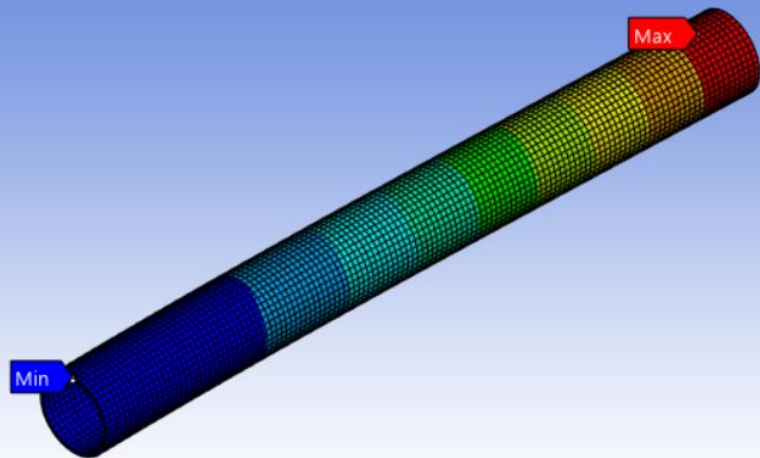
Results: Total Deformation for Each Mode

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



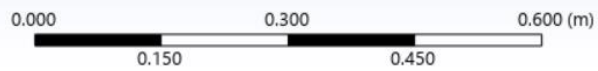
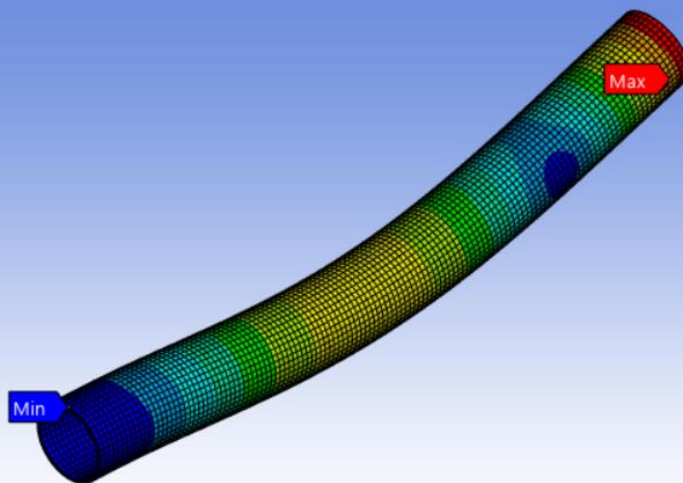
A: Modal

Total Deformation 2
Type: Total Deformation
Frequency: 97.349 Hz
Unit: m
12/24/2025 11:26:05 PM



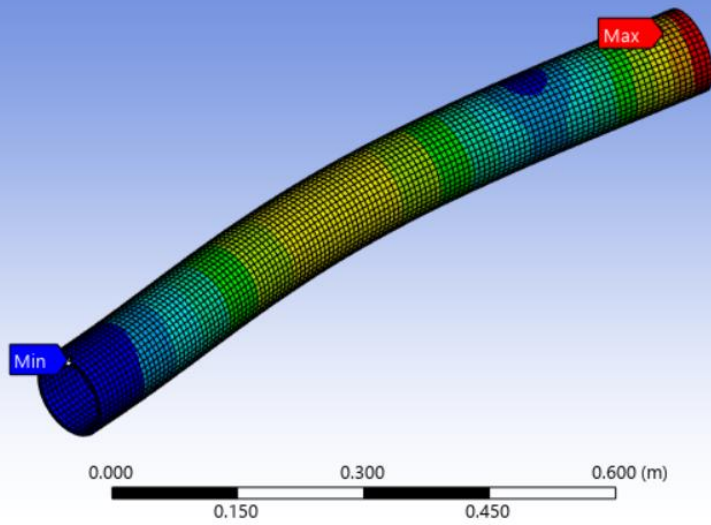
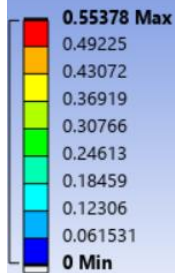
A: Modal

Total Deformation 3
Type: Total Deformation
Frequency: 557.59 Hz
Unit: m
12/24/2025 11:26:21 PM



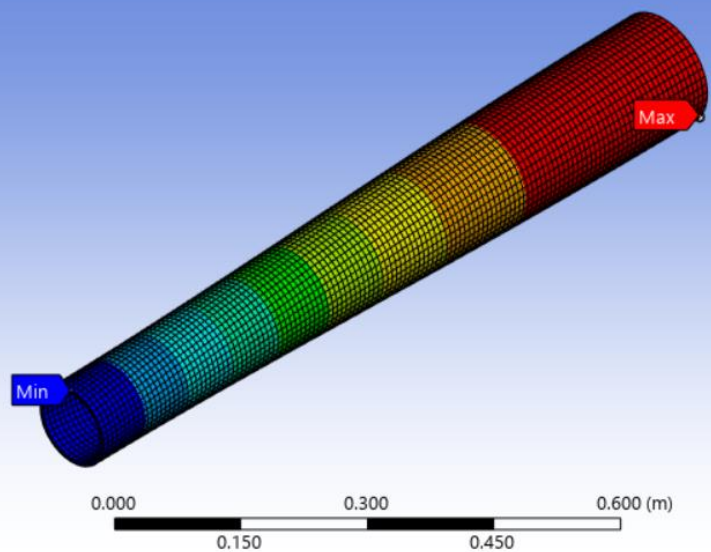
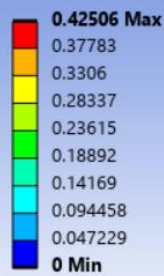
A: Modal

Total Deformation 4
Type: Total Deformation
Frequency: 557.6 Hz
Unit: m
12/24/2025 11:26:31 PM



A: Modal

Total Deformation 5
Type: Total Deformation
Frequency: 770.76 Hz
Unit: m
12/24/2025 11:26:43 PM



A: Modal
Total Deformation 6
Type: Total Deformation
Frequency: 1248.8 Hz
Unit: m
12/24/2025 11:26:57 PM

