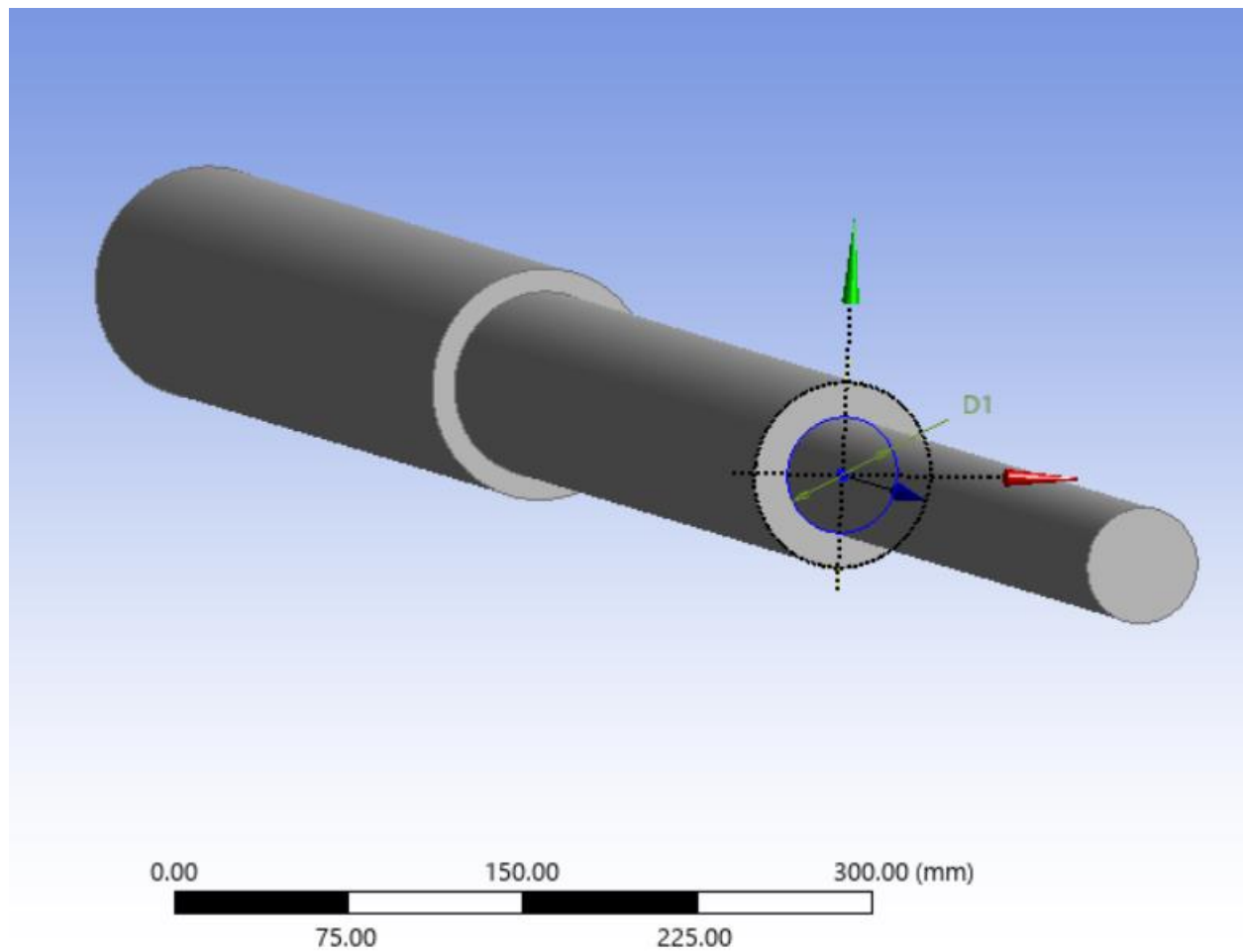





Project 23: ANSYS Static Structural: Torsion applied to a bar








































Problem Statement: Calculate the deformation and moment reaction for a bar under torsion.

Geometry:



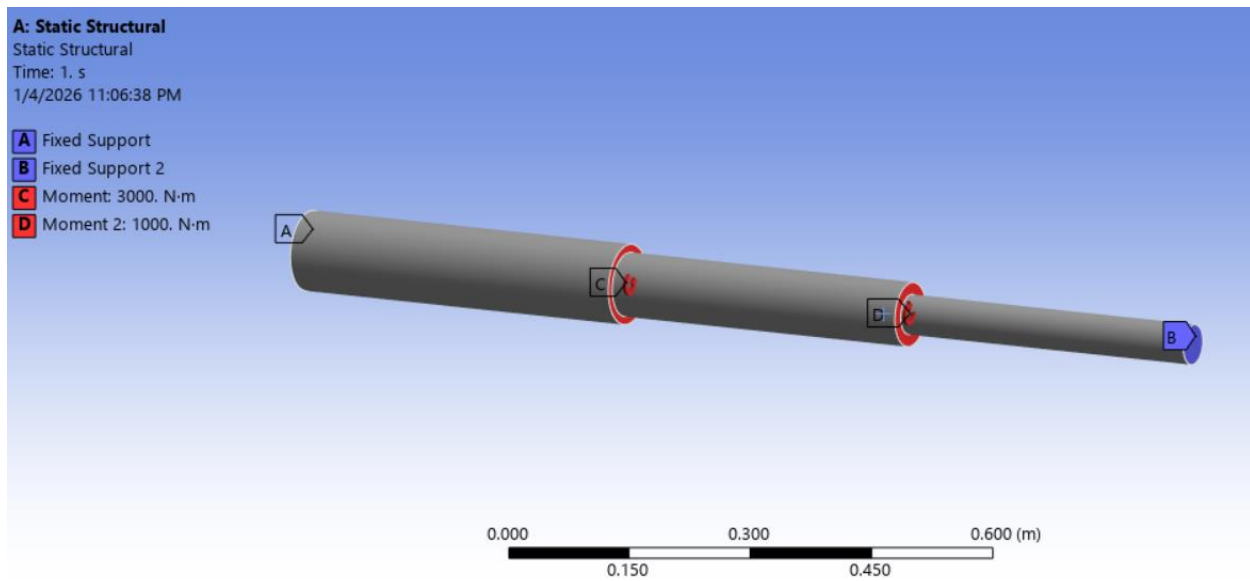
Material Properties:

3	 Structural Steel				Fatigue Data at zero mean stress comes from 1998 ASME BPV Code, Section 8, Div 2, Table 5-110.1
*	Click here to add a new material				

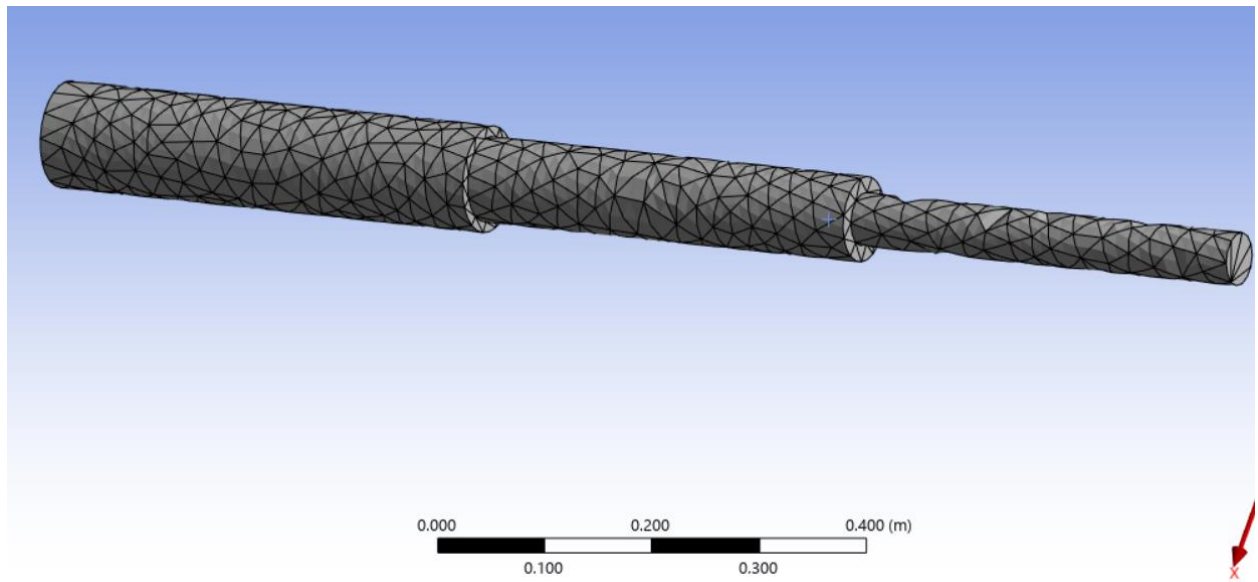
Properties of Outline Row 3: Structural Steel					
	A	B	C	D	E
1	Property	Value	Unit		
3	 Density	7850	kg m ⁻³		
4	  Isotropic Secant Coefficient of Thermal Expansion				
6	 Isotropic Elasticity				
7	Derive from	Young's Modulus a...			
8	Young's Modulus	2E+11	Pa		
9	Poisson's Ratio	0.3			
10	Bulk Modulus	1.6667E+11	Pa		
11	Shear Modulus	7.6923E+10	Pa		
12	  Strain-Life Parameters				
20	  S-N Curve	 Tabular			
24	 Tensile Yield Strength	2.5E+08	Pa		
25	 Compressive Yield Strength	2.5E+08	Pa		
26	 Tensile Ultimate Strength	4.6E+08	Pa		
27	 Compressive Ultimate Strength	0	Pa		

Boundary Conditions:

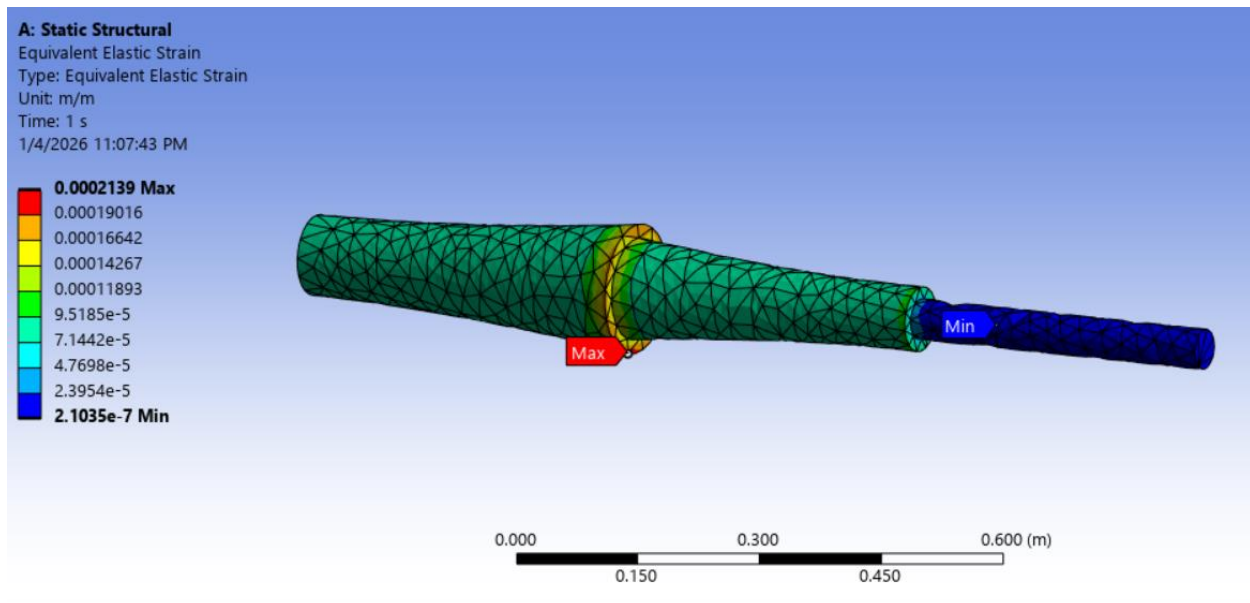
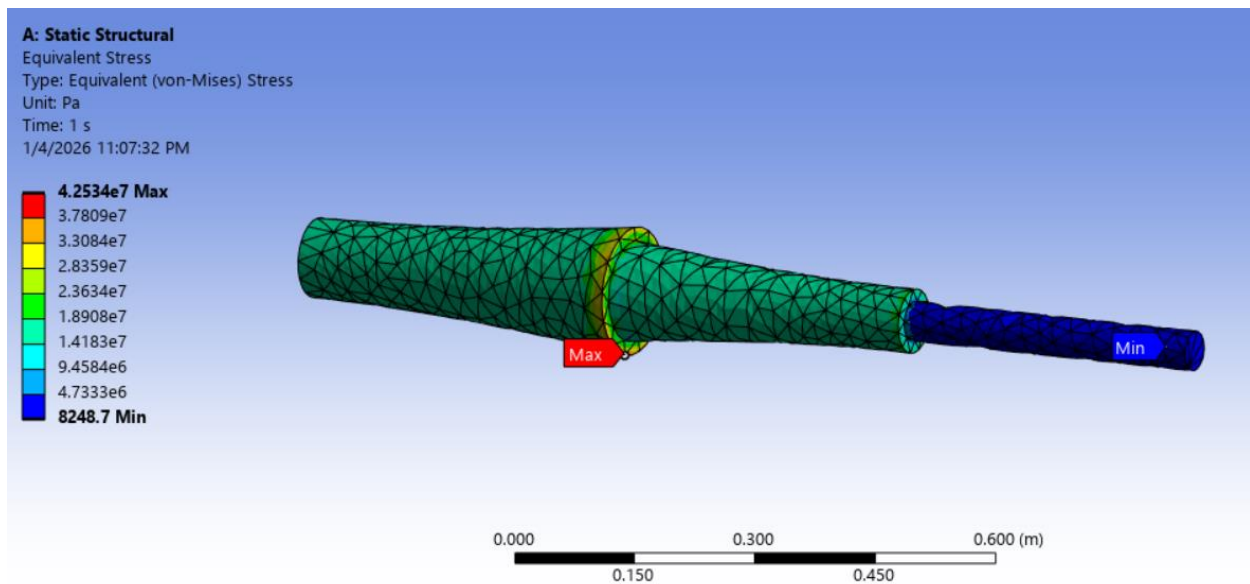
Left and right edges are fixed. Moments are applied in two points.



Mesh:

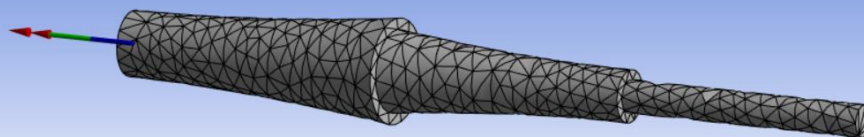


Results: Deformation, stress, strain, and moment reactions.

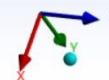


A: Static Structural
Moment Reaction
1/4/2026 11:07:57 PM

Ansys
2025 R2
STUDENT



0.000 0.300 0.600 (m)
0.150 0.450

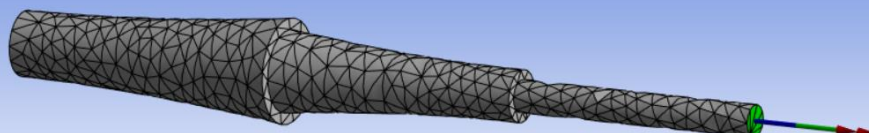


Graph
Animation
20 Frames

Tabular Data				
Time [s]	Moment Reaction (X) [N-m]	Moment Reaction (Y) [N-m]	Moment Reaction (Z) [N-m]	Moment Reaction (Total) [N-m]
1 1.	3.9973e-002	8.0179e-002	-2010.7	2010.7

A: Static Structural
Moment Reaction 2
1/4/2026 11:08:15 PM

Ansys
2025 R2
STUDENT



0.000 0.300 0.600 (m)
0.150 0.450



raph
Animation
20 Frames

Tabular Data				
Time [s]	Moment Reaction 2 (X) [N-m]	Moment Reaction 2 (Y) [N-m]	Moment Reaction 2 (Z) [N-m]	Moment Reaction 2 (Total) [N-m]
1 1.	1.3187e-002	-1.49e-004	10.694	10.694

