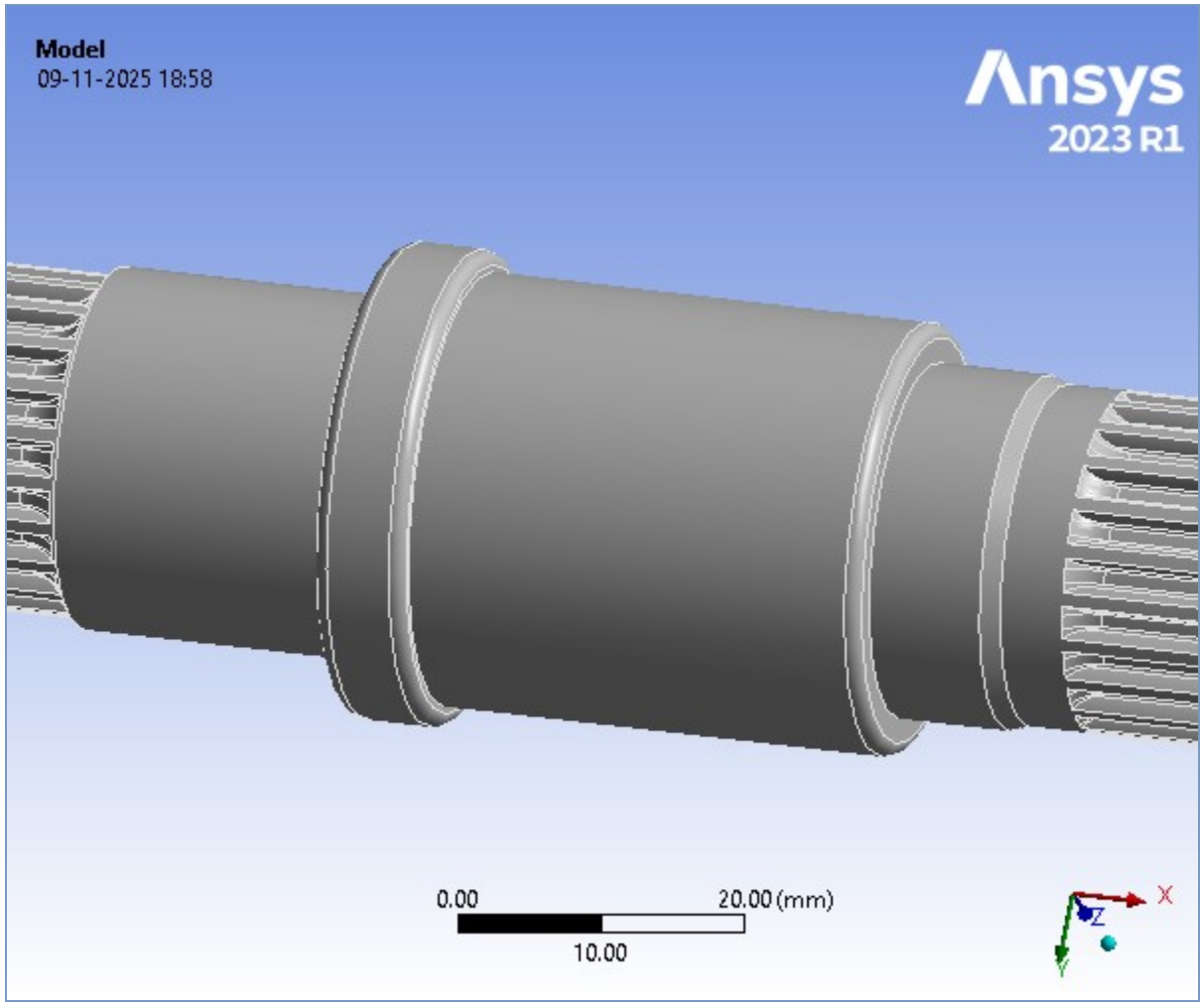
Project*

First Saved	Sunday, November 9, 2025
Last Saved	Sunday, November 9, 2025
Product Version	2023 R1
Save Project Before Solution	No
Save Project After Solution	No


Model
09-11-2025 18:58
Ansys
2023 R1
0.00
20.00 (mm)
10.00
X
Z

Contents

Units

TABLE 1

Unit System	Metric (mm, kg, N, s, mV, mA) Degrees rad/s Celsius
Angle	Degrees
Rotational Velocity	rad/s
Temperature	Celsius

Model (A4)

TABLE 2
Model (A4) > Geometry Imports

Object Name	*Geometry Imports*
State	Solved

TABLE 3
Model (A4) > Geometry Imports > Geometry Import (A3)

Object Name	*Geometry Import (A3)*
State	Solved
Definition	
Source	C:\Users\shrey\AppData\Local\Temp\WB_shrey_23856_2\wbnew_files\dp0\SYS\DM\SYS.agdb
Type	DesignModeler
Basic Geometry Options	
Parameters	Independent
Parameter Key	
Advanced Geometry Options	
Compare Parts On Update	No
Analysis Type	3-D

Geometry

TABLE 4
Model (A4) > Geometry

Object Name	*Geometry*
State	Fully Defined
Definition	
Source	C:\Users\shrey\AppData\Local\Temp\WB_shrey_23856_2\wbnew_files\dp0\SYS\DM\SYS.agdb
Type	DesignModeler
Length Unit	Meters
Element Control	Program Controlled
Display Style	Body Color
Bounding Box	
Length X	116.5 mm
Length Y	33.378 mm
Length Z	33.5 mm
Properties	
Volume	63265 mm³
Mass	0.49663 kg
Scale Factor Value	1.
Statistics	

Bodies	1
Active Bodies	1
Nodes	183268
Elements	125453
Mesh Metric	None
Update Options	
Assign Default Material	No
Basic Geometry Options	
Parameters	Independent
Parameter Key	
Attributes	Yes
Attribute Key	
Named Selections	Yes
Named Selection Key	
Material Properties	Yes
Advanced Geometry Options	
Use Associativity	Yes
Coordinate Systems	Yes
Coordinate System Key	
Reader Mode Saves Updated File	No
Use Instances	Yes
Smart CAD Update	Yes
Compare Parts On Update	No
Analysis Type	3-D
Import Facet Quality	Source
Clean Bodies On Import	No
Stitch Surfaces On Import	None
Decompose Disjoint Geometry	Yes
Enclosure and Symmetry Processing	Yes

TABLE 5
Model (A4) > Geometry > Parts

Object Name	*Part 1*
State	Meshed
Graphics Properties	
Visible	Yes
Transparency	1
Definition	
Suppressed	No

Stiffness Behavior	Flexible
Coordinate System	Default Coordinate System
Reference Temperature	By Environment
Treatment	None
Material	
Assignment	Structural Steel
Nonlinear Effects	Yes
Thermal Strain Effects	Yes
Bounding Box	
Length X	116.5 mm
Length Y	33.378 mm
Length Z	33.5 mm
Properties	
Volume	63265 mm³
Mass	0.49663 kg
Centroid X	58.064 mm
Centroid Y	7.3694e-004 mm
Centroid Z	4.2187e-004 mm
Moment of Inertia Ip1	46.47 kg·mm²
Moment of Inertia Ip2	467.94 kg·mm²
Moment of Inertia Ip3	467.94 kg·mm²
Statistics	
Nodes	183268
Elements	125453
Mesh Metric	None

TABLE 6
Model (A4) > Materials

Object Name	*Materials*
State	Fully Defined
Statistics	
Materials	1
Material Assignments	0

Coordinate Systems

TABLE 7
Model (A4) > Coordinate Systems > Coordinate System

Object Name	*Global Coordinate System*
State	Fully Defined
Definition	
Type	Cartesian
Coordinate System ID	0.
Origin	
Origin X	0. mm
Origin Y	0. mm
Origin Z	0. mm
Directional Vectors	
X Axis Data	[1. 0. 0.]
Y Axis Data	[0. 1. 0.]
Z Axis Data	[0. 0. 1.]

Mesh

TABLE 8
Model (A4) > Mesh

Object Name	*Mesh*
State	Solved
Display	
Display Style	Element Quality
Defaults	
Physics Preference	Mechanical
Element Order	Program Controlled
Element Size	Default
Sizing	
Use Adaptive Sizing	Yes
Resolution	Default (2)
Mesh Defeaturing	Yes
Defeature Size	Default
Transition	Fast
Span Angle Center	Coarse
Initial Size Seed	Assembly
Bounding Box Diagonal	125.73 mm
Average Surface Area	24.199 mm²
Minimum Edge Length	5.5708e-002 mm
Quality	

Check Mesh Quality	Yes, Errors
Error Limits	Aggressive Mechanical
Target Element Quality	Default (5.e-002)
Smoothing	Medium
Mesh Metric	None
Inflation	
Use Automatic Inflation	None
Inflation Option	Smooth Transition
Transition Ratio	0.272
Maximum Layers	5
Growth Rate	1.2
Inflation Algorithm	Pre
View Advanced Options	No
Advanced	
Number of CPUs for Parallel Part Meshing	Program Controlled
Straight Sided Elements	No
Rigid Body Behavior	Dimensionally Reduced
Triangle Surface Mesher	Program Controlled
Topology Checking	Yes
Pinch Tolerance	Please Define
Generate Pinch on Refresh	No
Statistics	
Nodes	183268
Elements	125453
Show Detailed Statistics	No

TABLE 9
Model (A4) > Mesh > Mesh Controls

Object Name	*Patch Conforming Method*	*Body Sizing*
State	Fully Defined	
Scope		
Scoping Method	Geometry Selection	
Geometry	1 Body	
Definition		
Suppressed	No	
Method	Tetrahedrons	
Algorithm	Patch Conforming	
Element Order	Use Global Setting	
Type		Element Size

Element Size		1.7 mm
Advanced		
Defeature Size		Default
Behavior		Soft

Static Structural (A5)

TABLE 10
Model (A4) > Analysis

Object Name	*Static Structural (A5)*
State	Solved
Definition	
Physics Type	Structural
Analysis Type	Static Structural
Solver Target	Mechanical APDL
Options	
Environment Temperature	22. °C
Generate Input Only	No

TABLE 11
Model (A4) > Static Structural (A5) > Analysis Settings

Object Name	*Analysis Settings*
State	Fully Defined
Step Controls	
Number Of Steps	1.
Current Step Number	1.
Step End Time	1. s
Auto Time Stepping	Program Controlled
Solver Controls	
Solver Type	Program Controlled
Weak Springs	Off
Solver Pivot Checking	Program Controlled
Large Deflection	Off
Inertia Relief	Off
Quasi-Static Solution	Off
Rotordynamics Controls	
Coriolis Effect	Off
Restart Controls	

Generate Restart Points	Program Controlled
Retain Files After Full Solve	No
Combine Restart Files	Program Controlled
Nonlinear Controls	
Newton-Raphson Option	Program Controlled
Force Convergence	Program Controlled
Moment Convergence	Program Controlled
Displacement Convergence	Program Controlled
Rotation Convergence	Program Controlled
Line Search	Program Controlled
Stabilization	Program Controlled
Advanced	
Inverse Option	No
Contact Split (DMP)	Off
Output Controls	
Stress	Yes
Back Stress	No
Strain	Yes
Contact Data	Yes
Nonlinear Data	No
Nodal Forces	No
Volume and Energy	Yes
Euler Angles	Yes
General Miscellaneous	No
Contact Miscellaneous	No
Store Results At	All Time Points
Result File Compression	Program Controlled
Analysis Data Management	
Solver Files Directory	C:\Users\shrey\Downloads\New folder (2)\Differential gear shaft report_files\dp0\SYS\MECH\
Future Analysis	None
Scratch Solver Files Directory	
Save MAPDL db	No
Contact Summary	Program Controlled
Delete Unneeded Files	Yes
Nonlinear Solution	No
Solver Units	Active System
Solver Unit System	nmm

TABLE 12

Model (A4) > Static Structural (A5) > Rotations

Object Name	*Rotational Velocity*
State	Fully Defined
Scope	
Scoping Method	Geometry Selection
Geometry	All Bodies
Definition	
Define By	Vector
Magnitude	100. rad/s (ramped)
Axis	Defined
Suppressed	No

FIGURE 1
Model (A4) > Static Structural (A5) > Rotational Velocity

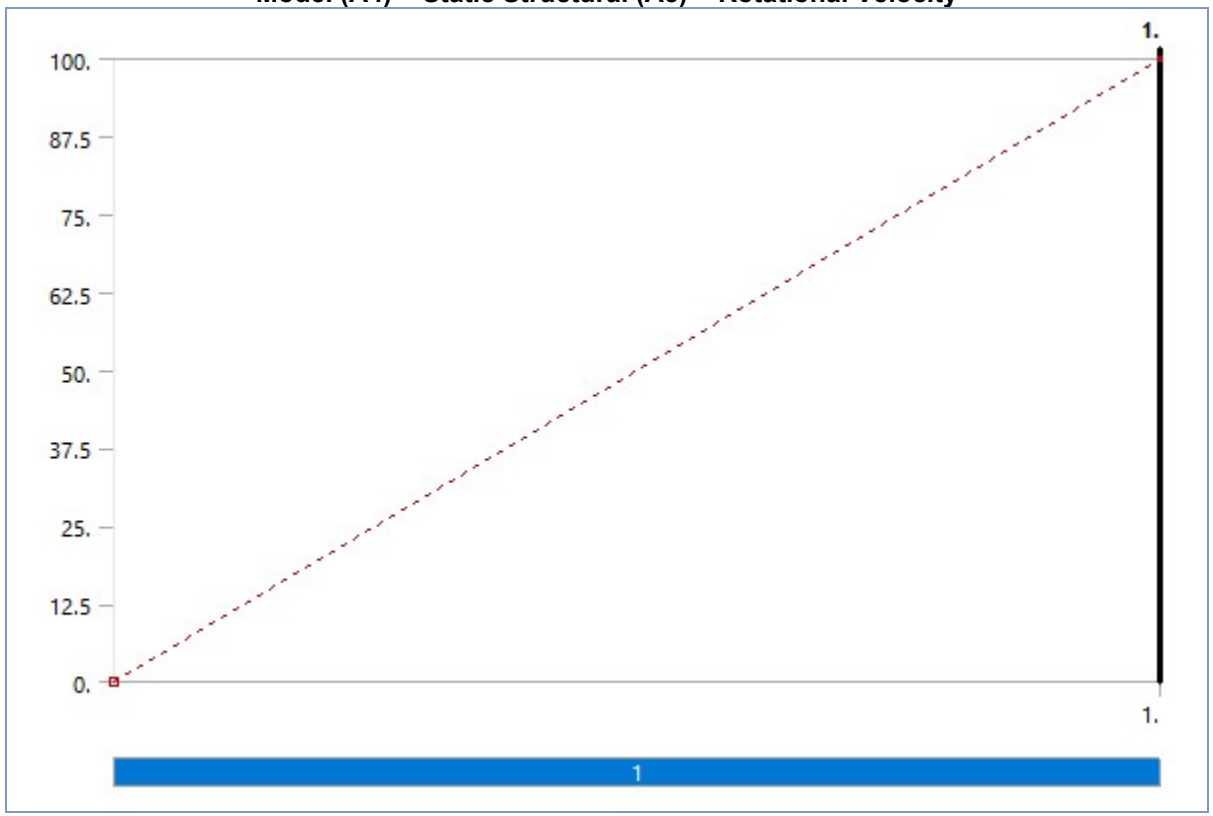


TABLE 13
Model (A4) > Static Structural (A5) > Loads

Object Name	*Moment*	*Frictionless Support*	*Force*
State	Fully Defined		
Scope			
Scoping Method	Geometry Selection		
Geometry	1 Face		
Definition			
Type	Moment	Frictionless Support	Force
Define By	Components		Components
Coordinate System	Global Coordinate System		Global Coordinate System
X Component	15. N·mm (ramped)		0. N (ramped)
Y Component	0. N·mm (ramped)		20. N (ramped)
Z Component	0. N·mm (ramped)		0. N (ramped)
Suppressed	No		
Behavior	Deformable		
Applied By			Surface Effect
Advanced			
Pinball Region	All		

FIGURE 2
Model (A4) > Static Structural (A5) > Moment

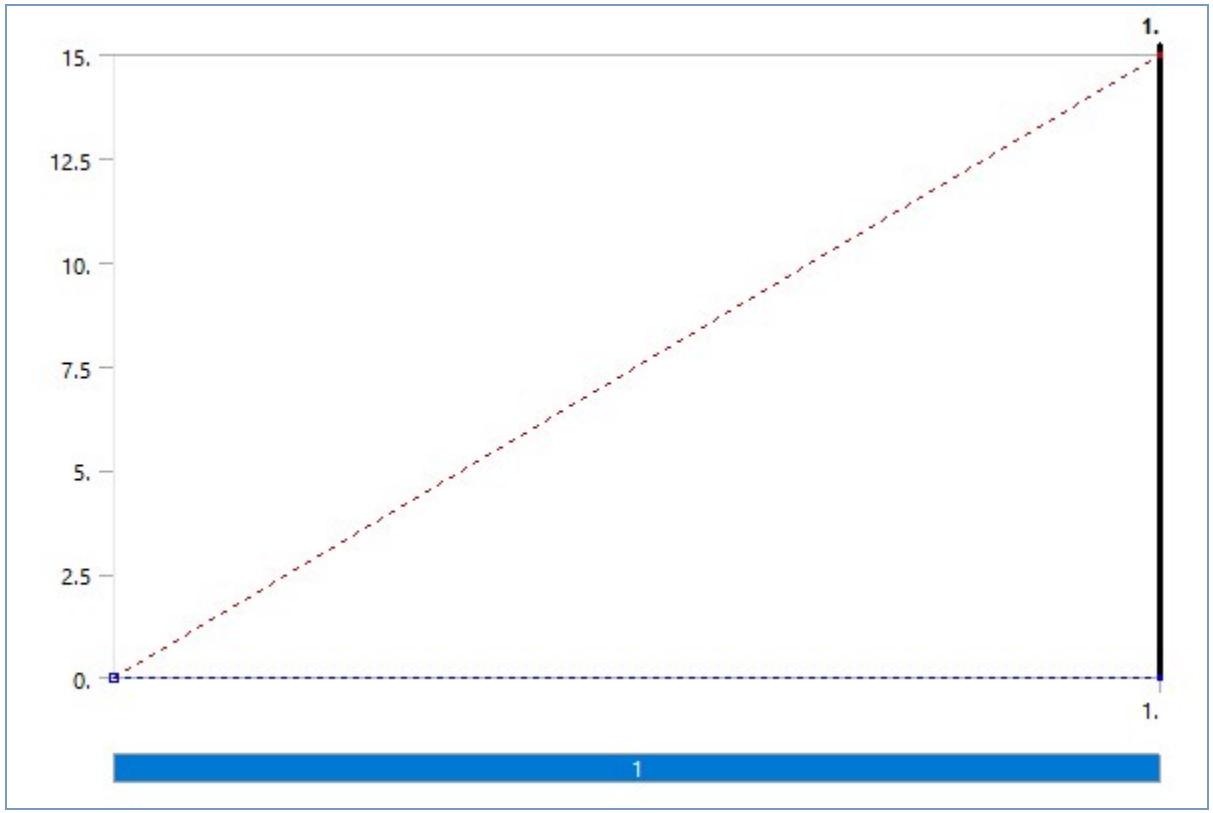
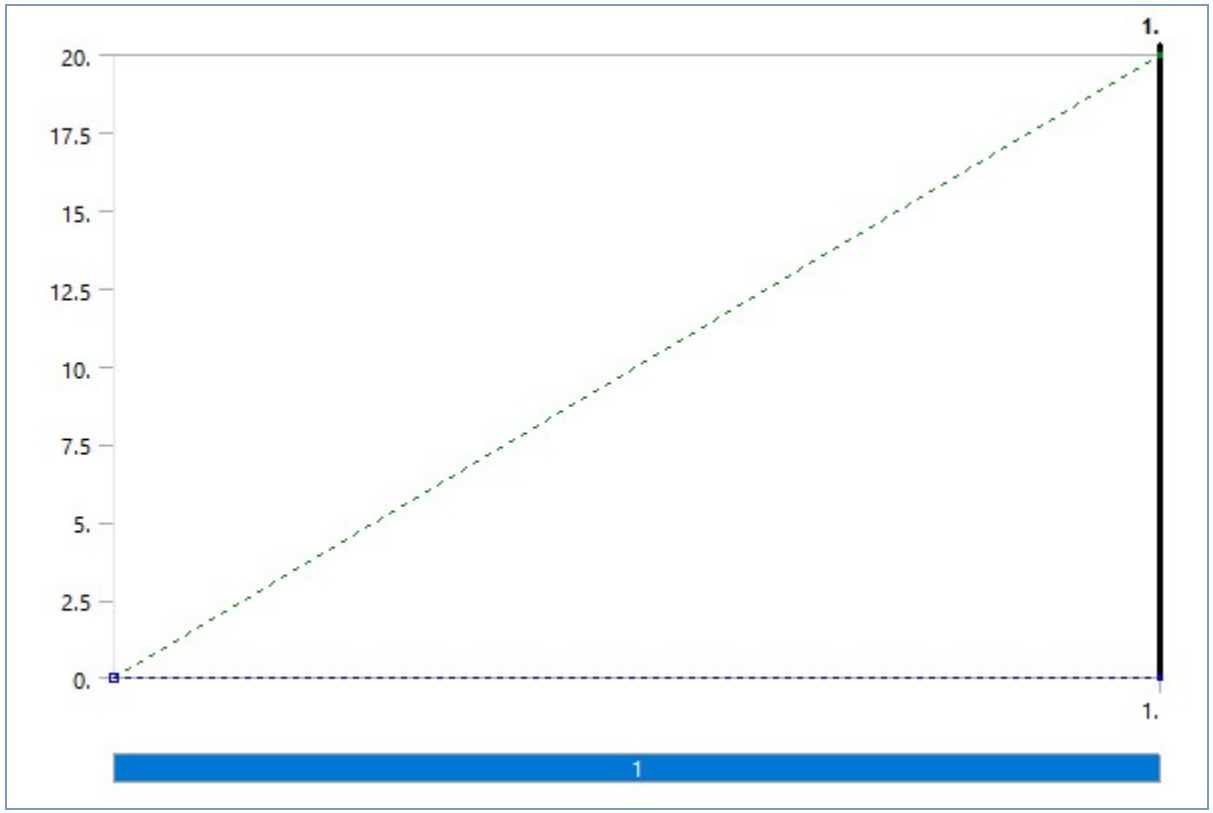


FIGURE 3
Model (A4) > Static Structural (A5) > Force



Solution (A6)

TABLE 14
Model (A4) > Static Structural (A5) > Solution

Object Name	*Solution (A6)*
State	Solved
Adaptive Mesh Refinement	
Max Refinement Loops	1.
Refinement Depth	2.
Information	
Status	Done
MAPDL Elapsed Time	1 m 44 s
MAPDL Memory Used	1.29 GB
MAPDL Result File Size	77.063 MB

Post Processing	
Beam Section Results	No
On Demand Stress/Strain	No

TABLE 15
Model (A4) > Static Structural (A5) > Solution (A6) > Solution Information

Object Name	*Solution Information*
State	Solved
Solution Information	
Solution Output	Solver Output
Newton-Raphson Residuals	0
Identify Element Violations	0
Update Interval	2.5 s
Display Points	All
FE Connection Visibility	
Activate Visibility	Yes
Display	All FE Connectors
Draw Connections Attached To	All Nodes
Line Color	Connection Type
Visible on Results	No
Line Thickness	Single
Display Type	Lines

TABLE 16
Model (A4) > Static Structural (A5) > Solution (A6) > Results

Object Name	*Equivalent Stress*	*Total Deformation*
State	Solved	
Scope		
Scoping Method	Geometry Selection	
Geometry	All Bodies	
Definition		
Type	Equivalent (von-Mises) Stress	Total Deformation
By	Time	
Display Time	Last	
Separate Data by Entity	No	
Calculate Time History	Yes	
Identifier		
Suppressed	No	
Integration Point Results		

Display Option	Averaged	
Average Across Bodies	No	
Results		
Minimum	3.0476e-004 MPa	23808 mm
Maximum	45764 MPa	1.1216e+005 mm
Average	12.071 MPa	67730 mm
Minimum Occurs On	Part 1	
Maximum Occurs On	Part 1	
Information		
Time	1. s	
Load Step	1	
Substep	1	
Iteration Number	1	

FIGURE 4
Model (A4) > Static Structural (A5) > Solution (A6) > Equivalent Stress

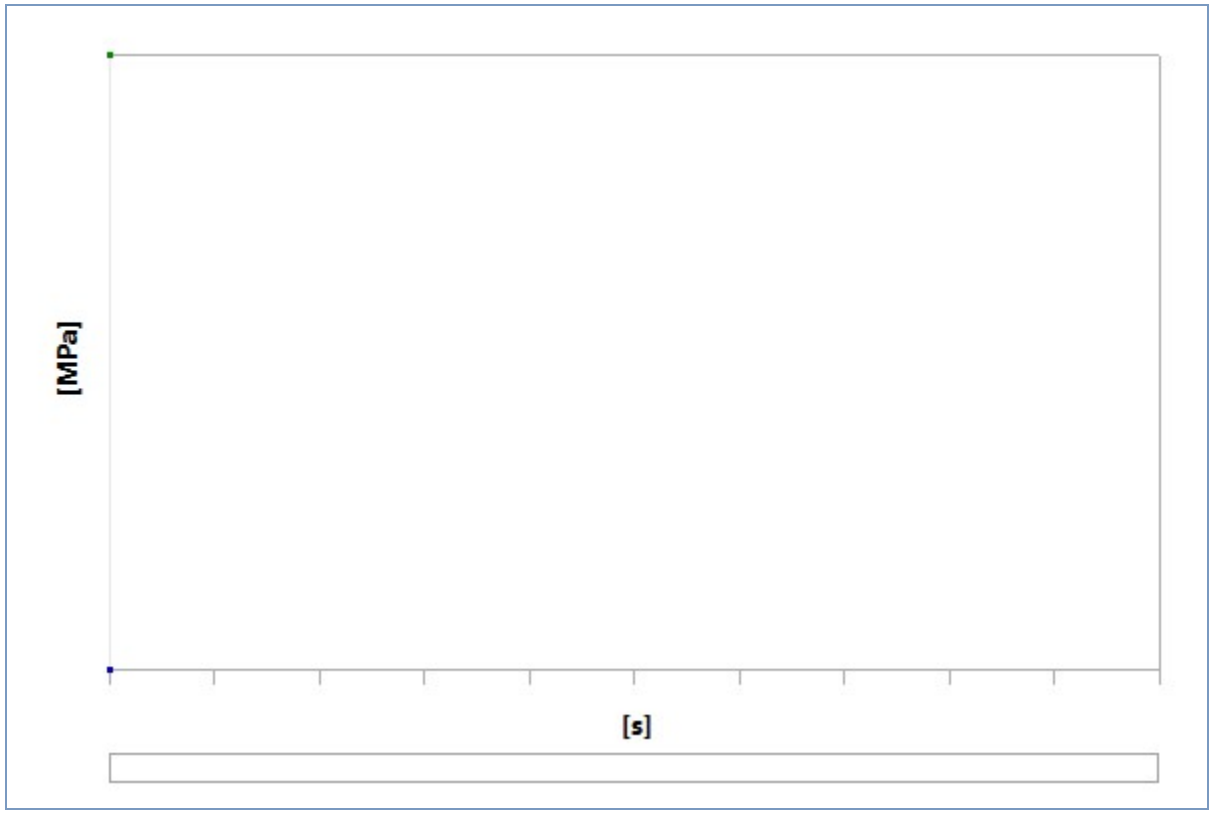


TABLE 17
Model (A4) > Static Structural (A5) > Solution (A6) > Equivalent Stress

Time [s]	Minimum [MPa]	Maximum [MPa]	Average [MPa]
1.	3.0476e-004	45764	12.071

FIGURE 5
Model (A4) > Static Structural (A5) > Solution (A6) > Total Deformation

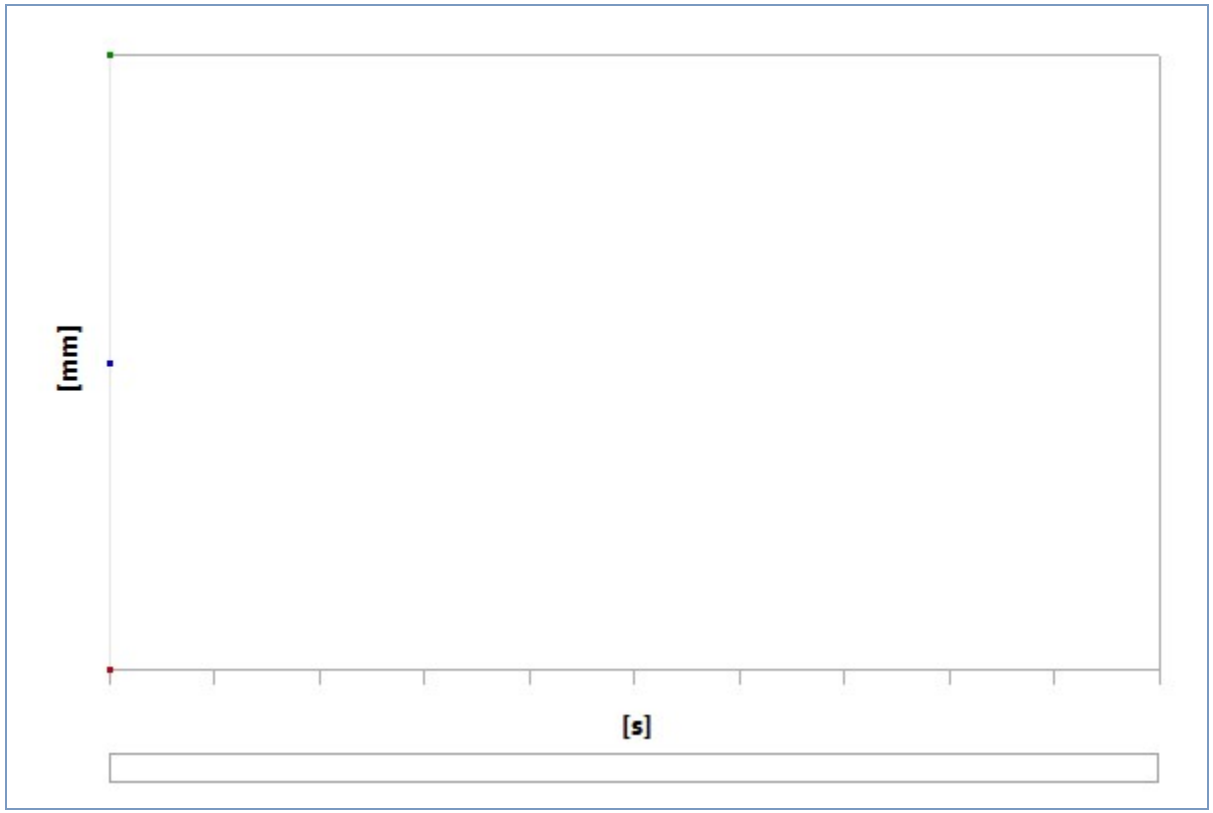


TABLE 18
Model (A4) > Static Structural (A5) > Solution (A6) > Total Deformation

Time [s]	Minimum [mm]	Maximum [mm]	Average [mm]
1.	23808	1.1216e+005	67730

Material Data

Structural Steel

TABLE 19
Structural Steel > Constants

Density	7.85e-006 kg mm^-3
Coefficient of Thermal Expansion	1.2e-005 C^-1

Specific Heat	4.34e+005 mJ kg^-1 C^-1
Thermal Conductivity	6.05e-002 W mm^-1 C^-1
Resistivity	1.7e-004 ohm mm

TABLE 20
Structural Steel > Color

Red	Green	Blue
132	139	179

TABLE 21
Structural Steel > Compressive Ultimate Strength

Compressive Ultimate Strength MPa
0

TABLE 22
Structural Steel > Compressive Yield Strength

Compressive Yield Strength MPa
250

TABLE 23
Structural Steel > Tensile Yield Strength

Tensile Yield Strength MPa
250

TABLE 24
Structural Steel > Tensile Ultimate Strength

Tensile Ultimate Strength MPa
460

TABLE 25
Structural Steel > Isotropic Secant Coefficient of Thermal Expansion

Zero-Thermal-Strain Reference Temperature C
22

TABLE 26
Structural Steel > S-N Curve

Alternating Stress MPa	Cycles	Mean Stress MPa
3999	10	0
2827	20	0

1896	50	0
1413	100	0
1069	200	0
441	2000	0
262	10000	0
214	20000	0
138	1.e+005	0
114	2.e+005	0
86.2	1.e+006	0

TABLE 27
Structural Steel > Strain-Life Parameters

Strength Coefficient MPa	Strength Exponent	Ductility Coefficient	Ductility Exponent	Cyclic Strength Coefficient MPa	Cyclic Strain Hardening Exponent
920	-0.106	0.213	-0.47	1000	0.2

TABLE 28
Structural Steel > Isotropic Elasticity

Young's Modulus MPa	Poisson's Ratio	Bulk Modulus MPa	Shear Modulus MPa	Temperature C
2.e+005	0.3	1.6667e+005	76923	

TABLE 29
Structural Steel > Isotropic Relative Permeability

Relative Permeability
10000