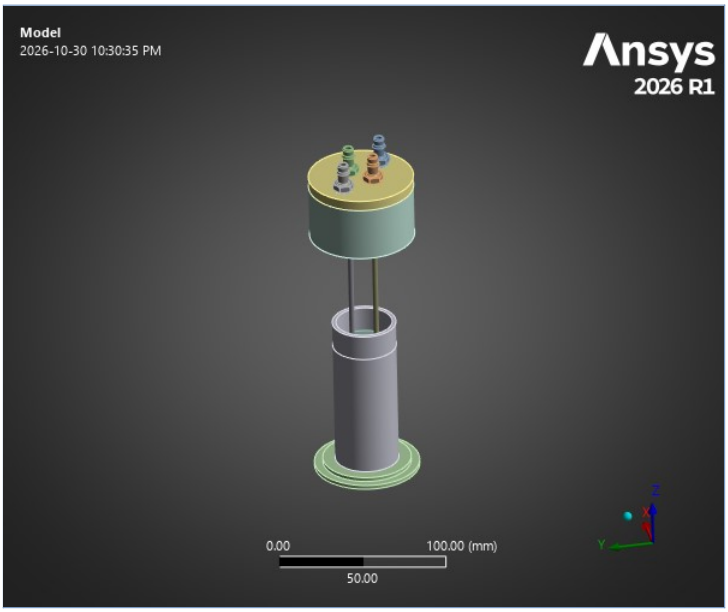
Project

First Saved	Friday, October 30, 2026
Last Saved	Friday, October 30, 2026
Product Version	2026 R1
Save Project Before Solution	No
Save Project After Solution	No



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  - Fibre_Blanket
  - Mullite

Report Not Finalized

Not all objects described below are in a finalized state. As a result, data may be incomplete, obsolete or in error. View first state problem . To finalize this report, edit objects as needed and solve the analyses.

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, B4)

TABLE 2
Model (A4, B4) > Geometry Imports

Object Name	*Geometry Imports*
State	Solved

TABLE 3
Model (A4, B4) > Geometry Imports > Geometry Import (A3, B3)

Object Name	*Geometry Import (A3, B3)*
State	Solved
Definition	
Source	P:\Ansys_Sims\v0_files\dp0\SYS\DM\SYS.dsco
Type	Discovery
Basic Geometry Options	
Solid Bodies	Yes
Surface Bodies	Yes
Line Bodies	Yes
Parameters	Independent
Parameter Key	
Attributes	Yes
Attribute Key	
Named Selections	Yes
Named Selection Key	
Material Properties	No
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
Mixed Import Resolution	None
Import Facet Quality	Source
Clean Bodies On Import	No
Stitch Surfaces On Import	None
Decompose Disjoint Geometry	Yes
Enclosure and Symmetry Processing	Yes

Geometry

TABLE 4
Model (A4, B4) > Geometry

Object Name	*Geometry*
State	Fully Defined
Definition	
Source	P:\Ansys_Sims\v0_files\dp0\SYS\DM\SYS.dsco
Type	Discovery
Length Unit	Meters
Element Control	Program Controlled
Display Style	Body Color
Bounding Box	
Length X	250. mm
Length Y	250. mm
Length Z	265.89 mm
Properties	
Volume	8.5034e+006 mm³
Mass	5.6002 kg
Scale Factor Value	1.
Statistics	
Bodies	20
Active Bodies	20
Nodes	829019
Elements	4172907
Mesh Metric	None
Update Options	
Assign Default Material	No
Basic Geometry Options	
Solid Bodies	Yes
Surface Bodies	Yes
Line Bodies	Yes
Parameters	Independent
Parameter Key	
Attributes	Yes
Attribute Key	
Named Selections	Yes
Named Selection Key	
Material Properties	No
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
Mixed Import Resolution	None
Import Facet Quality	Source
Clean Bodies On Import	No
Stitch Surfaces On Import	None
Decompose Disjoint Geometry	Yes
ID_GeometryPrefProcessPhysicsDefinition	No
Enclosure and Symmetry Processing	Yes

TABLE 5
Model (A4, B4) > Geometry > Parts

Object Name	*SilverPlatedCopperGasket*	*f0450x250n_lower*	*BasePlateForBody*	*Top_Tube*	*BasePlateForTop*	*f0450x250n_upper*	*Thermocouple Tube Fitting*	*Gas Tube Fitting*	*Anode Tube Fitting*	*Cathode Tube Fitting*
State	Hidden		Meshed			Hidden	Meshed			
Graphics Properties										
Visible	No		Yes			No	Yes			
Transparency	1									
Definition										
Suppressed	No									
Stiffness Behavior	Flexible									
Coordinate System	Default Coordinate System									
Reference Temperature	By Environment									
Treatment	None									
Material										
Assignment	Cu_OFHC	SS304					SS316			
Nonlinear Effects	Yes									
Thermal Strain Effects	Yes									

Bounding Box											
Length X	82.321 mm	113.54 mm	63.5 mm			113.54 mm	11.112 mm				
Length Y	82.321 mm	113.54 mm	63.5 mm			113.54 mm	12.789 mm				
Length Z	2.032 mm	17.272 mm	5.08 mm	33.02 mm	12.7 mm	17.272 mm	26.194 mm				
Properties											
Volume	4349.2 mm³	1.1069e+005 mm³	13720 mm³	30786 mm³	30992 mm³	1.1059e+005 mm³	1093.1 mm³				
Mass	3.8882e-002 kg	0.87446 kg	0.10839 kg	0.24321 kg	0.24484 kg	0.87368 kg	8.6904e-003 kg				
Centroid X	2.4028e-008 mm	3.6643e-005 mm	1.8511e-007 mm	-4.0216e-007 mm	2.5301e-002 mm	6.1737e-005 mm	-14.519 mm	13.051 mm	6.2418 mm	-6.2407 mm	
Centroid Y	9.1632e-015 mm	-4.6862e-006 mm	-1.7185e-015 mm	-1.4714e-015 mm	5.8347e-003 mm	5.3376e-005 mm	13.624 mm	-13.945 mm	6.2386 mm	-6.244 mm	
Centroid Z	147.04 mm	137.91 mm	-0.21927 mm	172.92 mm	189.98 mm	155.67 mm	197.25 mm		196.31 mm		
Moment of Inertia Ip1	26.308 kg·mm²	946.53 kg·mm²	24.192 kg·mm²	126.55 kg·mm²	61.965 kg·mm²	945.89 kg·mm²	0.39359 kg·mm²				
Moment of Inertia Ip2	26.308 kg·mm²	947.64 kg·mm²	24.192 kg·mm²	126.55 kg·mm²	58.091 kg·mm²	947. kg·mm²	0.3936 kg·mm²				
Moment of Inertia Ip3	52.588 kg·mm²	1852.6 kg·mm²	47.929 kg·mm²	208.91 kg·mm²	113.61 kg·mm²	1851.4 kg·mm²	0.12752 kg·mm²				
Statistics											
Nodes	37289	58161	7601	16744	21024	57986	3982				
Elements	173137	297053	34536	78722	98978	296443	15000				
Mesh Metric	None										
CAD Attributes											
PartTolerance:	0.00000001										
Color:175.169.143											
Color:173.173.173											
Color:130.130.130											
SCRootPartComponent											
Color:128.128.255											

TABLE 6
Model (A4, B4) > Geometry > Parts

Object Name	*SYS\Thermocouple*	*SYS\SS304 (Anode)*	*SYS\Mo (Cathode)*	*SYS\Floor*	*SYS\Side Insulation*	*SYS\Collar*	*SYS\Heater Tube*	*Alumina_Crucible*	*Reactor_Body_New:1\Body21*
State	Meshed			Hidden				Meshed	Hidden
Graphics Properties									
Visible	Yes			No				Yes	No
Transparency	1								
Definition									
Suppressed	No								
Stiffness Behavior	Flexible								
Coordinate System	Default Coordinate System								
Reference Temperature	By Environment								
Treatment	None								
Material									
Assignment	SS304		Mo	Fibre_Board	Fibre_Blanket	Fibre_Board	Mullite	Al2O3_995	SS304
Nonlinear Effects	Yes								
Thermal Strain Effects	Yes								
Bounding Box									
Length X	3.175 mm			250. mm			100. mm	38.5 mm	63.5 mm
Length Y	3.175 mm			250. mm			100. mm	38.5 mm	63.5 mm
Length Z	29.24 mm	155.78 mm		49.96 mm	102.54 mm	25. mm	102.54 mm	92.8 mm	137.16 mm
Properties									
Volume	231.5 mm³	1233.4 mm³		2.4524e+006 mm³	4.2281e+006 mm³	1.1404e+006 mm³	1.5302e+005 mm³	26455 mm³	1.2788e+005 mm³
Mass	1.8289e-003 kg	9.7435e-003 kg	1.2605e-002 kg	0.63763 kg	0.54119 kg	0.29649 kg	0.42844 kg	0.10317 kg	1.0103 kg
Centroid X	-14.485 mm	6.2413 mm	-6.2413 mm	-2.9597e-015 mm	-9.1028e-008 mm	6.7836e-009 mm	8.5304e-005 mm	-9.4655e-003 mm	5.3919e-007 mm
Centroid Y	13.615 mm	6.2413 mm	-6.2413 mm	-1.3165e-014 mm	5.2106e-015 mm	-2.8344e-015 mm	-4.8193e-004 mm	-1.4912e-002 mm	-1.5003e-015 mm
Centroid Z	181.16 mm	117.89 mm		-27.52 mm	48.73 mm	112.5 mm	48.731 mm	45.385 mm	68.58 mm
Moment of Inertia Ip1	0.13106 kg·mm²	19.61 kg·mm²	25.369 kg·mm²	2620.9 kg·mm²	2924. kg·mm²	1254.4 kg·mm²	859.58 kg·mm²	99.659 kg·mm²	2016.7 kg·mm²
Moment of Inertia Ip2	0.13106 kg·mm²	19.61 kg·mm²	25.369 kg·mm²	2620.9 kg·mm²	2924. kg·mm²	1254.4 kg·mm²	859.58 kg·mm²	99.684 kg·mm²	2016.7 kg·mm²
Moment of Inertia Ip3	2.2908e-003 kg·mm²	1.2154e-002 kg·mm²	1.5723e-002 kg·mm²	4976.7 kg·mm²	4900. kg·mm²	2477.9 kg·mm²	968.52 kg·mm²	32.357 kg·mm²	867.28 kg·mm²
Statistics									
Nodes	497	2550	2566	138082	236130	67848	11938	53866	67870
Elements	1833	9803	9802	771429	1332526	361205	46365	243798	326821
Mesh Metric	None								
CAD Attributes									
PartTolerance:	0.00000001								
SCRootPartComponent									
Color:128.128.255									
Color:175.172.143									
Color:173.173.173									

TABLE 7
Model (A4, B4) > Materials

Object Name	*Materials*
State	Fully Defined
Statistics	
Materials	10

Material Assignments	0

Coordinate Systems

TABLE 8
Model (A4, B4) > Coordinate Systems > Coordinate System

Object Name	*Global Coordinate System*	*P_MELT*	*P_MELT_TOP*	*P_CRUC_OUT*	*P_FURN*	*P_GASKET*	*P_FLANGE_RIM*	*P_LID*	*P_FITTING*
State	Fully Defined								
Definition									
Type	Cartesian								
Coordinate System ID	0.								
Coordinate System		Program Controlled							
APDL Name									
Suppressed		No							
Origin									
Origin X	0. mm	5. mm	15. mm	19.25 mm	45. mm	36. mm	56.8 mm	0. mm	13.05 mm
Origin Y	0. mm								-13.94 mm
Origin Z	0. mm	40. mm		50. mm		147. mm		195.8 mm	213. mm
Define by		Global Coordinates							
Location		Defined							
Directional Vectors									
X Axis Data	[1. 0. 0.]								
Y Axis Data	[0. 1. 0.]								
Z Axis Data	[0. 0. 1.]								
Transfer Properties									
Source									
Read Only	No								
Principal Axis									
Axis		X							
Define by		Global X Axis							
Orientation About Principal Axis									
Axis		Y							
Define by		Default							
Transformations									
Base Configuration		Absolute							
Transformed Configuration		[5. 0. 40.]	[15. 0. 40.]	[19.25 0. 50.]	[45. 0. 50.]	[36. 0. 147.]	[56.8 0. 147.]	[0. 0. 195.8]	[13.05 -13.94 213.]

Connections

TABLE 9
Model (A4, B4) > Connections

Object Name	*Connections*
State	Fully Defined
Auto Detection	
Generate Automatic Connection On Refresh	Yes
Transparency	
Enabled	Yes
Statistics	
Contacts	24
Active Contacts	24
Joints	0
Active Joints	0
Beams	0
Active Beams	0
Bearings	0
Active Bearings	0
Springs	0
Active Springs	0
Body Interactions	0
Active Body Interactions	0

TABLE 10
Model (A4, B4) > Connections > Contacts

Object Name	*Contacts*
State	Fully Defined
Definition	
Connection Type	Contact
Scope	
Scoping Method	Geometry Selection
Geometry	All Bodies
Auto Detection	
Tolerance Type	Slider
Tolerance Slider	0.
Tolerance Value	1.1059 mm
Use Range	No
Face/Face	Yes
Face-Face Angle Tolerance	75. °
Face Overlap Tolerance	Off
Cylindrical Faces	Include
Face/Edge	No
Edge/Edge	No
Priority	Include All
Group By	Bodies
Search Across	Bodies
Statistics	
Connections	24
Active Connections	24

TABLE 11
Model (A4, B4) > Connections > Contacts > Contact Regions

Object Name	C_Gasket_lower	C_Gasket_upper	C_lower_upper	C_Baseplate_crucible	C_topbaseplate_tube	C_tube_upper	C_topbaseplate_thermofitting	C_topebaseplate_
State	Fully Defined							
Scope								
Scoping Method	Geometry Selection							
Contact	2 Faces			1 Face	2 Faces		27 Faces	
Target	2 Faces			1 Face	2 Faces	5 Faces	14 Faces	
Contact Bodies	SilverPlatedCopperGasket		f0450x250n_lower	BasePlateForBody	Top_Tube			
Target Bodies	f0450x250n_lower	f0450x250n_upper		Alumina_Crucible	BasePlateForTop	f0450x250n_upper	Thermocouple Tube Fitting	Gas Tube F
Protected	No							
Definition								
Type	Bonded							
Scope Mode	Automatic							
Behavior	Program Controlled							
Trim Contact	Program Controlled							
Trim Tolerance	1.1059 mm							
Contact APDL Name								
Target APDL Name								
Suppressed	No							
Display								
Element Normals	No							
Advanced								
Formulation	Augmented Lagrange							
Small Sliding	Program Controlled							
Detection Method	Program Controlled							
Elastic Slip Tolerance	Program Controlled							
Thermal Conductance	Manual				Program Controlled			
Thermal Conductance Value	1.e-002 W/mm²·°C		2.e-003 W/mm²·°C	3.e-004 W/mm²·°C				
Pinball Region	Program Controlled							
Geometric Modification								
Contact Geometry Correction	None							
Target Geometry Correction	None							

TABLE 12
Model (A4, B4) > Connections > Contacts > Contact Regions

Object Name	C_anode_anodefitting	C_cathode_cathodefitting	C_anode_melt	C_cathode_melt	C_heatertube_sideinsulation	Contact Region	Contact Region 2	Contact Region 6	C Re
State	Fully Defined								
Scope									
Scoping Method	Geometry Selection								
Contact	2 Faces				1 Face	5 Faces	1 Face		2
Target	1 Face		2 Faces		3 Faces	2 Faces			
Contact Bodies	Anode Tube Fitting	Cathode Tube Fitting	SYS\CaCl2_Melt		SYS\Side Insulation	f0450x250n_lower	BasePlateForBody	SYS\Flo	
Target Bodies	SYS\SS304 (Anode)	SYS\Mo (Cathode)	SYS\SS304 (Anode)	SYS\Mo (Cathode)	SYS\Heater Tube	Reactor_Body_New:1 \Body21	SYS\Floor	SYS\Side Insulation	SYS
Protected	No								
Definition									
Type	Bonded								
Scope Mode	Automatic								
Behavior	Program Controlled								
Trim Contact	Program Controlled								
Trim Tolerance	1.1059 mm								
Contact APDL Name									
Target APDL Name									
Suppressed	No								
Display									
Element Normals	No								
Advanced									
Formulation	Augmented Lagrange								
Small Sliding	Program Controlled								
Detection Method	Program Controlled								
Elastic Slip Tolerance	Program Controlled								
Thermal Conductance	Manual		Program Controlled		Manual	Program Controlled			
Thermal Conductance	5.e-004 W/mm²·°C				2.e-004 W/mm²·°C				

Value				
Pinball Region	Program Controlled			
Geometric Modification				
Contact Geometry Correction	None			
Target Geometry Correction	None			

TABLE 13
Model (A4, B4) > Connections > Contacts > Contact Regions

Object Name	*Contact Region 3*	*Contact Region 4*
State	Fully Defined	
Scope		
Scoping Method	Geometry Selection	
Contact	2 Faces	
Target	2 Faces	
Contact Bodies	BasePlateForBody	SYS\CaCl2_Melt
Target Bodies	Reactor_Body_New:1\Body21	Alumina_Crucible
Protected	No	
Definition		
Type	Bonded	
Scope Mode	Automatic	
Behavior	Program Controlled	
Trim Contact	Program Controlled	
Trim Tolerance	1.1059 mm	
Contact APDL Name		
Target APDL Name		
Suppressed	No	
Display		
Element Normals	No	
Advanced		
Formulation	Program Controlled	
Small Sliding	Program Controlled	
Detection Method	Program Controlled	
Elastic Slip Tolerance	Program Controlled	
Thermal Conductance	Program Controlled	
Pinball Region	Program Controlled	
Geometric Modification		
Contact Geometry Correction	None	
Target Geometry Correction	None	

Mesh

TABLE 14
Model (A4, B4) > Mesh

Object Name	*Mesh*
State	Solved
Display	
Display Style	Use Geometry Setting
Defaults	
Physics Preference	Mechanical
Element Order	Linear
Element Size	Default
Sizing	
Mesh Sizing	Adaptive
Resolution	3
Mesh Defeaturing	Yes
Defeature Size	Default
Transition	Fast
Span Angle Center	Coarse
Initial Size Seed	Assembly
Bounding Box Diagonal	442.38 mm
Average Surface Area	1645.4 mm²
Minimum Edge Length	7.4025e-002 mm
Quality	
Check Mesh Quality	Yes, Errors
Error Limits	Aggressive Mechanical
Target Element Quality	Default (0.1)
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
Inflation Element Type	Wedges
View Advanced Options	No
Advanced	
Number of CPUs for Parallel Part Meshing	Program Controlled
Straight Sided Elements	
Rigid Body Behavior	Dimensionally Reduced
Triangle Surface Mesher	Program Controlled
Topology Checking	Yes

Pinch Tolerance	Please Define
Generate Pinch on Refresh	No
Auto-Map Fillets	No
Automatic Methods	
Sheet Body Method	Prime Quad Dominant
Sweepable Body Method	Sweep
Statistics	
Nodes	829019
Elements	4172907
Show Detailed Statistics	No

TABLE 15
Model (A4, B4) > Mesh > Mesh Controls

Object Name	*Patch Conforming Method 5*	*Patch Conforming Method 2*	*Patch Conforming Method 4*	*MultiZone 2*	*Inflation*	*Patch Conforming Method 3*	*Body Sizing*	*Crucible Sizing*	*Rods and Tube Sizing*	*Upper Lower Sizing*	*Insulation Sizing*
State	Fully Defined										
Scope											
Scoping Method	Geometry Selection										
Geometry	5 Bodies	2 Bodies	1 Body			4 Bodies	1 Body		7 Bodies	2 Bodies	4 Bodies
Definition											
Suppressed	No										
Method	Tetrahedrons			MultiZone		Tetrahedrons					
Algorithm	Patch Conforming					Patch Conforming					
Element Order	Use Global Setting					Use Global Setting					
Decomposition Type				Program Controlled							
Mapped/Swept Type				Hexa							
Surface Mesh Method				Program Controlled							
Free Mesh Type				Not Allowed							
Src/Trg Selection				Automatic							
Src/Trg Scoping Method				Program Controlled							
Source(s) and Target(s)				Program Controlled							
Sweep Size Behavior				Sweep Element Size							
Sweep Element Size				Default							
Element Option				Solid							
Boundary Scoping Method					Geometry Selection						
Boundary					2 Faces						
Inflation Option					First Layer Thickness						
First Layer Height					0.3 mm						
Maximum Layers					3						
Growth Rate					1.2						
Inflation Algorithm					Pre						
Type							Element Size				
Element Size							0.6 mm	1.0 mm		1.5 mm	3.0 mm
Advanced Improve Options											
Aggressive Thin Face Collapse	Program Controlled					Program Controlled					
Automatic Node Movement	Program Controlled					Program Controlled					
Refinement Options											
Refine at Thin Section	No					No					
Advanced											
Preserve Boundaries				Protected							
Mesh Based Defeaturing				Off							
Minimum Edge Length				9.9746 mm							
Write ICEM CFD Files				No							
Use Split Angle				No							
Enable Smoothing				No							
Defeature Size							Default				
Behavior							Soft				

TABLE 16
Model (A4, B4) > Mesh > Mesh Controls

Object Name	*Reactor Sizing*	*Patch Conforming Method*
State	Fully Defined	
Scope		
Scoping Method	Geometry Selection	
Geometry	5 Bodies	7 Bodies
Definition		
Suppressed	No	
Type	Element Size	
Element Size	1.5 mm	
Method		Tetrahedrons
Algorithm		Patch Conforming
Element Order		Use Global Setting

Advanced		
Defeature Size	Default	
Behavior	Soft	
Advanced Improve Options		
Aggressive Thin Face Collapse		Program Controlled
Automatic Node Movement		Program Controlled
Refinement Options		
Refine at Thin Section		No

Named Selections

TABLE 17
Model (A4, B4) > Named Selections > Named Selections

Object Name	*NS_HEATER*	*NS_SHELL_SIDE*	*NS_SHELL_TOP*	*NS_SHELL_BOTTOM*	*NS_MELT*	*NS_COIL_C*	*NS_COIL_B*	*NS_ENC_FURNACE*	*NS_ENC_RETORT*	*NS_COLUM*
State	Fully Defined									
Scope										
Scoping Method	Geometry Selection							Worksheet		
Geometry	1 Face	3 Faces	1 Face		1 Body	2 Faces		6 Faces	19 Faces	314 Fa
Definition										
Send to Solver	Yes									
Protected	Program Controlled									
Visible	Yes									
Program Controlled Inflation	Exclude									
Statistics										
Type	Manual									
Total Selection	1 Face	3 Faces	1 Face		1 Body	2 Faces		6 Faces	19 Faces	314 Fa
Surface Area	29841 mm²	1.3939e+005 mm²	45597 mm²	49064 mm²		5483. mm²		65725 mm²	55472 mm²	53230
Suppressed	0									
Used by Mesh Worksheet	No									
Tolerance										
Tolerance Type								Program Controlled		
Zero Tolerance								1.e-008		
Relative Tolerance								1.e-003		
Angular Tolerance								1. °		

Steady-State Thermal (A5)

TABLE 18
Model (A4, B4) > Analysis

Object Name	*Steady-State Thermal (A5)*
State	Solved
Definition	
Physics Type	Thermal
Analysis Type	Steady-State
Solver Target	Mechanical APDL
Options	
Generate Input Only	No

TABLE 19
Model (A4, B4) > Steady-State Thermal (A5) > Initial Condition

Object Name	*Initial Temperature*
State	Fully Defined
Definition	
Initial Temperature	Uniform Temperature
Initial Temperature Value	22. °C

TABLE 20
Model (A4, B4) > Steady-State Thermal (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
Maximum Iterations Per Substep	Program Controlled
Solver Controls	
Solver Type	Program Controlled
Solver Pivot Checking	Program Controlled
Radiosity Controls	
Radiosity Solver	Iterative Gauss-Seidel
Flux Convergence	1.e-004
Maximum Iteration	1000.
Solver Tolerance	1.e-007 W/mm²
Over Relaxation	0.1
Hemicube Resolution	10.

Nonlinear Controls	
Heat Convergence	On
--Value	Calculated by solver
--Tolerance	0.5%
--Minimum Reference	1.e-006 W
Temperature Convergence	On
--Value	Calculated by solver
--Tolerance	0.5%
--Minimum Reference	0. °C
Line Search	On
Advanced	
Contact Split (DMP)	Program Controlled
Output Controls	
Output Selection	None
Calculate Thermal Flux	Yes
Contact Data	Yes
Nodal Forces	No
Volume and Energy	Yes
Euler Angles	Yes
General Miscellaneous	No
Contact Miscellaneous	No
Store Results At	All Time Points
Result File Options	
Result File Compression	Program Controlled
Analysis Data Management	
Solver Files Directory	P:\Ansys_Sims\v0_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	Yes
Solver Units	Active System
Solver Unit System	nmm

TABLE 21
Model (A4, B4) > Steady-State Thermal (A5) > Loads

Object Name	*Temperature Heater*	*Convection Side Shell*	*Convection Top Shell*	*Convection Bottom Shell*	*Convection Coloumn Exit*	*Radiation tA Side Shell*	*Radiation tA Top Shell*	*Radiation tA Coloumn Exit*	*Radiation StS Er Furnace*
State	Fully Defined								
Scope									
Scoping Method	Named Selection								
Named Selection	NS_HEATER	NS_SHELL_SIDE	NS_SHELL_TOP	NS_SHELL_BOTTOM	NS_COLUMN_EXT	NS_SHELL_SIDE	NS_SHELL_TOP	NS_COLUMN_EXT	NS_ENC_FURNA
Definition									
Type	Temperature	Convection				Radiation			
Magnitude	975. °C (ramped)								
Suppressed	No								
Film Coefficient		7.e-006 W/mm²·°C (step applied)	8.e-006 W/mm²·°C (step applied)	2.e-006 W/mm²·°C (step applied)	1.e-005 W/mm²·°C (step applied)				
Ambient Temperature		22. °C (ramped)							
Convection Matrix		Program Controlled							
Element APDL Name									
Correlation						To Ambient			Surfac
Emissivity						0.85 (step applied)	0.8 (step applied)	0.6 (step applied)	0.8 (step applie
Enclosure									1.
Enclosure Type									Perfect

FIGURE 1
Model (A4, B4) > Steady-State Thermal (A5) > Temperature Heater

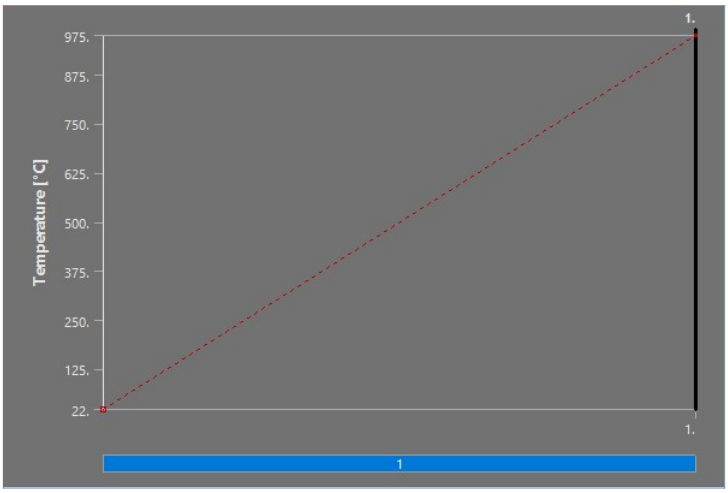


FIGURE 2
Model (A4, B4) > Steady-State Thermal (A5) > Convection Side Shell

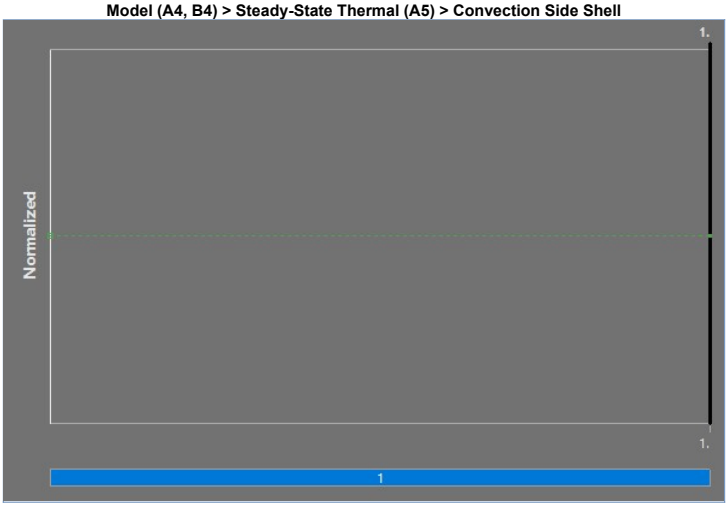


TABLE 22
Model (A4, B4) > Steady-State Thermal (A5) > Convection Side Shell

Steps	Time [s]	Convection Coefficient [W/mm²·°C]	Temperature [°C]
1	0.	= 7.e-006	= 22.
	1.	7.e-006	22.

FIGURE 3
Model (A4, B4) > Steady-State Thermal (A5) > Convection Top Shell

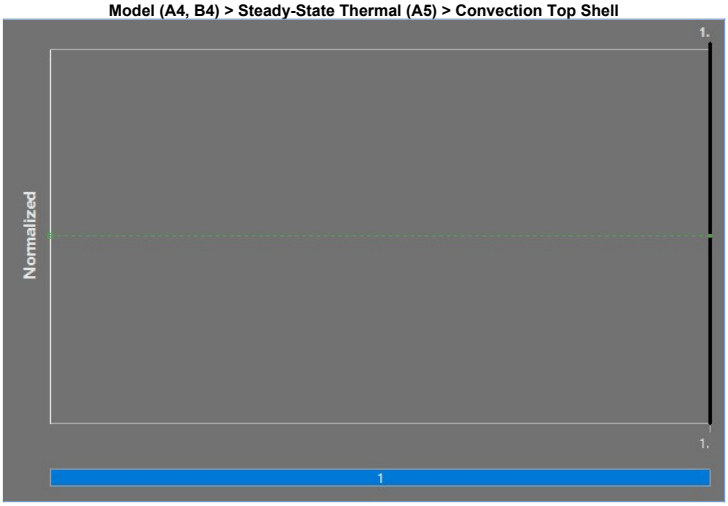


TABLE 23
Model (A4, B4) > Steady-State Thermal (A5) > Convection Top Shell

Steps	Time [s]	Convection Coefficient [W/mm²·°C]	Temperature [°C]
1	0.	= 8.e-006	= 22.
	1.	8.e-006	22.

FIGURE 4
Model (A4, B4) > Steady-State Thermal (A5) > Convection Bottom Shell

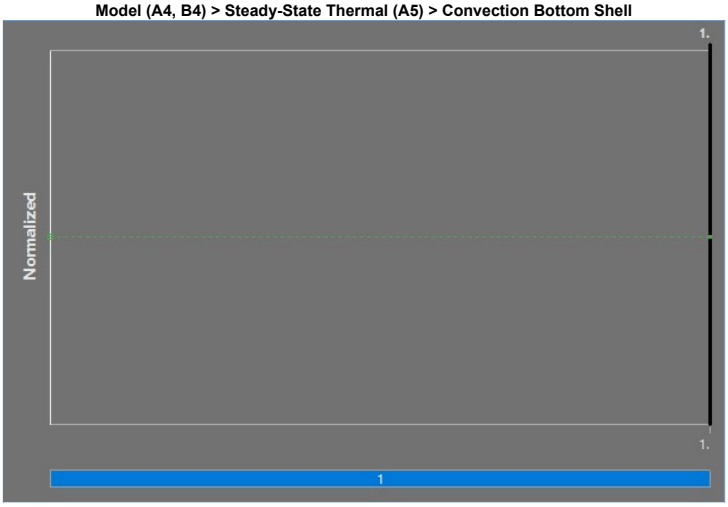


TABLE 24
Model (A4, B4) > Steady-State Thermal (A5) > Convection Bottom Shell

Steps	Time [s]	Convection Coefficient [W/mm²·°C]	Temperature [°C]
1	0.	= 2.e-006	= 22.
	1.	2.e-006	22.

FIGURE 5
Model (A4, B4) > Steady-State Thermal (A5) > Convection Coloumn Exit

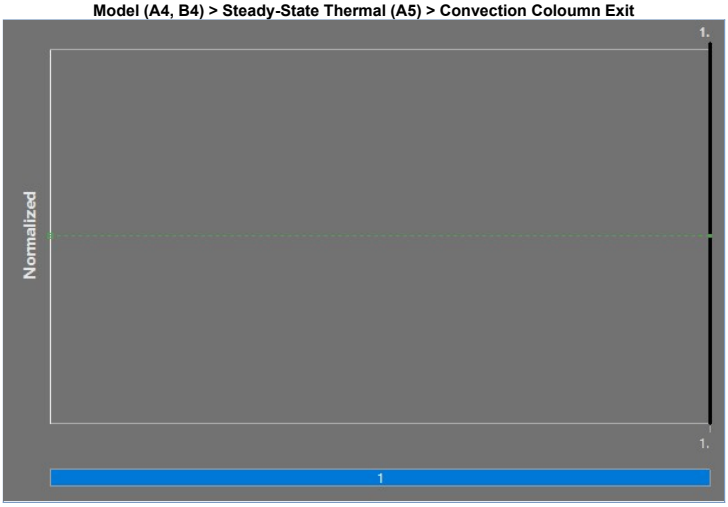


TABLE 25
Model (A4, B4) > Steady-State Thermal (A5) > Convection Coloumn Exit

Steps	Time [s]	Convection Coefficient [W/mm²·°C]	Temperature [°C]
1	0.	= 1.e-005	= 22.
	1.	1.e-005	22.

FIGURE 6
Model (A4, B4) > Steady-State Thermal (A5) > Radiation tA Side Shell

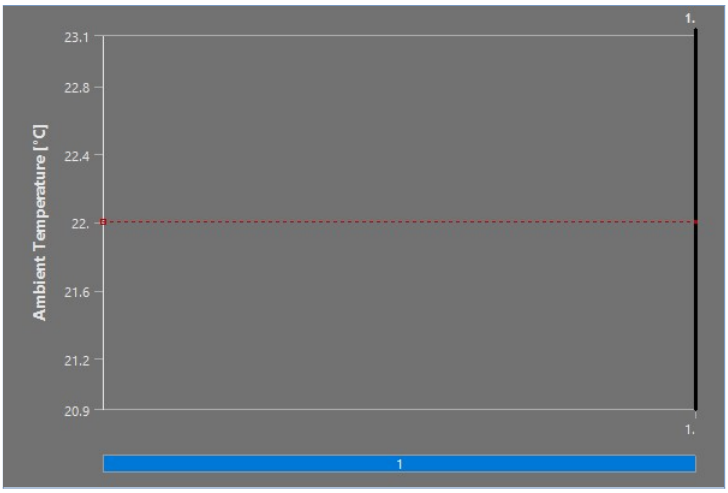


FIGURE 7
Model (A4, B4) > Steady-State Thermal (A5) > Radiation tA Top Shell

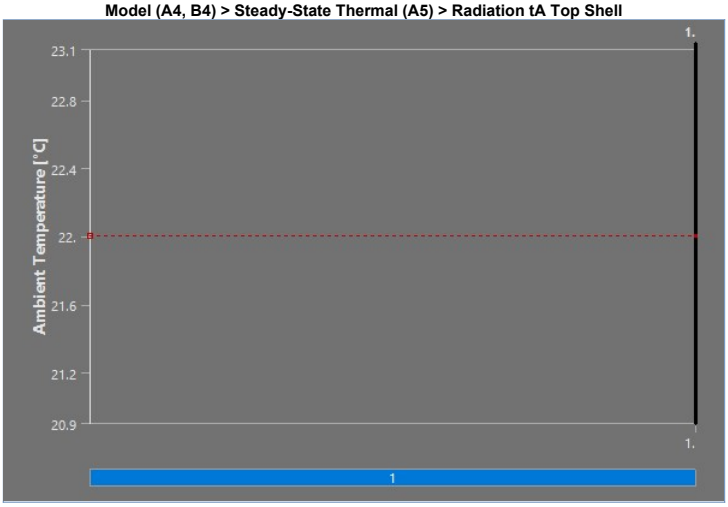


FIGURE 8
Model (A4, B4) > Steady-State Thermal (A5) > Radiation tA Coloumn Exit

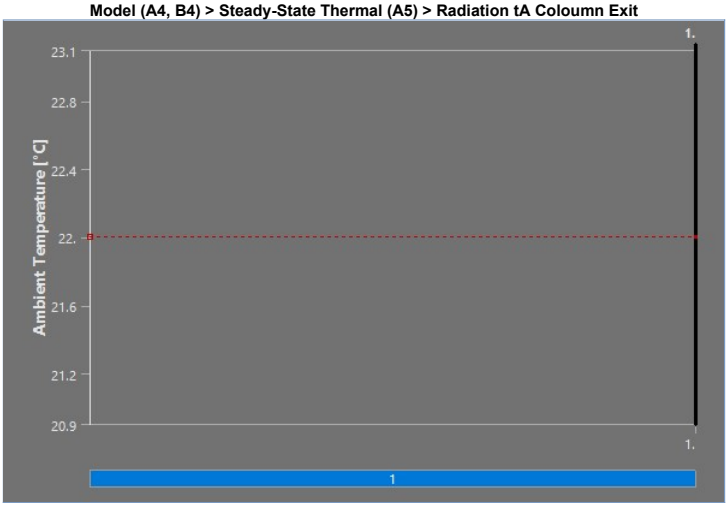


FIGURE 9
Model (A4, B4) > Steady-State Thermal (A5) > Radiation StS Enc Furnace

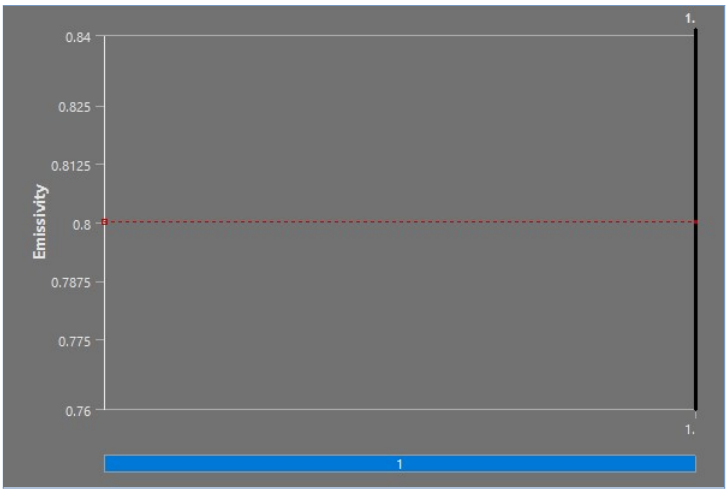


FIGURE 10
Model (A4, B4) > Steady-State Thermal (A5) > Radiation StS Enc Retort

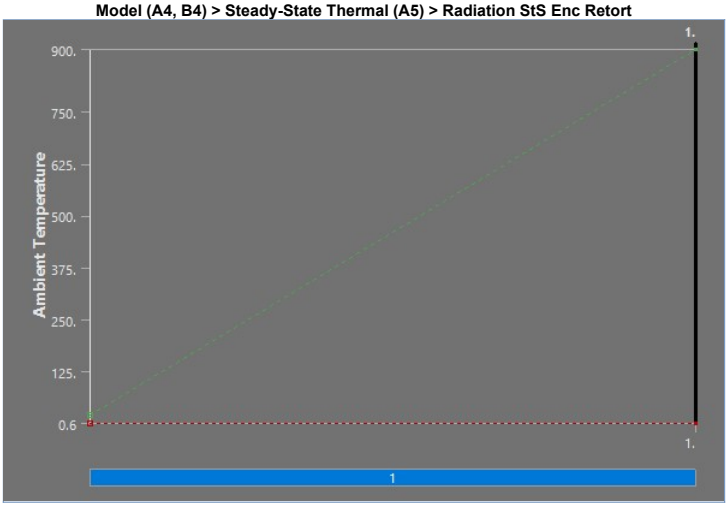
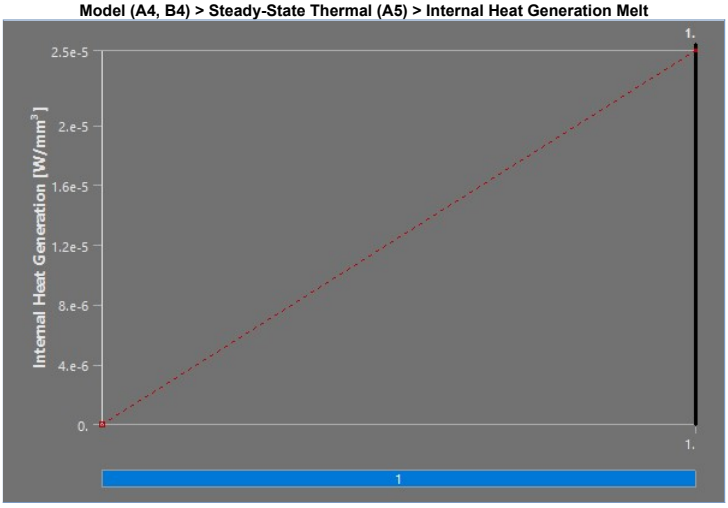


FIGURE 11
Model (A4, B4) > Steady-State Thermal (A5) > Internal Heat Generation Melt



Solution (A6)

TABLE 26
Model (A4, B4) > Steady-State Thermal (A5) > Solution

Object Name	*Solution (A6)*
State	Obsolete
Adaptive Mesh Refinement	
Max Refinement Loops	1.
Refinement Depth	2.
Information	
Status	Post-processing Required

MAPDL Elapsed Time	1 h 28 m
MAPDL Memory Used	22. GB
MAPDL Result File Size	1.5825 GB
Post Processing	
Beam Section Results	No
On Demand Stress/Strain	No

TABLE 27
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Solution Information

Object Name	*Solution Information*
State	Solved
Solution Information	
Solution Output	Solver Output
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 28
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Probes

Object Name	*Melt Probe*	*Melt Top*	*Crucible Out*	*Furnace*	*Gasket*	*Flange Rim*	*Lid*	*Fitting*	*Heater Temperature Rxn Probe*	*Reaction Probe Side Shell*	*Reaction Probe Top Shell*
State	Solved	Obsolete	Solved			Not Solved	Solved	Not Solved	Solved		
Definition											
Type	Temperature	Temperature	Temperature			Temperature	Temperature	Temperature	Reaction		
Location Method	Coordinate System	Coordinate System	Coordinate System			Coordinate System	Coordinate System	Coordinate System	Boundary Condition		
Location	P_MELT	P_MELT_TOP	P_CRUC_OUT	P_FURN	P_GASKET	P_FLANGE_RIM	P_LID	P_FITTING			
X Coordinate	5. mm	15. mm	19.25 mm	45. mm	36. mm	56.8 mm	0. mm	13.05 mm			
Y Coordinate	0. mm	0. mm	0. mm			0. mm	0. mm	-13.94 mm			
Z Coordinate	40. mm	40. mm	50. mm		147. mm	147. mm	195.8 mm	213. mm			
Suppressed	No	No	No			No	No	No	No		
Boundary Condition									Temperature Heater	Radiation tA Side Shell	Radiation tA Top Shell
Options											
Display Time	End Time	1. s	End Time			End Time	End Time	End Time	End Time		
Results											
Temperature	875.73 °C	875.54 °C	865.95 °C	954.75 °C	369.3 °C		335.86 °C				
Heat									623.88 W	-39.111 W	-29.929 W
Maximum Value Over Time											
Temperature	875.73 °C	875.54 °C	865.95 °C	954.75 °C	369.3 °C		335.86 °C				
Heat									623.88 W	-39.111 W	-29.929 W
Minimum Value Over Time											
Temperature	875.73 °C	875.54 °C	865.95 °C	954.75 °C	369.3 °C		335.86 °C				
Heat									623.88 W	-39.111 W	-29.929 W
Information											
Time	1. s	1. s	1. s				1. s		1. s		
Load Step	1	1	1			0	1	0	1		
Substep	1	1	1			0	1	0	1		
Iteration Number	10	10	10				10		10		

FIGURE 12
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Melt Probe

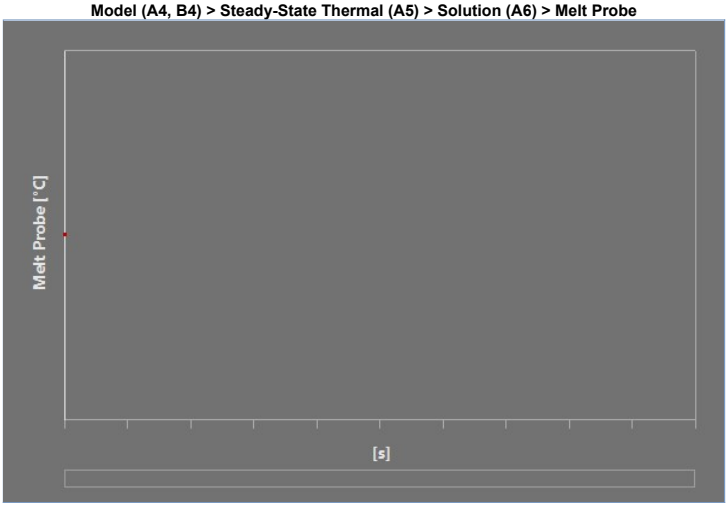


TABLE 29

Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Melt Probe

Time [s]	Melt Probe [°C]
1.	875.73

FIGURE 13
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Melt Top

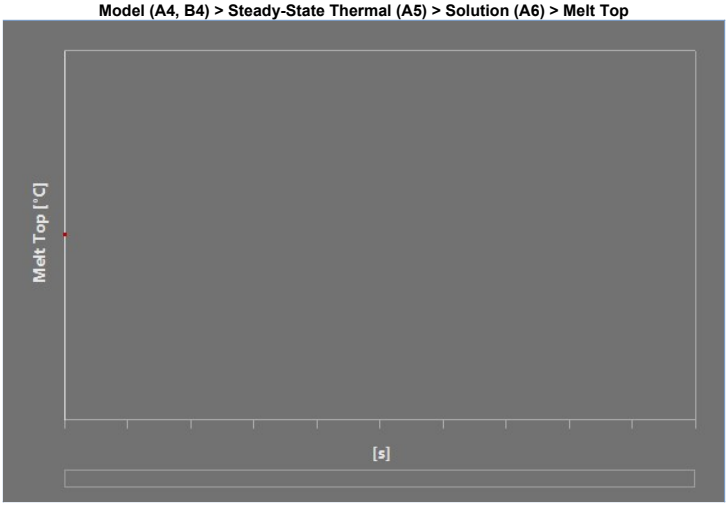


TABLE 30
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Melt Top

Time [s]	Melt Top [°C]
1.	875.54

FIGURE 14
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Crucible Out

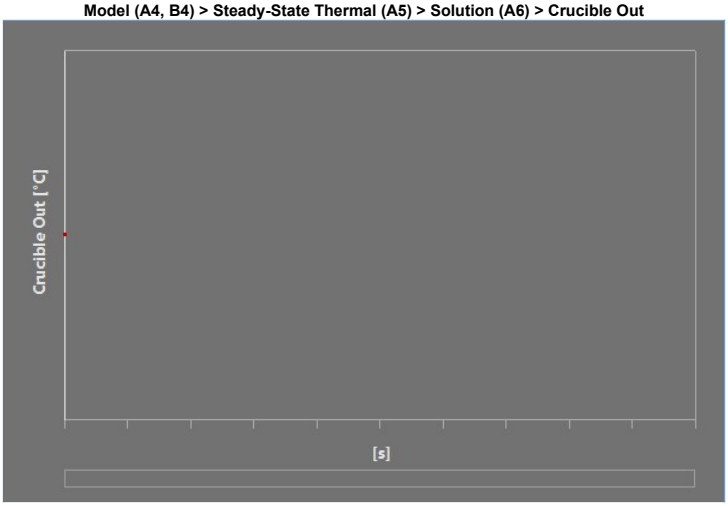


TABLE 31
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Crucible Out

Time [s]	Crucible Out [°C]
1.	865.95

FIGURE 15
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Furnace

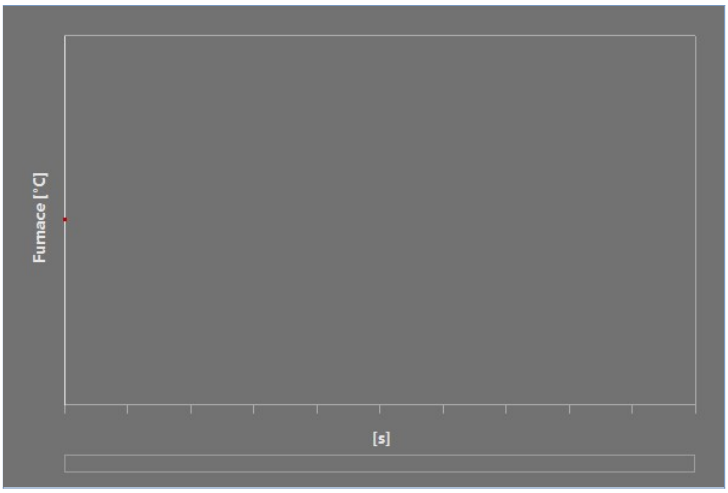


TABLE 32
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Furnace

Time [s]	Furnace [°C]
1.	954.75

FIGURE 16
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Gasket

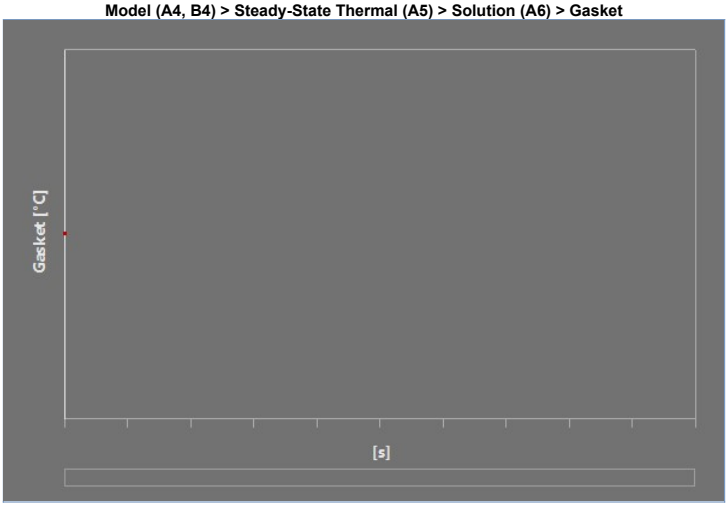


TABLE 33
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Gasket

Time [s]	Gasket [°C]
1.	369.3

FIGURE 17
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Lid

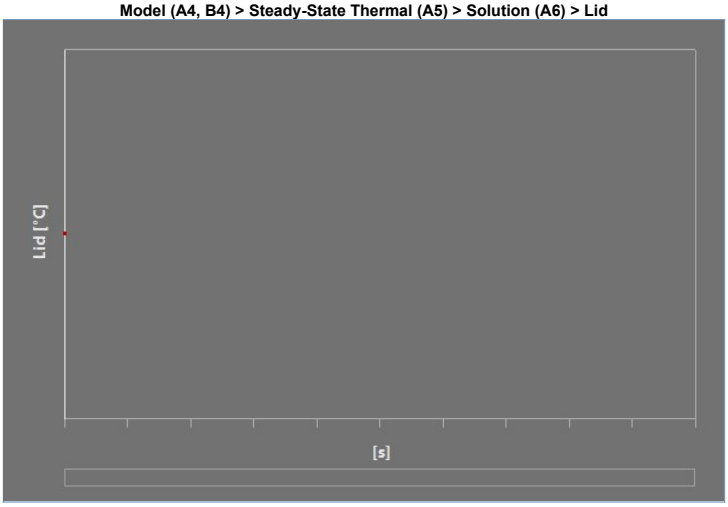


TABLE 34

Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Lid

Time [s]	Lid [°C]
1.	335.86

FIGURE 18
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Heater Temperature Rxn Probe

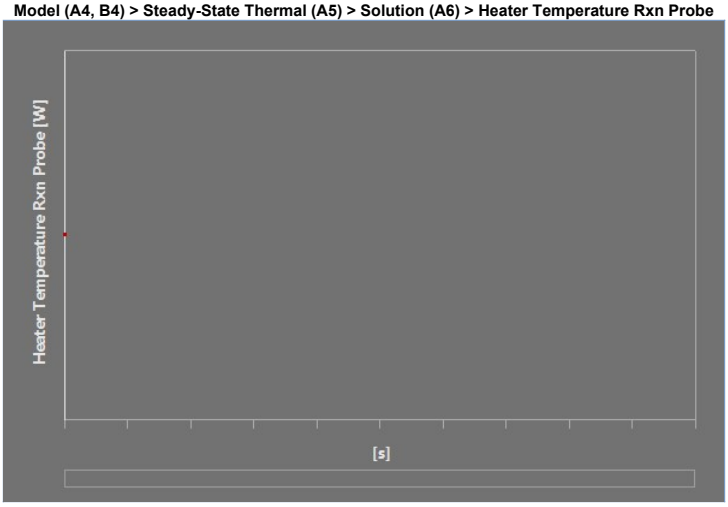


TABLE 35
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Heater Temperature Rxn Probe

Time [s]	Heater Temperature Rxn Probe [W]
1.	623.88

FIGURE 19
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Reaction Probe Side Shell

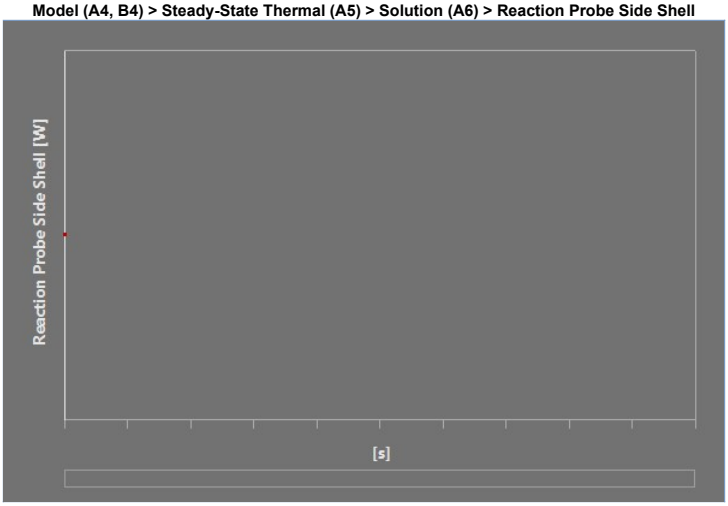


TABLE 36
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Reaction Probe Side Shell

Time [s]	Reaction Probe Side Shell [W]
1.	-39.111

FIGURE 20
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Reaction Probe Top Shell

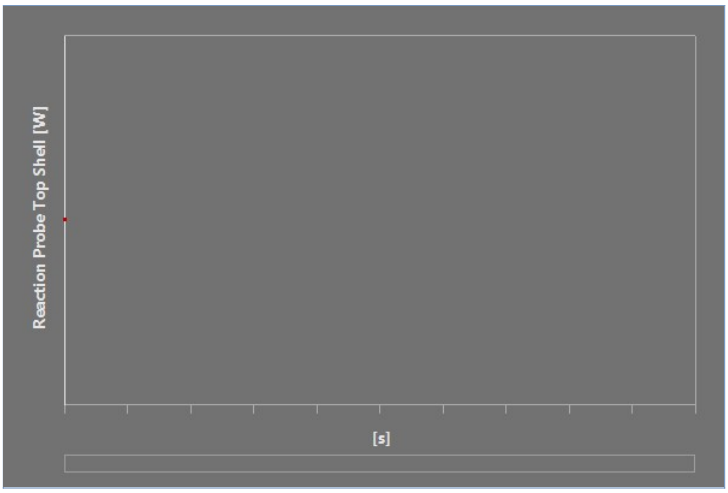


TABLE 37
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Reaction Probe Top Shell

Time [s]	Reaction Probe Top Shell [W]
1.	-29.929

TABLE 38
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Probes

Object Name	*Reaction Probe Column Exit*
State	Solved
Definition	
Type	Reaction
Location Method	Boundary Condition
Boundary Condition	Radiation tA Coloumn Exit
Suppressed	No
Options	
Display Time	End Time
Results	
Heat	-285.4 W
Maximum Value Over Time	
Heat	-285.4 W
Minimum Value Over Time	
Heat	-285.4 W
Information	
Time	1. s
Load Step	1
Substep	1
Iteration Number	10

FIGURE 21
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Reaction Probe Column Exit

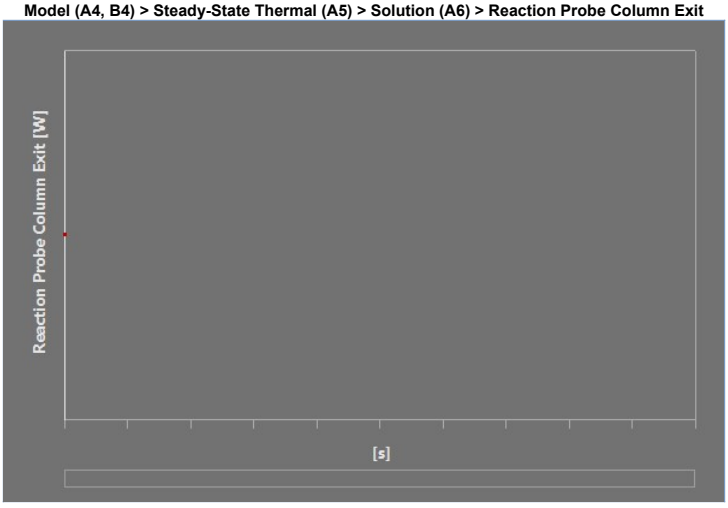


TABLE 39
Model (A4, B4) > Steady-State Thermal (A5) > Solution (A6) > Reaction Probe Column Exit

Time [s]	Reaction Probe Column Exit [W]
1.	-285.4

Transient Thermal (B5)

TABLE 40
Model (A4, B4) > Analysis

Object Name	*Transient Thermal (B5)*
State	Underdefined
Definition	
Physics Type	Thermal
Analysis Type	Transient
Solver Target	Mechanical APDL
Options	
Generate Input Only	No

TABLE 41
Model (A4, B4) > Transient Thermal (B5) > Initial Condition

Object Name	*Initial Temperature*
State	Fully Defined
Definition	
Initial Temperature	Uniform Temperature
Initial Temperature Value	22. °C

TABLE 42
Model (A4, B4) > Transient Thermal (B5) > 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
Initial Time Step	1.e-002 s
Minimum Time Step	1.e-003 s
Maximum Time Step	0.1 s
Maximum Iterations Per Substep	Program Controlled
Time Integration	On
Solver Controls	
Solver Type	Program Controlled
Radiosity Controls	
Radiosity Solver	Program Controlled
Flux Convergence	1.e-004
Maximum Iteration	1000.
Solver Tolerance	1.e-007 W/mm²
Over Relaxation	0.1
Hemicube Resolution	10.
Nonlinear Controls	
Heat Convergence	Program Controlled
Temperature Convergence	Program Controlled
Line Search	Program Controlled
Nonlinear Formulation	Program Controlled
Advanced	
Contact Split (DMP)	Program Controlled
Output Controls	
Output Selection	None
Calculate Thermal Flux	Yes
Contact Data	Yes
Nodal Forces	No
Volume and Energy	Yes
Euler Angles	Yes
General Miscellaneous	No
Contact Miscellaneous	No
Store Results At	All Time Points
Result File Options	
Result File Compression	Program Controlled
Analysis Data Management	
Solver Files Directory	P:\Ansys_Sims\v0_files\dp0\SYS-1\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

Solution (B6)

TABLE 43
Model (A4, B4) > Transient Thermal (B5) > Solution

Object Name	*Solution (B6)*
State	Underdefined
Adaptive Mesh Refinement	
Max Refinement Loops	1.
Refinement Depth	2.
Information	
Status	Solve Required
MAPDL Elapsed Time	
MAPDL Memory Used	
MAPDL Result File Size	
Post Processing	
Beam Section Results	No

TABLE 44

Model (A4, B4) > Transient Thermal (B5) > Solution (B6) > Solution Information

Object Name	*Solution Information*
State	Not Solved
Solution Information	
Solution Output	Solver Output
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 45
Model (A4, B4) > Transient Thermal (B5) > Solution (B6) > Solution Information > Result Charts

Object Name	*Temperature - Global Maximum*	*Temperature - Global Minimum*
State	Not Solved	
Scope		
Scoping Method	Global Maximum	Global Minimum
Definition		
Type	Temperature	
Suppressed	No	
Results		
Minimum		
Maximum		

Material Data

Cu_OFHC

TABLE 46
Cu_OFHC > Constants

Density	8.94e-006 kg mm^-3

TABLE 47
Cu_OFHC > Color

Red	Green	Blue
182	229	228

TABLE 48
Cu_OFHC > Isotropic Thermal Conductivity

Thermal Conductivity W mm^-1 K^-1	Temperature K
0.39	293.15
0.385	473.15
0.378	673.15
0.37	873.15
0.36	1073.2
0.35	1273.2

TABLE 49
Cu_OFHC > Specific Heat Constant Pressure

Specific Heat mJ kg^-1 K^-1	Temperature K
3.85e+005	293.15
4.e+005	473.15
4.1e+005	673.15
4.2e+005	873.15
4.3e+005	1073.2
4.4e+005	1273.2

SS304

TABLE 50
SS304 > Constants

Density	7.9e-006 kg mm^-3

TABLE 51
SS304 > Color

Red	Green	Blue
234	247	209

TABLE 52
SS304 > Isotropic Thermal Conductivity

Thermal Conductivity W mm^-1 K^-1	Temperature K
1.49e-002	293.15
1.75e-002	473.15
2.03e-002	673.15
2.28e-002	873.15
2.53e-002	1073.2
2.75e-002	1273.2

TABLE 53
SS304 > Specific Heat Constant Pressure

Specific Heat mJ kg^-1 K^-1	Temperature K
4.77e+005	293.15
5.15e+005	473.15

5.5e+005	673.15
5.8e+005	873.15
6.1e+005	1073.2
6.4e+005	1273.2

Al2O3_995

TABLE 54
Al2O3_995 > Constants

Density	3.9e-006 kg mm^-3

TABLE 55
Al2O3_995 > Color

Red	Green	Blue
235	222	222

TABLE 56
Al2O3_995 > Isotropic Thermal Conductivity

Thermal Conductivity W mm^-1 K^-1	Temperature K
1.49e-002	293.15
1.75e-002	473.15
2.03e-002	673.15
2.28e-002	873.15
2.53e-002	1073.2
2.75e-002	1273.2

TABLE 57
Al2O3_995 > Specific Heat Constant Pressure

Specific Heat mJ kg^-1 K^-1	Temperature K
7.75e+005	293.15
9.8e+005	473.15
1.08e+006	673.15
1.14e+006	873.15
1.18e+006	1073.2
1.205e+006	1273.2

SS316

TABLE 58
SS316 > Constants

Density	7.95e-006 kg mm^-3

TABLE 59
SS316 > Color

Red	Green	Blue
155	244	255

TABLE 60
SS316 > Isotropic Thermal Conductivity

Thermal Conductivity W mm^-1 K^-1	Temperature K
1.4e-002	293.15
1.63e-002	473.15
1.9e-002	673.15
2.15e-002	873.15
2.4e-002	1073.2
2.65e-002	1273.2

TABLE 61
SS316 > Specific Heat Constant Pressure

Specific Heat mJ kg^-1 K^-1	Temperature K
4.68e+005	293.15
5.1e+005	473.15
5.45e+005	673.15
5.75e+005	873.15
6.05e+005	1073.2
6.35e+005	1273.2

CaCl2

TABLE 62
CaCl2 > Constants

Specific Heat	7.3e+005 mJ kg^-1 K^-1
Density	2.1e-006 kg mm^-3

TABLE 63
CaCl2 > Color

Red	Green	Blue
103	192	205

TABLE 64
CaCl2 > Isotropic Thermal Conductivity

Thermal Conductivity W mm^-1 K^-1	Temperature K
1.e-003	293.15
1.e-003	1038.2
1.5e-003	1048.2
1.5e-003	1373.2

TABLE 65
CaCl2 > Enthalpy

Enthalpy mJ mm^-3	Temperature K
30.66	293.15
286.46	473.15
585.86	673.15
900.86	873.15
1172.9	1038.2
1712.6	1048.2
1760.9	1073.2
1954.7	1173.2
2051.7	1223.2
2148.6	1273.2
2342.4	1373.2

Mo

TABLE 66
Mo > Constants

Density	1.022e-005 kg mm^-3

TABLE 67
Mo > Color

Red	Green	Blue
170	170	170

TABLE 68
Mo > Isotropic Thermal Conductivity

Thermal Conductivity W mm^-1 K^-1	Temperature K
0.138	293.15
0.132	473.15
0.127	673.15
0.122	873.15
0.117	1073.2
0.112	1273.2

TABLE 69
Mo > Specific Heat Constant Pressure

Specific Heat mJ kg^-1 K^-1	Temperature K
2.5e+005	293.15
2.62e+005	473.15
2.72e+005	673.15
2.82e+005	873.15
2.92e+005	1073.2
3.02e+005	1273.2

Fibre_Board

TABLE 70
Fibre_Board > Constants

Density	2.6e-007 kg mm^-3

TABLE 71
Fibre_Board > Color

Red	Green	Blue
109	157	209

TABLE 72
Fibre_Board > Isotropic Thermal Conductivity

Thermal Conductivity W mm^-1 K^-1	Temperature K
5.5e-005	293.15
7.e-005	473.15
9.e-005	673.15
1.2e-004	873.15
1.5e-004	1073.2
1.9e-004	1273.2

TABLE 73
Fibre_Board > Specific Heat Constant Pressure

Specific Heat mJ kg^-1 K^-1	Temperature K
1.07e+006	293.15
1.07e+006	473.15
1.07e+006	673.15
1.07e+006	873.15
1.07e+006	1073.2
1.07e+006	1273.2

Fibre_Blanket

TABLE 74
Fibre_Blanket > Constants

Density	1.28e-007 kg mm^-3

TABLE 75
Fibre_Blanket > Color

Red	Green	Blue
130	181	143

TABLE 76
Fibre_Blanket > Isotropic Thermal Conductivity

Thermal Conductivity W mm^-1 K^-1	Temperature K
4.e-005	293.15
6.e-005	473.15
9.e-005	673.15
1.3e-004	873.15
1.8e-004	1073.2
2.5e-004	1273.2

TABLE 77
Fibre_Blanket > Specific Heat Constant Pressure

Specific Heat mJ kg^-1 K^-1	Temperature K
1.07e+006	293.15
1.07e+006	473.15
1.07e+006	673.15
1.07e+006	873.15
1.07e+006	1073.2
1.07e+006	1273.2

Mullite

TABLE 78
Mullite > Constants

Density	2.8e-006 kg mm^-3

TABLE 79
Mullite > Color

Red	Green	Blue
181	155	130

TABLE 80
Mullite > Isotropic Thermal Conductivity

Thermal Conductivity W mm^-1 K^-1	Temperature K
5.e-003	293.15
4.6e-003	473.15
4.2e-003	673.15
3.9e-003	873.15
3.7e-003	1073.2
3.5e-003	1273.2

TABLE 81
Mullite > Specific Heat Constant Pressure

Specific Heat mJ kg^-1 K^-1	Temperature K
7.6e+005	293.15
9.5e+005	473.15
1.05e+006	673.15
1.11e+006	873.15
1.14e+006	1073.2
1.16e+006	1273.2