

### **3.5.2.2 Thermal Evaluation Results – Model AOS-050A**

This appendix presents the following information, specific to the Model AOS-050A transport package:

- Normal Conditions of Transport Thermal Evaluation Results – Model AOS-050A
- Fire Condition Thermal Evaluation Results – Model AOS-050A

Table 3-32 lists the temperature monitoring points (nodes) for the Model AOS-050A transport package, under Normal conditions of transport and the Fire condition.

**Table 3-32. Temperature Monitoring Points, by Condition – Model AOS-050A**

Nodal Location	LIBRA Model Nodal Number, by Condition	
	Normal Conditions of Transport	Fire Condition
1	5001	5001
2	4532	4532
3	4227	4227
4	4752	4752
5	4838	4838
6	4993	4993
7	3309	3309
8	3351	3351
9	678	678
10	2537	2537
11	2533	2533
12	4828	4828
13	1888	1888
14	583	583
15	579	579
16	4313	4313
17	3148	3148
18	3001	3001
19	7533	7533
20	7377	7377
21	7371	7371
22	6942	6942
23	6267	6267
24	6121	6121
25	6001	6001
26	9501	15481
27	9950	15941
28	10014	16260
29	11016	17311
30	9428	11965
31	8463	9785
32	8462	9571
33	8197	8197
34	9711	15451
35	9821	16160

**Table 3-32. Temperature Monitoring Points, by Condition – Model AOS-050A (Continued)**

Nodal Location	LIBRA Model Nodal Number, by Condition	
	Normal Conditions of Transport	Fire Condition
36	10158	17790
37	10792	18750
38	9204	11485
39	8578	9900
40	8225	8673
41	8001	8225

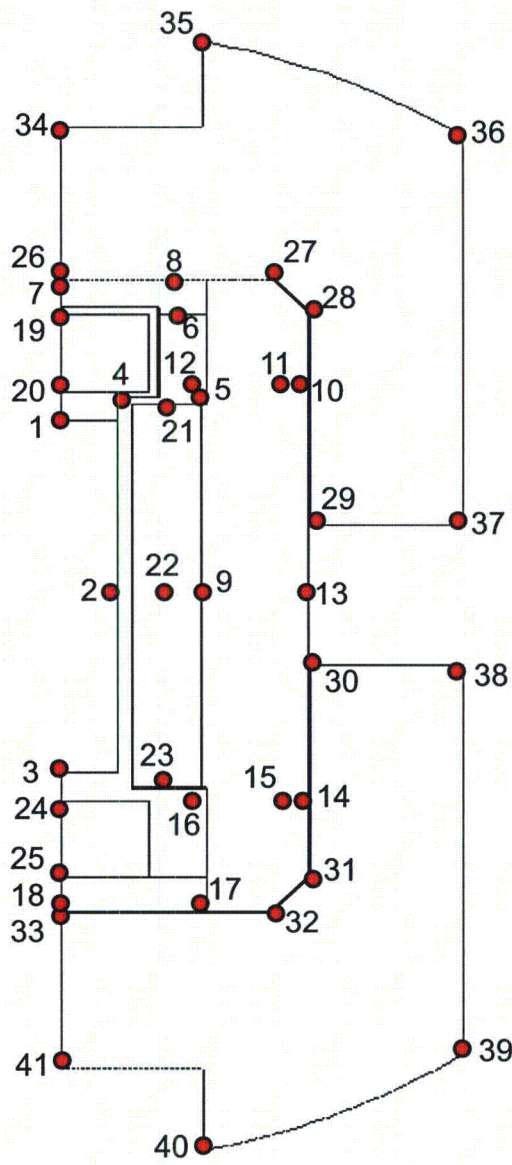
### 3.5.2.2.1 Normal Conditions of Transport Thermal Evaluation Results – Model AOS-050A

Table 3-33 lists the tables and figures in this appendix that present the Model AOS-050A transport package results under Normal conditions of transport, for Load Cases 101 through 106. Each table provides a list of temperatures at each monitoring node. The tables for Load Cases 101, 102, 105, and 106 also include a list of maximum temperatures within each transport package component.

Figure 3-33 illustrates the location of each node on the transport package, under Normal conditions of transport. (The node locations are listed in Table 3-32.)

**Table 3-33. Normal Conditions of Transport Thermal Evaluation Results – Model AOS-050A**

Load Case	Description	Results Table	Entire Model	Cask Model
101	100°F Ambient, Maximum Decay Heat	Table 3-34	Figure 3-34	Figure 3-35
102	100°F Ambient, Maximum Decay Heat, Maximum Insolation	Table 3-35	Figure 3-36	Figure 3-37
103	-20°F Ambient, Zero Decay Heat, Zero Insolation	Table 3-36	Figure 3-38	–
104	-40°F Ambient, Zero Decay Heat, Zero Insolation	Table 3-37	Figure 3-39	–
105	-40°F Ambient, Maximum Decay Heat	Table 3-38	Figure 3-40	Figure 3-41
106	-20°F Ambient, Maximum Decay Heat	Table 3-39	Figure 3-42	Figure 3-43



**Figure 3-33. Selected Nodal Locations for Normal Conditions of Transport – Model AOS-050A**

**Table 3-34. Load Case 101, 100°F Ambient, Maximum Decay Heat – Model AOS-050A**

Location	Node	Temp (C)	Temp (F)
1	5001	109.22	228.60
2	4532	104.78	220.60
3	4227	107.22	225.00
4	4752	104.56	220.20
5	4838	101.89	215.40
6	4993	101.83	215.30
7	3309	101.83	215.30
8	3351	101.72	215.10
9	678	101.94	215.50
10	2537	101.11	214.00
11	2533	101.17	214.10
12	4828	101.94	215.50
13	1888	99.72	211.50
14	583	101.17	214.10
15	579	101.22	214.20
16	4313	102.72	216.90
17	3148	101.50	214.70
18	3001	101.56	214.80
19	7533	102.89	217.20
20	7377	103.00	217.40
21	7371	102.50	216.50
22	6942	102.56	216.60
23	6267	102.61	216.70
24	6121	102.78	217.00
25	6001	102.78	217.00
26	9501	100.83	213.50
27	9950	100.22	212.40
28	10014	100.00	212.00
29	11016	82.94	181.30
30	9428	78.17	172.70
31	8463	100.00	212.00
32	8462	100.33	212.60
33	8197	100.72	213.30
34	9711	40.11	104.20
35	9821	38.78	101.80
36	10158	38.72	101.70
37	10792	45.00	113.00
38	9204	43.89	111.00
39	8578	41.39	106.50
40	8225	49.11	120.40
41	8001	53.61	128.50

Maximum Component Temperatures

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Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	----	-----	-----
Cask Outer Shell	101	2894	614	1.0211E+02	2.1580E+02
Bottom Plate	3001	3232	3120	1.0161E+02	2.1490E+02
Cask Lid	3233	3424	3233	1.0194E+02	2.1550E+02
Shell Cavity	4001	4998	4227	1.0722E+02	2.2500E+02
Cask Lid Plug	5001	5404	5001	1.0922E+02	2.2860E+02
Tungsten Alloy	6001	7656	7552	1.0306E+02	2.1750E+02
Bottom Cavity	4227	4236	4227	1.0722E+02	2.2500E+02
Side Cavity	4372	4702	4372	1.0506E+02	2.2110E+02
Top Cavity	5001	5012	5001	1.0922E+02	2.2860E+02
Lid Seal	4993	4993	4993	1.0183E+02	2.1530E+02
Cask Vent Port	2537	2537	2537	1.0111E+02	2.1400E+02
Cask Vent Port Seal	2533	2533	2533	1.0117E+02	2.1410E+02
Vt.Conic.Seal	4828	4828	4828	1.0194E+02	2.1550E+02
Cask Drain Port	583	583	583	1.0117E+02	2.1410E+02
Cask Drain Port Seal	579	579	579	1.0122E+02	2.1420E+02
Drn.Conic.Seal	4313	4313	4313	1.0272E+02	2.1690E+02
Test Port	3351	3351	3351	1.0172E+02	2.1510E+02

VECTOR: 1  
MIN: 1.0161E+02  
MAX: 2.2855E+02

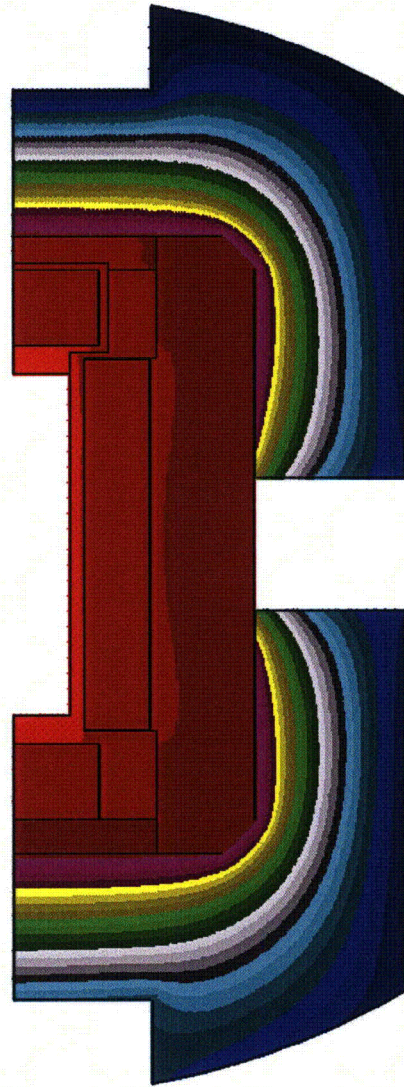
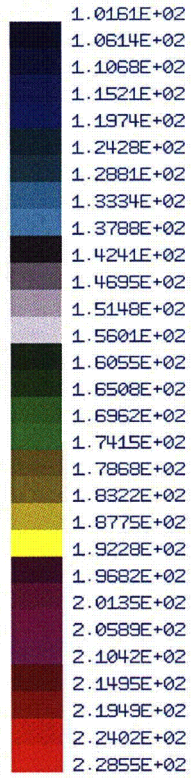


Figure 3-34. Load Case 101, 100°F Ambient, Maximum Decay Heat, Entire Model – Model AOS-050A



VECTOR: 1  
MIN: 2.1153E+02  
MAX: 2.2855E+02

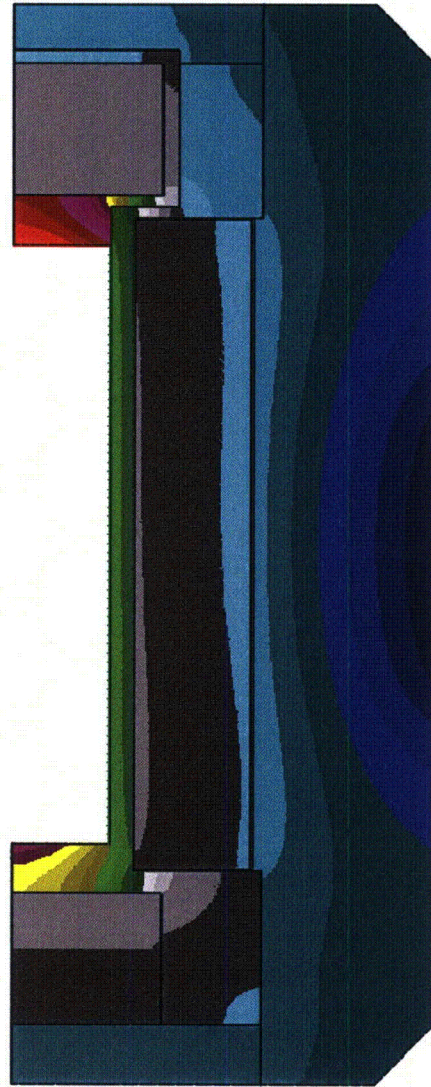
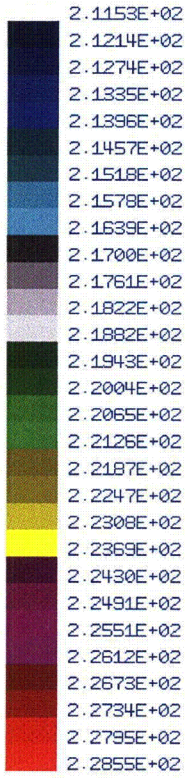


Figure 3-35. Load Case 101, 100°F Ambient, Maximum Decay Heat, Cask Model – Model AOS-050A

**Table 3-35. Load Case 102, 100°F Ambient, Maximum Decay Heat, Maximum Insolation – Model AOS-050A**

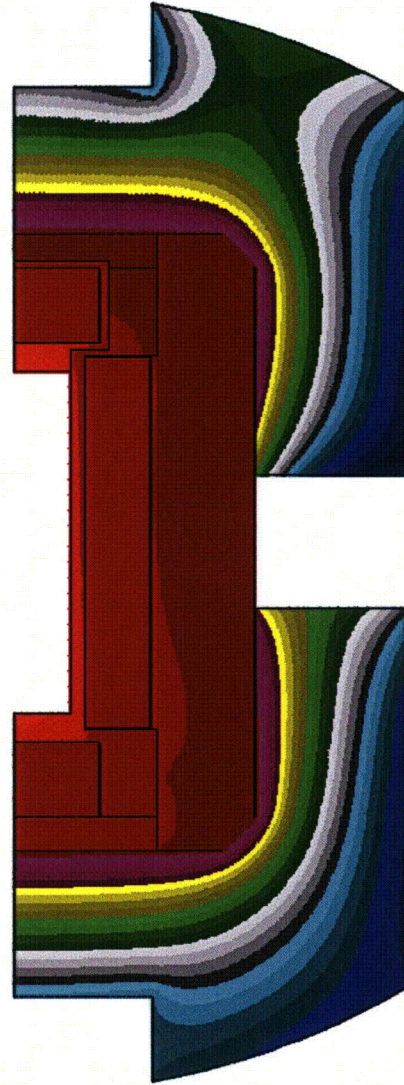
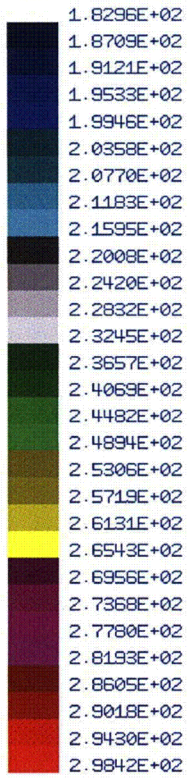
Location	Node	Temp (C)	Temp (F)
-----	-----	-----	-----
1	5001	148.00	298.40
2	4532	143.94	291.10
3	4227	146.50	295.70
4	4752	143.61	290.50
5	4838	141.06	285.90
6	4993	141.00	285.80
7	3309	141.06	285.90
8	3351	140.94	285.70
9	678	141.22	286.20
10	2537	140.22	284.40
11	2533	140.28	284.50
12	4828	141.11	286.00
13	1888	138.94	282.10
14	583	140.89	285.60
15	579	140.94	285.70
16	4313	142.28	288.10
17	3148	141.17	286.10
18	3001	141.22	286.20
19	7533	142.00	287.60
20	7377	142.06	287.70
21	7371	141.67	287.00
22	6942	141.83	287.30
23	6267	142.06	287.70
24	6121	142.33	288.20
25	6001	142.28	288.10
26	9501	140.39	284.70
27	9950	139.83	283.70
28	10014	139.56	283.20
29	11016	119.39	246.90
30	9428	130.06	266.10
31	8463	140.06	284.10
32	8462	140.22	284.40
33	8197	140.50	284.90
34	9711	105.44	221.80
35	9821	103.11	217.60
36	10158	102.89	217.20
37	10792	84.28	183.70
38	9204	103.67	218.60
39	8578	88.61	191.50
40	8225	95.11	203.20
41	8001	98.94	210.10

Maximum Component Temperatures

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Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	----	-----	-----
Cask Outer Shell	101	2894	606	1.4161E+02	2.8690E+02
Bottom Plate	3001	3232	3120	1.4128E+02	2.8630E+02
Cask Lid	3233	3424	3233	1.4111E+02	2.8600E+02
Shell Cavity	4001	4998	4227	1.4650E+02	2.9570E+02
Cask Lid Plug	5001	5404	5001	1.4800E+02	2.9840E+02
Tungsten Alloy	6001	7656	6247	1.4244E+02	2.8840E+02
Bottom Cavity	4227	4236	4227	1.4650E+02	2.9570E+02
Side Cavity	4372	4702	4372	1.4439E+02	2.9190E+02
Top Cavity	5001	5012	5001	1.4800E+02	2.9840E+02
Lid Seal	4993	4993	4993	1.4100E+02	2.8580E+02
Cask Vent Port	2537	2537	2537	1.4022E+02	2.8440E+02
Cask Vent Port Seal	2533	2533	2533	1.4028E+02	2.8450E+02
Vt.Conic.Seal	4828	4828	4828	1.4111E+02	2.8600E+02
Cask Drain Port	583	583	583	1.4089E+02	2.8560E+02
Cask Drain Port Seal	579	579	579	1.4094E+02	2.8570E+02
Drn.Conic.Seal	4313	4313	4313	1.4228E+02	2.8810E+02
Test Port	3351	3351	3351	1.4094E+02	2.8570E+02

VECTOR: 1  
MIN: 1.8296E+02  
MAX: 2.9842E+02



**Figure 3-36. Load Case 102, 100°F Ambient, Maximum Decay Heat, Maximum Insolation, Entire Model – Model AOS-050A**

VECTOR: 1  
MIN: 2.8200E+02  
MAX: 2.9842E+02

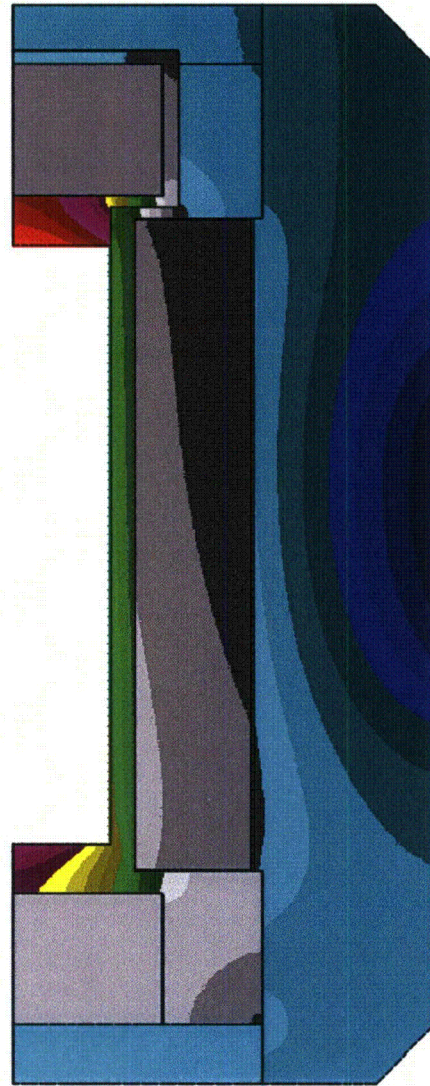
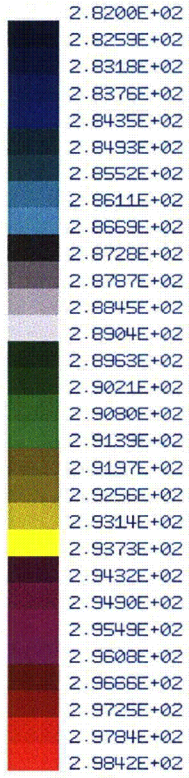


Figure 3-37. Load Case 102, 100°F Ambient, Maximum Decay Heat, Maximum Insolation, Cask Model – Model AOS-050A

**Table 3-36. Load Case 103, -20°F Ambient, Zero Decay Heat, Zero Insolation – Model AOS-050A**

Location	Node	Temp (C)	Temp (F)
1	5001	-28.89	-20.00
2	4532	-28.89	-20.00
3	4227	-28.89	-20.00
4	4752	-28.89	-20.00
5	4838	-28.89	-20.00
6	4993	-28.89	-20.00
7	3309	-28.89	-20.00
8	3351	-28.89	-20.00
9	678	-28.89	-20.00
10	2537	-28.89	-20.00
11	2533	-28.89	-20.00
12	4828	-28.89	-20.00
13	1888	-28.89	-20.00
14	583	-28.89	-20.00
15	579	-28.89	-20.00
16	4313	-28.89	-20.00
17	3148	-28.89	-20.00
18	3001	-28.89	-20.00
19	7533	-28.89	-20.00
20	7377	-28.89	-20.00
21	7371	-28.89	-20.00
22	6942	-28.89	-20.00
23	6267	-28.89	-20.00
24	6121	-28.89	-20.00
25	6001	-28.89	-20.00
26	9501	-28.89	-20.00
27	9950	-28.89	-20.00
28	10014	-28.89	-20.00
29	11016	-28.89	-20.00
30	9428	-28.89	-20.00
31	8463	-28.89	-20.00
32	8462	-28.89	-20.00
33	8197	-28.89	-20.00
34	9711	-28.89	-20.00
35	9821	-28.89	-20.00
36	10158	-28.89	-20.00
37	10792	-28.89	-20.00
38	9204	-28.89	-20.00
39	8578	-28.89	-20.00
40	8225	-28.89	-20.00
41	8001	-28.89	-20.00

VECTOR: 1  
MIN: -2.0000E+01  
MAX: -2.0000E+01

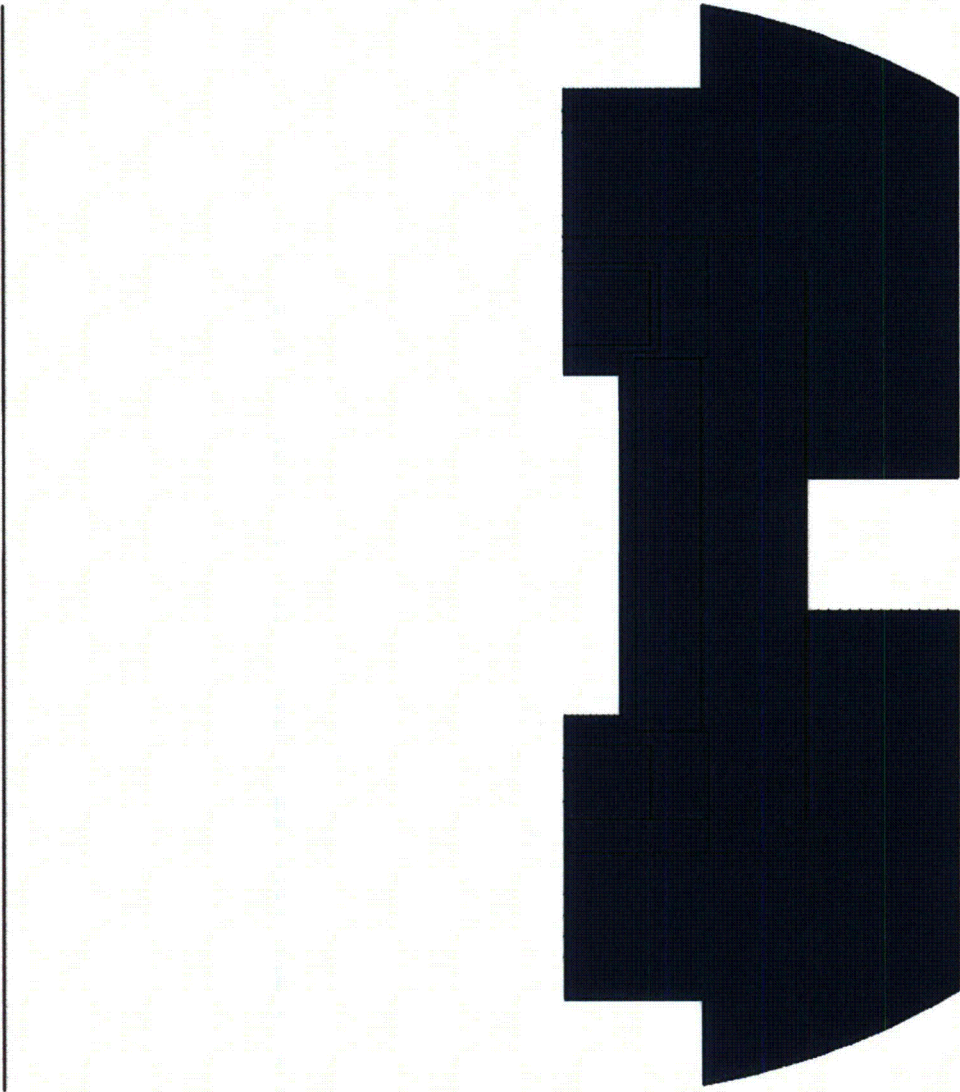
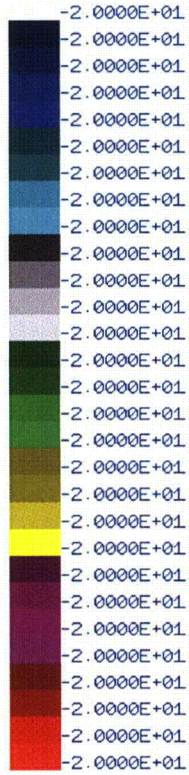


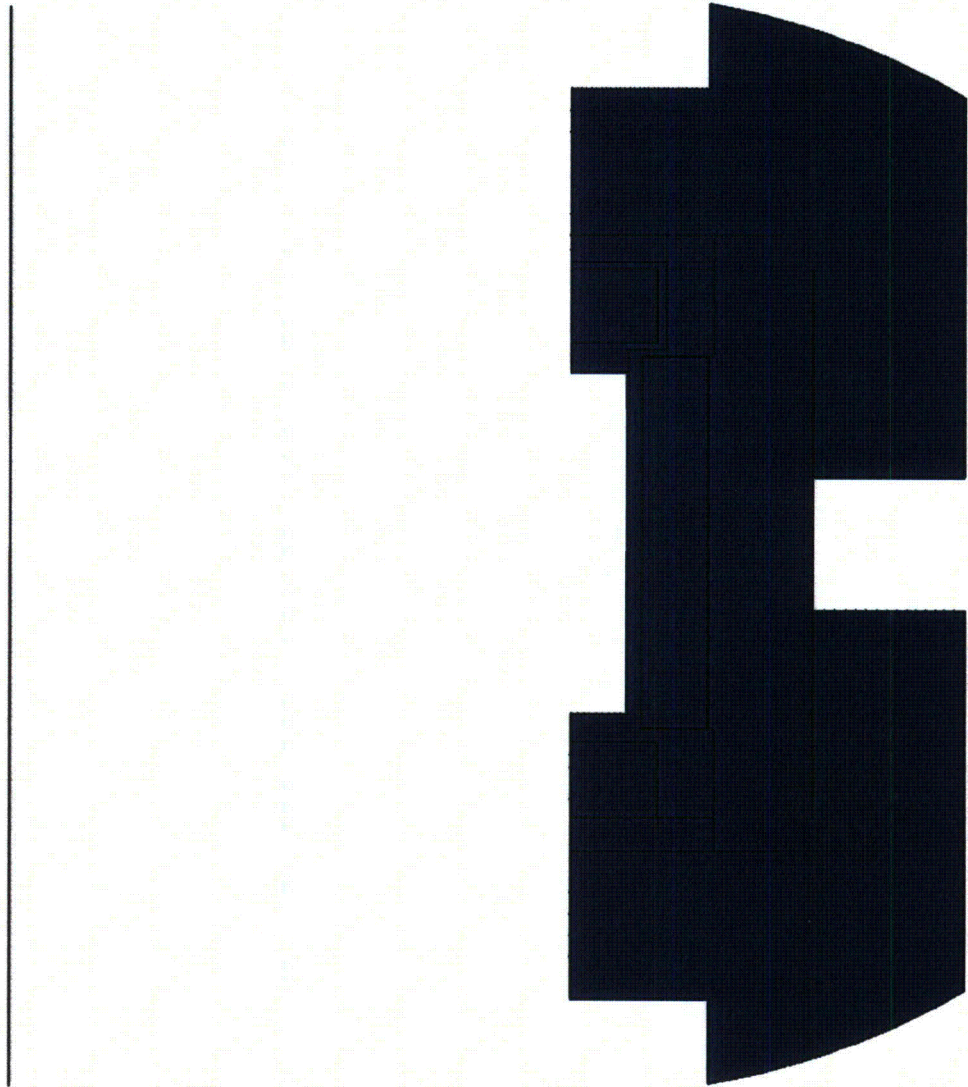
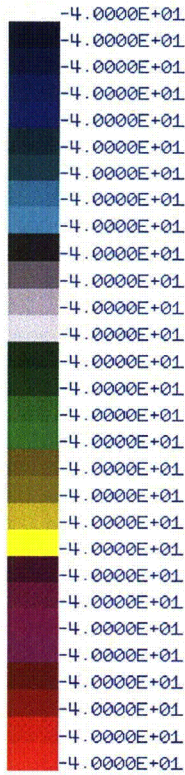
Figure 3-38. Load Case 103, -20°F Ambient, Zero Decay Heat, Zero Insolation, Entire Model – Model AOS-050A

**Table 3-37. Load Case 104, -40°F Ambient, Zero Decay Heat, Zero Insolation – Model AOS-050A**

Location	Node	Temp (C)	Temp (F)
1	5001	-40.00	-40.00
2	4532	-40.00	-40.00
3	4227	-40.00	-40.00
4	4752	-40.00	-40.00
5	4838	-40.00	-40.00
6	4993	-40.00	-40.00
7	3309	-40.00	-40.00
8	3351	-40.00	-40.00
9	678	-40.00	-40.00
10	2537	-40.00	-40.00
11	2533	-40.00	-40.00
12	4828	-40.00	-40.00
13	1888	-40.00	-40.00
14	583	-40.00	-40.00
15	579	-40.00	-40.00
16	4313	-40.00	-40.00
17	3148	-40.00	-40.00
18	3001	-40.00	-40.00
19	7533	-40.00	-40.00
20	7377	-40.00	-40.00
21	7371	-40.00	-40.00
22	6942	-40.00	-40.00
23	6267	-40.00	-40.00
24	6121	-40.00	-40.00
25	6001	-40.00	-40.00
26	9501	-40.00	-40.00
27	9950	-40.00	-40.00
28	10014	-40.00	-40.00
29	11016	-40.00	-40.00
30	9428	-40.00	-40.00
31	8463	-40.00	-40.00
32	8462	-40.00	-40.00
33	8197	-40.00	-40.00
34	9711	-40.00	-40.00
35	9821	-40.00	-40.00
36	10158	-40.00	-40.00
37	10792	-40.00	-40.00
38	9204	-40.00	-40.00
39	8578	-40.00	-40.00
40	8225	-40.00	-40.00
41	8001	-40.00	-40.00



VECTOR: 1  
MIN: -4.0000E+01  
MAX: -4.0000E+01



**Figure 3-39. Load Case 104, -40°F Ambient, Zero Decay Heat, Zero Insolation, Entire Model – Model AOS-050A**

**Table 3-38. Load Case 105, -40°F Ambient, Maximum Decay Heat – Model AOS-050A**

Location	Node	Temp (C)	Temp (F)
1	5001	37.74	99.94
2	4532	32.84	91.11
3	4227	35.36	95.64
4	4752	32.51	90.51
5	4838	29.66	85.39
6	4993	29.58	85.24
7	3309	29.61	85.29
8	3351	29.44	85.00
9	678	29.65	85.37
10	2537	28.76	83.77
11	2533	28.84	83.92
12	4828	29.71	85.48
13	1888	27.22	80.99
14	583	28.77	83.79
15	579	28.84	83.92
16	4313	30.44	86.80
17	3148	29.09	84.36
18	3001	29.15	84.47
19	7533	30.87	87.57
20	7377	30.96	87.72
21	7371	30.23	86.42
22	6942	30.27	86.48
23	6267	30.28	86.50
24	6121	30.54	86.98
25	6001	30.49	86.88
26	9501	28.49	83.28
27	9950	27.66	81.79
28	10014	27.30	81.14
29	11016	9.86	49.75
30	9428	2.55	36.59
31	8463	27.16	80.89
32	8462	27.67	81.81
33	8197	28.28	82.90
34	9711	-36.76	-34.16
35	9821	-38.56	-37.41
36	10158	-38.50	-37.30
37	10792	-29.39	-20.90
38	9204	-32.64	-26.75
39	8578	-34.81	-30.66
40	8225	-26.09	-14.96
41	8001	-21.03	-5.85

Maximum Component Temperatures

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Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	----	-----	-----
Cask Outer Shell	101	2894	622	2.9794E+01	8.5630E+01
Bottom Plate	3001	3232	3120	2.9228E+01	8.4610E+01
Cask Lid	3233	3424	3233	2.9694E+01	8.5450E+01
Shell Cavity	4001	4998	4227	3.5356E+01	9.5640E+01
Cask Lid Plug	5001	5404	5001	3.7744E+01	9.9940E+01
Tungsten Alloy	6001	7656	7552	3.1039E+01	8.7870E+01
Bottom Cavity	4227	4236	4227	3.5356E+01	9.5640E+01
Side Cavity	4372	4702	4372	3.3044E+01	9.1480E+01
Top Cavity	5001	5012	5001	3.7744E+01	9.9940E+01
Lid Seal	4993	4993	4993	2.9578E+01	8.5240E+01
Cask Vent Port	2537	2537	2537	2.8761E+01	8.3770E+01
Cask Vent Port Seal	2533	2533	2533	2.8844E+01	8.3920E+01
Vt.Conic.Seal	4828	4828	4828	2.9711E+01	8.5480E+01
Cask Drain Port	583	583	583	2.8772E+01	8.3790E+01
Cask Drain Port Seal	579	579	579	2.8844E+01	8.3920E+01
Drn.Conic.Seal	4313	4313	4313	3.0444E+01	8.6800E+01
Test Port	3351	3351	3351	2.9444E+01	8.5000E+01

VECTOR: 1  
 MIN: -3.7697E+01  
 MAX: 9.9939E+01

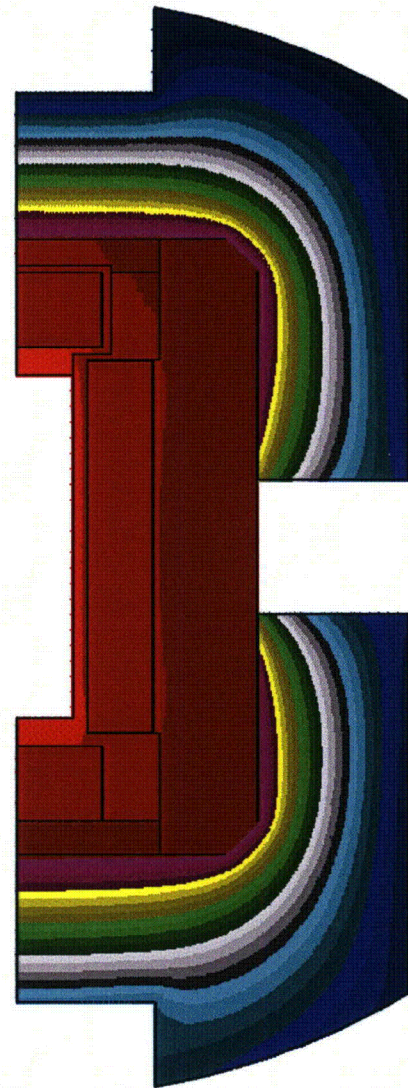
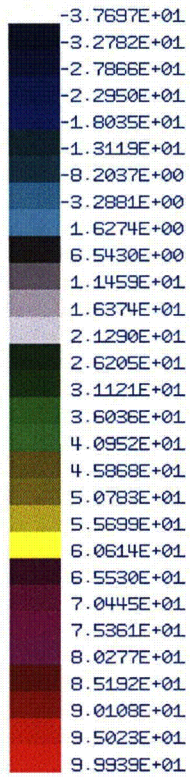


Figure 3-40. Load Case 105, -40°F Ambient, Maximum Decay Heat, Entire Model – Model AOS-050A

VECTOR: 1  
MIN: 8.0986E+01  
MAX: 9.9939E+01

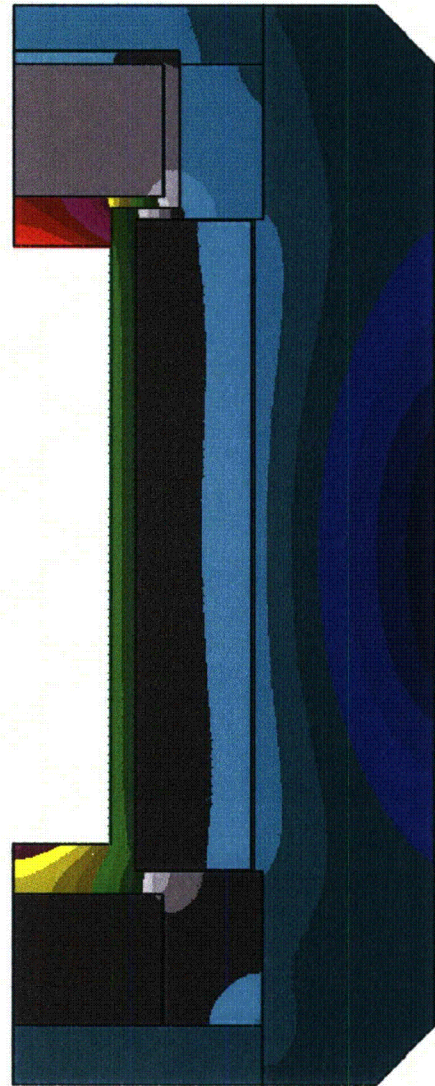
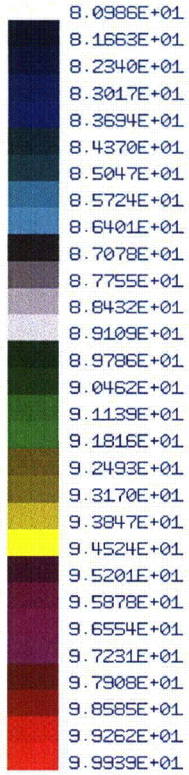


Figure 3-41. Load Case 105, -40°F Ambient, Maximum Decay Heat, Cask Model – Model AOS-050A

**Table 3-39. Load Case 106, -20°F Ambient, Maximum Decay Heat – Model AOS-050A**

Location	Node	Temp (C)	Temp (F)
1	5001	48.11	118.60
2	4532	43.28	109.90
3	4227	45.78	114.40
4	4752	42.94	109.30
5	4838	40.11	104.20
6	4993	40.06	104.10
7	3309	40.06	104.10
8	3351	39.89	103.80
9	678	40.11	104.20
10	2537	39.22	102.60
11	2533	39.33	102.80
12	4828	40.17	104.30
13	1888	37.72	99.90
14	583	39.28	102.70
15	579	39.33	102.80
16	4313	40.89	105.60
17	3148	39.56	103.20
18	3001	39.61	103.30
19	7533	41.28	106.30
20	7377	41.39	106.50
21	7371	40.72	105.30
22	6942	40.72	105.30
23	6267	40.78	105.40
24	6121	41.00	105.80
25	6001	40.94	105.70
26	9501	38.94	102.10
27	9950	38.17	100.70
28	10014	37.83	100.10
29	11016	20.44	68.80
30	9428	13.51	56.31
31	8463	37.72	99.89
32	8462	38.22	100.80
33	8197	38.78	101.80
34	9711	-25.74	-14.34
35	9821	-27.47	-17.45
36	10158	-27.41	-17.33
37	10792	-18.63	-1.54
38	9204	-21.52	-6.74
39	8578	-23.81	-10.85
40	8225	-15.24	4.57
41	8001	-10.26	13.53

Maximum Component Temperatures

-----

Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	----	-----	-----
Cask Outer Shell	101	2894	614	4.0278E+01	1.0450E+02
Bottom Plate	3001	3232	3120	3.9722E+01	1.0350E+02
Cask Lid	3233	3424	3233	4.0167E+01	1.0430E+02
Shell Cavity	4001	4998	4227	4.5778E+01	1.1440E+02
Cask Lid Plug	5001	5404	5001	4.8111E+01	1.1860E+02
Tungsten Alloy	6001	7656	7551	4.1444E+01	1.0660E+02
Bottom Cavity	4227	4236	4227	4.5778E+01	1.1440E+02
Side Cavity	4372	4702	4372	4.3444E+01	1.1020E+02
Top Cavity	5001	5012	5001	4.8111E+01	1.1860E+02
Lid Seal	4993	4993	4993	4.0056E+01	1.0410E+02
Cask Vent Port	2537	2537	2537	3.9222E+01	1.0260E+02
Cask Vent Port Seal	2533	2533	2533	3.9333E+01	1.0280E+02
Vt.Conic.Seal	4828	4828	4828	4.0167E+01	1.0430E+02
Cask Drain Port	583	583	583	3.9278E+01	1.0270E+02
Cask Drain Port Seal	579	579	579	3.9333E+01	1.0280E+02
Drn.Conic.Seal	4313	4313	4313	4.0889E+01	1.0560E+02
Test Port	3351	3351	3351	3.9889E+01	1.0380E+02

VECTOR: 1  
MIN: -1.7702E+01  
MAX: 1.1855E+02

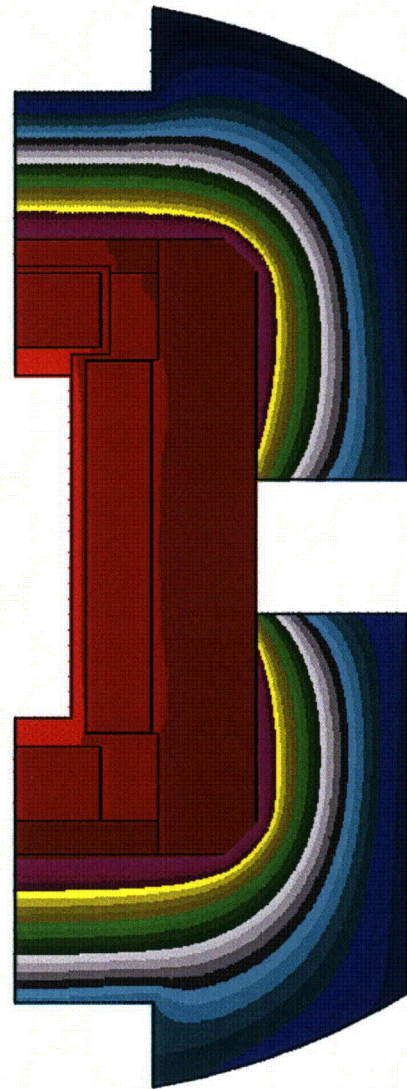
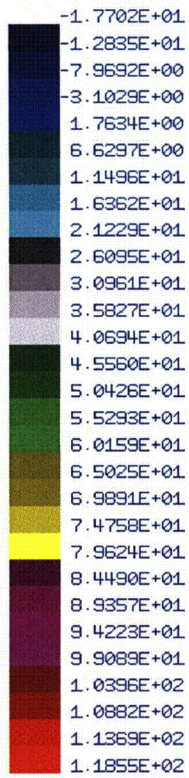


Figure 3-42. Load Case 106, -20°F Ambient, Maximum Decay Heat, Entire Model – Model AOS-050A



VECTOR: 1  
MIN: 9.9901E+01  
MAX: 1.1855E+02

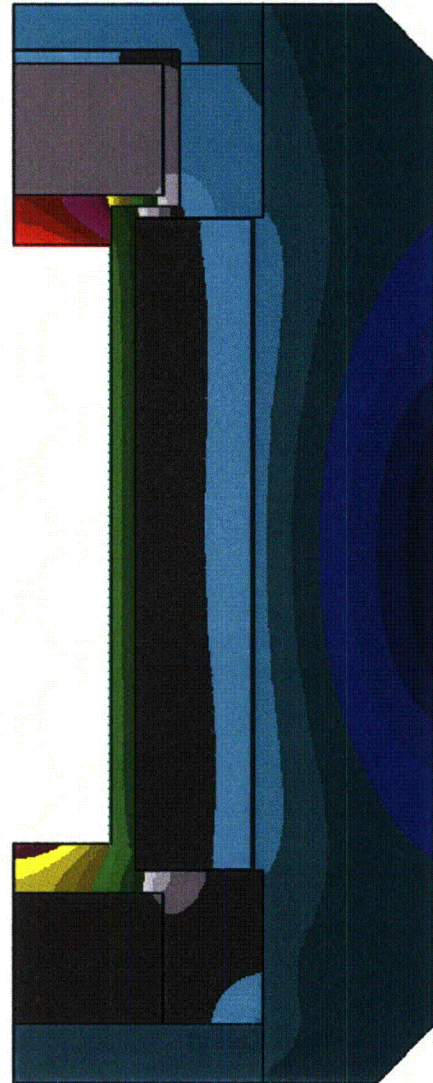
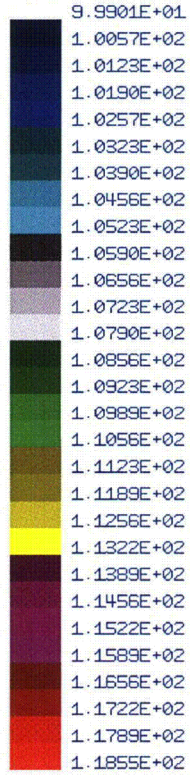


Figure 3-43. Load Case 106, -20°F Ambient, Maximum Decay Heat, Cask Model – Model AOS-050A

### 3.5.2.2.2 Fire Condition Thermal Evaluation Results – Model AOS-050A

Table 3-40 lists the tables and figures in this appendix that present the Model AOS-050A transport package results under the Fire condition, for Load Cases 111 and 112. Each table provides a list of temperatures at each monitoring node. Also listed are the maximum temperatures within each transport package component.

Figure 3-44 illustrates the location of each node on the transport package, under the Fire condition. (The node locations are listed in Table 3-32.)

**Table 3-40. Fire Condition Thermal Evaluation Results – Model AOS-050A**

Load Case	Description	Temperature versus Time	Results Table	Entire Model	Cask Model
111	Fire at 30 Minutes, 1,475°F Ambient, Maximum Decay Heat		Table 3-41	Figure 3-48	Figure 3-49
112	Post Fire at 60 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation		Table 3-42	Figure 3-50	Figure 3-51
	Post Fire at 90 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation	Figure 3-45	Table 3-43	Figure 3-52	Figure 3-53
	Post Fire at 120 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation	Figure 3-46	Table 3-44	Figure 3-54	Figure 3-55
	Post Fire at 150 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation	Figure 3-47	Table 3-45	Figure 3-56	Figure 3-57
	Post Fire at 180 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation		Table 3-46	Figure 3-58	Figure 3-59

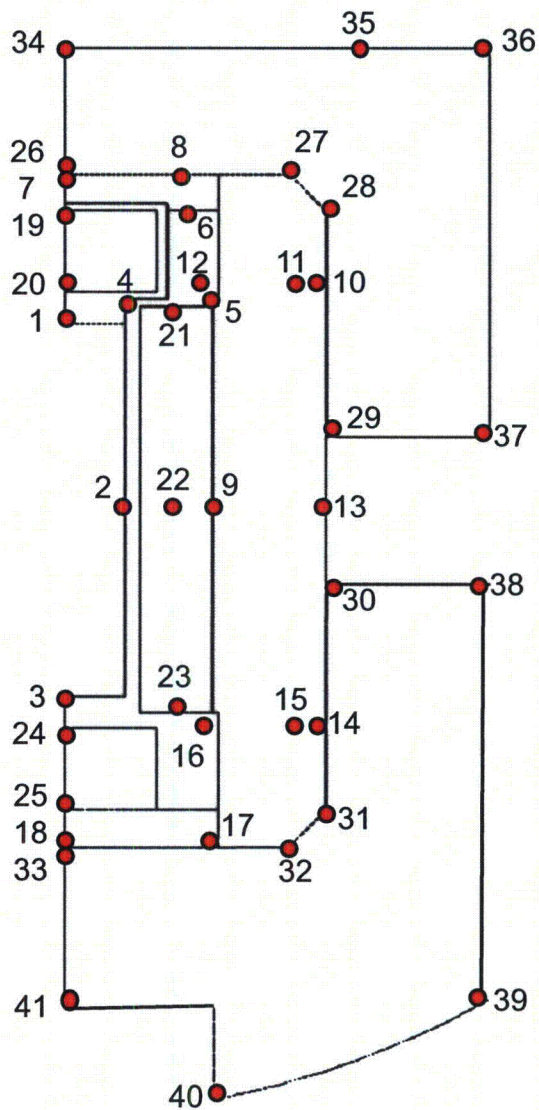
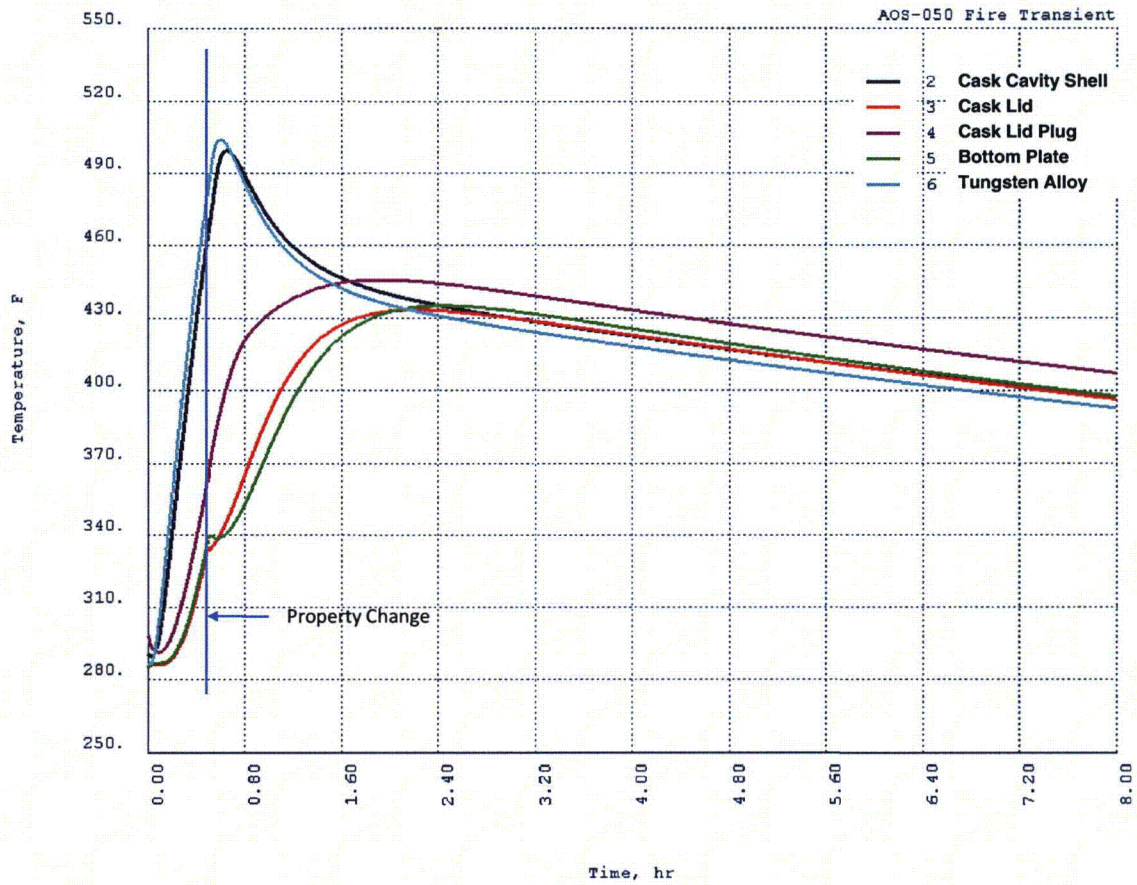
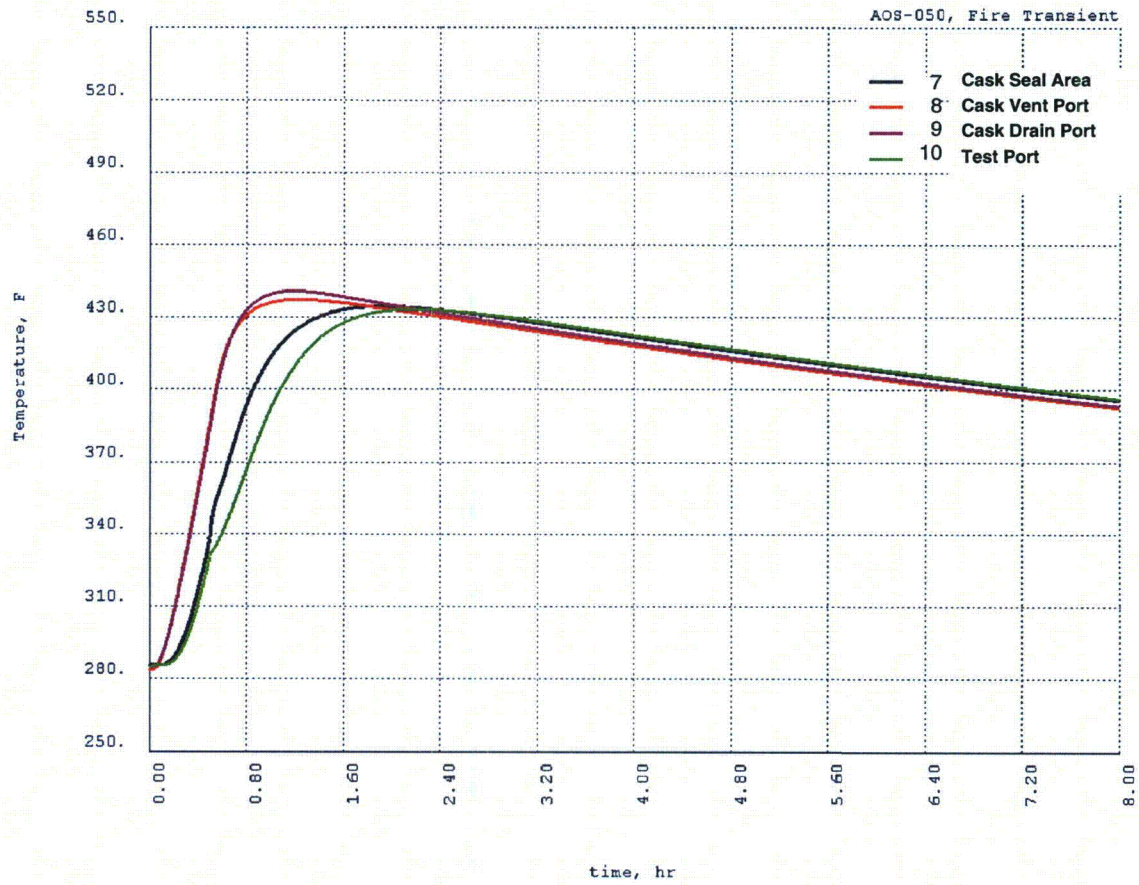


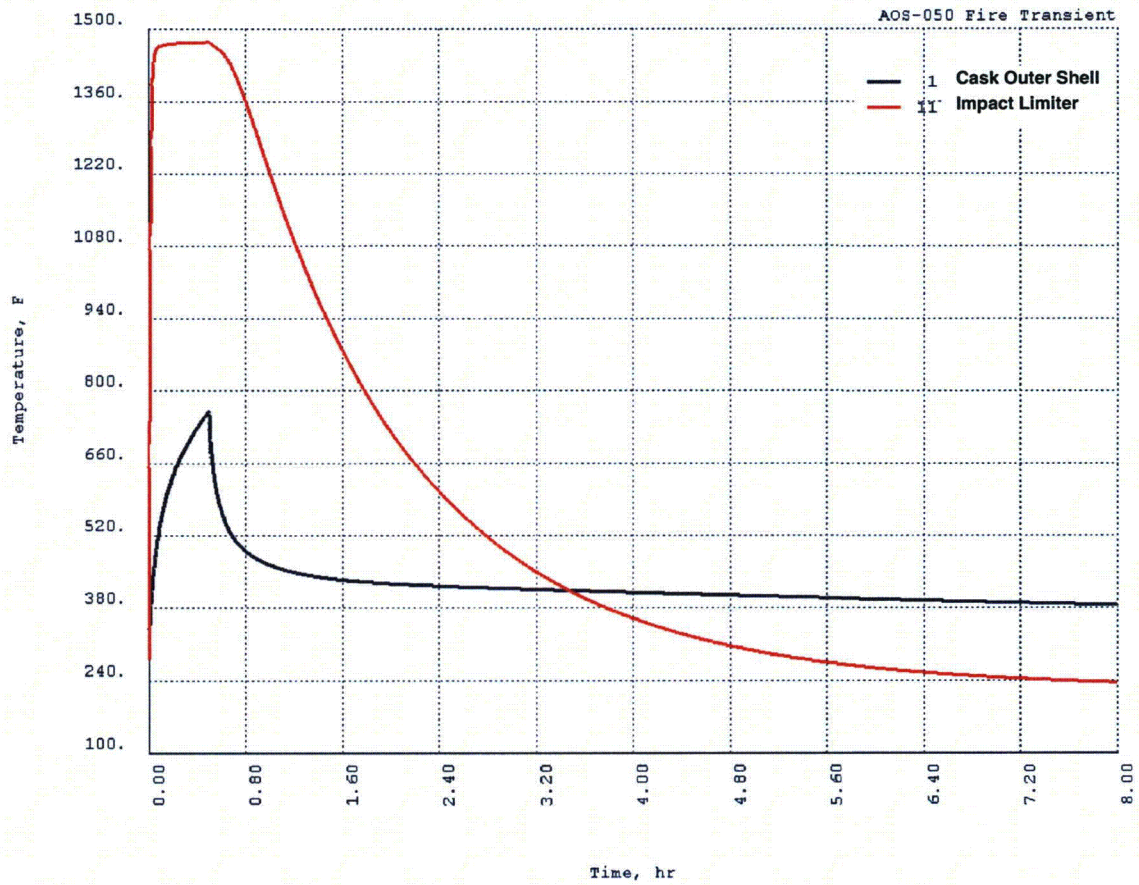
Figure 3-44. Selected Nodal Locations for Fire Condition – Model AOS-050A



**Figure 3-45. Fire for 30 Minutes and Post Fire Cool Down for 7.5 Hours, Temperature versus Time, for Cask Cavity Shell, Cask Lid, Cask Lid Plug, Bottom Plate, and Tungsten Alloy – Model AOS-050A**



**Figure 3-46. Fire for 30 Minutes and Post Fire Cool Down for 7.5 Hours, Temperature versus Time, for Cask Seal Area, Cask Vent Port, Cask Drain Port, and Test Port – Model AOS-050A**



**Figure 3-47. Fire for 30 Minutes and Post Fire Cool Down for 7.5 Hours, Temperature versus Time, for Cask Outer Shell and Impact Limiter – Model AOS-050A**

**Table 3-41. Load Case 111, Fire at 30 Minutes, 1,475°F Ambient, Maximum Decay Heat – Model AOS-050A**

Location	Node	Temp (C)	Temp (F)
-----	----	-----	-----
1	5001	184.17	363.50
2	4532	240.33	464.60
3	4227	187.06	368.70
4	4752	191.94	377.50
5	4838	199.78	391.60
6	4993	169.67	337.40
7	3309	166.72	332.10
8	3351	165.56	330.00
9	678	267.83	514.10
10	2537	196.50	385.70
11	2533	196.44	385.60
12	4828	194.44	382.00
13	1888	413.94	777.10
14	583	195.39	383.70
15	579	195.33	383.60
16	4313	195.39	383.70
17	3001	169.67	337.40
18	3148	166.17	331.10
19	7533	174.33	345.80
20	7377	178.83	353.90
21	7371	210.61	411.10
22	6942	244.00	471.20
23	6267	209.61	409.30
24	6121	181.06	357.90
25	6001	175.94	348.70
26	15481	166.67	332.00
27	15941	166.06	330.90
28	16260	170.00	338.00
29	17311	446.22	835.20
30	11965	446.56	835.80
31	9785	170.50	338.90
32	9571	166.67	332.00
33	8197	169.56	337.20
34	15451	797.78	1468.00
35	16160	797.78	1468.00
36	17790	800.00	1472.00
37	18750	800.00	1472.00
38	11485	800.56	1473.00
39	9900	800.00	1472.00
40	8673	800.56	1473.00
41	8225	798.33	1469.00

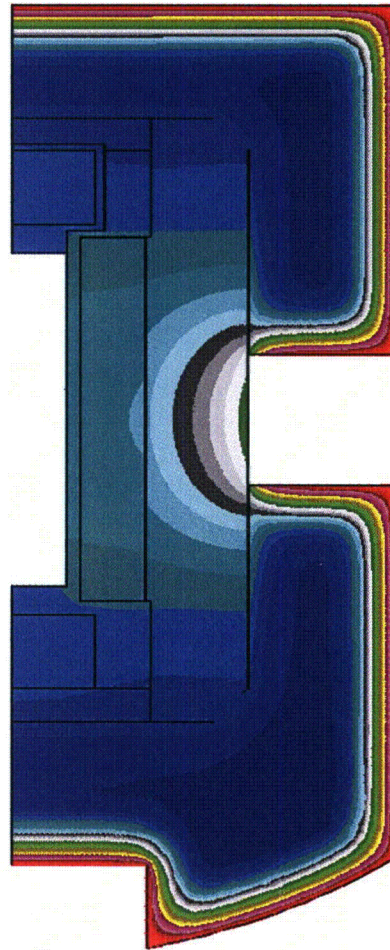
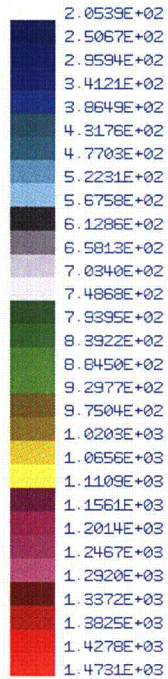
Maximum Component Temperatures

-----

Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	1888	4.1394E+02	7.7710E+02
Bottom Plate	3001	3232	3120	1.7489E+02	3.4680E+02
Cask Lid	3233	3424	3233	1.6972E+02	3.3750E+02
Shell Cavity	4001	4998	4536	2.4056E+02	4.6500E+02
Cask Lid Plug	5001	5404	5012	1.9583E+02	3.8450E+02
Tungsten Alloy	6001	7656	6949	2.5039E+02	4.8270E+02
Bottom Cavity	4227	4236	4236	2.0144E+02	3.9460E+02
Side Cavity	4372	4702	4532	2.4033E+02	4.6460E+02
Top Cavity	5001	5012	5012	1.9583E+02	3.8450E+02
Lid Seal	4993	4993	4993	1.6967E+02	3.3740E+02
Cask Vent Port	2537	2537	2537	1.9650E+02	3.8570E+02
Cask Vent Port Seal	2533	2533	2533	1.9644E+02	3.8560E+02
Vt.Conic.Seal	4828	4828	4828	1.9444E+02	3.8200E+02
Cask Drain Port	583	583	583	1.9539E+02	3.8370E+02
Cask Drain Port Seal	579	579	579	1.9533E+02	3.8360E+02
Drn.Conic.Seal	4313	4313	4313	1.9539E+02	3.8370E+02
Test Port	3351	3351	3351	1.6556E+02	3.3000E+02

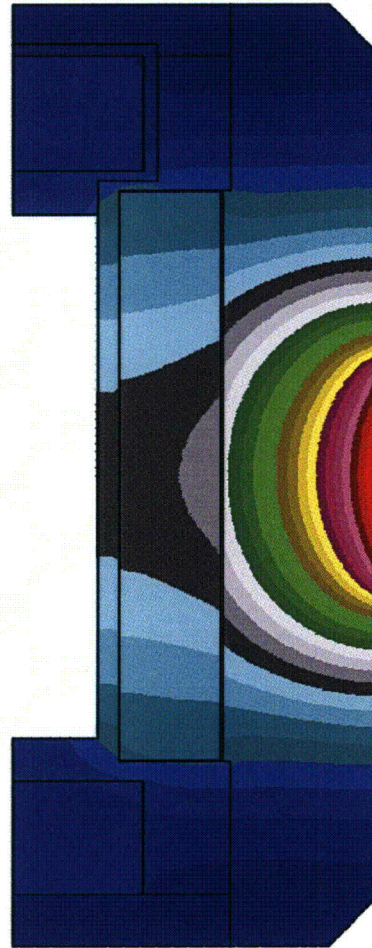


VECTOR: 50  
MIN: 2.0539E+02  
MAX: 1.4731E+03



**Figure 3-48. Load Case 111, Fire at 30 Minutes, 1,475°F Ambient, Maximum Decay Heat, Entire Model – Model AOS-050A**

VECTOR: 50  
MIN: 3.2937E+02  
MAX: 7.7708E+02



**Figure 3-49. Load Case 111, Fire at 30 Minutes, 1,475°F Ambient, Maximum Decay Heat, Cask Model – Model AOS-050A**

**Table 3-42. Load Case 112, Post Fire at 60 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation – Model AOS-050A**

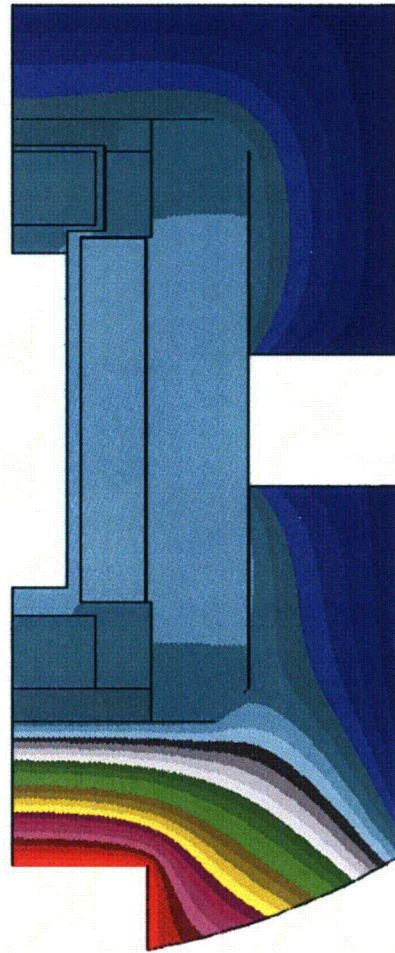
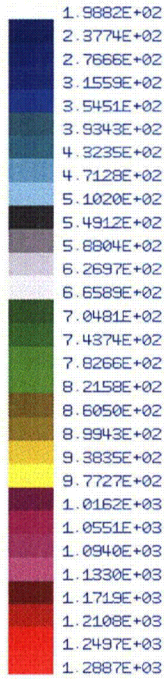
Location	Node	Temp (C)	Temp (F)
-----	----	-----	-----
1	5001	221.94	431.50
2	4532	243.89	471.00
3	4227	227.78	442.00
4	4752	227.22	441.00
5	4838	219.39	426.90
6	4993	211.78	413.20
7	3309	194.22	381.60
8	3351	199.83	391.70
9	678	241.78	467.20
10	2537	224.28	435.70
11	2533	224.44	436.00
12	4828	217.00	422.60
13	1888	237.89	460.20
14	583	226.22	439.20
15	579	226.33	439.40
16	4313	206.50	403.70
17	3001	190.61	375.10
18	3148	205.44	401.80
19	7533	200.89	393.60
20	7377	201.28	394.30
21	7371	237.06	458.70
22	6942	241.61	466.90
23	6267	237.50	459.50
24	6121	204.94	400.90
25	6001	204.44	400.00
26	15481	191.28	376.30
27	15941	208.06	406.50
28	16260	213.22	415.80
29	17311	180.56	357.00
30	11965	186.56	367.80
31	9785	217.89	424.20
32	9571	215.44	419.80
33	8197	200.72	393.30
34	15451	115.50	239.90
35	16160	114.22	237.60
36	17790	102.72	216.90
37	18750	93.83	200.90
38	11485	106.61	223.90
39	9900	236.33	457.40
40	8673	660.00	1220.00
41	8225	698.33	1289.00

Maximum Component Temperatures

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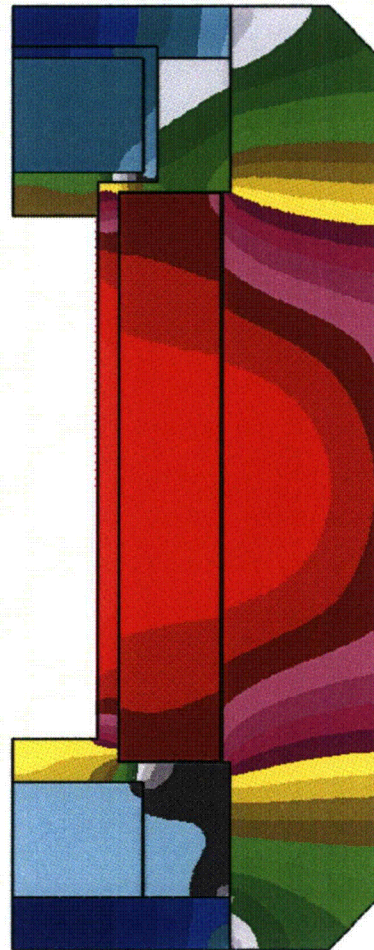
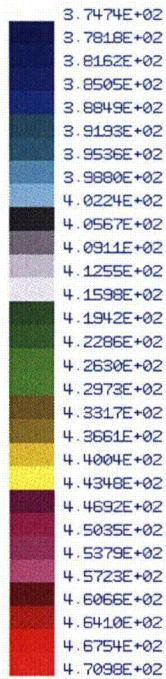
Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	1887	3.7294E+02	7.0330E+02
Bottom Plate	3001	3232	3001	2.2383E+02	4.3490E+02
Cask Lid	3233	3424	3329	2.2289E+02	4.3320E+02
Shell Cavity	4001	4998	4532	2.5939E+02	4.9890E+02
Cask Lid Plug	5001	5404	5001	2.2972E+02	4.4550E+02
Tungsten Alloy	6001	7656	6938	2.6200E+02	5.0360E+02
Bottom Cavity	4227	4236	4236	2.3072E+02	4.4730E+02
Side Cavity	4372	4702	4532	2.5939E+02	4.9890E+02
Top Cavity	5001	5012	5001	2.2972E+02	4.4550E+02
Lid Seal	4993	4993	4993	2.2344E+02	4.3420E+02
Cask Vent Port	2537	2537	2537	2.2494E+02	4.3690E+02
Cask Vent Port Seal	2533	2533	2533	2.2511E+02	4.3720E+02
Vt.Conic.Seal	4828	4828	4828	2.2389E+02	4.3500E+02
Cask Drain Port	583	583	583	2.2689E+02	4.4040E+02
Cask Drain Port Seal	579	579	579	2.2700E+02	4.4060E+02
Drn.Conic.Seal	4313	4313	4313	2.2428E+02	4.3570E+02
Test Port	3351	3351	3351	2.2278E+02	4.3300E+02

VECTOR: 50  
 MIN: 1.9882E+02  
 MAX: 1.2887E+03



**Figure 3-50. Load Case 112, Post Fire at 60 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Entire Model – Model AOS-050A**

VECTOR: 50  
MIN: 3.7474E+02  
MAX: 4.7098E+02



**Figure 3-51. Load Case 112, Post Fire at 60 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Cask Model – Model AOS-050A**

**Table 3-43. Load Case 112, Post Fire at 90 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation – Model AOS-050A**

Location	Node	Temp (C)	Temp (F)
-----	----	-----	-----
1	5001	228.50	443.30
2	4532	231.50	448.70
3	4227	228.94	444.10
4	4752	227.17	440.90
5	4838	223.94	435.10
6	4993	222.06	431.70
7	3309	216.17	421.10
8	3351	218.17	424.70
9	678	228.61	443.50
10	2537	224.50	436.10
11	2533	224.61	436.30
12	4828	223.39	434.10
13	1888	223.44	434.20
14	583	226.06	438.90
15	579	226.11	439.00
16	4313	220.11	428.20
17	3001	214.06	417.30
18	3148	220.06	428.10
19	7533	218.61	425.50
20	7377	218.78	425.80
21	7371	228.39	443.10
22	6942	229.39	444.90
23	6267	228.89	444.00
24	6121	219.56	427.20
25	6001	219.39	426.90
26	15481	213.83	416.90
27	15941	219.56	427.20
28	16260	220.89	429.60
29	17311	172.11	341.80
30	11965	179.39	354.90
31	9785	223.94	435.10
32	9571	224.61	436.30
33	8197	220.50	428.90
34	15451	115.17	239.30
35	16160	113.22	235.80
36	17790	100.56	213.00
37	18750	89.56	193.20
38	11485	104.44	220.00
39	9900	178.61	353.50
40	8673	496.44	925.60
41	8225	556.67	1034.00

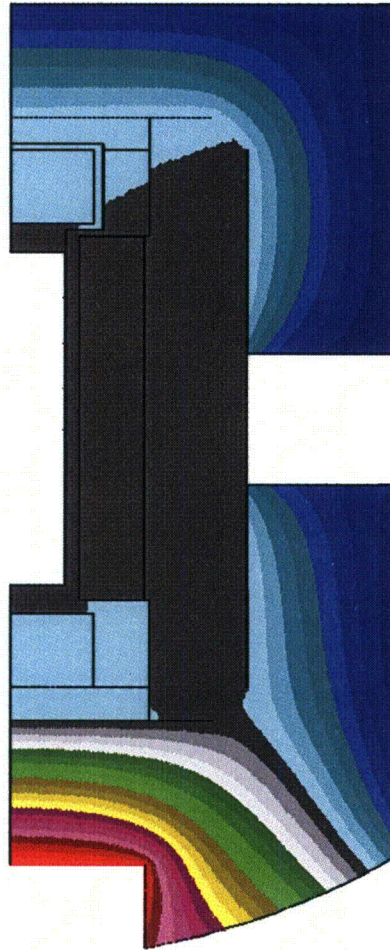
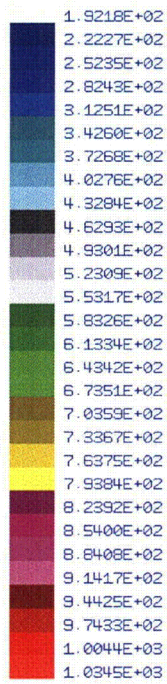
Maximum Component Temperatures

-----

Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	1887	3.7294E+02	7.0330E+02
Bottom Plate	3001	3232	3001	2.2383E+02	4.3490E+02
Cask Lid	3233	3424	3329	2.2289E+02	4.3320E+02
Shell Cavity	4001	4998	4532	2.5939E+02	4.9890E+02
Cask Lid Plug	5001	5404	5001	2.2972E+02	4.4550E+02
Tungsten Alloy	6001	7656	6938	2.6200E+02	5.0360E+02
Bottom Cavity	4227	4236	4236	2.3072E+02	4.4730E+02
Side Cavity	4372	4702	4532	2.5939E+02	4.9890E+02
Top Cavity	5001	5012	5001	2.2972E+02	4.4550E+02
Lid Seal	4993	4993	4993	2.2344E+02	4.3420E+02
Cask Vent Port	2537	2537	2537	2.2494E+02	4.3690E+02
Cask Vent Port Seal	2533	2533	2533	2.2511E+02	4.3720E+02
Vt.Conic.Seal	4828	4828	4828	2.2389E+02	4.3500E+02
Cask Drain Port	583	583	583	2.2689E+02	4.4040E+02
Cask Drain Port Seal	579	579	579	2.2700E+02	4.4060E+02
Drn.Conic.Seal	4313	4313	4313	2.2428E+02	4.3570E+02
Test Port	3351	3351	3351	2.2278E+02	4.3300E+02

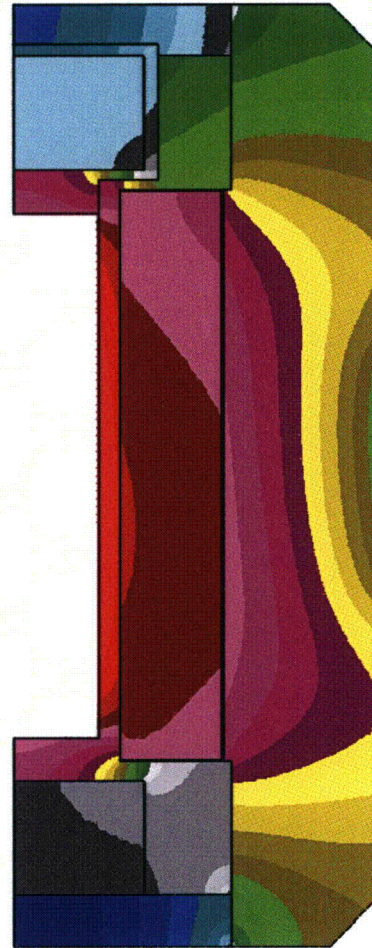
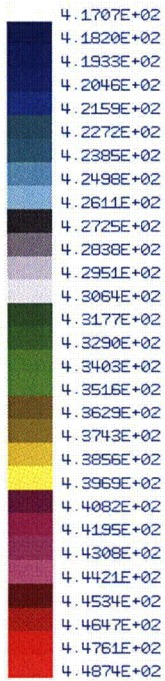


VECTOR: 100  
MIN: 1.9218E+02  
MAX: 1.0345E+03



**Figure 3-52. Load Case 112, Post Fire at 90 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Entire Model – Model AOS-050A**

VECTOR: 100  
MIN: 4.1707E+02  
MAX: 4.4874E+02



**Figure 3-53. Load Case 112, Post Fire at 90 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Cask Model – Model AOS-050A**

**Table 3-44. Load Case 112, Post Fire at 120 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation – Model AOS-050A**

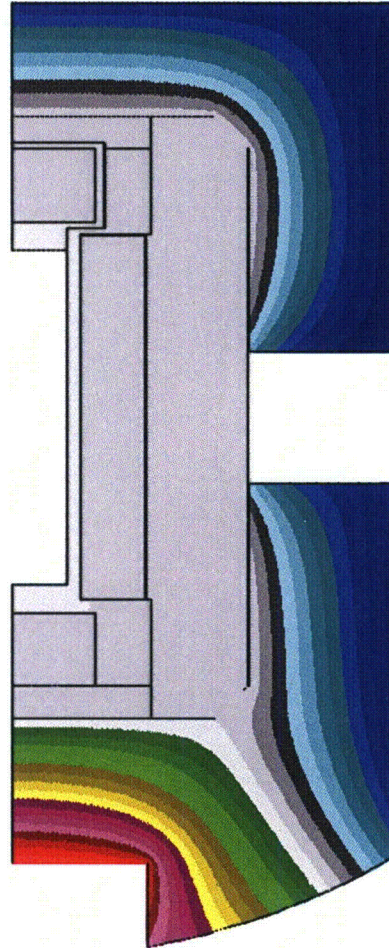
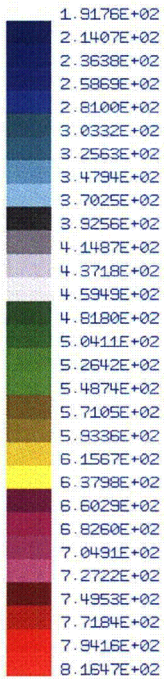
Location	Node	Temp (C)	Temp (F)
-----	----	-----	-----
1	5001	229.72	445.50
2	4532	226.39	439.50
3	4227	228.56	443.40
4	4752	226.00	438.80
5	4838	223.61	434.50
6	4993	223.39	434.10
7	3309	222.22	432.00
8	3351	222.56	432.60
9	678	223.33	434.00
10	2537	222.67	432.80
11	2533	222.83	433.10
12	4828	223.61	434.50
13	1888	217.94	424.30
14	583	223.72	434.70
15	579	223.78	434.80
16	4313	224.00	435.20
17	3001	222.44	432.40
18	3148	223.50	434.30
19	7533	223.44	434.20
20	7377	223.56	434.40
21	7371	224.39	435.90
22	6942	224.33	435.80
23	6267	224.78	436.60
24	6121	223.94	435.10
25	6001	223.89	435.00
26	15481	219.94	427.90
27	15941	221.00	429.80
28	16260	221.06	429.90
29	17311	168.94	336.10
30	11965	176.33	349.40
31	9785	223.00	433.40
32	9571	224.50	436.10
33	8197	225.78	438.40
34	15451	115.33	239.60
35	16160	113.22	235.80
36	17790	100.56	213.00
37	18750	89.17	192.50
38	11485	104.11	219.40
39	9900	149.94	301.90
40	8673	382.56	720.60
41	8225	435.83	816.50

Maximum Component Temperatures

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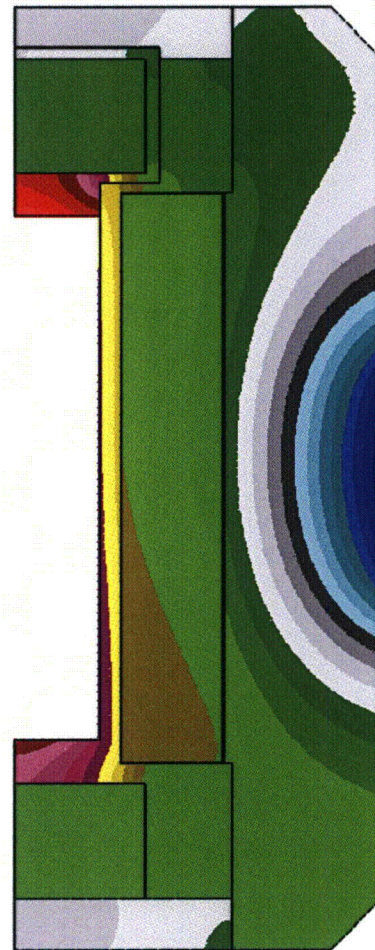
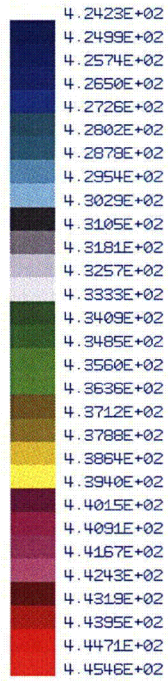
Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	1887	3.7294E+02	7.0330E+02
Bottom Plate	3001	3232	3001	2.2383E+02	4.3490E+02
Cask Lid	3233	3424	3329	2.2289E+02	4.3320E+02
Shell Cavity	4001	4998	4532	2.5939E+02	4.9890E+02
Cask Lid Plug	5001	5404	5001	2.2972E+02	4.4550E+02
Tungsten Alloy	6001	7656	6938	2.6200E+02	5.0360E+02
Bottom Cavity	4227	4236	4236	2.3072E+02	4.4730E+02
Side Cavity	4372	4702	4532	2.5939E+02	4.9890E+02
Top Cavity	5001	5012	5001	2.2972E+02	4.4550E+02
Lid Seal	4993	4993	4993	2.2344E+02	4.3420E+02
Cask Vent Port	2537	2537	2537	2.2494E+02	4.3690E+02
Cask Vent Port Seal	2533	2533	2533	2.2511E+02	4.3720E+02
Vt.Conic.Seal	4828	4828	4828	2.2389E+02	4.3500E+02
Cask Drain Port	583	583	583	2.2689E+02	4.4040E+02
Cask Drain Port Seal	579	579	579	2.2700E+02	4.4060E+02
Drn.Conic.Seal	4313	4313	4313	2.2428E+02	4.3570E+02
Test Port	3351	3351	3351	2.2278E+02	4.3300E+02

VECTOR: 150  
MIN: 1.9176E+02  
MAX: 8.1647E+02



**Figure 3-54. Load Case 112, Post Fire at 120 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Entire Model – Model AOS-050A**

VECTOR: 150  
MIN: 4.2423E+02  
MAX: 4.4546E+02



**Figure 3-55. Load Case 112, Post Fire at 120 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Cask Model – Model AOS-050A**

**Table 3-45. Load Case 112, Post Fire at 150 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation – Model AOS-050A**

Location	Node	Temp (C)	Temp (F)
-----	-----	-----	-----
1	5001	228.61	443.50
2	4532	223.39	434.10
3	4227	227.17	440.90
4	4752	224.11	435.40
5	4838	222.00	431.60
6	4993	222.28	432.10
7	3309	222.56	432.60
8	3351	222.33	432.20
9	678	220.22	428.40
10	2537	220.61	429.10
11	2533	220.72	429.30
12	4828	222.17	431.90
13	1888	214.83	418.70
14	583	221.39	430.50
15	579	221.50	430.70
16	4313	223.94	435.10
17	3001	223.78	434.80
18	3148	223.17	433.70
19	7533	223.44	434.20
20	7377	223.50	434.30
21	7371	221.67	431.00
22	6942	221.33	430.40
23	6267	222.06	431.70
24	6121	224.11	435.40
25	6001	224.11	435.40
26	15481	220.33	428.60
27	15941	219.89	427.80
28	16260	219.56	427.20
29	17311	167.00	332.60
30	11965	174.44	346.00
31	9785	220.94	429.70
32	9571	222.50	432.50
33	8197	225.28	437.50
34	15451	115.33	239.60
35	16160	113.22	235.80
36	17790	100.56	213.00
37	18750	88.94	192.10
38	11485	103.94	219.10
39	9900	132.06	269.70
40	8673	303.61	578.50
41	8225	347.11	656.80

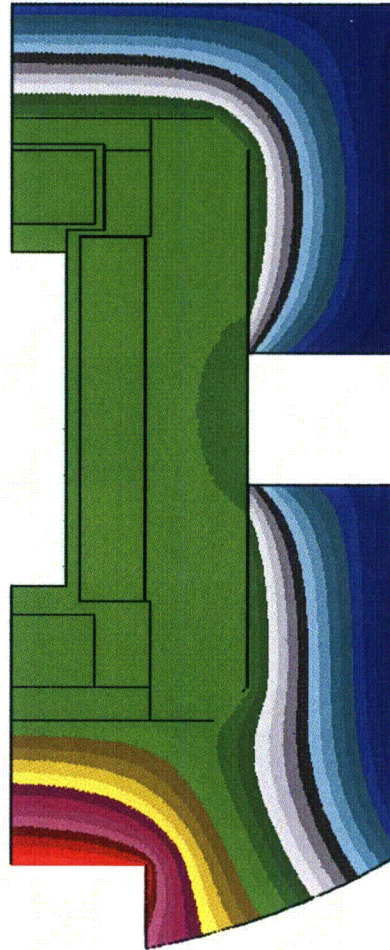
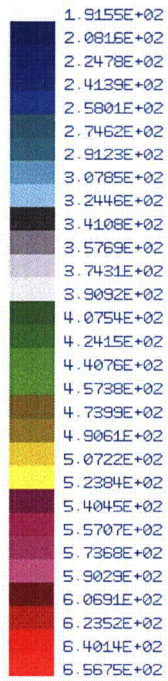
Maximum Component Temperatures

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Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	1887	3.7294E+02	7.0330E+02
Bottom Plate	3001	3232	3001	2.2383E+02	4.3490E+02
Cask Lid	3233	3424	3329	2.2289E+02	4.3320E+02
Shell Cavity	4001	4998	4532	2.5939E+02	4.9890E+02
Cask Lid Plug	5001	5404	5001	2.2972E+02	4.4550E+02
Tungsten Alloy	6001	7656	6938	2.6200E+02	5.0360E+02
Bottom Cavity	4227	4236	4236	2.3072E+02	4.4730E+02
Side Cavity	4372	4702	4532	2.5939E+02	4.9890E+02
Top Cavity	5001	5012	5001	2.2972E+02	4.4550E+02
Lid Seal	4993	4993	4993	2.2344E+02	4.3420E+02
Cask Vent Port	2537	2537	2537	2.2494E+02	4.3690E+02
Cask Vent Port Seal	2533	2533	2533	2.2511E+02	4.3720E+02
Vt.Conic.Seal	4828	4828	4828	2.2389E+02	4.3500E+02
Cask Drain Port	583	583	583	2.2689E+02	4.4040E+02
Cask Drain Port Seal	579	579	579	2.2700E+02	4.4060E+02
Drn.Conic.Seal	4313	4313	4313	2.2428E+02	4.3570E+02
Test Port	3351	3351	3351	2.2278E+02	4.3300E+02

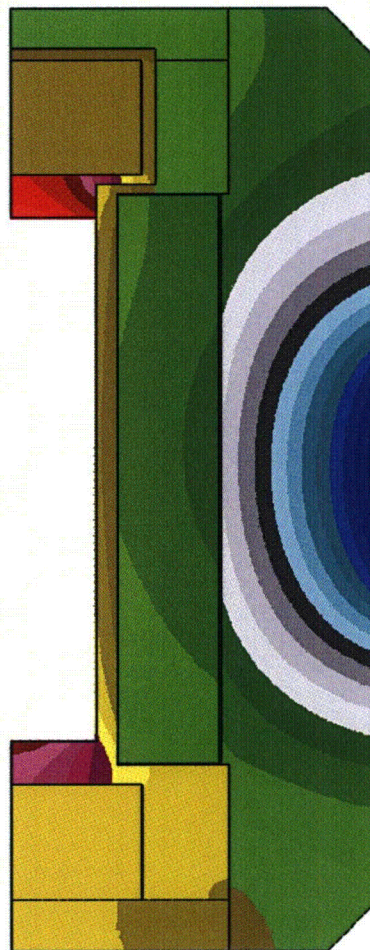
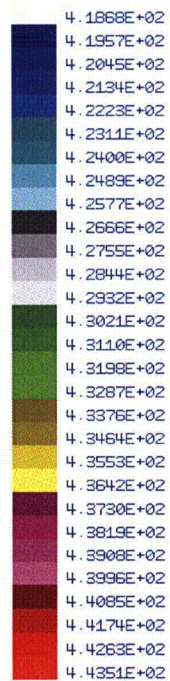


VECTOR: 200  
MIN: 1.9155E+02  
MAX: 6.5675E+02



**Figure 3-56. Load Case 112, Post Fire at 150 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Entire Model – Model AOS-050A**

VECTOR: 200  
 MIN: 4.1868E+02  
 MAX: 4.4351E+02



**Figure 3-57. Load Case 112, Post Fire at 150 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Cask Model – Model AOS-050A**

**Table 3-46. Load Case 112, Post Fire at 180 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation – Model AOS-050A**

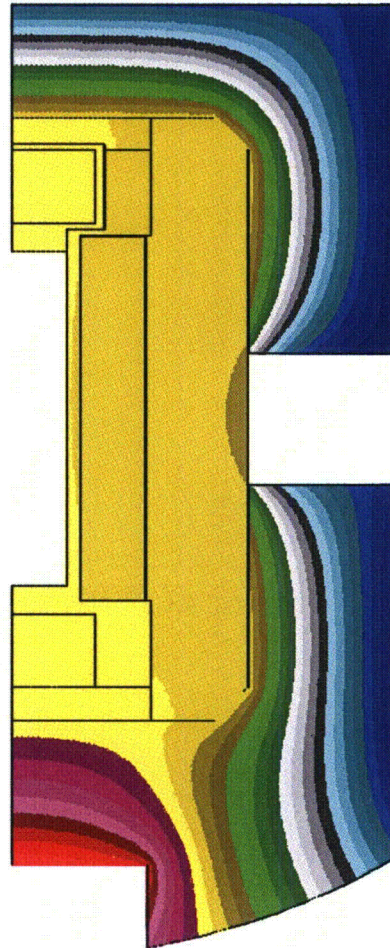
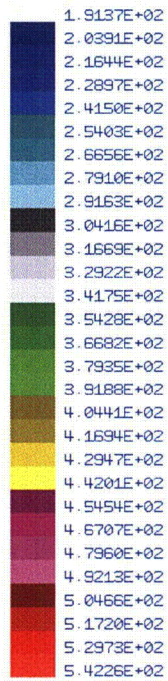
Location	Node	Temp (C)	Temp (F)
-----	----	-----	-----
1	5001	226.83	440.30
2	4532	221.00	429.80
3	4227	225.28	437.50
4	4752	222.11	431.80
5	4838	220.00	428.00
6	4993	220.44	428.80
7	3309	221.11	430.00
8	3351	220.78	429.40
9	678	217.89	424.20
10	2537	218.50	425.30
11	2533	218.61	425.50
12	4828	220.22	428.40
13	1888	212.50	414.50
14	583	219.22	426.60
15	579	219.28	426.70
16	4313	222.56	432.60
17	3001	222.67	432.80
18	3148	221.50	430.70
19	7533	221.94	431.50
20	7377	222.00	431.60
21	7371	219.39	426.90
22	6942	219.00	426.20
23	6267	219.72	427.50
24	6121	222.78	433.00
25	6001	222.72	432.90
26	15481	218.94	426.10
27	15941	218.06	424.50
28	16260	217.61	423.70
29	17311	165.44	329.80
30	11965	173.00	343.40
31	9785	218.67	425.60
32	9571	220.06	428.10
33	8197	223.00	433.40
34	15451	115.28	239.50
35	16160	113.22	235.80
36	17790	100.56	213.00
37	18750	88.78	191.80
38	11485	103.83	218.90
39	9900	120.06	248.10
40	8673	248.22	478.80
41	8225	283.50	542.30

Maximum Component Temperatures

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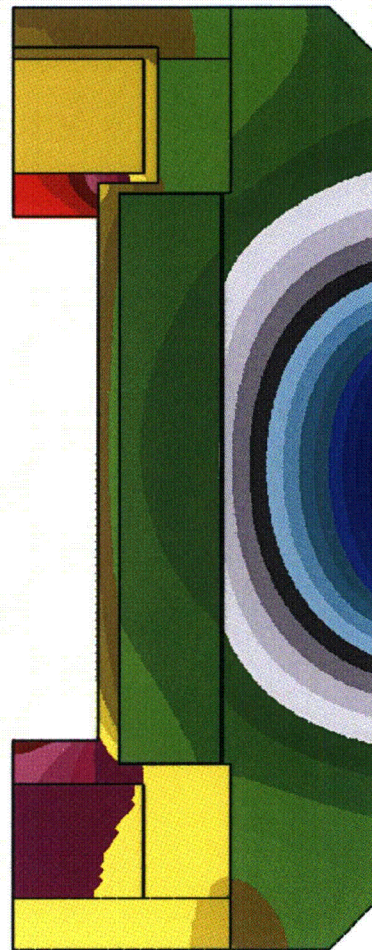
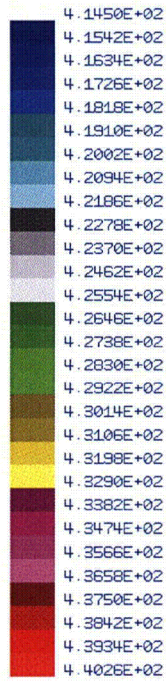
Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	1887	3.7294E+02	7.0330E+02
Bottom Plate	3001	3232	3001	2.2383E+02	4.3490E+02
Cask Lid	3233	3424	3329	2.2289E+02	4.3320E+02
Shell Cavity	4001	4998	4532	2.5939E+02	4.9890E+02
Cask Lid Plug	5001	5404	5001	2.2972E+02	4.4550E+02
Tungsten Alloy	6001	7656	6938	2.6200E+02	5.0360E+02
Bottom Cavity	4227	4236	4236	2.3072E+02	4.4730E+02
Side Cavity	4372	4702	4532	2.5939E+02	4.9890E+02
Top Cavity	5001	5012	5001	2.2972E+02	4.4550E+02
Lid Seal	4993	4993	4993	2.2344E+02	4.3420E+02
Cask Vent Port	2537	2537	2537	2.2494E+02	4.3690E+02
Cask Vent Port Seal	2533	2533	2533	2.2511E+02	4.3720E+02
Vt.Conic.Seal	4828	4828	4828	2.2389E+02	4.3500E+02
Cask Drain Port	583	583	583	2.2689E+02	4.4040E+02
Cask Drain Port Seal	579	579	579	2.2700E+02	4.4060E+02
Drn.Conic.Seal	4313	4313	4313	2.2428E+02	4.3570E+02
Test Port	3351	3351	3351	2.2278E+02	4.3300E+02

VECTOR: 250  
MIN: 1.9137E+02  
MAX: 5.4226E+02



**Figure 3-58. Load Case 112, Post Fire at 180 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Entire Model – Model AOS-050A**

VECTOR: 250  
MIN: 4.1450E+02  
MAX: 4.4026E+02



**Figure 3-59. Load Case 112, Post Fire at 180 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Cask Model – Model AOS-050A**

### **3.5.2.3 Thermal Evaluation Results – Models AOS-100A and AOS-100A-S**

This appendix presents the following information, specific to the Model AOS-100A and AOS-100A-S transport packages:

- Normal Conditions of Transport Thermal Evaluation Results – Models AOS-100A and AOS-100A-S
- Fire Condition Thermal Evaluation Results – Model AOS-100A and AOS-100A-S

Table 3-47 lists the temperature monitoring points (nodes) for the Model AOS-100 (A, B, and A-S) transport packages, under Normal conditions of transport and the Fire condition.

**Table 3-47. Temperature Monitoring Points, by Condition – Model AOS-100**

Nodal Location	LIBRA Model Nodal Number, by Condition	
	Normal Conditions of Transport	Fire Condition
1	5001	5001
2	4532	4532
3	4227	4227
4	4752	4752
5	4838	4838
6	4993	4993
7	3309	3309
8	3351	3351
9	678	678
10	2537	2537
11	2533	2533
12	4828	4828
13	1888	1888
14	583	583
15	579	579
16	4313	4313
17	3148	3148
18	3001	3001
19	7533	7533
20	7377	7377
21	7371	7371
22	6942	6942
23	6267	6267
24	6121	6121
25	6001	6001
26	9501	15481
27	9950	15941
28	10014	16260
29	10781	17129
30	9091	11531
31	8463	9785
32	8462	9571
33	8197	8197
34	9711	15451
35	9821	16160



**Table 3-47. Temperature Monitoring Points, by Condition – Model AOS-100 (Continued)**

Nodal Location	LIBRA Model Nodal Number, by Condition	
	Normal Conditions of Transport	Fire Condition
36	10158	17608
37	10605	18360
38	9102	11051
39	8578	9900
40	8225	8673
41	8001	8225

### 3.5.2.3.1 Normal Conditions of Transport Thermal Evaluation Results – Models AOS-100A and AOS-100A-S

Table 3-48 lists the tables and figures in this appendix that present the Model AOS-100A and AOS-100A-S transport package results under Normal conditions of transport, for Load Cases 101 through 106. Each table provides a list of temperatures at each monitoring node. The tables for Load Cases 101, 102, 105, and 106 also include a list of maximum temperatures within each transport package component.

Figure 3-60 illustrates the location of each node on the Model AOS-100 (A, B, and A-S) transport packages, under Normal conditions of transport. (The node locations are listed in Table 3-47.)

**Table 3-48. Normal Conditions of Transport Thermal Evaluation Results – Models AOS-100A and AOS-100A-S**

Load Case	Description	Results Table	Entire Model	Cask Model
101	100°F Ambient, Maximum Decay Heat	Table 3-49	Figure 3-61	Figure 3-62
102	100°F Ambient, Maximum Decay Heat, Maximum Insolation	Table 3-50	Figure 3-63	Figure 3-64
103	-20°F Ambient, Zero Decay Heat, Zero Insolation	Table 3-51	Figure 3-65	–
104	-40°F Ambient, Zero Decay Heat, Zero Insolation	Table 3-52	Figure 3-66	–
105	-40°F Ambient, Maximum Decay Heat	Table 3-53	Figure 3-67	Figure 3-68
106	-20°F Ambient, Maximum Decay Heat	Table 3-54	Figure 3-69	Figure 3-70



**Table 3-49. Load Case 101, 100°F Ambient, Maximum Decay Heat – Models AOS-100A and AOS-100A-S**

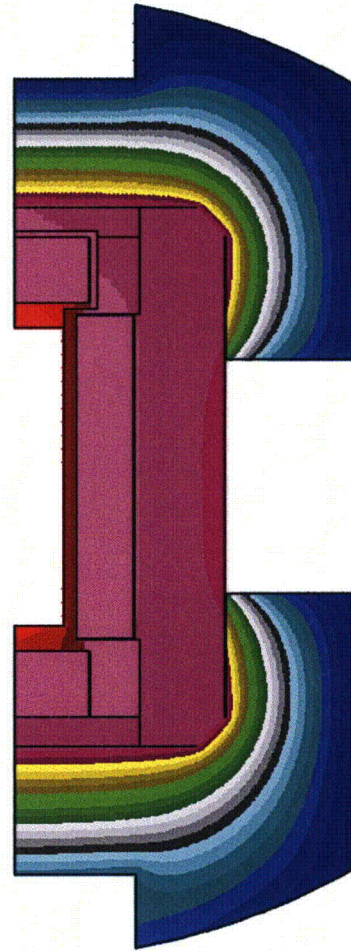
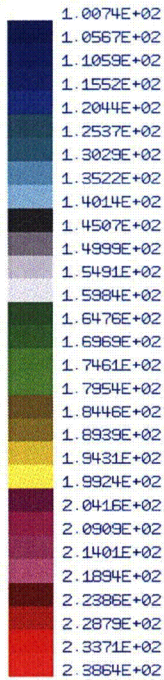
Location	Node	Temp (C)	Temp (F)
-----	----	-----	-----
1	5001	114.78	238.60
2	4532	106.89	224.40
3	4227	111.06	231.90
4	4752	106.11	223.00
5	4838	101.00	213.80
6	4993	100.83	213.50
7	3309	101.11	214.00
8	3351	100.72	213.30
9	678	101.28	214.30
10	2537	99.06	210.30
11	2533	99.28	210.70
12	4828	101.06	213.90
13	1888	97.56	207.60
14	583	98.94	210.10
15	579	99.11	210.40
16	4313	102.00	215.60
17	3148	100.00	212.00
18	3001	100.39	212.70
19	7533	103.06	217.50
20	7377	103.22	217.80
21	7371	102.22	216.00
22	6942	102.39	216.30
23	6267	102.28	216.10
24	6121	102.28	216.10
25	6001	102.17	215.90
26	9501	100.39	212.70
27	9950	98.89	210.00
28	10014	98.06	208.50
29	10781	74.89	166.80
30	9091	72.56	162.60
31	8463	97.56	207.60
32	8462	98.67	209.60
33	8197	99.89	211.80
34	9711	39.39	102.90
35	9821	38.28	100.90
36	10158	38.22	100.80
37	10605	41.17	106.10
38	9102	40.33	104.60
39	8578	40.22	104.40
40	8225	48.28	118.90
41	8001	53.00	127.40

Maximum Component Temperatures

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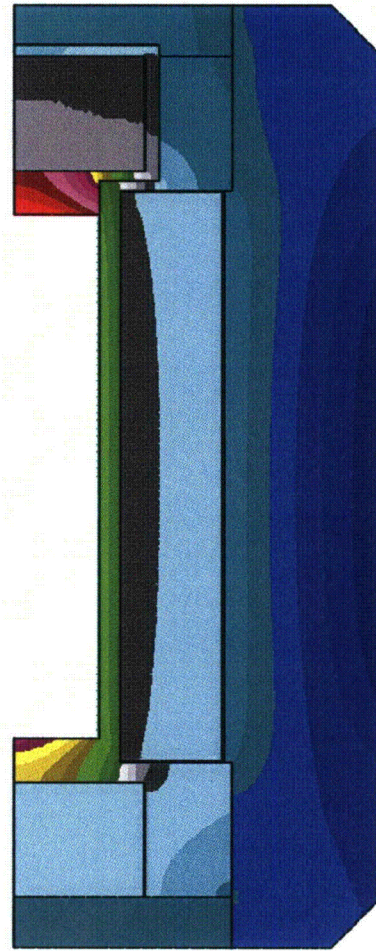
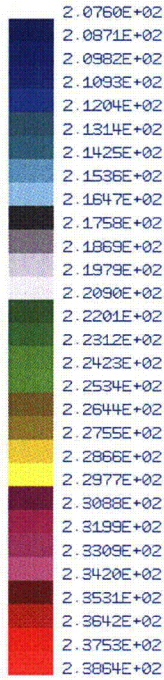
Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	724	1.0133E+02	2.1440E+02
Bottom Plate	3001	3232	3103	1.0050E+02	2.1290E+02
Cask Lid	3233	3424	3233	1.0122E+02	2.1420E+02
Shell Cavity	4001	4998	4227	1.1106E+02	2.3190E+02
Cask Lid Plug	5001	5404	5001	1.1478E+02	2.3860E+02
Tungsten Alloy	6001	7656	7552	1.0333E+02	2.1800E+02
Bottom Cavity	4227	4236	4227	1.1106E+02	2.3190E+02
Side Cavity	4372	4702	4372	1.0694E+02	2.2450E+02
Top Cavity	5001	5012	5001	1.1478E+02	2.3860E+02
Lid Seal	4993	4993	4993	1.0083E+02	2.1350E+02
Cask Vent Port	2537	2537	2537	9.9056E+01	2.1030E+02
Cask Vent Port Seal	2533	2533	2533	9.9278E+01	2.1070E+02
Vt.Conic.Seal	4828	4828	4828	1.0106E+02	2.1390E+02
Cask Drain Port	583	583	583	9.8944E+01	2.1010E+02
Cask Drain Port Seal	579	579	579	9.9111E+01	2.1040E+02
Drn.Conic.Seal	4313	4313	4313	1.0200E+02	2.1560E+02
Test Port	3351	3351	3351	1.0072E+02	2.1330E+02

VECTOR: 1  
MIN: 1.0074E+02  
MAX: 2.3864E+02



**Figure 3-61. Load Case 101, 100°F Ambient, Maximum Decay Heat, Entire Model – Models AOS-100A and AOS-100A-S**

VECTOR: 1  
MIN: 2.0760E+02  
MAX: 2.3864E+02



**Figure 3-62. Load Case 101, 100°F Ambient, Maximum Decay Heat, Cask Model – Models AOS-100A and AOS-100A-S**

**Table 3-50. Load Case 102, 100°F Ambient, Maximum Decay Heat, Maximum Insolation – Models AOS-100A and AOS-100A-S**

Location	Node	Temp (C)	Temp (F)
-----	----	-----	-----
1	5001	158.33	317.00
2	4532	151.11	304.00
3	4227	155.39	311.70
4	4752	150.17	302.30
5	4838	145.17	293.30
6	4993	145.00	293.00
7	3309	145.28	293.50
8	3351	144.94	292.90
9	678	145.78	294.40
10	2537	143.17	289.70
11	2533	143.44	290.20
12	4828	145.22	293.40
13	1888	142.22	288.00
14	583	144.11	291.40
15	579	144.22	291.60
16	4313	146.89	296.40
17	3148	145.00	293.00
18	3001	145.39	293.70
19	7533	147.06	296.70
20	7377	147.22	297.00
21	7371	146.56	295.80
22	6942	146.89	296.40
23	6267	147.00	296.60
24	6121	147.17	296.90
25	6001	147.00	296.60
26	9501	144.78	292.60
27	9950	143.33	290.00
28	10014	142.56	288.60
29	10781	113.94	237.10
30	9091	127.50	261.50
31	8463	143.28	289.90
32	8462	143.94	291.10
33	8197	144.89	292.80
34	9711	110.39	230.70
35	9821	100.06	212.10
36	10158	100.89	213.60
37	10605	83.33	182.00
38	9102	101.17	214.10
39	8578	90.17	194.30
40	8225	97.39	207.30
41	8001	101.56	214.80

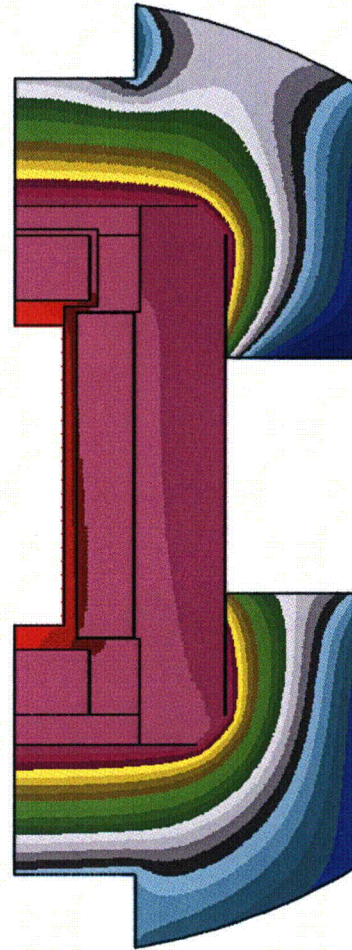
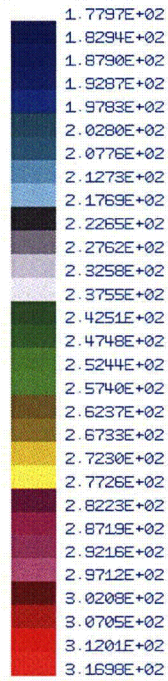


Maximum Component Temperatures

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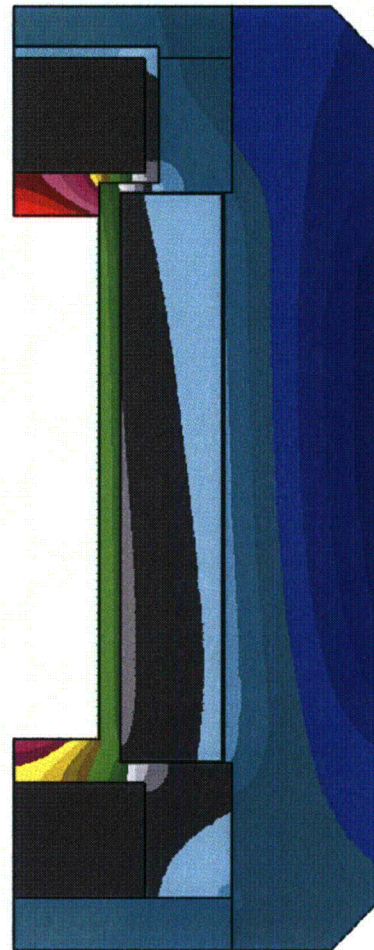
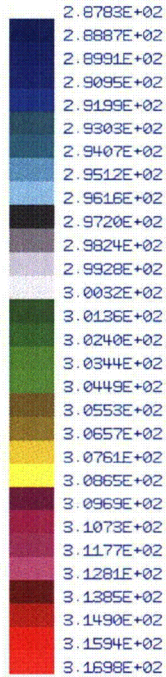
Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	616	1.4600E+02	2.9480E+02
Bottom Plate	3001	3232	3120	1.4550E+02	2.9390E+02
Cask Lid	3233	3424	3233	1.4539E+02	2.9370E+02
Shell Cavity	4001	4998	4227	1.5539E+02	3.1170E+02
Cask Lid Plug	5001	5404	5001	1.5833E+02	3.1700E+02
Tungsten Alloy	6001	7656	6320	1.4750E+02	2.9750E+02
Bottom Cavity	4227	4236	4227	1.5539E+02	3.1170E+02
Side Cavity	4372	4702	4372	1.5144E+02	3.0460E+02
Top Cavity	5001	5012	5001	1.5833E+02	3.1700E+02
Lid Seal	4993	4993	4993	1.4500E+02	2.9300E+02
Cask Vent Port	2537	2537	2537	1.4317E+02	2.8970E+02
Cask Vent Port Seal	2533	2533	2533	1.4344E+02	2.9020E+02
Vt.Conic.Seal	4828	4828	4828	1.4522E+02	2.9340E+02
Cask Drain Port	583	583	583	1.4411E+02	2.9140E+02
Cask Drain Port Seal	579	579	579	1.4422E+02	2.9160E+02
Drn.Conic.Seal	4313	4313	4313	1.4689E+02	2.9640E+02
Test Port	3351	3351	3351	1.4494E+02	2.9290E+02

VECTOR: 1  
MIN: 1.7797E+02  
MAX: 3.1698E+02



**Figure 3-63. Load Case 102, 100°F Ambient, Maximum Decay Heat, Maximum Insolation, Entire Model – Models AOS-100A and AOS-100A-S**

VECTOR: 1  
 MIN: 2 8783E+02  
 MAX: 3 1698E+02



**Figure 3-64. Load Case 102, 100°F Ambient, Maximum Decay Heat, Maximum Insolation, Cask Model – Models AOS-100A and AOS-100A-S**

**Table 3-51. Load Case 103, -20°F Ambient, Zero Decay Heat, Zero Insolation – Models AOS-100A and AOS-100A-S**

Location	Node	Temp (C)	Temp (F)
-----	-----	-----	-----
1	5001	-28.89	-20.00
2	4532	-28.89	-20.00
3	4227	-28.89	-20.00
4	4752	-28.89	-20.00
5	4838	-28.89	-20.00
6	4993	-28.89	-20.00
7	3309	-28.89	-20.00
8	3351	-28.89	-20.00
9	678	-28.89	-20.00
10	2537	-28.89	-20.00
11	2533	-28.89	-20.00
12	4828	-28.89	-20.00
13	1888	-28.89	-20.00
14	583	-28.89	-20.00
15	579	-28.89	-20.00
16	4313	-28.89	-20.00
17	3148	-28.89	-20.00
18	3001	-28.89	-20.00
19	7533	-28.89	-20.00
20	7377	-28.89	-20.00
21	7371	-28.89	-20.00
22	6942	-28.89	-20.00
23	6267	-28.89	-20.00
24	6121	-28.89	-20.00
25	6001	-28.89	-20.00
26	9501	-28.89	-20.00
27	9950	-28.89	-20.00
28	10014	-28.89	-20.00
29	10781	-28.89	-20.00
30	9091	-28.89	-20.00
31	8463	-28.89	-20.00
32	8462	-28.89	-20.00
33	8197	-28.89	-20.00
34	9711	-28.89	-20.00
35	9821	-28.89	-20.00
36	10158	-28.89	-20.00
37	10605	-28.89	-20.00
38	9102	-28.89	-20.00
39	8578	-28.89	-20.00
40	8225	-28.89	-20.00
41	8001	-28.89	-20.00

VECTOR: 1  
MIN: -2.0000E+01  
MAX: -2.0000E+01

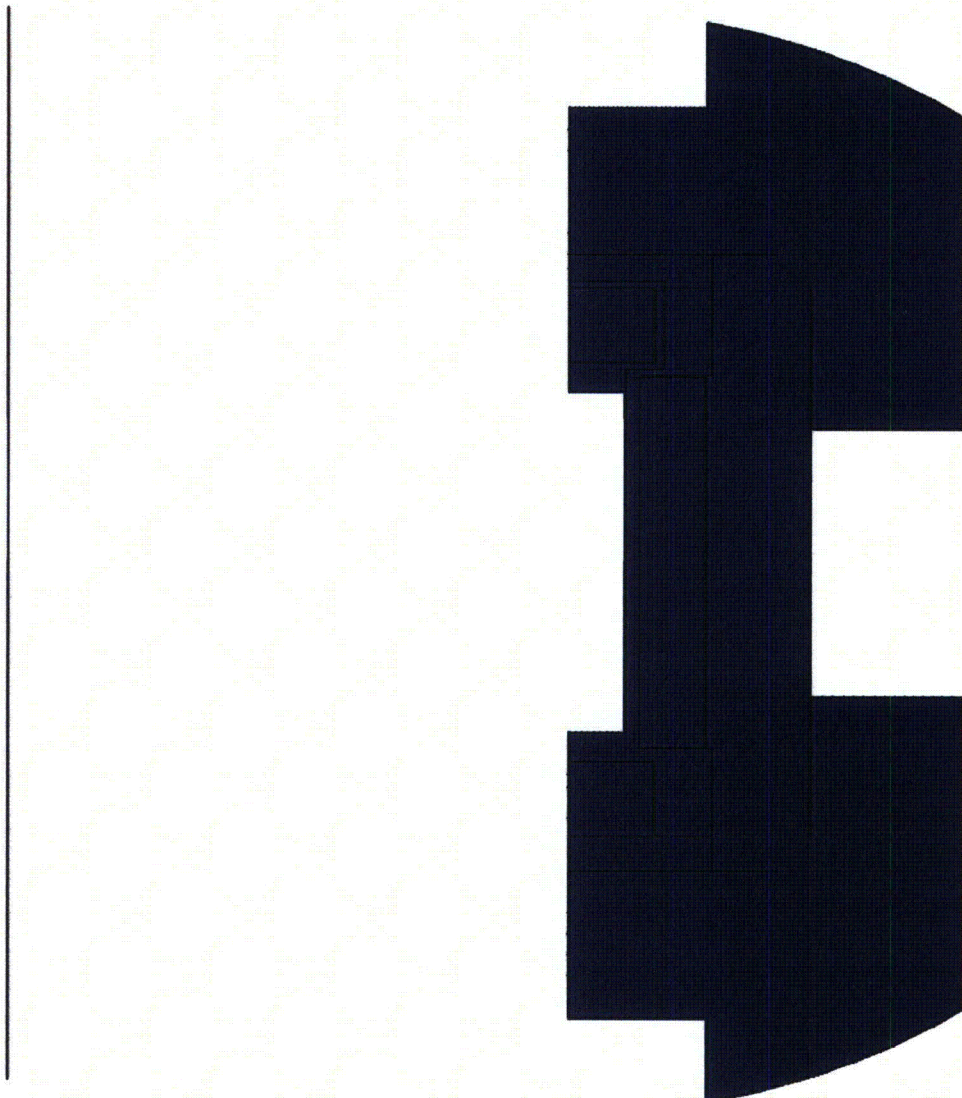
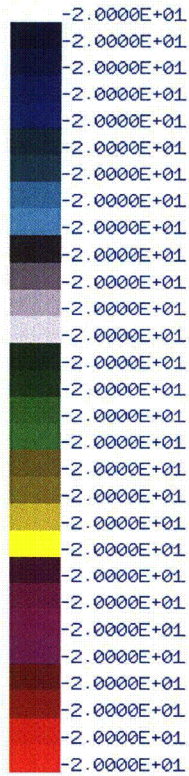
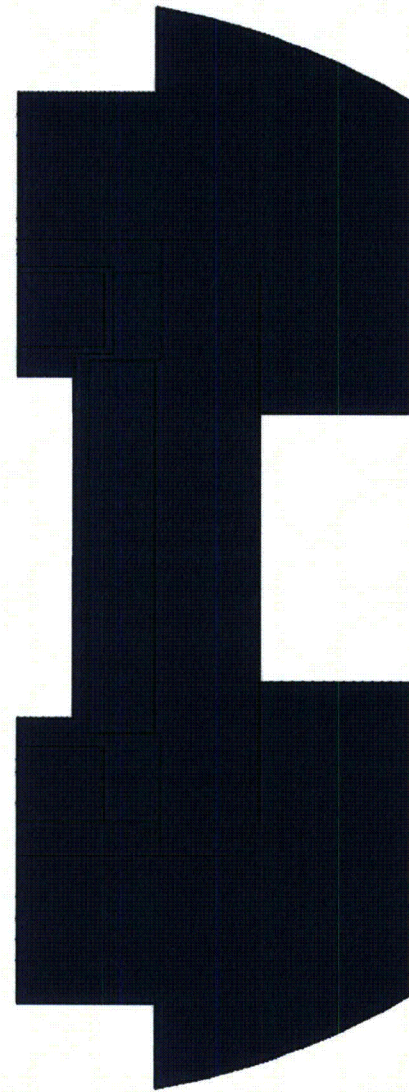
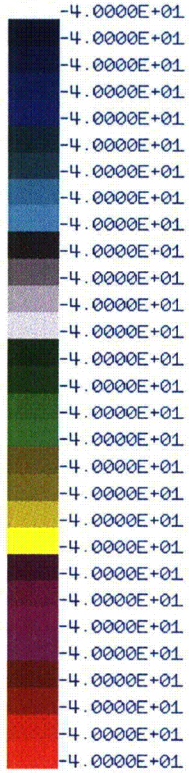


Figure 3-65. Load Case 103, -20°F Ambient, Zero Decay Heat, Zero Insolation, Entire Model – Models AOS-100A and AOS-100A-S

**Table 3-52. Load Case 104, -40°F Ambient, Zero Decay Heat, Zero Insolation – Models AOS-100A and AOS-100A-S**

Location	Node	Temp (C)	Temp (F)
-----	----	-----	-----
1	5001	-40.00	-40.00
2	4532	-40.00	-40.00
3	4227	-40.00	-40.00
4	4752	-40.00	-40.00
5	4838	-40.00	-40.00
6	4993	-40.00	-40.00
7	3309	-40.00	-40.00
8	3351	-40.00	-40.00
9	678	-40.00	-40.00
10	2537	-40.00	-40.00
11	2533	-40.00	-40.00
12	4828	-40.00	-40.00
13	1888	-40.00	-40.00
14	583	-40.00	-40.00
15	579	-40.00	-40.00
16	4313	-40.00	-40.00
17	3148	-40.00	-40.00
18	3001	-40.00	-40.00
19	7533	-40.00	-40.00
20	7377	-40.00	-40.00
21	7371	-40.00	-40.00
22	6942	-40.00	-40.00
23	6267	-40.00	-40.00
24	6121	-40.00	-40.00
25	6001	-40.00	-40.00
26	9501	-40.00	-40.00
27	9950	-40.00	-40.00
28	10014	-40.00	-40.00
29	10781	-40.00	-40.00
30	9091	-40.00	-40.00
31	8463	-40.00	-40.00
32	8462	-40.00	-40.00
33	8197	-40.00	-40.00
34	9711	-40.00	-40.00
35	9821	-40.00	-40.00
36	10158	-40.00	-40.00
37	10605	-40.00	-40.00
38	9102	-40.00	-40.00
39	8578	-40.00	-40.00
40	8225	-40.00	-40.00
41	8001	-40.00	-40.00

VECTOR: 1  
MIN: -4.0000E+01  
MAX: -4.0000E+01



**Figure 3-66. Load Case 104, -40°F Ambient, Zero Decay Heat, Zero Insolation, Entire Model – Models AOS-100A and AOS-100A-S**

**Table 3-53. Load Case 105, -40°F Ambient, Maximum Decay Heat – Models AOS-100A and AOS-100A-S**

Location	Node	Temp (C)	Temp (F)
-----	-----	-----	-----
1	5001	45.17	113.30
2	4532	36.38	97.49
3	4227	40.72	105.30
4	4752	35.49	95.89
5	4838	29.95	85.91
6	4993	29.79	85.63
7	3309	30.12	86.22
8	3351	29.69	85.45
9	678	30.14	86.26
10	2537	27.89	82.21
11	2533	28.11	82.59
12	4828	30.06	86.10
13	1888	26.08	78.95
14	583	27.64	81.76
15	579	27.85	82.13
16	4313	30.93	87.68
17	3148	28.74	83.74
18	3001	29.23	84.62
19	7533	32.47	90.45
20	7377	32.68	90.82
21	7371	31.14	88.05
22	6942	31.28	88.30
23	6267	31.13	88.04
24	6121	31.25	88.25
25	6001	31.10	87.98
26	9501	29.36	84.84
27	9950	27.46	81.42
28	10014	26.30	79.34
29	10781	2.58	36.64
30	9091	-1.81	28.75
31	8463	25.50	77.90
32	8462	27.09	80.76
33	8197	28.64	83.55
34	9711	-37.70	-35.86
35	9821	-39.18	-38.53
36	10158	-39.34	-38.81
37	10605	-34.23	-29.61
38	9102	-36.38	-33.48
39	8578	-36.78	-34.21
40	8225	-27.38	-17.29
41	8001	-21.91	-7.44



Maximum Component Temperatures

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Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	722	3.0211E+01	8.6380E+01
Bottom Plate	3001	3232	3120	2.9344E+01	8.4820E+01
Cask Lid	3233	3424	3233	3.0244E+01	8.6440E+01
Shell Cavity	4001	4998	4227	4.0722E+01	1.0530E+02
Cask Lid Plug	5001	5404	5001	4.5167E+01	1.1330E+02
Tungsten Alloy	6001	7656	7552	3.2756E+01	9.0960E+01
Bottom Cavity	4227	4236	4227	4.0722E+01	1.0530E+02
Side Cavity	4372	4702	4372	3.6422E+01	9.7560E+01
Top Cavity	5001	5012	5001	4.5167E+01	1.1330E+02
Lid Seal	4993	4993	4993	2.9794E+01	8.5630E+01
Cask Vent Port	2537	2537	2537	2.7894E+01	8.2210E+01
Cask Vent Port Seal	2533	2533	2533	2.8106E+01	8.2590E+01
Vt.Conic.Seal	4828	4828	4828	3.0056E+01	8.6100E+01
Cask Drain Port	583	583	583	2.7644E+01	8.1760E+01
Cask Drain Port Seal	579	579	579	2.7850E+01	8.2130E+01
Drn.Conic.Seal	4313	4313	4313	3.0933E+01	8.7680E+01
Test Port	3351	3351	3351	2.9694E+01	8.5450E+01

VECTOR: 1  
MIN: -3.8853E+01  
MAX: 1.1329E+02

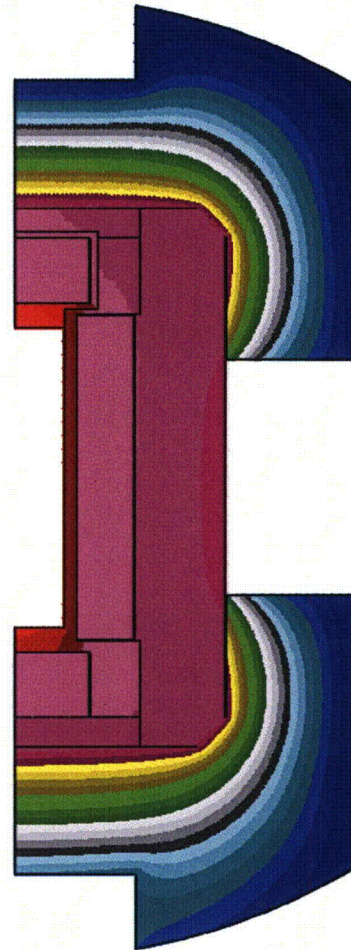
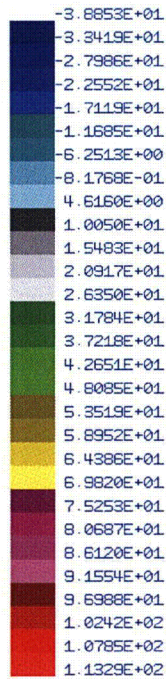
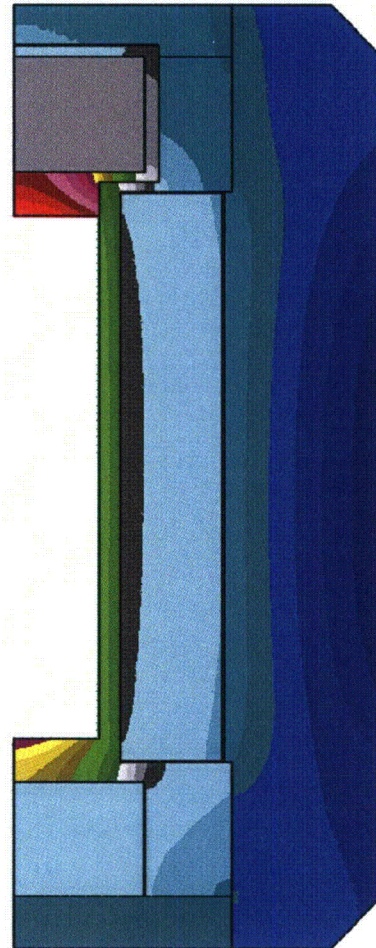
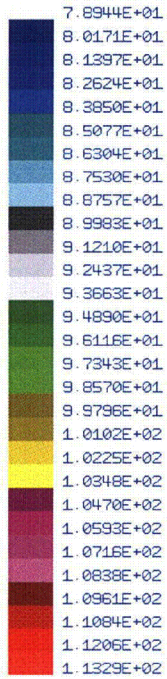


Figure 3-67. Load Case 105, -40°F Ambient, Maximum Decay Heat, Entire Model – Models AOS-100A and AOS-100A-S

VECTOR: 1  
MIN: 7.8944E+01  
MAX: 1.1329E+02



**Figure 3-68. Load Case 105, -40°F Ambient, Maximum Decay Heat, Cask Model – Models AOS-100A and AOS-100A-S**

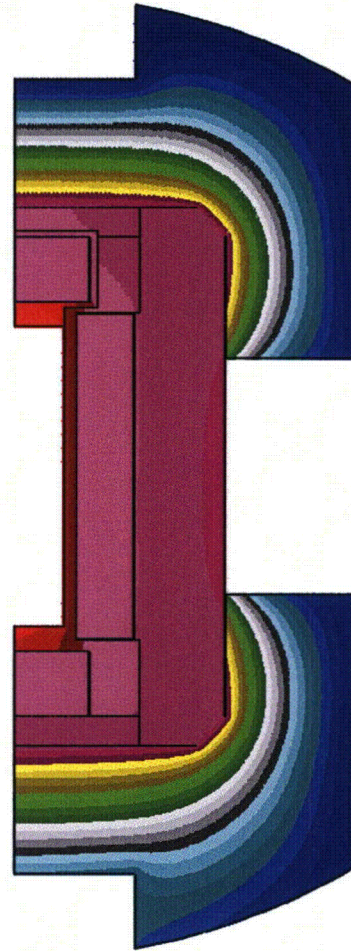
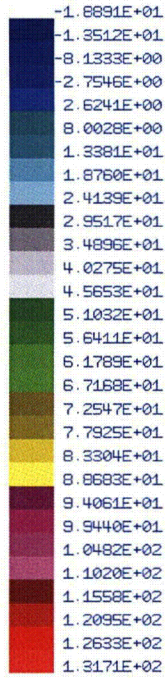
**Table 3-54. Load Case 106, -20°F Ambient, Maximum Decay Heat – Models AOS-100A and AOS-100A-S**

Location	Node	Temp (C)	Temp (F)
-----	-----	-----	-----
1	5001	55.39	131.70
2	4532	46.72	116.10
3	4227	51.06	123.90
4	4752	45.89	114.60
5	4838	40.39	104.70
6	4993	40.22	104.40
7	3309	40.56	105.00
8	3351	40.17	104.30
9	678	40.61	105.10
10	2537	38.33	101.00
11	2533	38.56	101.40
12	4828	40.50	104.90
13	1888	36.62	97.92
14	583	38.11	100.60
15	579	38.33	101.00
16	4313	41.39	106.50
17	3148	39.22	102.60
18	3001	39.67	103.40
19	7533	42.83	109.10
20	7377	43.06	109.50
21	7371	41.61	106.90
22	6942	41.72	107.10
23	6267	41.61	106.90
24	6121	41.67	107.00
25	6001	41.56	106.80
26	9501	39.78	103.60
27	9950	37.94	100.30
28	10014	36.84	98.31
29	10781	12.88	55.18
30	9091	8.62	47.52
31	8463	36.06	96.90
32	8462	37.59	99.67
33	8197	39.11	102.40
34	9711	-26.72	-16.09
35	9821	-28.13	-18.63
36	10158	-28.24	-18.84
37	10605	-23.56	-10.40
38	9102	-25.51	-13.91
39	8578	-25.68	-14.23
40	8225	-16.47	2.36
41	8001	-11.10	12.02

Maximum Component Temperatures  
-----

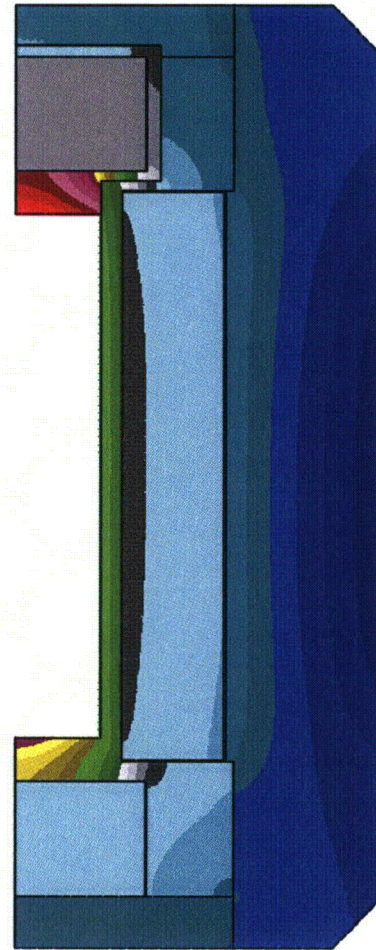
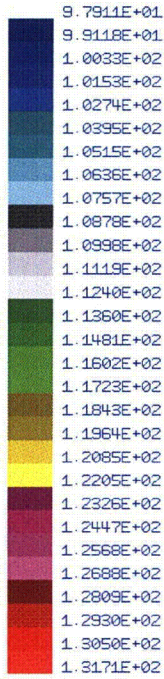
Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
Cask Outer Shell	101	2894	698	4.0667E+01	1.0520E+02
Bottom Plate	3001	3232	3103	3.9778E+01	1.0360E+02
Cask Lid	3233	3424	3233	4.0667E+01	1.0520E+02
Shell Cavity	4001	4998	4227	5.1056E+01	1.2390E+02
Cask Lid Plug	5001	5404	5001	5.5389E+01	1.3170E+02
Tungsten Alloy	6001	7656	7552	4.3111E+01	1.0960E+02
Bottom Cavity	4227	4236	4227	5.1056E+01	1.2390E+02
Side Cavity	4372	4702	4372	4.6778E+01	1.1620E+02
Top Cavity	5001	5012	5001	5.5389E+01	1.3170E+02
Lid Seal	4993	4993	4993	4.0222E+01	1.0440E+02
Cask Vent Port	2537	2537	2537	3.8333E+01	1.0100E+02
Cask Vent Port Seal	2533	2533	2533	3.8556E+01	1.0140E+02
Vt.Conic.Seal	4828	4828	4828	4.0500E+01	1.0490E+02
Cask Drain Port	583	583	583	3.8111E+01	1.0060E+02
Cask Drain Port Seal	579	579	579	3.8333E+01	1.0100E+02
Drn.Conic.Seal	4313	4313	4313	4.1389E+01	1.0650E+02
Test Port	3351	3351	3351	4.0167E+01	1.0430E+02

VECTOR: 1  
 MIN: -1.8891E+01  
 MAX: 1.3171E+02



**Figure 3-69. Load Case 106, -20°F Ambient, Maximum Decay Heat, Entire Model – Models AOS-100A and AOS-100A-S**

VECTOR: 1  
 MIN: 9.7911E+01  
 MAX: 1.3171E+02



**Figure 3-70. Load Case 106, -20°F Ambient, Maximum Decay Heat, Cask Model – Models AOS-100A and AOS-100A-S**

### 3.5.2.3.2 Fire Condition Thermal Evaluation Results – Model AOS-100A and AOS-100A-S

Table 3-55 lists the tables and figures in this appendix that present the Model AOS-100A and AOS-100A-S transport package results under the Fire condition, for Load Cases 111 and 112. Each table provides a list of temperatures at each monitoring node. Also listed are the maximum temperatures within each transport package component.

Figure 3-71 illustrates the location of each node on the Model AOS-100 (A, B, and A-S) transport packages, under the Fire condition. (The node locations are listed in Table 3-47.)

**Table 3-55. Fire Condition Thermal Evaluation Results – Models AOS-100A and AOS-100A-S**

Load Case	Description	Temperature versus Time	Results Table	Entire Model	Cask Model
111	Fire at 30 Minutes, 1,475°F Ambient, Maximum Decay Heat		Table 3-56	Figure 3-75	Figure 3-76
112	Post Fire at 60 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation		Table 3-57	Figure 3-77	Figure 3-78
	Post Fire at 90 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation	Figure 3-72	Table 3-58	Figure 3-79	Figure 3-80
	Post Fire at 120 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation	Figure 3-73	Table 3-59	Figure 3-81	Figure 3-82
	Post Fire at 150 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation	Figure 3-74	Table 3-60	Figure 3-83	Figure 3-84
	Post Fire at 180 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation		Table 3-61	Figure 3-85	Figure 3-86



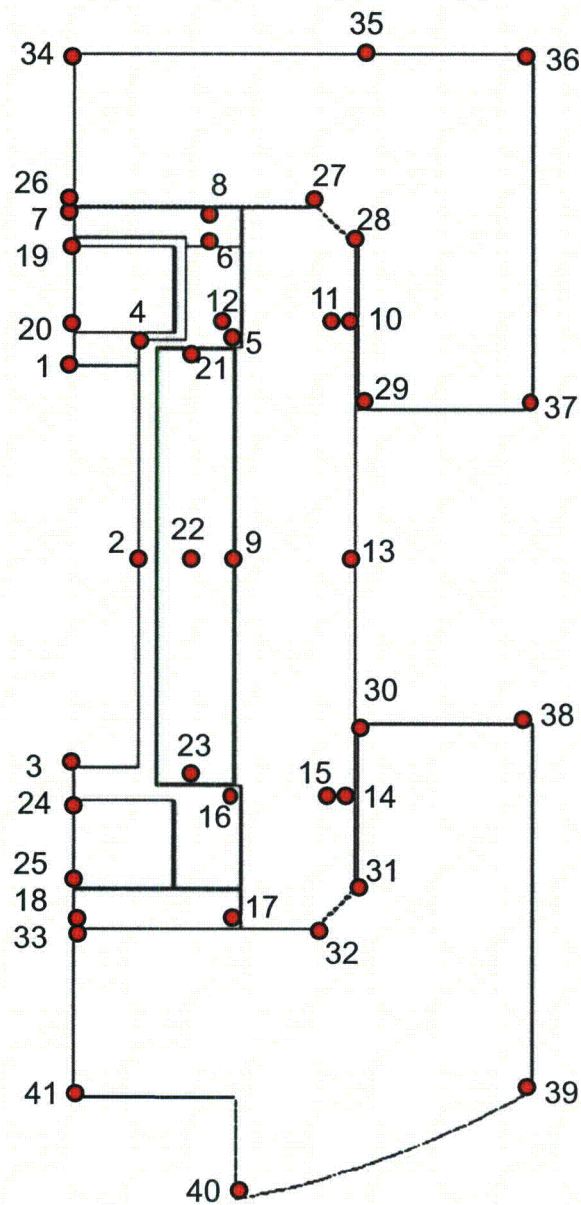
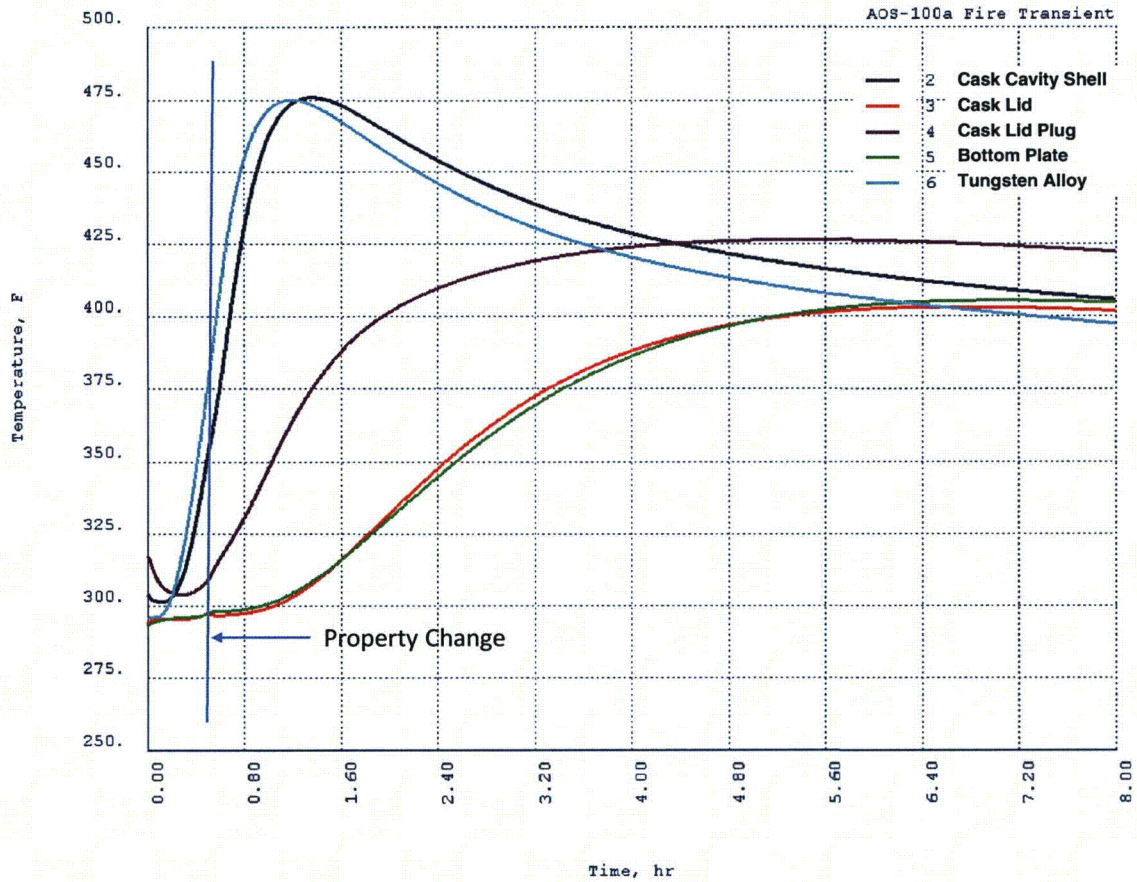
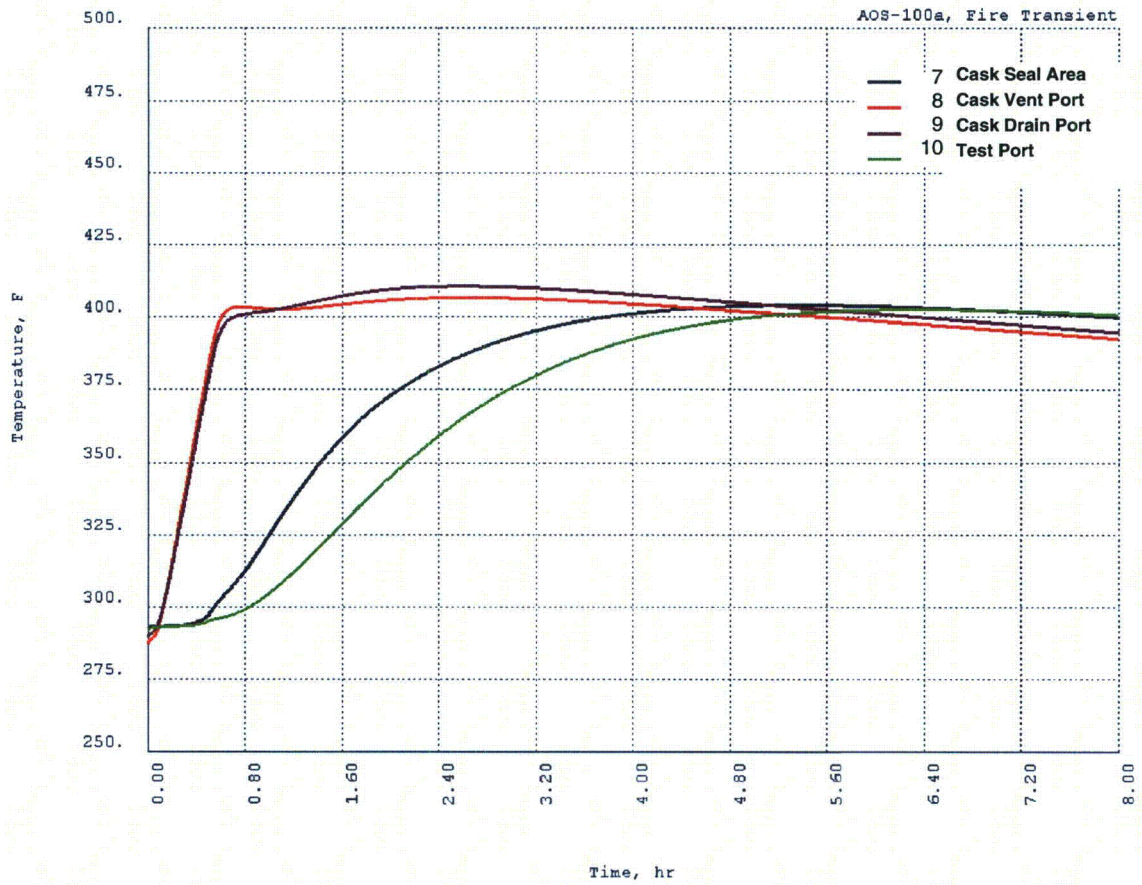


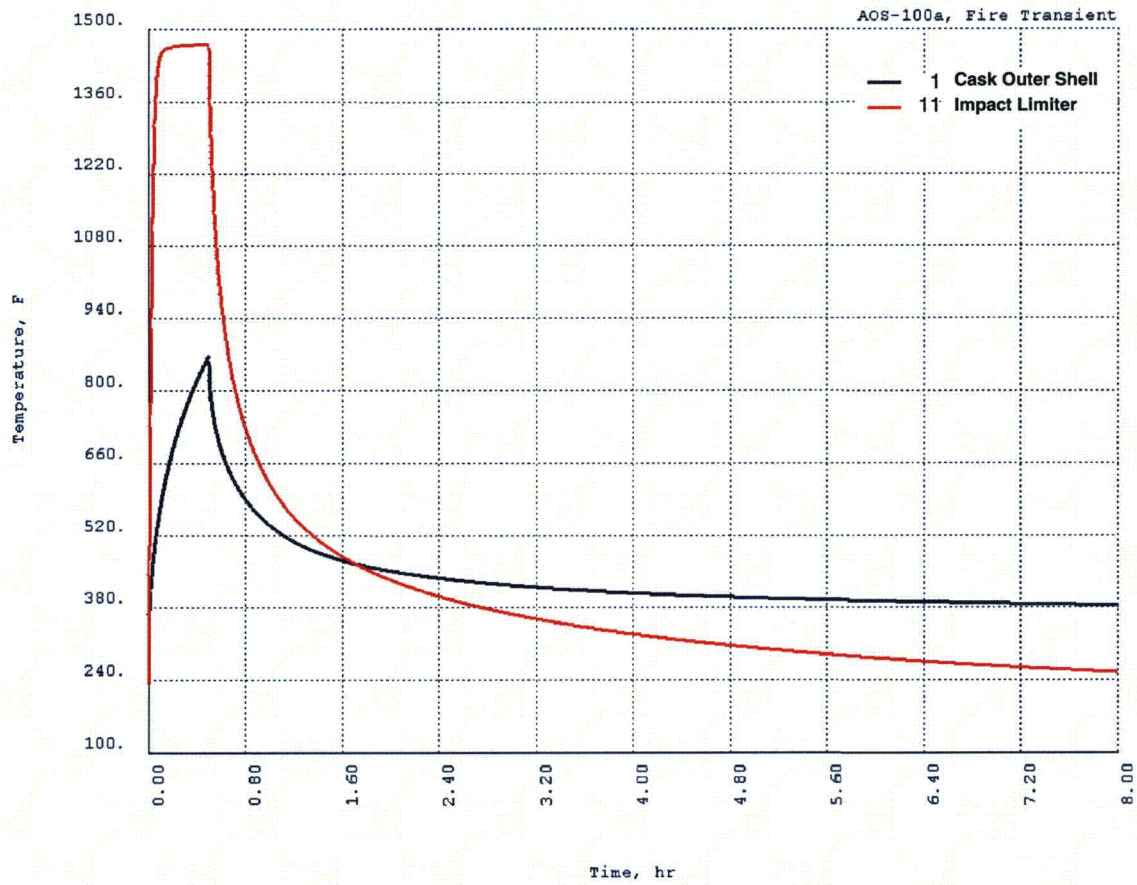
Figure 3-71. Selected Nodal Locations for Fire Condition – Model AOS-100



**Figure 3-72. Fire for 30 Minutes and Post Fire Cool Down for 7.5 Hours, Temperature versus Time, for Cask Cavity Shell, Cask Lid, Cask Lid Plug, Bottom Plate, and Tungsten Alloy – Models AOS-100A and AOS-100A-S**



**Figure 3-73. Fire for 30 Minutes and Post Fire Cool Down for 7.5 Hours, Temperature versus Time, for Cask Seal Area, Cask Vent Port, Cask Drain Port, and Test Port – Models AOS-100A and AOS-100A-S**



**Figure 3-74. Fire for 30 Minutes and Post Fire Cool Down for 7.5 Hours, Temperature versus Time, for Cask Outer Shell and Impact Limiter – Models AOS-100A and AOS-100A-S**

**Table 3-56. Load Case 111, Fire at 30 Minutes, 1,475°F Ambient, Maximum Decay Heat – Models AOS-100A and AOS-100A-S**

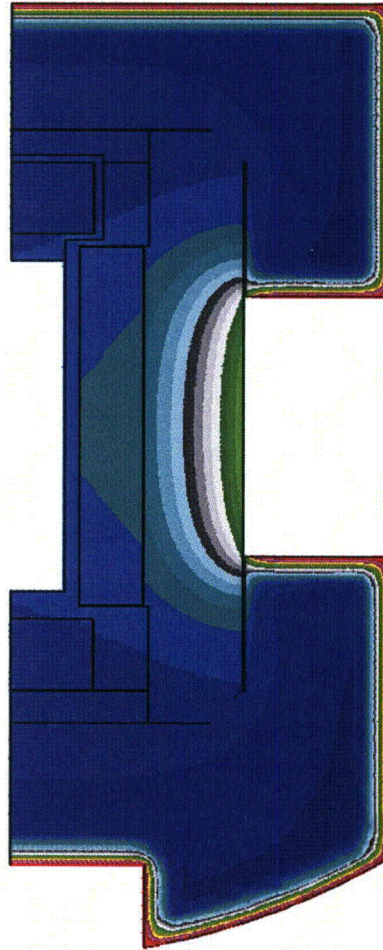
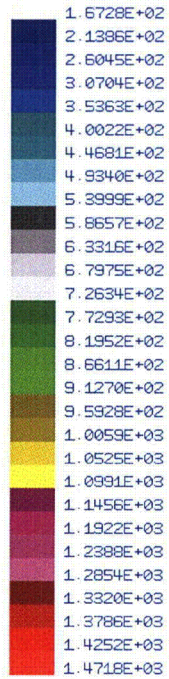
Location	Node	Temp (C)	Temp (F)
-----	----	-----	-----
1	5001	153.72	308.70
2	4532	177.89	352.20
3	4227	154.56	310.20
4	4752	154.61	310.30
5	4838	167.17	332.90
6	4993	147.00	296.60
7	3309	146.61	295.90
8	3351	146.00	294.80
9	678	211.39	412.50
10	2537	195.11	383.20
11	2533	192.11	377.80
12	4828	160.44	320.80
13	1888	463.11	865.60
14	583	192.61	378.70
15	579	189.83	373.70
16	4313	161.61	322.90
17	3148	146.67	296.00
18	3001	147.28	297.10
19	7533	148.33	299.00
20	7377	150.17	302.30
21	7371	165.06	329.10
22	6942	183.06	361.50
23	6267	165.00	329.00
24	6121	150.83	303.50
25	6001	148.94	300.10
26	15481	146.61	295.90
27	15941	146.89	296.40
28	16260	150.50	302.90
29	17129	443.72	830.70
30	11531	444.56	832.20
31	9785	151.33	304.40
32	9571	147.72	297.90
33	8197	147.28	297.10
34	15451	797.22	1467.00
35	16160	796.67	1466.00
36	17608	799.44	1471.00
37	18360	799.44	1471.00
38	11051	799.44	1471.00
39	9900	798.89	1470.00
40	8673	800.00	1472.00
41	8225	797.78	1468.00

Maximum Component Temperatures

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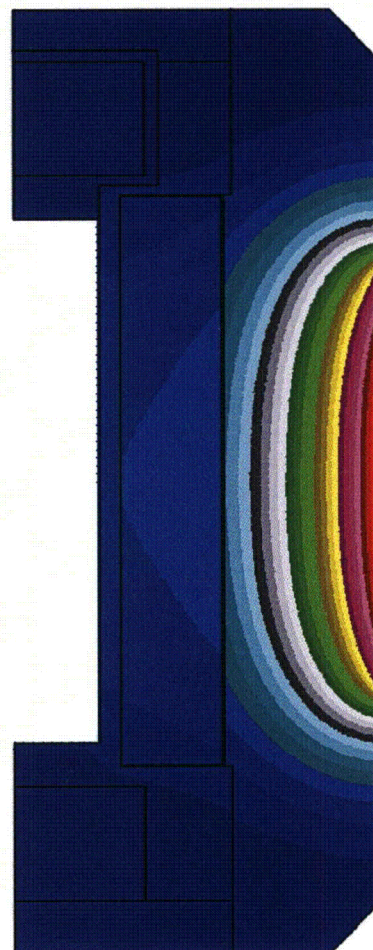
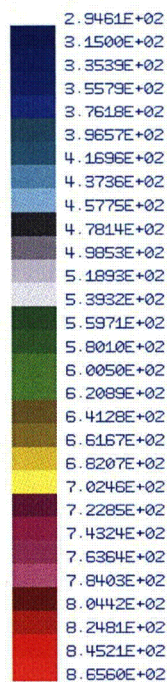
Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	1888	4.6311E+02	8.6560E+02
Bottom Plate	3001	3232	3120	1.4872E+02	2.9970E+02
Cask Lid	3233	3424	3233	1.4739E+02	2.9730E+02
Shell Cavity	4001	4998	4531	1.7861E+02	3.5350E+02
Cask Lid Plug	5001	5404	5012	1.5878E+02	3.1780E+02
Tungsten Alloy	6001	7656	6938	1.9078E+02	3.7540E+02
Bottom Cavity	4227	4236	4236	1.6044E+02	3.2080E+02
Side Cavity	4372	4702	4527	1.7789E+02	3.5220E+02
Top Cavity	5001	5012	5012	1.5878E+02	3.1780E+02
Lid Seal	4993	4993	4993	1.4700E+02	2.9660E+02
Cask Vent Port	2537	2537	2537	1.9511E+02	3.8320E+02
Cask Vent Port Seal	2533	2533	2533	1.9211E+02	3.7780E+02
Vt.Conic.Seal	4828	4828	4828	1.6044E+02	3.2080E+02
Cask Drain Port	583	583	583	1.9261E+02	3.7870E+02
Cask Drain Port Seal	579	579	579	1.8983E+02	3.7370E+02
Drn.Conic.Seal	4313	4313	4313	1.6161E+02	3.2290E+02
Test Port	3351	3351	3351	1.4600E+02	2.9480E+02

VECTOR: 50  
MIN: 1.6728E+02  
MAX: 1.4718E+03



**Figure 3-75. Load Case 111, Fire at 30 Minutes, 1,475°F Ambient, Maximum Decay Heat, Entire Model – Models AOS-100A and AOS-100A-S**

VECTOR: 50  
 MIN: 2.9461E+02  
 MAX: 8.6560E+02



**Figure 3-76. Load Case 111, Fire at 30 Minutes, 1,475°F Ambient, Maximum Decay Heat, Cask Model – Models AOS-100A and AOS-100A-S**



**Table 3-57. Load Case 112, Post Fire at 60 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation – Models AOS-100A and AOS-100A-S**

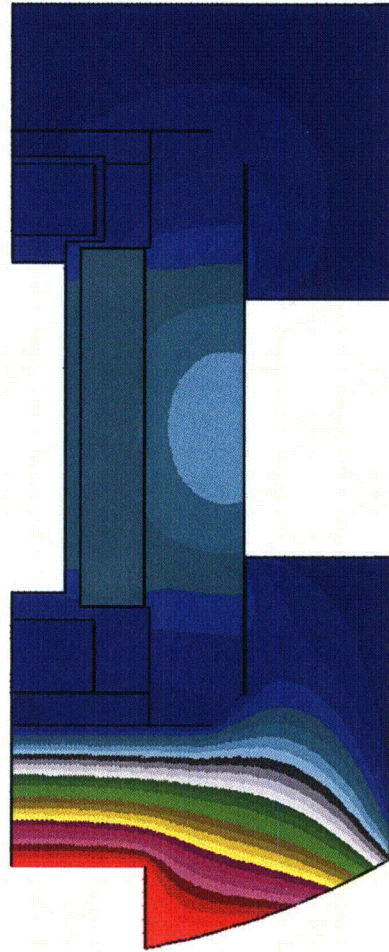
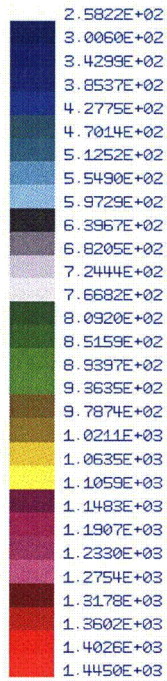
Location	Node	Temp (C)	Temp (F)
-----	----	-----	-----
1	5001	175.11	347.20
2	4532	238.78	461.80
3	4227	186.78	368.20
4	4752	193.61	380.50
5	4838	181.56	358.80
6	4993	162.61	324.70
7	3309	148.28	298.90
8	3351	151.39	304.50
9	678	253.89	489.00
10	2537	205.78	402.40
11	2533	205.50	401.90
12	4828	174.83	346.70
13	1888	281.17	538.10
14	583	205.50	401.90
15	579	205.33	401.60
16	4313	162.56	324.60
17	3148	159.22	318.60
18	3001	149.22	300.60
19	7533	153.22	307.80
20	7377	153.78	308.80
21	7371	223.50	434.30
22	6942	240.39	464.70
23	6267	223.28	433.90
24	6121	157.72	315.90
25	6001	156.94	314.50
26	15481	148.17	298.70
27	15941	162.61	324.70
28	16260	173.11	343.60
29	17129	184.00	363.20
30	11531	181.72	359.10
31	9785	176.94	350.50
32	9571	168.11	334.60
33	8197	154.44	310.00
34	15451	130.17	266.30
35	16160	130.39	266.70
36	17608	127.94	262.30
37	18360	128.39	263.10
38	11051	128.11	262.60
39	9900	325.33	617.60
40	8673	785.00	1445.00
41	8225	770.56	1419.00

Maximum Component Temperatures

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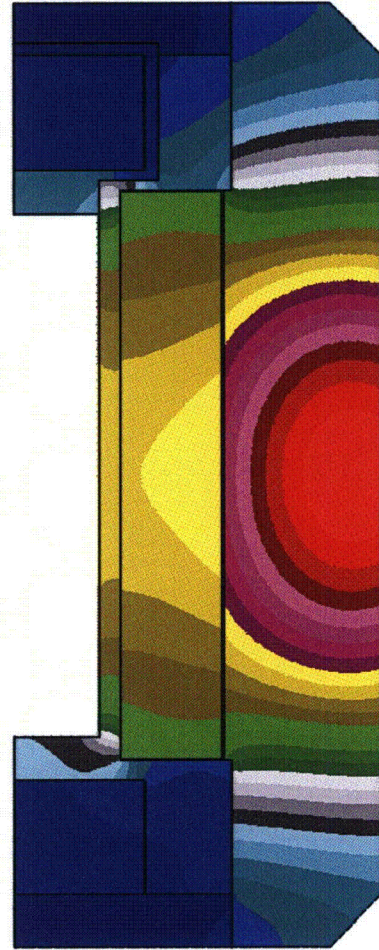
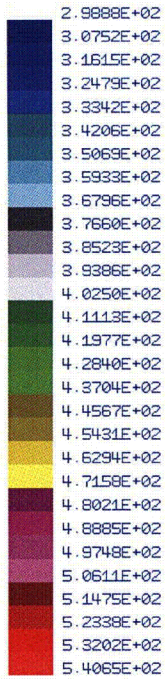
Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	1888	4.2717E+02	8.0090E+02
Bottom Plate	3001	3232	3001	2.0733E+02	4.0520E+02
Cask Lid	3233	3424	3233	2.0606E+02	4.0290E+02
Shell Cavity	4001	4998	4527	2.4644E+02	4.7560E+02
Cask Lid Plug	5001	5404	5001	2.1894E+02	4.2610E+02
Tungsten Alloy	6001	7656	6938	2.4594E+02	4.7470E+02
Bottom Cavity	4227	4236	4227	2.1800E+02	4.2440E+02
Side Cavity	4372	4702	4527	2.4644E+02	4.7560E+02
Top Cavity	5001	5012	5001	2.1894E+02	4.2610E+02
Lid Seal	4993	4993	4993	2.0656E+02	4.0380E+02
Cask Vent Port	2537	2537	2537	2.0806E+02	4.0650E+02
Cask Vent Port Seal	2533	2533	2533	2.0850E+02	4.0730E+02
Vt.Conic.Seal	4828	4828	4828	2.0739E+02	4.0530E+02
Cask Drain Port	583	583	583	2.1022E+02	4.1040E+02
Cask Drain Port Seal	579	579	579	2.1061E+02	4.1110E+02
Drn.Conic.Seal	4313	4313	4313	2.0828E+02	4.0690E+02
Test Port	3351	3351	3351	2.0572E+02	4.0230E+02

VECTOR: 50  
MIN: 2.5822E+02  
MAX: 1.4450E+03



**Figure 3-77. Load Case 112, Post Fire at 60 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Entire Model – Models AOS-100A and AOS-100A-S**

VECTOR: 50  
MIN: 2.9888E+02  
MAX: 5.4065E+02



**Figure 3-78. Load Case 112, Post Fire at 60 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Cask Model – Models AOS-100A and AOS-100A-S**

**Table 3-58. Load Case 112, Post Fire at 90 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation – Models AOS-100A and AOS-100A-S**

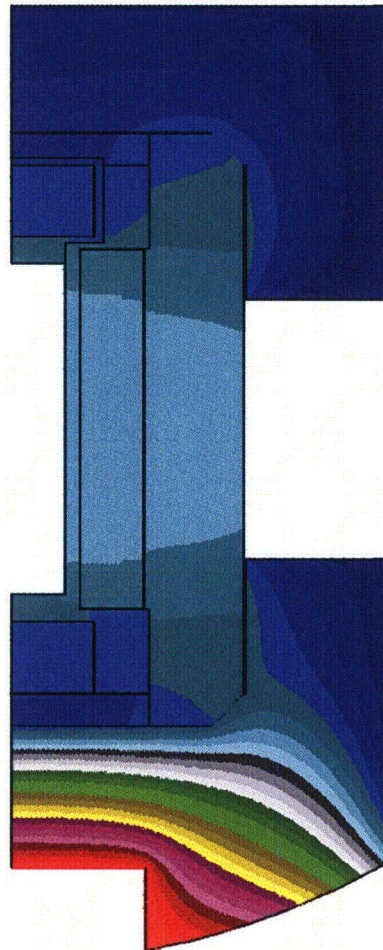
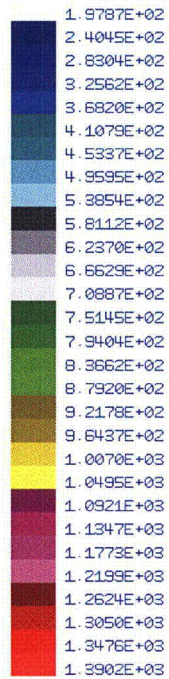
Location	Node	Temp (C)	Temp (F)
1	5001	194.89	382.80
2	4532	245.83	474.50
3	4227	207.72	405.90
4	4752	209.11	408.40
5	4838	194.83	382.70
6	4993	178.67	353.60
7	3309	155.33	311.60
8	3351	162.33	324.20
9	678	245.78	474.40
10	2537	206.44	403.60
11	2533	206.83	404.30
12	4828	189.72	373.50
13	1888	247.00	476.60
14	583	207.89	406.20
15	579	208.22	406.80
16	4313	174.56	346.20
17	3148	172.67	342.80
18	3001	155.72	312.30
19	7533	163.33	326.00
20	7377	164.11	327.40
21	7371	231.22	448.20
22	6942	242.56	468.60
23	6267	231.00	447.80
24	6121	169.72	337.50
25	6001	168.72	335.70
26	15481	154.39	309.90
27	15941	177.56	351.60
28	16260	185.11	365.20
29	17129	163.00	325.40
30	11531	169.17	336.50
31	9785	189.39	372.90
32	9571	183.78	362.80
33	8197	161.56	322.80
34	15451	113.28	235.90
35	16160	113.06	235.50
36	17608	104.06	219.30
37	18360	92.72	198.90
38	11051	105.11	221.20
39	9900	255.94	492.70
40	8673	750.00	1382.00
41	8225	749.44	1381.00

Maximum Component Temperatures

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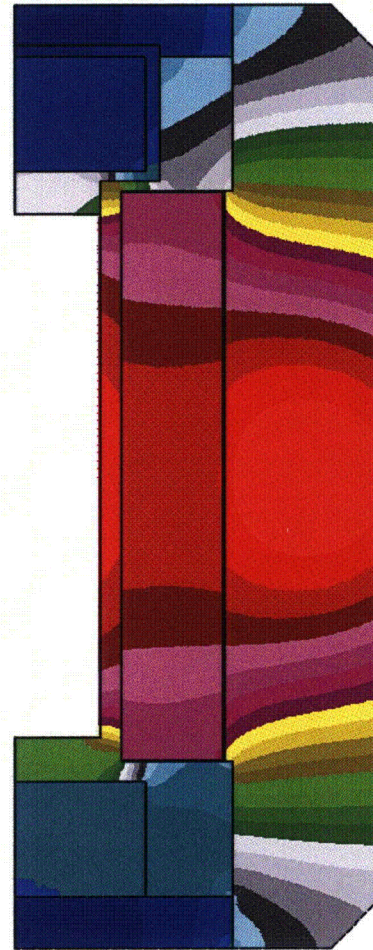
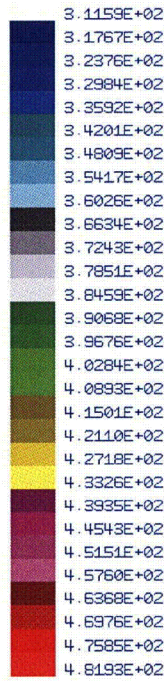
Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	1888	4.2717E+02	8.0090E+02
Bottom Plate	3001	3232	3001	2.0733E+02	4.0520E+02
Cask Lid	3233	3424	3233	2.0606E+02	4.0290E+02
Shell Cavity	4001	4998	4527	2.4644E+02	4.7560E+02
Cask Lid Plug	5001	5404	5001	2.1894E+02	4.2610E+02
Tungsten Alloy	6001	7656	6938	2.4594E+02	4.7470E+02
Bottom Cavity	4227	4236	4227	2.1800E+02	4.2440E+02
Side Cavity	4372	4702	4527	2.4644E+02	4.7560E+02
Top Cavity	5001	5012	5001	2.1894E+02	4.2610E+02
Lid Seal	4993	4993	4993	2.0656E+02	4.0380E+02
Cask Vent Port	2537	2537	2537	2.0806E+02	4.0650E+02
Cask Vent Port Seal	2533	2533	2533	2.0850E+02	4.0730E+02
Vt.Conic.Seal	4828	4828	4828	2.0739E+02	4.0530E+02
Cask Drain Port	583	583	583	2.1022E+02	4.1040E+02
Cask Drain Port Seal	579	579	579	2.1061E+02	4.1110E+02
Drn.Conic.Seal	4313	4313	4313	2.0828E+02	4.0690E+02
Test Port	3351	3351	3351	2.0572E+02	4.0230E+02

VECTOR: 100  
MIN: 1.9787E+02  
MAX: 1.3902E+03



**Figure 3-79. Load Case 112, Post Fire at 90 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Entire Model – Models AOS-100A and AOS-100A-S**

VECTOR: 100  
 MIN: 3.1159E+02  
 MAX: 4.8193E+02



**Figure 3-80. Load Case 112, Post Fire at 90 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Cask Model – Models AOS-100A and AOS-100A-S**



**Table 3-59. Load Case 112, Post Fire at 120 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation  
– Models AOS-100A and AOS-100A-S**

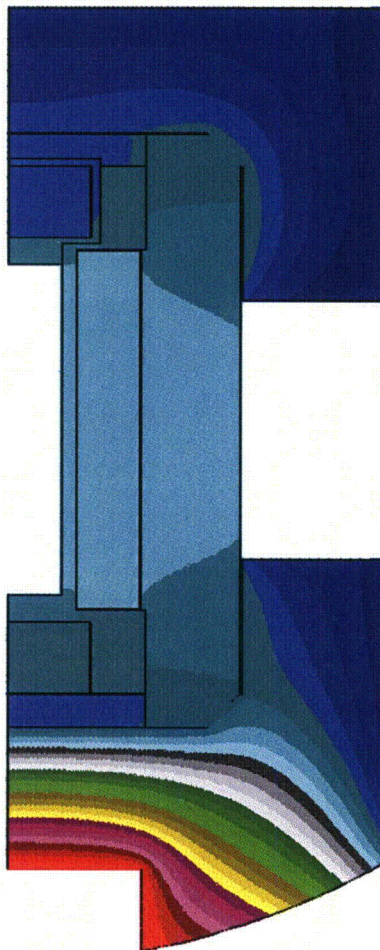
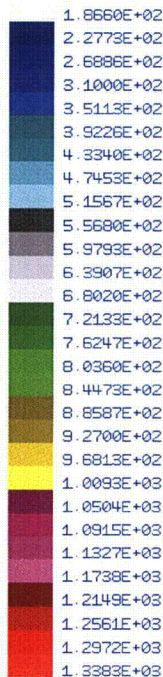
Location	Node	Temp (C)	Temp (F)
-----	-----	-----	-----
1	5001	205.11	401.20
2	4532	239.61	463.30
3	4227	214.22	417.60
4	4752	213.11	415.60
5	4838	201.28	394.30
6	4993	189.28	372.70
7	3309	166.17	331.10
8	3351	173.72	344.70
9	678	236.06	456.90
10	2537	207.56	405.60
11	2533	208.06	406.50
12	4828	197.72	387.90
13	1888	231.50	448.70
14	583	209.61	409.30
15	579	210.00	410.00
16	4313	184.72	364.50
17	3148	182.83	361.10
18	3001	165.50	329.90
19	7533	174.67	346.40
20	7377	175.44	347.80
21	7371	227.89	442.20
22	6942	235.50	455.90
23	6267	227.89	442.20
24	6121	180.83	357.50
25	6001	179.94	355.90
26	15481	165.06	329.10
27	15941	187.72	369.90
28	16260	193.06	379.50
29	17129	158.72	317.70
30	11531	166.94	332.50
31	9785	197.44	387.40
32	9571	193.72	380.70
33	8197	171.00	339.80
34	15451	112.17	233.90
35	16160	111.72	233.10
36	17608	101.28	214.30
37	18360	86.61	187.90
38	11051	102.50	216.50
39	9900	222.06	431.70
40	8673	700.56	1293.00
41	8225	725.56	1338.00

Maximum Component Temperatures

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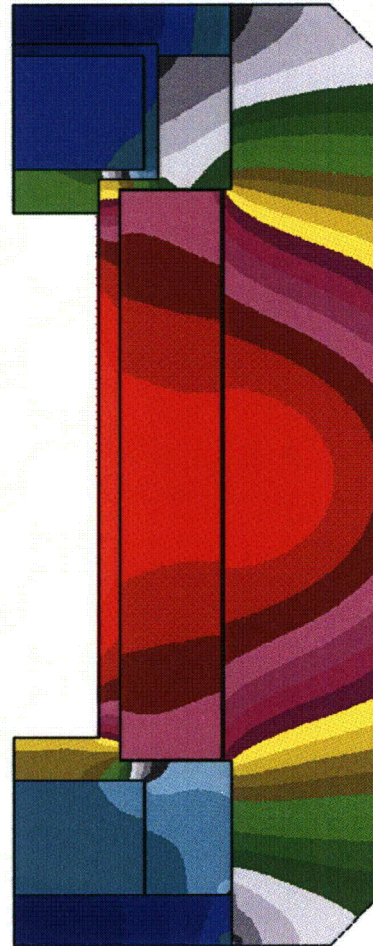
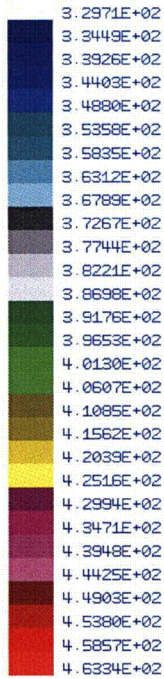
Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	1888	4.2717E+02	8.0090E+02
Bottom Plate	3001	3232	3001	2.0733E+02	4.0520E+02
Cask Lid	3233	3424	3233	2.0606E+02	4.0290E+02
Shell Cavity	4001	4998	4527	2.4644E+02	4.7560E+02
Cask Lid Plug	5001	5404	5001	2.1894E+02	4.2610E+02
Tungsten Alloy	6001	7656	6938	2.4594E+02	4.7470E+02
Bottom Cavity	4227	4236	4227	2.1800E+02	4.2440E+02
Side Cavity	4372	4702	4527	2.4644E+02	4.7560E+02
Top Cavity	5001	5012	5001	2.1894E+02	4.2610E+02
Lid Seal	4993	4993	4993	2.0656E+02	4.0380E+02
Cask Vent Port	2537	2537	2537	2.0806E+02	4.0650E+02
Cask Vent Port Seal	2533	2533	2533	2.0850E+02	4.0730E+02
Vt.Conic.Seal	4828	4828	4828	2.0739E+02	4.0530E+02
Cask Drain Port	583	583	583	2.1022E+02	4.1040E+02
Cask Drain Port Seal	579	579	579	2.1061E+02	4.1110E+02
Drn.Conic.Seal	4313	4313	4313	2.0828E+02	4.0690E+02
Test Port	3351	3351	3351	2.0572E+02	4.0230E+02

VECTOR: 150  
MIN: 1.8660E+02  
MAX: 1.3383E+03



**Figure 3-81. Load Case 112, Post Fire at 120 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Entire Model – Models AOS-100A and AOS-100A-S**

VECTOR: 150  
 MIN: 3.2971E+02  
 MAX: 4.6334E+02



**Figure 3-82. Load Case 112, Post Fire at 120 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Cask Model – Models AOS-100A and AOS-100A-S**

**Table 3-60. Load Case 112, Post Fire at 150 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation  
– Models AOS-100A and AOS-100A-S**

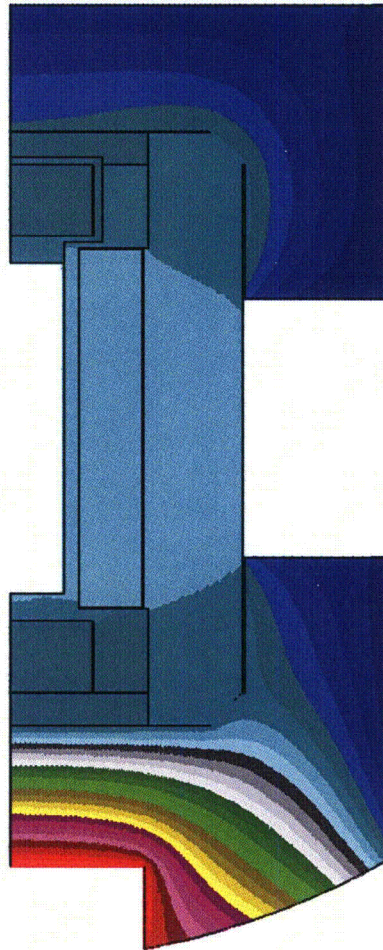
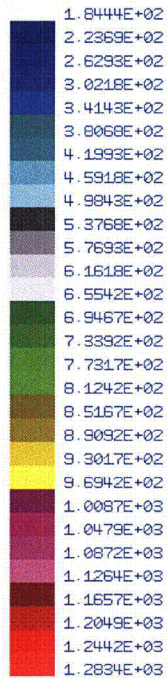
Location	Node	Temp (C)	Temp (F)
-----	-----	-----	-----
1	5001	210.56	411.00
2	4532	233.00	451.40
3	4227	216.44	421.60
4	4752	214.06	417.30
5	4838	204.61	400.30
6	4993	196.00	384.80
7	3309	176.94	350.50
8	3351	183.33	362.00
9	678	228.33	443.00
10	2537	208.00	406.40
11	2533	208.50	407.30
12	4828	202.17	395.90
13	1888	222.22	432.00
14	583	210.22	410.40
15	579	210.56	411.00
16	4313	192.44	378.40
17	3148	190.50	374.90
18	3001	175.50	347.90
19	7533	184.39	363.90
20	7377	185.00	365.00
21	7371	223.56	434.40
22	6942	228.78	443.80
23	6267	223.72	434.70
24	6121	189.50	373.10
25	6001	188.78	371.80
26	15481	175.78	348.40
27	15941	194.44	382.00
28	16260	198.06	388.50
29	17129	157.06	314.70
30	11531	165.78	330.40
31	9785	202.11	395.80
32	9571	199.89	391.80
33	8197	180.50	356.90
34	15451	112.17	233.90
35	16160	111.61	232.90
36	17608	100.94	213.70
37	18360	85.50	185.90
38	11051	102.17	215.90
39	9900	200.61	393.10
40	8673	650.00	1202.00
41	8225	695.00	1283.00

Maximum Component Temperatures

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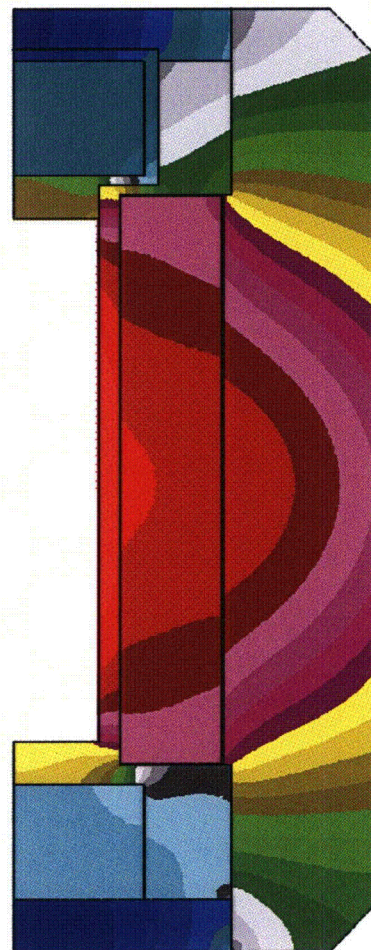
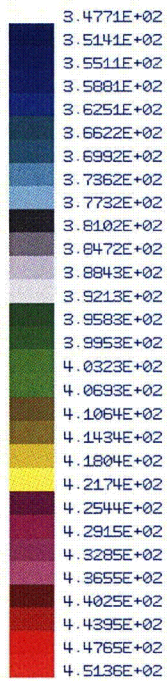
Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	1888	4.2717E+02	8.0090E+02
Bottom Plate	3001	3232	3001	2.0733E+02	4.0520E+02
Cask Lid	3233	3424	3233	2.0606E+02	4.0290E+02
Shell Cavity	4001	4998	4527	2.4644E+02	4.7560E+02
Cask Lid Plug	5001	5404	5001	2.1894E+02	4.2610E+02
Tungsten Alloy	6001	7656	6938	2.4594E+02	4.7470E+02
Bottom Cavity	4227	4236	4227	2.1800E+02	4.2440E+02
Side Cavity	4372	4702	4527	2.4644E+02	4.7560E+02
Top Cavity	5001	5012	5001	2.1894E+02	4.2610E+02
Lid Seal	4993	4993	4993	2.0656E+02	4.0380E+02
Cask Vent Port	2537	2537	2537	2.0806E+02	4.0650E+02
Cask Vent Port Seal	2533	2533	2533	2.0850E+02	4.0730E+02
Vt.Conic.Seal	4828	4828	4828	2.0739E+02	4.0530E+02
Cask Drain Port	583	583	583	2.1022E+02	4.1040E+02
Cask Drain Port Seal	579	579	579	2.1061E+02	4.1110E+02
Drn.Conic.Seal	4313	4313	4313	2.0828E+02	4.0690E+02
Test Port	3351	3351	3351	2.0572E+02	4.0230E+02

VECTOR: 200  
MIN: 1.8444E+02  
MAX: 1.2834E+03



**Figure 3-83. Load Case 112, Post Fire at 150 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Entire Model – Models AOS-100A and AOS-100A-S**

VECTOR: 200  
 MIN: 3.4771E+02  
 MAX: 4.5136E+02



**Figure 3-84. Load Case 112, Post Fire at 150 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Cask Model – Models AOS-100A and AOS-100A-S**



**Table 3-61. Load Case 112, Post Fire at 180 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation  
– Models AOS-100A and AOS-100A-S**

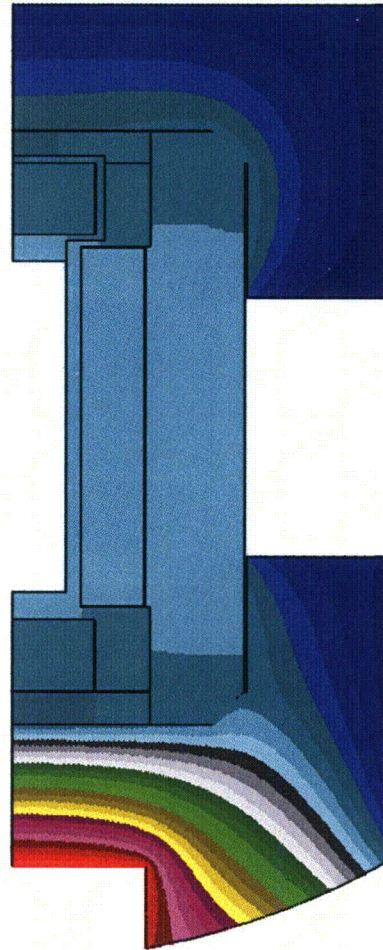
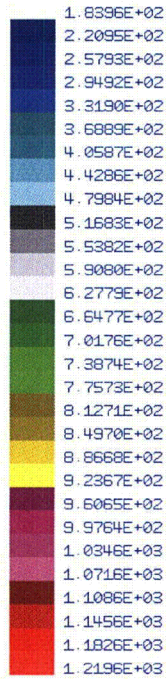
Location	Node	Temp (C)	Temp (F)
-----	----	-----	-----
1	5001	213.94	417.10
2	4532	227.61	441.70
3	4227	217.39	423.30
4	4752	214.22	417.60
5	4838	206.39	403.50
6	4993	200.39	392.70
7	3309	185.83	366.50
8	3351	190.83	375.50
9	678	222.56	432.60
10	2537	207.89	406.20
11	2533	208.39	407.10
12	4828	204.78	400.60
13	1888	215.89	420.60
14	583	210.00	410.00
15	579	210.39	410.70
16	4313	198.00	388.40
17	3148	196.17	385.10
18	3001	184.22	363.60
19	7533	191.94	377.50
20	7377	192.44	378.40
21	7371	219.78	427.60
22	6942	223.44	434.20
23	6267	220.17	428.30
24	6121	195.89	384.60
25	6001	195.33	383.60
26	15481	184.72	364.50
27	15941	198.78	389.80
28	16260	201.06	393.90
29	17129	155.89	312.60
30	11531	164.72	328.50
31	9785	204.67	400.40
32	9571	203.67	398.60
33	8197	188.72	371.70
34	15451	112.28	234.10
35	16160	111.67	233.00
36	17608	100.89	213.60
37	18360	85.22	185.40
38	11051	102.06	215.70
39	9900	185.22	365.40
40	8673	602.22	1116.00
41	8225	660.00	1220.00

Maximum Component Temperatures

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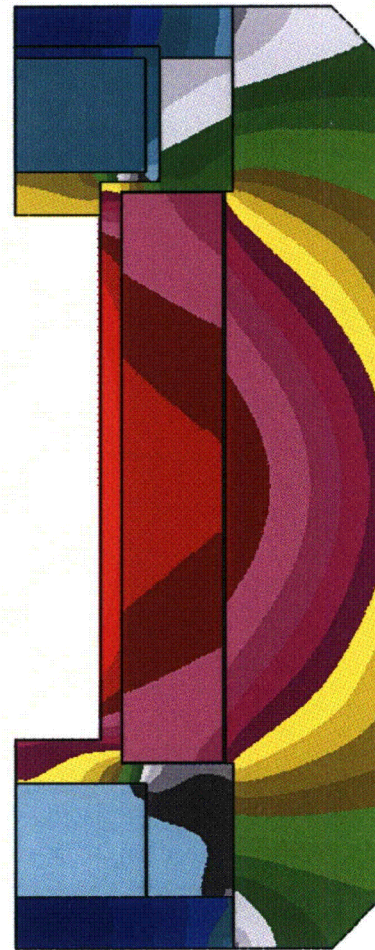
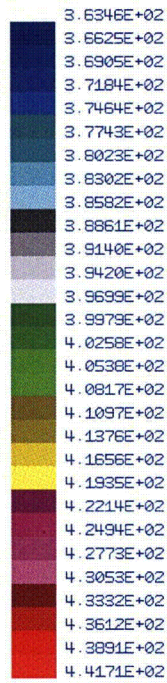
Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	1888	4.2717E+02	8.0090E+02
Bottom Plate	3001	3232	3001	2.0733E+02	4.0520E+02
Cask Lid	3233	3424	3233	2.0606E+02	4.0290E+02
Shell Cavity	4001	4998	4527	2.4644E+02	4.7560E+02
Cask Lid Plug	5001	5404	5001	2.1894E+02	4.2610E+02
Tungsten Alloy	6001	7656	6938	2.4594E+02	4.7470E+02
Bottom Cavity	4227	4236	4227	2.1800E+02	4.2440E+02
Side Cavity	4372	4702	4527	2.4644E+02	4.7560E+02
Top Cavity	5001	5012	5001	2.1894E+02	4.2610E+02
Lid Seal	4993	4993	4993	2.0656E+02	4.0380E+02
Cask Vent Port	2537	2537	2537	2.0806E+02	4.0650E+02
Cask Vent Port Seal	2533	2533	2533	2.0850E+02	4.0730E+02
Vt.Conic.Seal	4828	4828	4828	2.0739E+02	4.0530E+02
Cask Drain Port	583	583	583	2.1022E+02	4.1040E+02
Cask Drain Port Seal	579	579	579	2.1061E+02	4.1110E+02
Drn.Conic.Seal	4313	4313	4313	2.0828E+02	4.0690E+02
Test Port	3351	3351	3351	2.0572E+02	4.0230E+02

VECTOR: 250  
 MIN: 1.8396E+02  
 MAX: 1.2196E+03



**Figure 3-85. Load Case 112, Post Fire at 180 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Entire Model – Models AOS-100A and AOS-100A-S**

VECTOR: 250  
MIN: 3.6346E+02  
MAX: 4.4171E+02



**Figure 3-86. Load Case 112, Post Fire at 180 Minutes, 100°F, Maximum Decay Heat, Maximum Insolation, Cask Model – Models AOS-100A and AOS-100A-S**

### **3.5.2.4 Thermal Evaluation Results – Model AOS-100B**

This appendix presents the following information, specific to the Model AOS-100B transport package:

- Normal Conditions of Transport Thermal Evaluation Results – Model AOS-100B
- Fire Condition Thermal Evaluation Results – Model AOS-100B

Table 3-47 lists the temperature monitoring points (nodes) for the Model AOS-100 (A, B, and A-S) transport packages, under Normal conditions of transport and the Fire condition.

### 3.5.2.4.1 Normal Conditions of Transport Thermal Evaluation Results – Model AOS-100B

Table 3-62 lists the tables and figures in this appendix that present the Model AOS-100B transport package results under Normal conditions of transport, for Load Cases 101 through 106. Each table provides a list of temperatures at each monitoring node. The tables for Load Cases 101, 102, 105, and 106 also include a list of maximum temperatures within each transport package component.

Figure 3-60 illustrates the location of each node on the Model AOS-100 (A, B, and A-S) transport packages, under Normal conditions of transport. (The node locations are listed in Table 3-47.)

**Table 3-62. Normal Conditions of Transport Thermal Evaluation Results – Model AOS-100B**

Load Case	Description	Results Table	Entire Model	Cask Model
101	100°F Ambient, Maximum Decay Heat	Table 3-63	Figure 3-87	Figure 3-88
102	100°F Ambient, Maximum Decay Heat, Maximum Insolation	Table 3-64	Figure 3-89	Figure 3-90
103	-20°F Ambient, Zero Decay Heat, Zero Insolation	Table 3-65	Figure 3-91	–
104	-40°F Ambient, Zero Decay Heat, Zero Insolation	Table 3-66	Figure 3-92	–
105	-40°F Ambient, Maximum Decay Heat	Table 3-67	Figure 3-93	Figure 3-94
106	-20°F Ambient, Maximum Decay Heat	Table 3-68	Figure 3-95	Figure 3-96

**Table 3-63. Load Case 101, 100°F Ambient, Maximum Decay Heat – Model AOS-100B**

Location	Node	Temp (C)	Temp (F)
1	5001	114.94	238.90
2	4532	107.17	224.90
3	4227	111.17	232.10
4	4752	106.28	223.30
5	4838	101.00	213.80
6	4993	100.83	213.50
7	3309	101.11	214.00
8	3351	100.72	213.30
9	678	101.28	214.30
10	2537	99.06	210.30
11	2533	99.28	210.70
12	4828	101.11	214.00
13	1888	97.56	207.60
14	583	98.94	210.10
15	579	99.11	210.40
16	4313	102.06	215.70
17	3148	100.00	212.00
18	3001	100.44	212.80
19	7533	103.11	217.60
20	7377	103.33	218.00
21	7371	102.33	216.20
22	6942	102.56	216.60
23	6267	102.39	216.30
24	6121	102.39	216.30
25	6001	102.22	216.00
26	9501	100.39	212.70
27	9950	98.89	210.00
28	10014	98.06	208.50
29	10781	74.89	166.80
30	9091	72.56	162.60
31	8463	97.56	207.60
32	8462	98.67	209.60
33	8197	99.89	211.80
34	9711	39.39	102.90
35	9821	38.28	100.90
36	10158	38.22	100.80
37	10605	41.17	106.10
38	9102	40.33	104.60
39	8578	40.22	104.40
40	8225	48.28	118.90
41	8001	53.00	127.40

Maximum Component Temperatures

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Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	626	1.0128E+02	2.1430E+02
Bottom Plate	3001	3232	3120	1.0056E+02	2.1300E+02
Cask Lid	3233	3424	3233	1.0122E+02	2.1420E+02
Shell Cavity	4001	4998	4227	1.1117E+02	2.3210E+02
Cask Lid Plug	5001	5404	5001	1.1494E+02	2.3890E+02
Carbon Steel	6001	7656	7552	1.0344E+02	2.1820E+02
Bottom Cavity	4227	4236	4227	1.1117E+02	2.3210E+02
Side Cavity	4372	4702	4372	1.0717E+02	2.2490E+02
Top Cavity	5001	5012	5001	1.1494E+02	2.3890E+02
Lid Seal	4993	4993	4993	1.0083E+02	2.1350E+02
Cask Vent Port	2537	2537	2537	9.9056E+01	2.1030E+02
Cask Vent Port Seal	2533	2533	2533	9.9278E+01	2.1070E+02
Vt.Conic.Seal	4828	4828	4828	1.0111E+02	2.1400E+02
Cask Drain Port	583	583	583	9.8944E+01	2.1010E+02
Cask Drain Port Seal	579	579	579	9.9111E+01	2.1040E+02
Drn.Conic.Seal	4313	4313	4313	1.0206E+02	2.1570E+02
Test Port	3351	3351	3351	1.0072E+02	2.1330E+02



VECTOR: 1  
MIN: 1.0074E+02  
MAX: 2.3887E+02

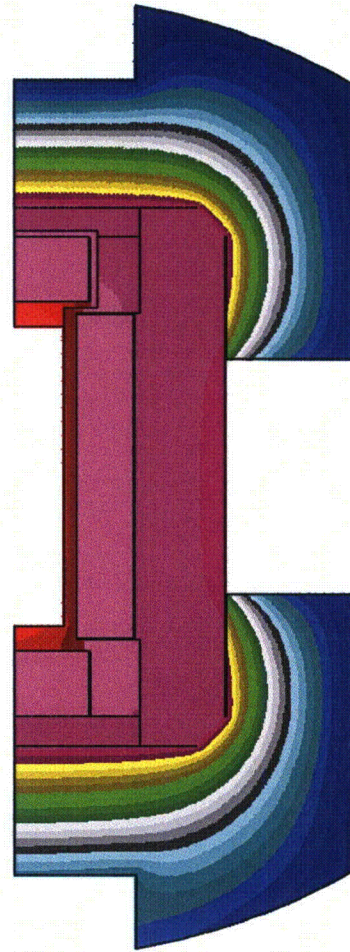
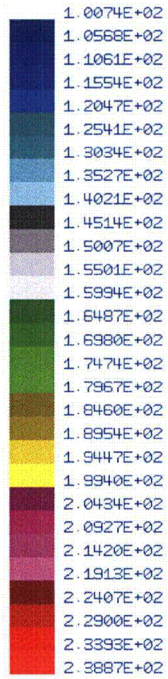


Figure 3-87. Load Case 101, 100°F Ambient, Maximum Decay Heat, Entire Model – Model AOS-100B

VECTOR: 1  
MIN: 2.0760E+02  
MAX: 2.3887E+02

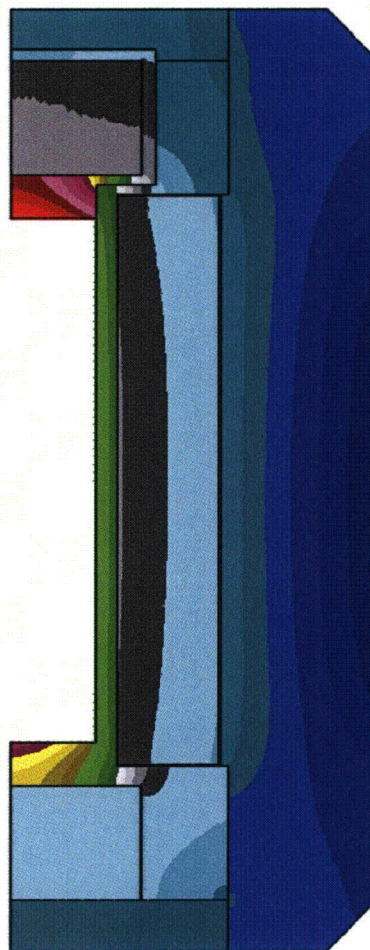
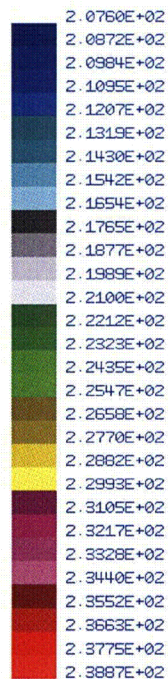


Figure 3-88. Load Case 101, 100°F Ambient, Maximum Decay Heat, Cask Model – Model AOS-100B

**Table 3-64. Load Case 102, 100°F Ambient, Maximum Decay Heat, Maximum Insolation – Model AOS-100B**

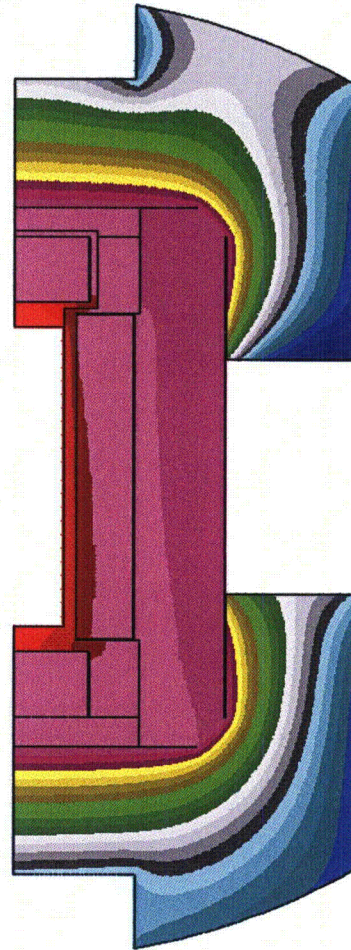
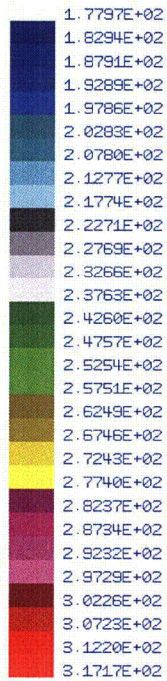
Location	Node	Temp (C)	Temp (F)
1	5001	158.44	317.20
2	4532	151.39	304.50
3	4227	155.61	312.10
4	4752	150.33	302.60
5	4838	145.17	293.30
6	4993	145.00	293.00
7	3309	145.28	293.50
8	3351	144.89	292.80
9	678	145.78	294.40
10	2537	143.17	289.70
11	2533	143.39	290.10
12	4828	145.22	293.40
13	1888	142.22	288.00
14	583	144.11	291.40
15	579	144.28	291.70
16	4313	147.00	296.60
17	3148	145.06	293.10
18	3001	145.44	293.80
19	7533	147.06	296.70
20	7377	147.28	297.10
21	7371	146.61	295.90
22	6942	147.06	296.70
23	6267	147.17	296.90
24	6121	147.28	297.10
25	6001	147.11	296.80
26	9501	144.72	292.50
27	9950	143.33	290.00
28	10014	142.50	288.50
29	10781	113.89	237.00
30	9091	127.50	261.50
31	8463	143.33	290.00
32	8462	144.00	291.20
33	8197	144.94	292.90
34	9711	110.39	230.70
35	9821	100.06	212.10
36	10158	100.89	213.60
37	10605	83.33	182.00
38	9102	101.17	214.10
39	8578	90.17	194.30
40	8225	97.39	207.30
41	8001	101.61	214.90

Maximum Component Temperatures

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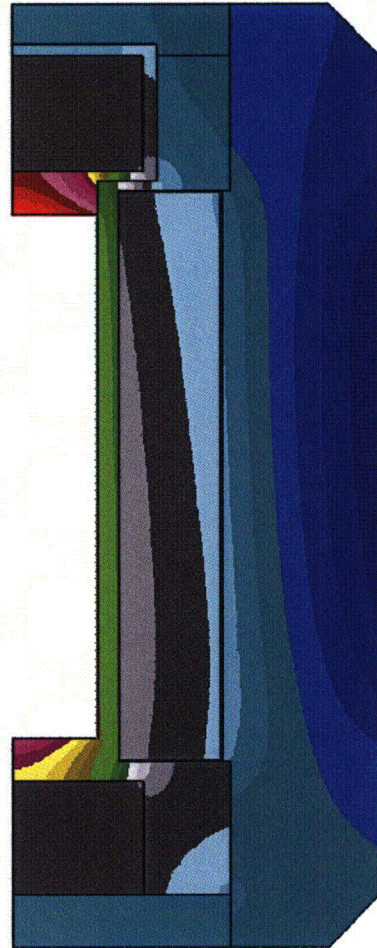
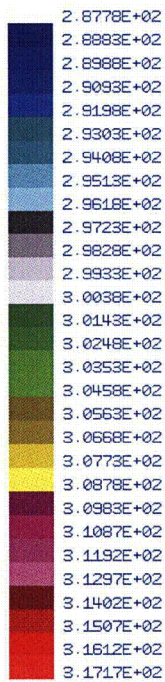
Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	614	1.4600E+02	2.9480E+02
Bottom Plate	3001	3232	3103	1.4556E+02	2.9400E+02
Cask Lid	3233	3424	3233	1.4533E+02	2.9360E+02
Shell Cavity	4001	4998	4227	1.5561E+02	3.1210E+02
Cask Lid Plug	5001	5404	5001	1.5844E+02	3.1720E+02
Carbon Steel	6001	7656	6324	1.4789E+02	2.9820E+02
Bottom Cavity	4227	4236	4227	1.5561E+02	3.1210E+02
Side Cavity	4372	4702	4372	1.5167E+02	3.0500E+02
Top Cavity	5001	5012	5001	1.5844E+02	3.1720E+02
Lid Seal	4993	4993	4993	1.4500E+02	2.9300E+02
Cask Vent Port	2537	2537	2537	1.4317E+02	2.8970E+02
Cask Vent Port Seal	2533	2533	2533	1.4339E+02	2.9010E+02
Vt.Conic.Seal	4828	4828	4828	1.4522E+02	2.9340E+02
Cask Drain Port	583	583	583	1.4411E+02	2.9140E+02
Cask Drain Port Seal	579	579	579	1.4428E+02	2.9170E+02
Drn.Conic.Seal	4313	4313	4313	1.4700E+02	2.9660E+02
Test Port	3351	3351	3351	1.4489E+02	2.9280E+02

VECTOR: 1  
MIN: 1.7797E+02  
MAX: 3.1717E+02



**Figure 3-89. Load Case 102, 100°F Ambient, Maximum Decay Heat, Maximum Insolation, Entire Model – Model AOS-100B**

VECTOR: 1  
 MIN: 2.8778E+02  
 MAX: 3.1717E+02

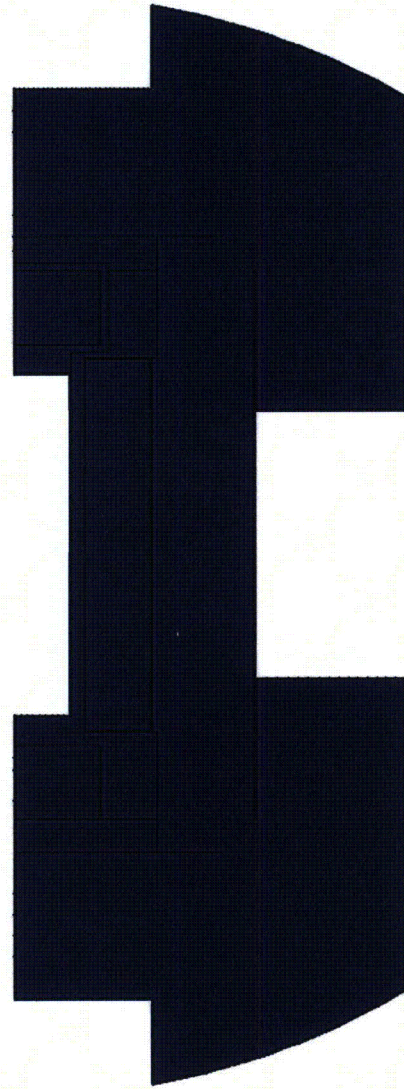
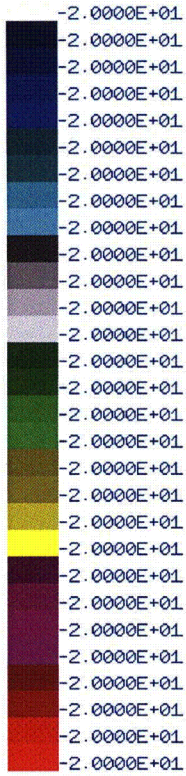


**Figure 3-90. Load Case 102, 100°F Ambient, Maximum Decay Heat, Maximum Insolation, Cask Model – Model AOS-100B**

**Table 3-65. Load Case 103, -20°F Ambient, Zero Decay Heat, Zero Insolation – Model AOS-100B**

Location	Node	Temp (C)	Temp (F)
-----	-----	-----	-----
1	5001	-28.89	-20.00
2	4532	-28.89	-20.00
3	4227	-28.89	-20.00
4	4752	-28.89	-20.00
5	4838	-28.89	-20.00
6	4993	-28.89	-20.00
7	3309	-28.89	-20.00
8	3351	-28.89	-20.00
9	678	-28.89	-20.00
10	2537	-28.89	-20.00
11	2533	-28.89	-20.00
12	4828	-28.89	-20.00
13	1888	-28.89	-20.00
14	583	-28.89	-20.00
15	579	-28.89	-20.00
16	4313	-28.89	-20.00
17	3148	-28.89	-20.00
18	3001	-28.89	-20.00
19	7533	-28.89	-20.00
20	7377	-28.89	-20.00
21	7371	-28.89	-20.00
22	6942	-28.89	-20.00
23	6267	-28.89	-20.00
24	6121	-28.89	-20.00
25	6001	-28.89	-20.00
26	9501	-28.89	-20.00
27	9950	-28.89	-20.00
28	10014	-28.89	-20.00
29	10781	-28.89	-20.00
30	9091	-28.89	-20.00
31	8463	-28.89	-20.00
32	8462	-28.89	-20.00
33	8197	-28.89	-20.00
34	9711	-28.89	-20.00
35	9821	-28.89	-20.00
36	10158	-28.89	-20.00
37	10605	-28.89	-20.00
38	9102	-28.89	-20.00
39	8578	-28.89	-20.00
40	8225	-28.89	-20.00
41	8001	-28.89	-20.00

VECTOR: 1  
MIN: -2.0000E+01  
MAX: -2.0000E+01



**Figure 3-91. Load Case 103, -20°F Ambient, Zero Decay Heat, Zero Insolation, Entire Model – Model AOS-100B**



**Table 3-66. Load Case 104, -40°F Ambient, Zero Decay Heat, Zero Insolation – Model AOS-100B**

Location	Node	Temp (C)	Temp (F)
-----	----	-----	-----
1	5001	-40.00	-40.00
2	4532	-40.00	-40.00
3	4227	-40.00	-40.00
4	4752	-40.00	-40.00
5	4838	-40.00	-40.00
6	4993	-40.00	-40.00
7	3309	-40.00	-40.00
8	3351	-40.00	-40.00
9	678	-40.00	-40.00
10	2537	-40.00	-40.00
11	2533	-40.00	-40.00
12	4828	-40.00	-40.00
13	1888	-40.00	-40.00
14	583	-40.00	-40.00
15	579	-40.00	-40.00
16	4313	-40.00	-40.00
17	3148	-40.00	-40.00
18	3001	-40.00	-40.00
19	7533	-40.00	-40.00
20	7377	-40.00	-40.00
21	7371	-40.00	-40.00
22	6942	-40.00	-40.00
23	6267	-40.00	-40.00
24	6121	-40.00	-40.00
25	6001	-40.00	-40.00
26	9501	-40.00	-40.00
27	9950	-40.00	-40.00
28	10014	-40.00	-40.00
29	10781	-40.00	-40.00
30	9091	-40.00	-40.00
31	8463	-40.00	-40.00
32	8462	-40.00	-40.00
33	8197	-40.00	-40.00
34	9711	-40.00	-40.00
35	9821	-40.00	-40.00
36	10158	-40.00	-40.00
37	10605	-40.00	-40.00
38	9102	-40.00	-40.00
39	8578	-40.00	-40.00
40	8225	-40.00	-40.00
41	8001	-40.00	-40.00

VECTOR: 1  
MIN: -4.0000E+01  
MAX: -4.0000E+01

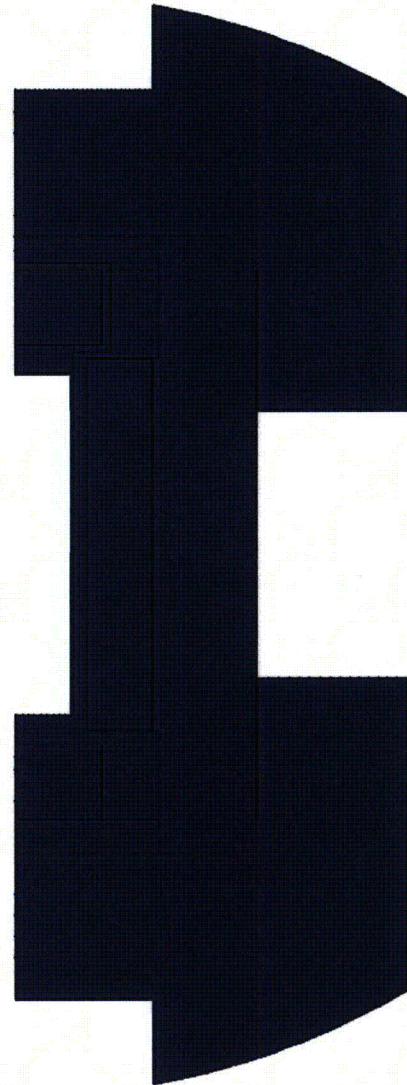
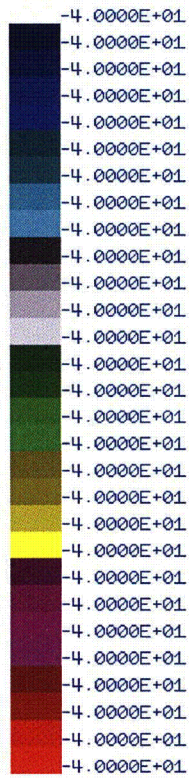


Figure 3-92. Load Case 104, -40°F Ambient, Zero Decay Heat, Zero Insolation, Entire Model – Model AOS-100B

**Table 3-67. Load Case 105, -40°F Ambient, Maximum Decay Heat – Model AOS-100B**

Location	Node	Temp (C)	Temp (F)
1	5001	45.28	113.50
2	4532	36.61	97.89
3	4227	40.83	105.50
4	4752	35.62	96.11
5	4838	29.97	85.94
6	4993	29.81	85.66
7	3309	30.13	86.23
8	3351	29.70	85.46
9	678	30.14	86.26
10	2537	27.89	82.21
11	2533	28.11	82.59
12	4828	30.07	86.13
13	1888	26.08	78.95
14	583	27.64	81.75
15	579	27.84	82.12
16	4313	30.98	87.76
17	3148	28.75	83.75
18	3001	29.24	84.64
19	7533	32.51	90.51
20	7377	32.76	90.97
21	7371	31.22	88.19
22	6942	31.39	88.51
23	6267	31.21	88.18
24	6121	31.32	88.37
25	6001	31.13	88.03
26	9501	29.36	84.85
27	9950	27.46	81.43
28	10014	26.31	79.35
29	10781	2.58	36.64
30	9091	-1.81	28.75
31	8463	25.50	77.90
32	8462	27.09	80.77
33	8197	28.65	83.57
34	9711	-37.70	-35.86
35	9821	-39.18	-38.53
36	10158	-39.34	-38.81
37	10605	-34.23	-29.61
38	9102	-36.38	-33.48
39	8578	-36.78	-34.21
40	8225	-27.38	-17.29
41	8001	-21.91	-7.43

Maximum Component Temperatures

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Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	722	3.0211E+01	8.6380E+01
Bottom Plate	3001	3232	3120	2.9361E+01	8.4850E+01
Cask Lid	3233	3424	3233	3.0250E+01	8.6450E+01
Shell Cavity	4001	4998	4227	4.0833E+01	1.0550E+02
Cask Lid Plug	5001	5404	5001	4.5278E+01	1.1350E+02
Carbon Steel	6001	7656	7552	3.2856E+01	9.1140E+01
Bottom Cavity	4227	4236	4227	4.0833E+01	1.0550E+02
Side Cavity	4372	4702	4527	3.6606E+01	9.7890E+01
Top Cavity	5001	5012	5001	4.5278E+01	1.1350E+02
Lid Seal	4993	4993	4993	2.9811E+01	8.5660E+01
Cask Vent Port	2537	2537	2537	2.7894E+01	8.2210E+01
Cask Vent Port Seal	2533	2533	2533	2.8106E+01	8.2590E+01
Vt.Conic.Seal	4828	4828	4828	3.0072E+01	8.6130E+01
Cask Drain Port	583	583	583	2.7639E+01	8.1750E+01
Cask Drain Port Seal	579	579	579	2.7844E+01	8.2120E+01
Drn.Conic.Seal	4313	4313	4313	3.0978E+01	8.7760E+01
Test Port	3351	3351	3351	2.9700E+01	8.5460E+01

VECTOR: 1  
MIN: -3.8853E+01  
MAX: 1.1347E+02

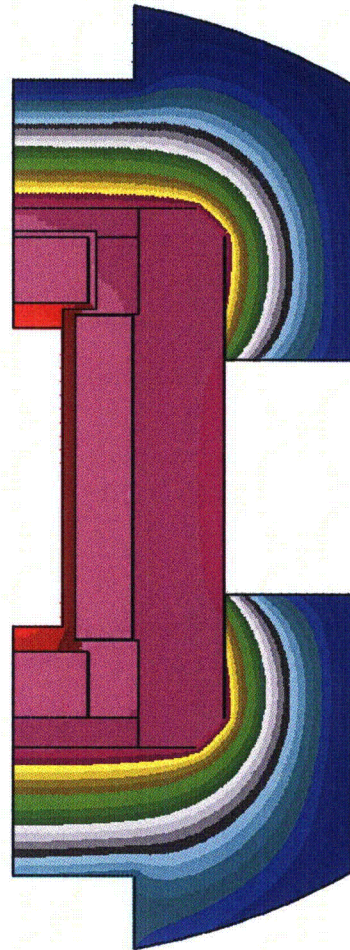
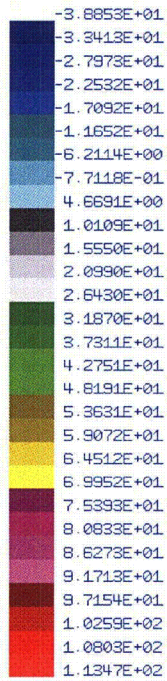


Figure 3-93. Load Case 105, -40°F Ambient, Maximum Decay Heat, Entire Model – Model AOS-100B

VECTOR: 1  
 MIN: 7.8944E+01  
 MAX: 1.1347E+02

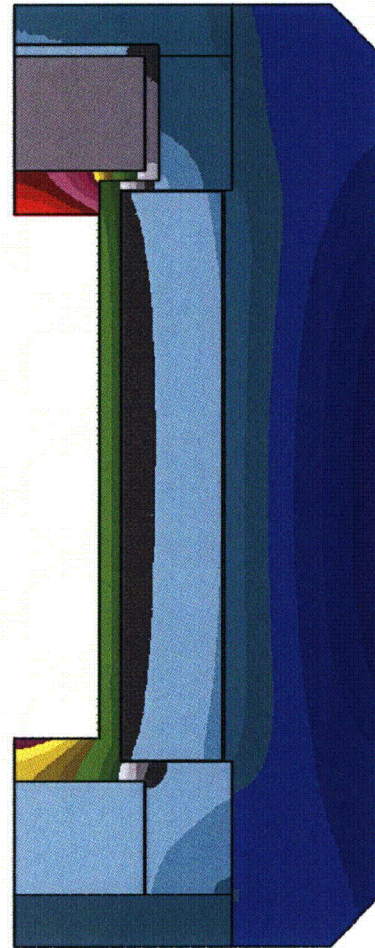
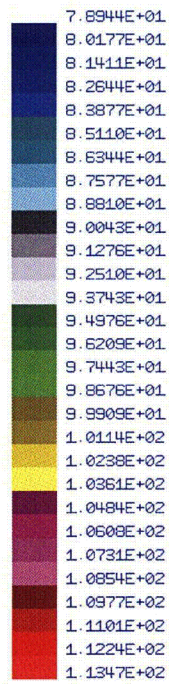


Figure 3-94. Load Case 105, -40°F Ambient, Maximum Decay Heat, Cask Model – Model AOS-100B

**Table 3-68. Load Case 106, -20°F Ambient, Maximum Decay Heat – Model AOS-100B**

Location	Node	Temp (C)	Temp (F)
-----	-----	-----	-----
1	5001	55.50	131.90
2	4532	47.00	116.60
3	4227	51.17	124.10
4	4752	46.00	114.80
5	4838	40.39	104.70
6	4993	40.28	104.50
7	3309	40.56	105.00
8	3351	40.17	104.30
9	678	40.61	105.10
10	2537	38.39	101.10
11	2533	38.56	101.40
12	4828	40.50	104.90
13	1888	36.62	97.92
14	583	38.11	100.60
15	579	38.33	101.00
16	4313	41.44	106.60
17	3148	39.22	102.60
18	3001	39.72	103.50
19	7533	42.89	109.20
20	7377	43.17	109.70
21	7371	41.67	107.00
22	6942	41.89	107.40
23	6267	41.67	107.00
24	6121	41.78	107.20
25	6001	41.56	106.80
26	9501	39.78	103.60
27	9950	37.94	100.30
28	10014	36.84	98.32
29	10781	12.88	55.18
30	9091	8.62	47.51
31	8463	36.06	96.91
32	8462	37.60	99.68
33	8197	39.11	102.40
34	9711	-26.72	-16.09
35	9821	-28.13	-18.63
36	10158	-28.24	-18.84
37	10605	-23.56	-10.40
38	9102	-25.51	-13.91
39	8578	-25.68	-14.23
40	8225	-16.47	2.36
41	8001	-11.10	12.02

Maximum Component Temperatures

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Component	Node_1	Node_2	Node	Max_Temp (C)	Max_Temp (F)
-----	-----	-----	-----	-----	-----
Cask Outer Shell	101	2894	696	4.0667E+01	1.0520E+02
Bottom Plate	3001	3232	3120	3.9833E+01	1.0370E+02
Cask Lid	3233	3424	3233	4.0667E+01	1.0520E+02
Shell Cavity	4001	4998	4227	5.1167E+01	1.2410E+02
Cask Lid Plug	5001	5404	5001	5.5500E+01	1.3190E+02
Carbon Steel	6001	7656	7552	4.3222E+01	1.0980E+02
Bottom Cavity	4227	4236	4227	5.1167E+01	1.2410E+02
Side Cavity	4372	4702	4507	4.7000E+01	1.1660E+02
Top Cavity	5001	5012	5001	5.5500E+01	1.3190E+02
Lid Seal	4993	4993	4993	4.0278E+01	1.0450E+02
Cask Vent Port	2537	2537	2537	3.8389E+01	1.0110E+02
Cask Vent Port Seal	2533	2533	2533	3.8556E+01	1.0140E+02
Vt.Conic.Seal	4828	4828	4828	4.0500E+01	1.0490E+02
Cask Drain Port	583	583	583	3.8111E+01	1.0060E+02
Cask Drain Port Seal	579	579	579	3.8333E+01	1.0100E+02
Drn.Conic.Seal	4313	4313	4313	4.1444E+01	1.0660E+02
Test Port	3351	3351	3351	4.0167E+01	1.0430E+02



VECTOR: 1  
MIN: -1.8891E+01  
MAX: 1.3190E+02

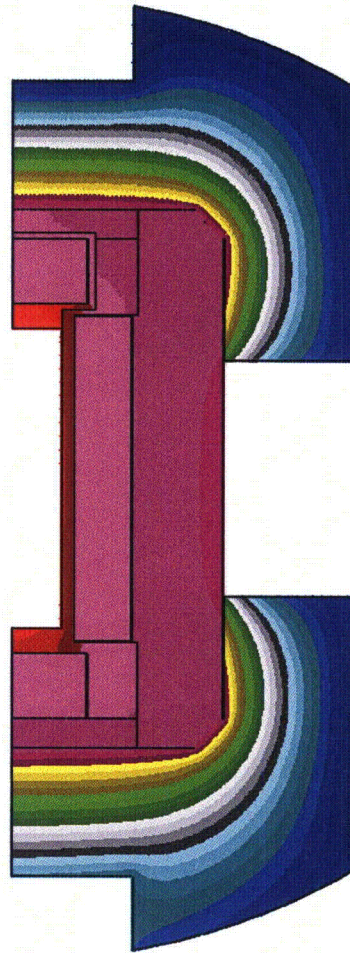
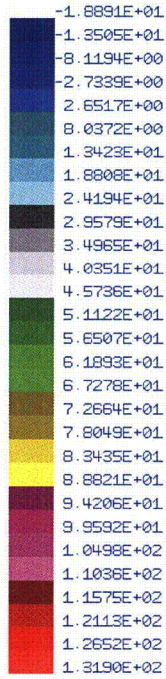


Figure 3-95. Load Case 106, -20°F Ambient, Maximum Decay Heat, Entire Model – Model AOS-100B

VECTOR: 1  
MIN: 9.7911E+01  
MAX: 1.3190E+02

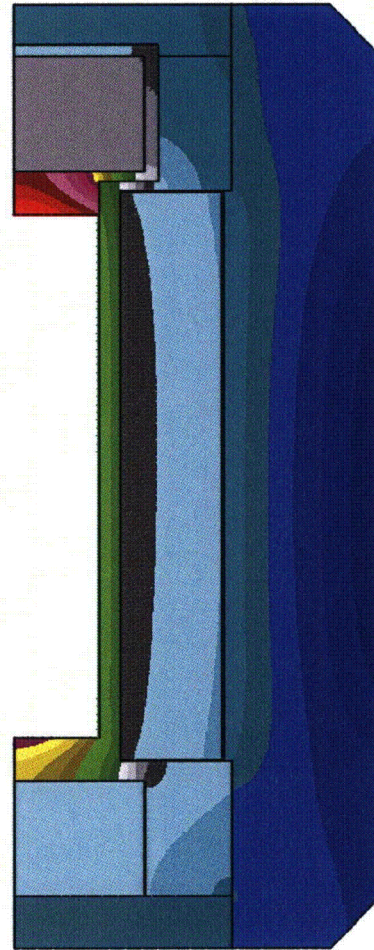
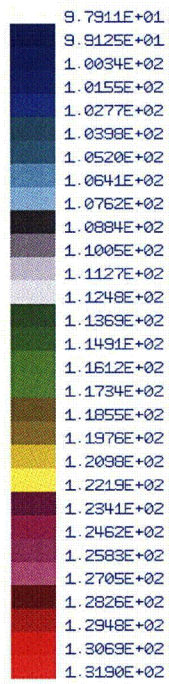


Figure 3-96. Load Case 106, -20°F Ambient, Maximum Decay Heat, Cask Model – Model AOS-100B