

SMALL SCALE ASTM E 119/UL 263  
TWO HOUR FIRE TESTING  
FOR MARINOWARE  
ON JOIST-RITE WITH ARMOROC FLOOR  
VTEC #100-2949-2  
TESTED: MAY 23, 2008  
REVISION 2.0: OCTOBER 14, 2008

October 14, 2008

**Client:** Marinoware  
137 Broadway, Suite B1  
Amityville, NY 11701

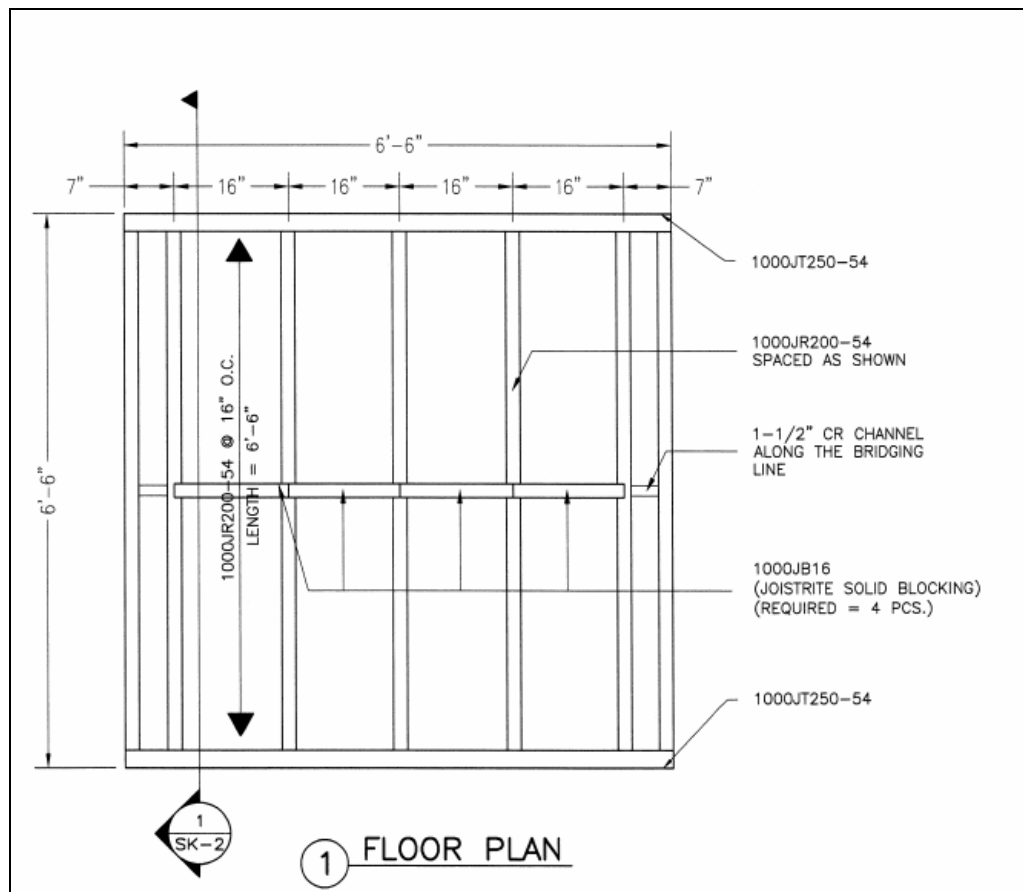
**Attn:** Mr. Nick Camizzi

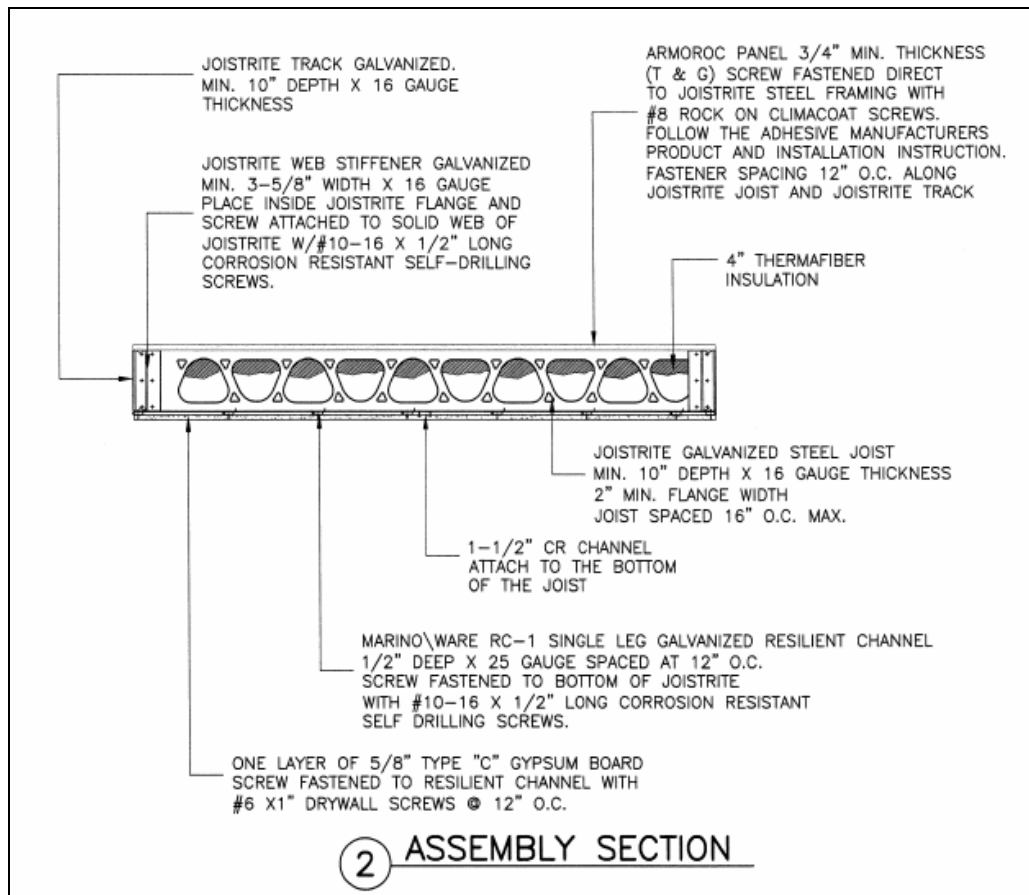
**Subject:** Small Scale Two Hour ASTM E119/UL263 Fire Endurance Screening Testing on Marinoware Joist-Rite with ARMOROC Panel, as furnished by Ameriform, LLC.

**SAMPLE DESCRIPTION:**

- 1- ARMOROC Panel, 3/4" minimum thickness (as manufactured by Jilin Tiancheng) with Pemco P5100 adhesive applied to Armoroc board joints only, screw fastened direct to Joist-Rite Steel framing with #8 Rock-On Climacoat screws. Fastener spacing 12" O.C.
- 2- 1000JR200-54 Joist-Rite Galvanized steel joists, 10" depth x 16 Ga thickness x 2" flange width. Joists spaced at 16" O.C. maximum. Double joists only at end of panel spaced 7" apart.
- 3- 1000JT250-54 Galvanized steel Joist-Rite Track receiving ends of Joist-Rite joists, 10" depth x 16 Ga minimum. Screw fastened to top & bottom flange of Joist-Rite joist with #10-16 x 3/4" corrosion resistant self-drilling screws.
- 4- Galvanized steel Joist-Rite web stiffener, 3-5/8" x 16Ga, placed inside of perimeter Joist-Rite flange and placed outside of other Joist-Rite steel joists. Joist-Rite Web Stiffener attached to web of Joist-Rite with four #10-16 x 3/4" corrosion resistant self-drilling screws.
- 5- 1000JB16 JoistRite Solid Blocking was placed between the second and third JoistRite joists, between the third and fourth JoistRite joists, between the fourth and fifth JoistRite joists, and between the fifth and sixth JoistRite Joists. Screw fastened to top and bottom flange of JoistRite joist with #10-16 x 3/4" corrosion resistant self-drilling screws through predrilled holes.

- 6- 1-1/2" CR Channel along the bridging line.
- 7- Marinoware RC-1 single leg galvanized resilient channel, 1/2" deep x 25 Ga minimum at 12" O.C. screw fastened to bottom flange of Joist-Rite steel joist with #10-16 x 3/4" corrosion resistant self-drilling screws.
- 8- Thermafiber insulation 4" thick in joist cavity against Armoroc Panel.
- 9- One layer of 5/8" Type C gypsum board, screw fastened to resilient furring channels with #6 x 1" drywall screws at 12" O.C.



**PROCEDURE:**

The furnace measures nominally 5 ft x 5 ft x 7 ft. The outside construction is steel and the furnace is lined with a ceramic refractory insulation.

Four burners, one centered on each wall, provide uniform heat. Each burner is rated for 1.5 million Btu/hr and is of the flat flame or non-impinging flame design. Furnace conditions are monitored by four 1/4" grounded Inconel-sheathed chromel-alumel thermocouples.

The unexposed surface temperature of the sample was monitored by nine, 20-gauge type K, fiberglass sheathed thermocouples. An insulating pad was placed over each thermocouple on the unexposed side of the sample.

The fire test was run following the E119/UL263 time-temperature curve.

The endpoint for the E119 Fire Endurance Testing occurs when either all the thermocouples on the unexposed side of the sample reach an average of 250°F + ambient starting temperature, any individual thermocouple on the sample exceeds 325°F + ambient starting temperature, or when the sample experiences burn-through.

### **RESULTS:**

At 20 minutes, smoke began emitting from the sample.

At 129 minutes, the furnace was voluntarily shut off without reaching any of the end points.

### **Time Deflection Data**

<u>TIME (MINS)</u>	<u>DEFLECTION (IN)</u>	<u>TIME (MINS)</u>	<u>DEFLECTION (IN)</u>
0	0.00	75	0.000
15	0.00	90	0.125
30	0.00	105	0.125
45	0.00	120	0.125
60	0.00	129	0.375

The time-temperature data are contained on the following pages.

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Neil Schultz  
Executive Director

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Amirudin Rahim  
Technical Director

**Revision 1.0:** "Sample Description" was corrected.

**Revision 2.0:** Added "as furnished by Ameriform, LLC", "as manufactured by Jilin Tiancheng", and Armoroc "Panel"

*Disclaimer: This test should be used to measure and describe the properties of materials, products or assemblies in response to heat and flame under controlled laboratory conditions. It should not be used to describe or appraise the fire hazards or fire risks of materials, products or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment that takes into account all of the factors that are pertinent to an assessment of fire hazard of a particular end use.*

**Notice:** VTEC Laboratories Inc. will not be liable for any loss or damage resulting from the use of the data in this report, in excess of the invoice. This report pertains to the sample tested only. Such report shall not be interpreted to be a warranty, either expressed or implied as to the suitability or fitness of said sample for such uses or applications, as the party contracting for the report may apply such sample.

Time (min)	TC 1 Sample Deg. F	TC 2 Sample Deg. F	TC 3 Sample Deg. F	TC 4 Sample Deg. F	TC 5 Sample Deg. F	TC 6 Sample Deg. F	TC 7 Sample Deg. F	TC 8 Sample Deg. F	TC 9 Sample Deg. F	TC 10 Furnace Deg. F	TC 11 Furnace Deg. F	TC 12 Furnace Deg. F	TC 13 Furnace Deg. F	TC 14 Sample Average Deg. F	TC 15 Furnace Average Deg. F
0	62	62	62	62	62	62	62	62	61	70	73	77	76	74	62
1	62	62	62	62	62	62	62	62	61	196	245	270	242	238	62
2	62	62	62	62	62	62	62	62	61	546	598	639	599	596	62
3	62	62	62	62	62	62	62	62	61	797	810	843	824	819	62
4	62	62	62	62	62	62	62	62	61	901	937	935	933	927	62
5	62	62	62	62	62	62	62	62	61	974	1004	1007	1004	998	62
6	62	62	62	62	62	62	62	62	61	1065	1075	1113	1094	1087	62
7	62	62	62	62	62	62	62	62	61	1116	1118	1138	1134	1126	62
8	62	62	62	62	62	62	62	61	61	1164	1178	1178	1179	1175	62
9	62	62	62	62	62	62	62	62	61	1218	1222	1224	1224	1222	62
10	62	62	62	62	62	62	62	62	61	1311	1307	1315	1320	1313	62
11	62	62	62	62	62	62	62	62	61	1351	1341	1343	1351	1346	62
12	62	62	62	62	62	62	62	62	61	1363	1350	1359	1361	1358	62
13	62	62	62	62	62	62	62	62	61	1380	1365	1377	1374	1374	62
14	62	62	62	62	62	62	62	62	61	1379	1370	1390	1383	1380	62
15	62	62	63	63	63	62	62	62	62	1398	1392	1415	1406	1403	62
16	63	62	63	63	63	62	62	62	62	1514	1351	1457	1443	1441	62
17	63	62	63	63	63	62	62	62	62	1463	1461	1455	1461	1460	62
18	63	63	63	64	63	62	62	62	62	1499	1499	1415	1473	1471	63
19	63	63	63	64	64	62	62	62	62	1482	1481	1472	1479	1478	63
20	63	63	63	65	64	63	63	63	62	1295	1575	1568	1481	1480	63
21	63	63	63	66	65	63	63	63	62	1494	1491	1484	1491	1490	63
22	63	64	63	66	65	63	63	63	62	1507	1506	1502	1511	1507	64
23	64	64	63	67	66	63	64	63	63	1509	1506	1502	1513	1508	64
24	64	64	64	68	67	63	64	64	63	1510	1509	1502	1513	1509	65
25	64	65	64	69	68	64	65	65	63	1513	1509	1507	1514	1511	65
26	64	65	64	69	68	64	65	65	63	1517	1510	1504	1514	1511	65
27	65	66	65	70	69	65	65	66	64	1517	1517	1513	1518	1516	66
28	65	67	65	71	70	65	66	66	64	1525	1521	1498	1523	1517	66
29	66	67	65	72	71	65	67	67	64	1524	1519	1517	1526	1521	67
30	66	68	66	73	72	66	67	67	65	1523	1525	1522	1525	1524	68
31	67	69	66	74	73	66	68	68	65	1538	1536	1533	1532	1535	68
32	67	69	66	75	74	66	68	68	66	1554	1547	1544	1557	1550	69
33	68	70	67	76	75	67	69	69	66	1570	1572	1564	1574	1570	70
34	68	71	67	78	76	67	70	69	67	1597	1580	1575	1591	1586	70
35	69	72	68	79	78	68	70	70	67	1569	1566	1567	1572	1569	71
36	69	73	68	81	79	68	71	71	68	1573	1564	1568	1575	1570	72

Time (min)	TC 1	TC 2	TC 3	TC 4	TC 5	TC 6	TC 7	TC 8	TC 9	TC 10	TC 11	TC 12	TC 13	TC 14 Sample	TC 15 Furnace
	Sample Deg. F	Sample Deg. F	Sample Deg. F	Sample Deg. F	Sample Deg. F	Sample Deg. F	Sample Deg. F	Sample Deg. F	Sample Deg. F	Furnace Deg. F	Furnace Deg. F	Furnace Deg. F	Furnace Deg. F	Average Deg. F	Average Deg. F
37	70	75	68	83	81	68	72	71	68	826	1572	1572	1327	1324	73
38	70	76	69	84	82	69	72	72	69	1591	1588	1582	1588	1587	74
39	71	77	69	86	84	69	73	73	69	1592	1592	1589	1598	1593	75
40	71	78	70	88	86	70	74	73	70	1604	1597	1599	1606	1602	75
41	72	79	70	90	87	70	74	74	71	827	1603	1599	1350	1345	76
42	72	80	71	91	89	71	75	74	71	1611	1606	1609	1617	1611	77
43	73	82	71	93	91	71	76	75	72	1618	1617	1611	1621	1617	78
44	73	83	71	95	92	72	76	75	72	1619	1617	1614	1626	1619	79
45	73	84	72	97	94	72	77	76	73	1621	1621	1619	1622	1621	80
46	74	85	72	99	96	72	78	76	73	1628	1623	1624	1630	1626	81
47	74	87	72	101	98	73	79	77	74	1091	1626	1629	1454	1450	82
48	75	88	73	103	100	73	79	78	74	463	1630	1634	1252	1245	83
49	75	89	73	105	101	73	80	78	75	1646	1641	1644	1653	1646	83
50	76	91	74	107	103	74	81	79	76	1645	1647	1646	1652	1647	84
51	76	92	74	109	105	74	81	80	76	1654	1648	1646	1654	1651	85
52	76	93	75	112	107	75	82	80	77	1664	1664	1666	1667	1665	86
53	77	95	75	114	109	75	83	81	77	1674	1677	1675	1683	1677	87
54	77	96	75	116	111	76	84	81	78	1680	1683	1681	1687	1683	88
55	78	98	76	118	113	76	85	82	79	1685	1689	1685	1687	1687	89
56	79	99	77	120	114	77	85	83	79	1696	1691	1695	1699	1695	90
57	79	101	77	123	117	77	86	84	80	1692	1693	1694	1702	1695	92
58	80	102	77	125	118	78	87	85	81	1701	1701	1698	1705	1701	93
59	80	104	78	127	120	78	88	86	82	1711	1706	1706	1714	1709	94
60	81	105	79	129	123	79	89	87	82	1709	1708	1707	1713	1709	95
61	81	107	80	132	125	80	90	88	83	1710	1707	1710	1715	1710	96
62	82	109	80	134	126	81	91	89	84	1709	1714	1713	1716	1713	97
63	83	110	81	136	129	81	92	90	85	1717	1719	1717	1719	1718	99
64	84	112	82	139	131	82	93	91	86	1723	1723	1718	1729	1723	100
65	84	114	83	141	133	83	95	93	87	1720	1717	1720	1722	1720	101
66	85	115	83	143	135	83	96	94	88	1708	1708	1705	1712	1708	102
67	86	117	84	146	137	84	97	96	88	1718	1720	1716	1724	1719	104
68	87	119	85	148	139	85	98	97	90	1724	1728	1725	1731	1727	105
69	88	121	86	150	141	86	100	98	90	1731	1730	1728	1731	1730	107
70	89	122	87	153	143	87	101	100	91	1735	1734	1737	1738	1736	108
71	90	124	88	155	145	88	102	101	92	1738	1734	1736	1741	1737	110
72	90	126	89	157	148	89	104	103	93	1744	1740	1741	1746	1743	111
73	91	128	90	159	149	90	105	104	95	1750	1743	1745	1752	1748	112

Time (min)	TC 1	TC 2	TC 3	TC 4	TC 5	TC 6	TC 7	TC 8	TC 9	TC 10	TC 11	TC 12	TC 13	TC 14 Sample	TC 15 Furnace
	Sample Deg. F	Sample Deg. F	Sample Deg. F	Sample Deg. F	Sample Deg. F	Sample Deg. F	Sample Deg. F	Sample Deg. F	Sample Deg. F	Furnace Deg. F	Furnace Deg. F	Furnace Deg. F	Furnace Deg. F	Average Deg. F	Average Deg. F
74	92	129	91	162	152	91	106	106	96	1749	1750	1746	1752	1749	114
75	93	131	92	164	154	92	108	107	97	1755	1751	1748	1756	1752	115
76	94	133	93	166	156	94	109	109	98	1751	1750	1750	1751	1751	117
77	95	135	94	169	159	95	110	110	99	1754	1756	1754	1755	1755	118
78	97	137	95	171	161	96	112	112	100	1759	1758	1755	1765	1759	120
79	97	139	96	173	163	97	113	113	101	1759	1759	1760	1767	1761	121
80	99	140	97	175	165	98	115	115	102	1756	1759	1760	1764	1760	123
81	100	142	98	177	167	99	116	116	103	1762	1762	1760	1769	1763	124
82	101	144	99	180	169	101	118	118	105	1768	1762	1766	1769	1766	126
83	102	146	100	182	171	102	119	119	106	1762	1761	1764	1771	1765	127
84	103	148	101	183	173	103	121	121	107	1765	1764	1764	1769	1766	129
85	104	149	102	186	175	104	122	122	108	1771	1769	1769	1773	1770	130
86	105	152	103	187	177	106	124	123	109	1761	1764	1765	1773	1766	132
87	106	154	105	189	179	107	125	125	111	1770	1765	1767	1776	1770	133
88	107	155	106	191	181	108	127	127	112	1769	1769	1768	1769	1769	135
89	108	157	107	193	183	110	128	128	113	1772	1774	1770	1776	1773	136
90	109	159	108	195	185	111	130	130	114	1769	1770	1771	1770	1770	138
91	110	160	109	197	187	112	132	131	116	1770	1773	1773	1780	1774	139
92	112	162	110	199	188	113	133	133	117	1775	1775	1776	1781	1776	141
93	113	164	111	200	190	115	135	134	118	1770	1770	1774	1777	1773	142
94	114	166	112	201	191	116	136	136	119	1767	1771	1769	1772	1770	144
95	115	168	113	203	193	117	137	137	120	1777	1772	1773	1775	1774	145
96	116	169	115	204	194	118	139	139	122	1782	1781	1786	1785	1784	146
97	117	171	116	206	196	119	141	140	123	1796	1792	1792	1799	1795	147
98	118	173	117	207	197	121	142	141	124	1803	1801	1801	1805	1803	149
99	119	174	118	208	198	122	144	143	125	1807	1810	1808	1817	1810	150
100	120	176	119	209	199	123	145	144	127	1813	1815	1816	1816	1815	151
101	121	178	120	210	200	124	147	146	128	1818	1818	1818	1824	1819	153
102	122	179	121	211	201	125	148	148	129	1821	1818	1823	1831	1823	154
103	123	181	122	212	202	126	149	149	131	1827	1824	1825	1832	1827	155
104	124	183	123	213	203	128	151	151	132	1825	1823	1824	1828	1825	156
105	125	184	124	214	204	129	152	152	133	1835	1835	1830	1833	1833	158
106	125	185	126	216	205	131	154	153	135	1832	1832	1832	1836	1833	159
107	126	187	127	217	207	132	155	155	136	1832	1829	1834	1833	1832	160
108	127	188	128	218	208	133	157	156	137	1835	1838	1838	1846	1839	161
109	129	189	129	219	208	134	158	158	138	1840	1833	1831	1840	1836	163
110	130	191	130	220	209	136	159	159	140	1835	1830	1838	1843	1836	164

Time (min)	TC 1 Sample Deg. F	TC 2 Sample Deg. F	TC 3 Sample Deg. F	TC 4 Sample Deg. F	TC 5 Sample Deg. F	TC 6 Sample Deg. F	TC 7 Sample Deg. F	TC 8 Sample Deg. F	TC 9 Sample Deg. F	TC 10 Furnace Deg. F	TC 11 Furnace Deg. F	TC 12 Furnace Deg. F	TC 13 Furnace Deg. F	TC 14 Sample Average Deg. F	TC 15 Furnace Average Deg. F
111	131	192	131	221	211	137	160	160	141	1837	1838	1839	1844	1840	165
112	132	194	132	222	212	138	162	162	142	1836	1834	1836	1836	1835	166
113	133	195	133	223	213	139	163	163	144	1842	1839	1835	1841	1839	167
114	134	196	134	225	214	140	164	164	145	1843	1841	1838	1845	1842	169
115	135	197	135	226	215	142	166	166	147	1841	1839	1836	1839	1839	170
116	136	199	136	227	216	143	167	167	148	1842	1838	1837	1842	1840	171
117	137	200	137	228	217	144	168	169	149	1846	1843	1839	1846	1843	172
118	138	201	138	229	219	145	170	170	150	1842	1843	1832	1843	1840	173
119	139	202	139	230	220	147	171	171	152	1848	1831	1829	1842	1837	174
120	140	203	140	231	221	148	172	172	153	1848	1837	1829	1842	1839	176
121	141	204	141	233	222	149	173	174	154	1840	1834	1829	1843	1836	177
122	142	205	142	234	223	150	175	175	156	1806	1826	1827	1828	1822	178
123	143	206	143	236	225	151	176	176	157	1814	1833	1845	1832	1831	179
124	144	207	144	237	225	152	178	177	158	1816	1844	1855	1840	1839	180
125	145	208	145	239	227	154	179	179	160	1803	1845	1854	1837	1835	181
126	146	209	146	240	228	155	180	179	161	1804	1844	1851	1835	1833	183