

Testing Report on Pilot-Scale Wood Stud Wall

Client

Intermat
2045 Placentia Avenue
Costa Mesa, CA 92627
USA

Reported by

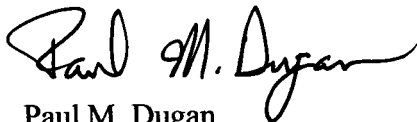
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Test Number: WHI 495 PSV 1590

Test Date: 8/6/2002

Issue Date: 8/19/2002

Testing supervised by:



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Introduction

Intertek Testing Services (ITS) Antioch, California Laboratory conducted a 2 hour fire test for the client, Intermat. The test conformed to the following standards: *ASTM E119 (1998)*, *UL 263 (2000)*, *UBC 7-1 (1997)*, *NFPA 251 (1999)*, *ULC CAN/ULC-S101-M89 (1989)* except the size of the test sample was 60" wide x 47-3/4" tall. The pilot-scale, wood stud gypsum wallboard wall was tested for 2 hours

The test samples were received at the ITS Antioch, CA laboratory on August 6, 2002. The samples were in good condition when received.

Al Cacchoine of Alliance Construction witnessed the test.

Test Materials

Exposed Face:

One layer, USG Firecode gypsum wallboard, Type X, 5/8" thick fastened with #6 x 1" drywall screws 6" on center around the edge and 12" on center in the field; 1 layer 1/8" thick hardboard; 1 layer 22 gauge hot-pit galvanized sheet metal (against studs). The hardboard/sheet metal assembly was fastened to the wall framing with 4d nails 6" on center around the edge and 12" on center in the field prior to the installation and fastening of the gypsum wallboard.

Unexposed Face:

One layer, USG Firecode gypsum wallboard, Type X, 5/8" thick fastened with #6 x 1" drywall screws 8" on center around the edge and 12" on center in the field.

Wall:

2" x 4" wood stud wall fastened with 16d framing nails and with single-faced fiberglass batting, 4" thick (R13).

Test Assembly Construction

The test sample arrived pre-assembled and prefabricated. The drywall on the unexposed face was removed to allow finish thermocouples and single-faced fiberglass batting to be installed. The gypsum wallboard was then attached to the exposed and the unexposed faces of the assemblies.

Fire Endurance Test

Data acquisition began after burner ignition and positioning of the test assembly. To maintain the time-temperature curve specified in Sec. 7.202 of UBC Standard 7-1 (1997), temperatures within the furnace were monitored with nine thermocouples and controlled by adjusting fuel flow to the burners.

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Conditions of the exposed and unexposed faces of the test assembly were periodically observed and recorded (see Appendix B). Unexposed surface temperatures were recorded with six thermocouples.

One pressure-tap was installed through the vertical centerline of the furnace wall adjacent to the door frame at the top elevation to measure furnace pressures. The pressure tap was attached to a pressure gauge. Readings from the gauge was monitored for controlling furnace pressure by adjusting dampers in the furnace exhaust stacks to maintain the neutral pressure level in the furnace at the top of the wall after five minutes test time.

The table of test results and the graph of the furnace curve are included in Appendix C.

At 98 minutes into the fire endurance test, the test was stopped because the maximum allowable temperature was exceeded on TC #4, which read 403°F.

Test assembly movement was within the allowable limits specified in the test standards.

Hose Stream Test

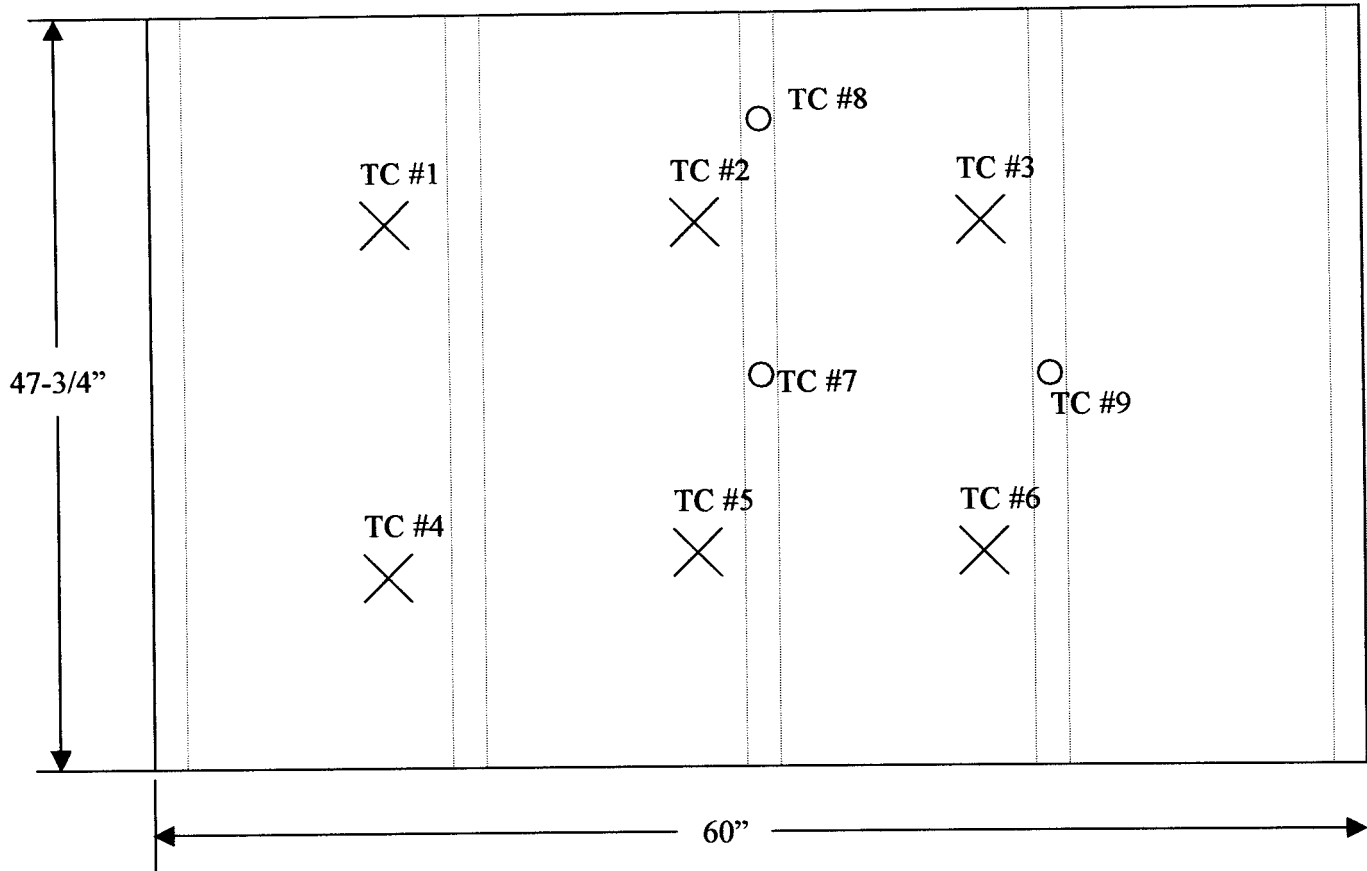
Immediately after the fire test, the exposed face of the wall assembly was subjected to the hose stream test for 20 seconds (1.5 sec/ft² or 16.15 sec/m²), with a water pressure of 30 psi (207kPa).

No through-openings developed.

Conclusion

The 60" wide x 47-3/4" tall wall described in this report, complied with the *Standard for Fire Tests of Building Construction and Materials, ASTM E119 (1998), UL 263 (2000), UBC 7-1 (1997), NFPA 251 (1999), ULC CAN/ULC-S101-M89 (1989)* for a 1 hour fire-rating, except for the reduced size of the test assembly,

Appendix A - Figures and Photos
Figure 1 – Unexposed TC Locations



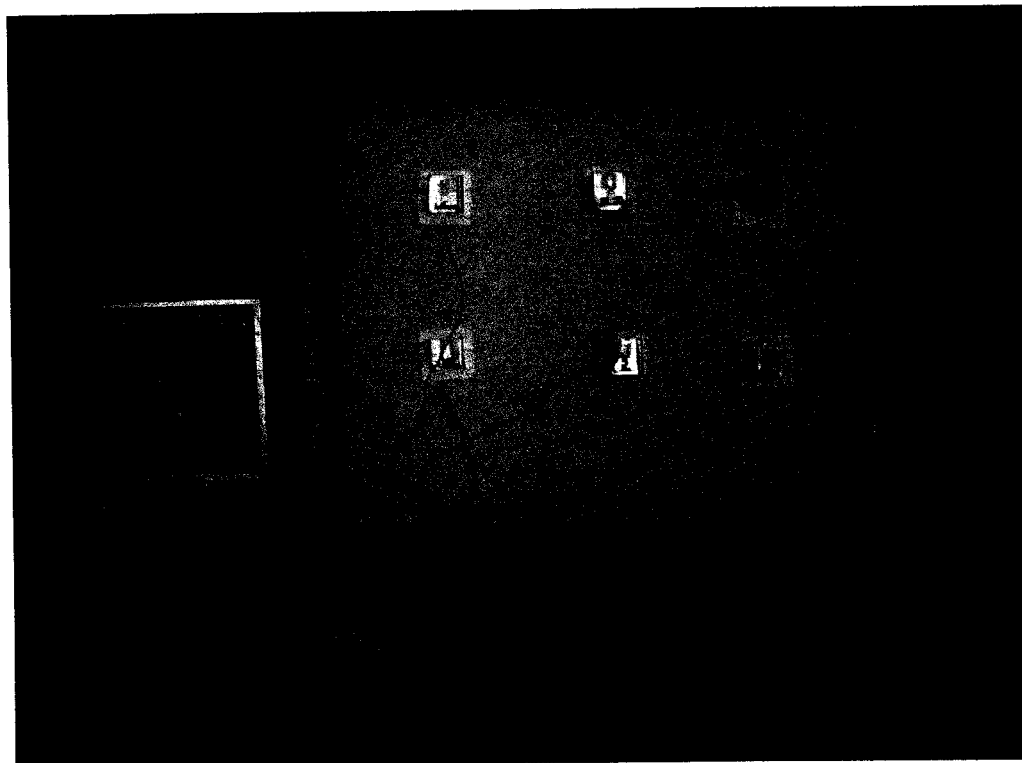
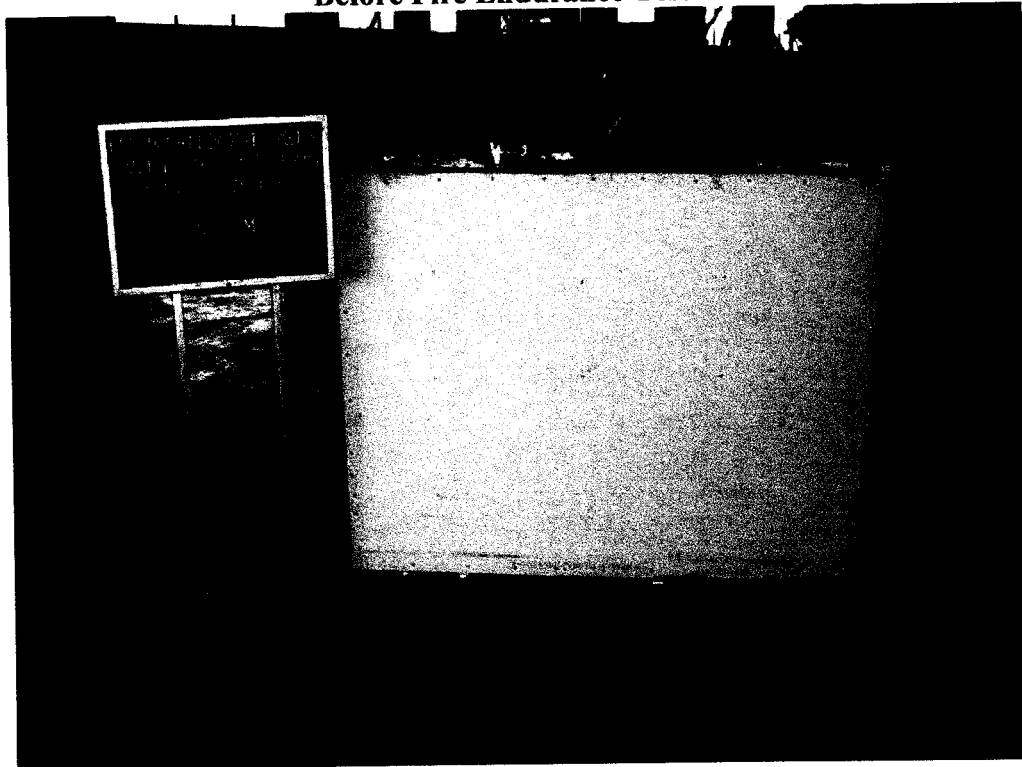
Finish Thermocouples: TC 7-9
Unexposed Thermocouples: TC 1-6

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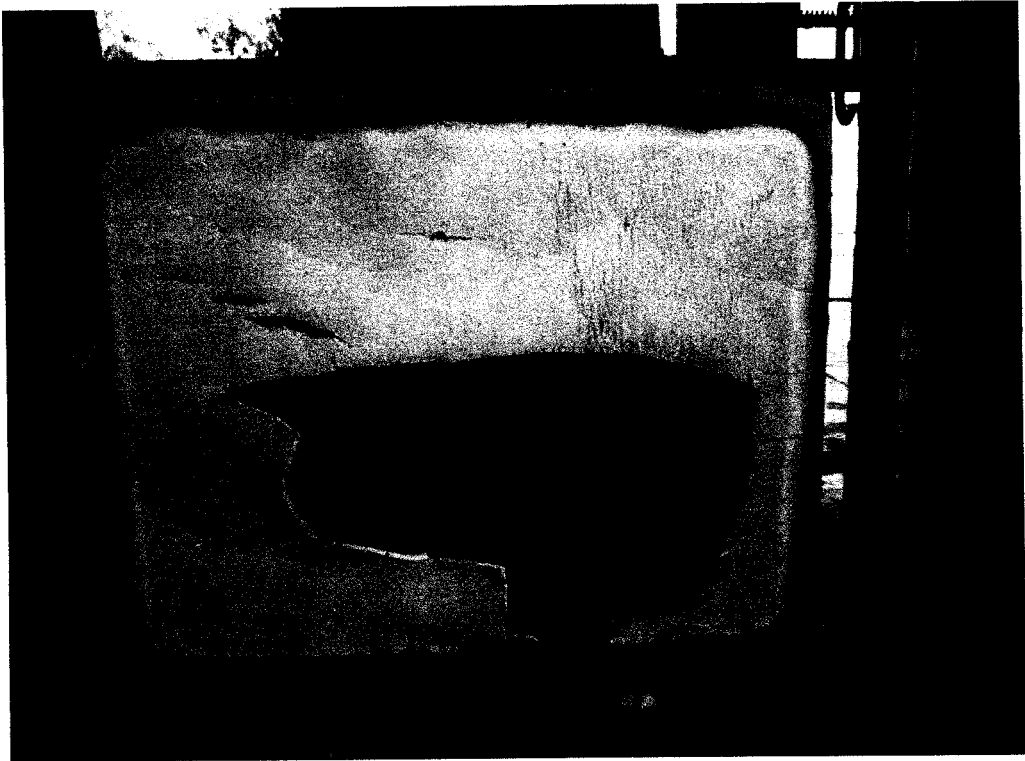
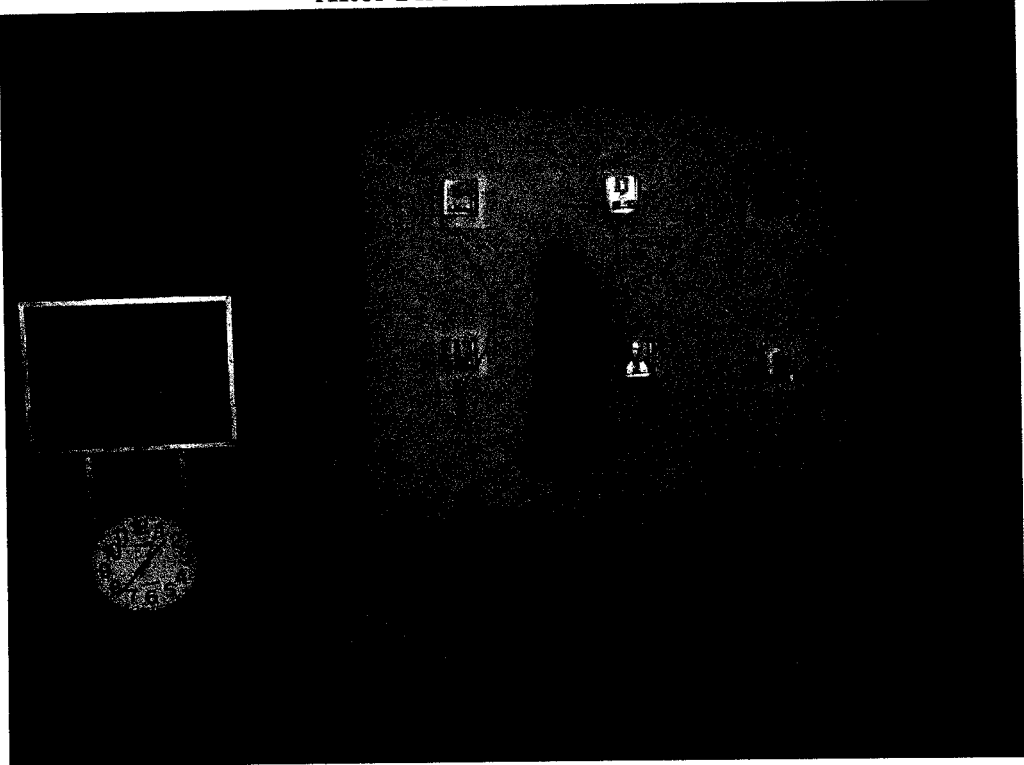
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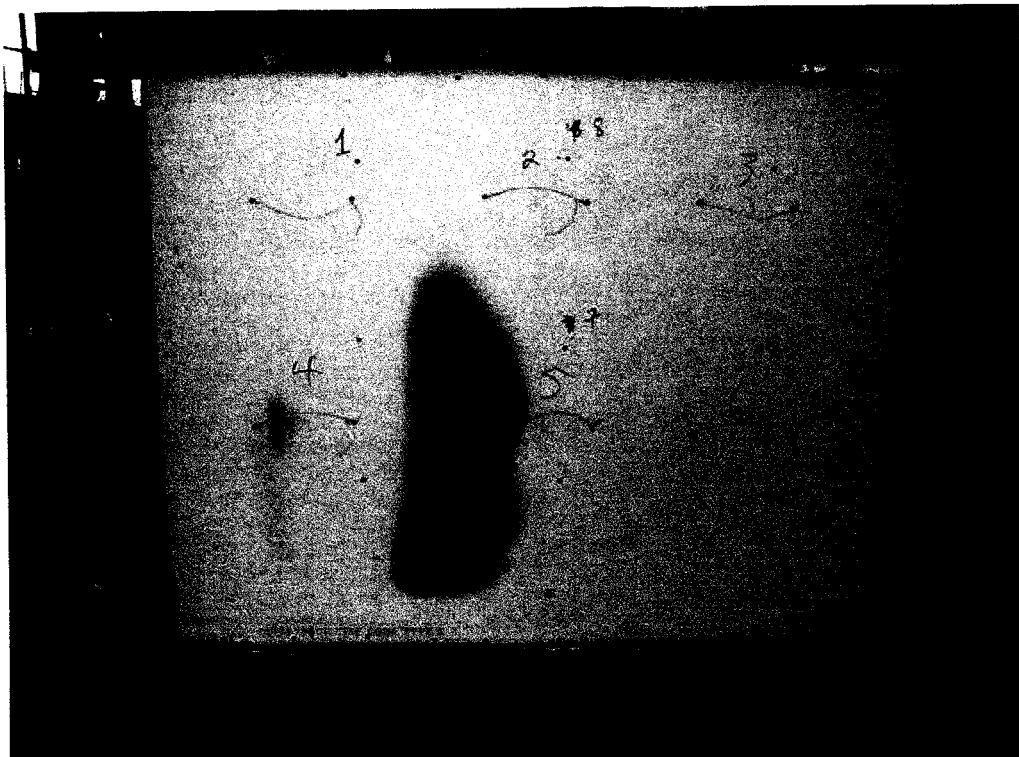
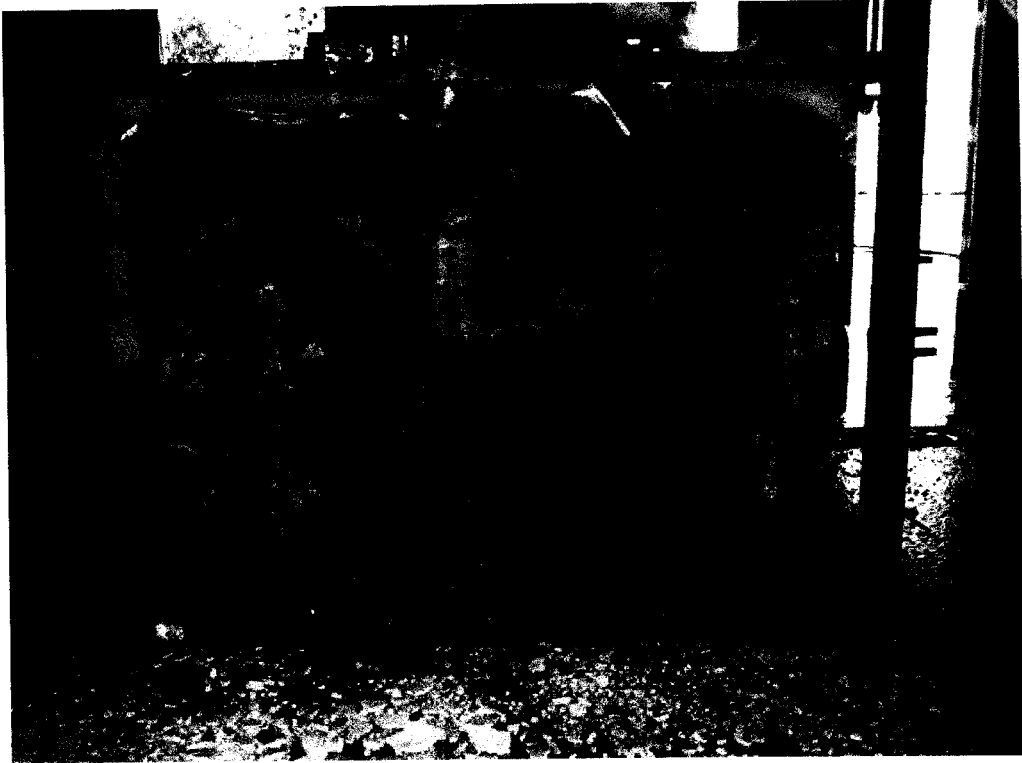
Before Fire Endurance Test



After Fire Endurance Test



Hose Stream Test



Appendix B - Test Observations

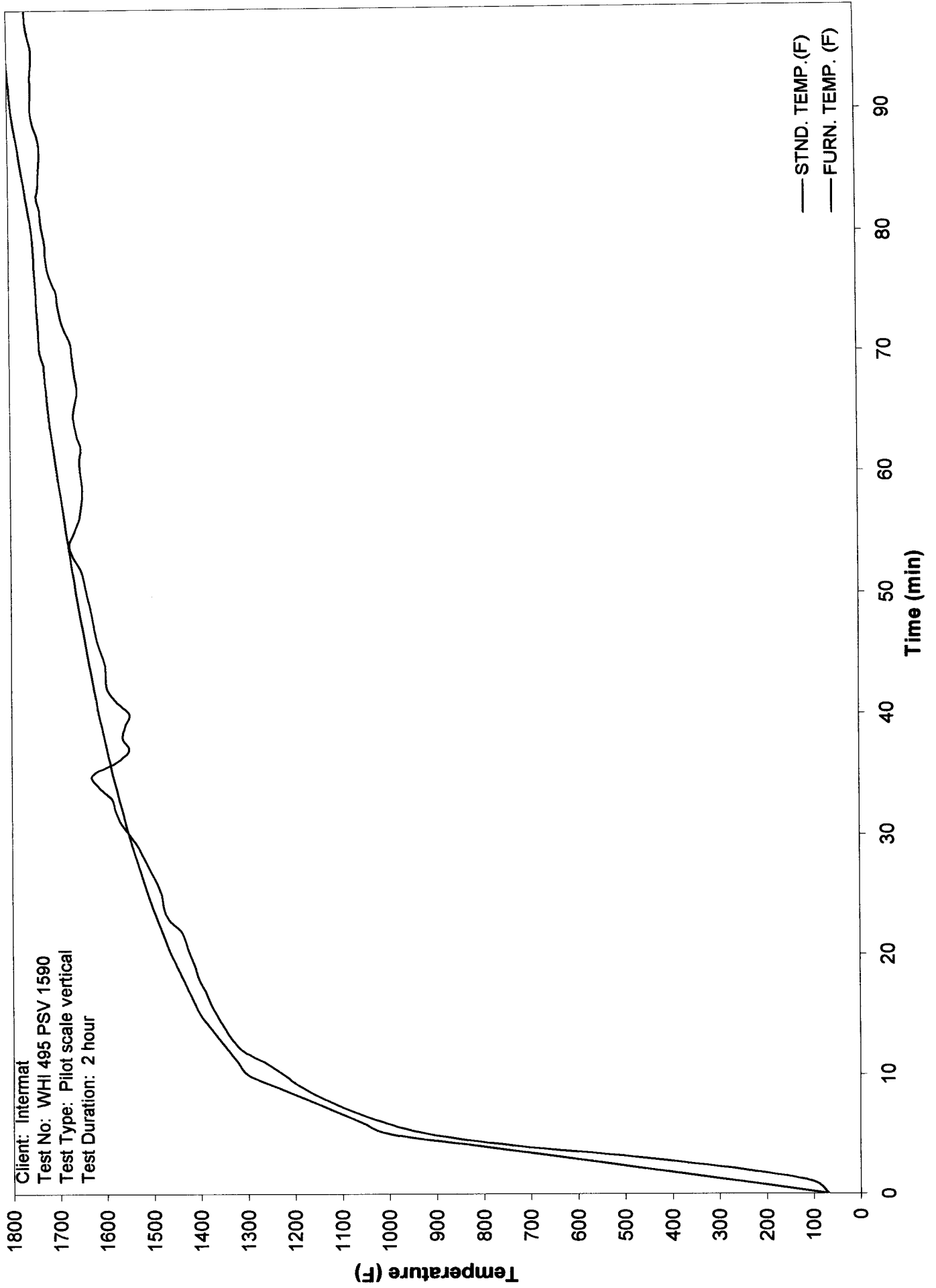
<u>Approximate Test Time, Min</u>	<u>Exposed Face</u>	<u>Unexposed Face</u>
2 1/2	Ignition of face	No change
20	No change	No change
32	Large crack at 24" down from top; flames shooting out of crack	No change
60	Drywall beginning to sag into furnace	Smoke/steam escaping from around assembly
70	More sagging of drywall into furnace	More smoke/steam
90	1st layer of drywall falling into furnace	No change
95	No change	Dark spot on left bottom side
98	Maximum temperature exceeded; stopped test	No change

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Appendix C - Test Data

Furnace Performance

Client: Internat
Test No: WHI 495 PSV 1590
Test Type: Pilot scale vertical
Test Duration: 2 hour



Test Data

	0	1	2	3	4	5	6	7	8	9	10	11	12
TIME (MIN)													
STND. TEMP.(F)	68	254	441	627	814	1000	1060	1120	1180	1240	1300	1320	1340
FURN. TEMP. (F)	69	102	250	471	734	919	1012	1084	1141	1188	1224	1261	1309
STND. AREA (DEG-MIN)	0	109	404	886	1554	2408	3375	4403	5490	6637	7844	9088	10352
TEST AREA (DEG-MIN)	0	11	124	431	984	1770	2677	3665	4715	5816	6959	8134	9356
AMBIENT (F)	69	69	69	69	69	69	69	70	69	70	70	70	70
FURN. 1 (F)	69	100	221	417	666	856	957	1038	1101	1150	1187	1226	1278
FURN. 2 (F)	69	109	275	481	779	938	1012	1073	1123	1164	1198	1229	1270
FURN. 3 (F)	69	118	316	599	864	1032	1107	1166	1209	1245	1274	1309	1347
FURN. 4 (F)	69	92	195	397	641	844	960	1049	1122	1176	1219	1261	1319
FURN. 5 (F)	69	85	186	355	575	784	914	1010	1084	1144	1188	1226	1270
FURN. 6 (F)	69	109	304	578	875	1058	1120	1166	1210	1247	1276	1316	1367
UNEXP. 1 (F)	68	68	68	68	68	68	68	68	68	68	68	68	68
UNEXP. 2 (F)	68	68	68	68	68	68	68	68	68	68	68	68	68
UNEXP. 3 (F)	68	68	68	68	68	68	68	68	68	68	68	68	68
UNEXP. 4 (F)	68	68	68	68	68	68	68	68	68	68	68	68	68
UNEXP. 5 (F)	-	-	-	-	-	-	-	-	-	-	-	-	-
UNEXP. 6 (F)	68	67	67	68	68	68	68	68	68	68	68	68	68
UNEXP. 7 (F)	65	65	65	65	65	66	67	69	71	73	75	77	79
UNEXP. 8 (F)	66	67	66	66	66	67	66	67	67	67	67	67	67
UNEXP. 9 (F)	67	67	67	70	82	108	133	152	165	174	179	182	184
AVG FURNACE (F)	69	102	250	471	734	919	1012	1084	1141	1188	1224	1261	1309
MIN FURNACE (F)	69	85	186	355	575	784	914	1010	1084	1144	1187	1226	1270
MAX FURNACE (F)	69	118	316	599	875	1058	1120	1166	1210	1247	1276	1316	1367
AVG UNEXP. (F)	67	67	67	67	69	72	75	77	79	80	81	81	82
MIN UNEXP. (F)	65	65	65	65	65	66	66	67	67	67	67	67	67
MAX UNEXP. (F)	68	68	68	70	82	108	133	152	165	174	179	182	184

Test Data

	13	14	15	16	17	18	19	20	21	22	23	24	25
TIME (MIN)													
STND. TEMP.(F)	1359	1379	1399	1412	1424	1437	1449	1462	1472	1481	1492	1501	1511
FURN. TEMP. (F)	1333	1349	1365	1379	1390	1403	1411	1422	1430	1441	1467	1478	1482
STND. AREA (DEG-MIN)	11635	12938	14261	15600	16951	18315	19691	21080	22480	23890	25310	26739	28178
TEST AREA (DEG-MIN)	10612	11887	13178	14484	15801	17131	18471	19820	21179	22547	23935	25344	26756
AMBIENT (F)	70	70	70	70	70	70	70	70	70	70	70	71	70
FURN. 1 (F)	1304	1322	1339	1353	1366	1378	1384	1398	1408	1420	1449	1458	1460
FURN. 2 (F)	1295	1312	1328	1343	1356	1368	1379	1390	1399	1409	1434	1447	1456
FURN. 3 (F)	1368	1383	1396	1409	1418	1431	1440	1449	1456	1464	1487	1498	1503
FURN. 4 (F)	1342	1357	1374	1388	1401	1413	1418	1431	1439	1453	1483	1491	1490
FURN. 5 (F)	1298	1317	1333	1348	1360	1372	1382	1391	1400	1410	1436	1450	1456
FURN. 6 (F)	1390	1405	1420	1432	1437	1453	1463	1474	1478	1488	1515	1525	1526
UNEXP. 1 (F)	68	68	68	69	69	69	69	69	70	70	70	70	71
UNEXP. 2 (F)	68	68	68	69	69	69	69	70	71	73	76	79	83
UNEXP. 3 (F)	68	68	68	68	69	69	69	69	69	70	70	70	70
UNEXP. 4 (F)	68	68	69	69	69	69	69	70	70	70	70	71	71
UNEXP. 5 (F)	68	68	68	69	69	69	70	70	72	73	76	79	81
UNEXP. 6 (F)	68	68	68	68	68	68	68	68	69	69	69	69	69
UNEXP. 7 (F)	81	84	87	96	105	131	158	172	178	180	175	178	174
UNEXP. 8 (F)	67	67	67	67	67	67	68	68	68	68	68	68	69
UNEXP. 9 (F)	186	187	188	189	191	191	192	193	198	197	197	202	201
AVG FURNACE (F)	1333	1349	1365	1379	1390	1403	1411	1422	1430	1441	1467	1478	1482
MIN FURNACE (F)	1295	1312	1328	1343	1356	1368	1379	1390	1399	1409	1434	1447	1456
MAX FURNACE (F)	1390	1405	1420	1432	1437	1453	1463	1474	1478	1488	1515	1525	1526
AVG UNEXP. (F)	82	83	84	85	86	89	92	95	96	97	97	98	99
MIN UNEXP. (F)	67	67	67	67	67	67	68	68	68	68	68	68	69
MAX UNEXP. (F)	186	187	188	189	191	191	192	193	198	197	197	202	201

Test Data

	26	27	28	29	30	31	32	33	34	35	36	37	38
TIME (MIN)													
STND. TEMP.(F)	1519	1527	1535	1543	1551	1557	1564	1571	1578	1584	1590	1596	1602
FURN. TEMP. (F)	1492	1505	1518	1531	1547	1567	1579	1586	1614	1628	1578	1549	1563
STND. AREA (DEG-MIN)	29626	31081	32545	34017	35496	36983	38477	39977	41484	42998	44519	46045	47576
TEST AREA (DEG-MIN)	28176	29607	31052	32509	33981	35473	36981	38495	40030	41586	43123	44607	46099
AMBIENT (F)	70	70	71	71	71	71	71	71	71	71	71	72	71
FURN. 1 (F)	1470	1484	1495	1509	1526	1546	1559	1568	1609	1624	1580	1554	1556
FURN. 2 (F)	1475	1498	1520	1539	1572	1612	1656	1710	1746	1789	1742	1675	1640
FURN. 3 (F)	1516	1524	1537	1547	1558	1578	1591	1615	1646	1686	1624	1575	1574
FURN. 4 (F)	1495	1510	1519	1530	1545	1557	1554	1535	1556	1551	1500	1494	1534
FURN. 5 (F)	1464	1476	1488	1500	1513	1531	1539	1532	1550	1552	1510	1492	1524
FURN. 6 (F)	1530	1537	1546	1560	1570	1581	1575	1560	1581	1568	1512	1506	1553
UNEXP. 1 (F)	71	71	71	72	72	72	73	73	74	74	75	77	78
UNEXP. 2 (F)	86	89	91	93	94	95	95	96	96	96	96	96	97
UNEXP. 3 (F)	71	71	71	71	72	72	72	73	73	74	74	75	75
UNEXP. 4 (F)	71	71	72	72	72	72	73	73	74	75	76	77	79
UNEXP. 5 (F)	84	86	88	89	89	90	90	90	91	91	92	93	94
UNEXP. 6 (F)	69	69	70	70	70	70	70	71	71	71	72	72	72
UNEXP. 7 (F)	163	150	140	136	135	137	141	146	153	157	161	166	180
UNEXP. 8 (F)	69	69	69	70	70	70	70	71	71	72	72	73	74
UNEXP. 9 (F)	201	201	207	242	283	320	354	387	427	468	506	529	573
AVG FURNACE (F)	1492	1505	1518	1531	1547	1567	1579	1586	1614	1628	1578	1549	1563
MIN FURNACE (F)	1464	1476	1488	1500	1513	1531	1539	1532	1550	1551	1500	1492	1524
MAX FURNACE (F)	1530	1537	1546	1560	1572	1612	1656	1710	1746	1789	1742	1675	1640
AVG UNEXP. (F)	98	97	98	102	106	111	115	120	125	131	136	140	147
MIN UNEXP. (F)	69	69	69	70	70	70	70	71	71	71	72	72	72
MAX UNEXP. (F)	201	201	207	242	283	320	354	387	427	468	506	529	573

Test Data

	39	40	41	42	43	44	45	46	47	48	49	50	51
TIME (MIN)	1608	1613	1618	1623	1628	1633	1638	1643	1648	1652	1657	1661	1665
STND. TEMP.(F)	1558	1549	1577	1596	1598	1600	1608	1617	1623	1627	1633	1639	1644
FURN. TEMP. (F)	49114	50657	52206	53760	55318	56882	58451	60024	61602	63184	64772	66363	67959
STND. AREA (DEG-MIN)	47592	49077	50573	52095	53624	55156	56691	58238	59791	61348	62911	64479	66053
TEST AREA (DEG-MIN)	72	71	72	72	72	72	72	73	72	73	73	72	73
AMBIENT (F)	1548	1539	1567	1585	1587	1587	1595	1603	1612	1616	1620	1625	1629
FURN. 1 (F)	1605	1580	1589	1601	1602	1603	1607	1615	1622	1626	1629	1633	1637
FURN. 2 (F)	1563	1553	1583	1602	1603	1604	1608	1615	1615	1620	1625	1632	1636
FURN. 3 (F)	1540	1538	1576	1598	1600	1601	1615	1625	1634	1636	1642	1648	1654
FURN. 4 (F)	1528	1523	1547	1569	1575	1579	1587	1599	1606	1612	1618	1626	1633
FURN. 5 (F)	1561	1560	1598	1619	1623	1628	1637	1645	1650	1653	1661	1668	1675
FURN. 6 (F)	80	83	86	90	94	100	105	110	115	120	126	132	137
UNEXP. 1 (F)	98	99	100	102	105	108	111	114	117	121	124	127	130
UNEXP. 2 (F)	76	77	78	79	81	83	85	88	91	95	99	104	109
UNEXP. 3 (F)	81	84	88	93	98	104	109	115	120	126	132	138	145
UNEXP. 4 (F)	95	97	98	101	103	106	110	113	117	121	125	129	134
UNEXP. 5 (F)	73	74	75	76	78	79	82	84	87	90	94	97	101
UNEXP. 6 (F)	198	231	276	320	350	377	398	417	435	455	475	494	514
UNEXP. 7 (F)	75	76	78	80	83	87	90	94	97	101	104	106	109
UNEXP. 8 (F)	610	642	677	714	750	782	816	851	887	922	958	992	1026
UNEXP. 9 (F)	1558	1549	1577	1596	1598	1600	1608	1617	1623	1627	1633	1639	1644
AVG FURNACE (F)	1528	1523	1547	1569	1575	1579	1587	1599	1606	1612	1618	1625	1629
MIN FURNACE (F)	1605	1580	1598	1619	1623	1628	1637	1645	1650	1653	1661	1668	1675
MAX FURNACE (F)	154	163	173	184	194	203	212	221	230	239	248	258	267
AVG UNEXP. (F)	73	74	75	76	78	79	82	84	87	90	94	97	101
MIN UNEXP. (F)	610	642	677	714	750	782	816	851	887	922	958	992	1026
MAX UNEXP. (F)													

Test Data

	52	53	54	55	56	57	58	59	60	61	62	63	64
TIME (MIN)													
STND. TEMP.(F)	1669	1673	1677	1681	1685	1689	1693	1697	1700	1704	1708	1711	1715
FURN. TEMP. (F)	1652	1667	1675	1665	1654	1649	1647	1647	1651	1653	1649	1657	1662
STND. AREA (DEG-MIN)	69559	71163	72771	74383	75999	77619	79242	80870	82501	84135	85774	87416	89061
TEST AREA (DEG-MIN)	67633	69227	70832	72434	74025	75609	77189	78768	80350	81934	83518	85104	86696
AMBIENT (F)	73	73	73	74	73	74	74	73	74	74	74	74	75
FURN. 1 (F)	1636	1652	1658	1650	1641	1637	1635	1636	1641	1644	1640	1649	1654
FURN. 2 (F)	1645	1656	1663	1657	1649	1648	1646	1645	1647	1648	1641	1646	1649
FURN. 3 (F)	1646	1663	1673	1656	1643	1636	1633	1635	1638	1639	1637	1649	1655
FURN. 4 (F)	1663	1681	1687	1678	1668	1662	1659	1661	1667	1671	1667	1677	1683
FURN. 5 (F)	1640	1656	1667	1658	1646	1639	1636	1636	1638	1640	1637	1645	1650
FURN. 6 (F)	1682	1696	1705	1693	1680	1674	1671	1672	1675	1676	1671	1679	1683
UNEXP. 1 (F)	141	144	147	150	153	157	163	168	173	178	181	184	187
UNEXP. 2 (F)	133	135	138	140	142	145	147	149	151	153	155	158	162
UNEXP. 3 (F)	114	119	124	129	134	139	143	147	149	152	153	155	157
UNEXP. 4 (F)	155	164	170	174	178	182	185	189	191	194	197	199	201
UNEXP. 5 (F)	139	143	146	148	150	152	153	154	155	156	156	158	161
UNEXP. 6 (F)	105	109	113	116	120	123	127	130	133	136	138	141	144
UNEXP. 7 (F)	535	556	579	603	626	654	689	740	824	940	1088	1215	1299
UNEXP. 8 (F)	113	117	121	126	133	152	196	293	485	713	954	1134	1246
UNEXP. 9 (F)	1058	1084	1113	1144	1177	1212	1252	1286	1317	1343	1368	1384	1401
AVG FURNACE (F)	1652	1667	1675	1665	1654	1649	1647	1647	1651	1653	1649	1657	1662
MIN FURNACE (F)	1636	1652	1658	1650	1641	1636	1633	1635	1638	1639	1637	1645	1649
MAX FURNACE (F)	1682	1696	1705	1693	1680	1674	1671	1672	1675	1676	1671	1679	1683
AVG UNEXP. (F)	277	286	294	303	313	324	339	362	398	441	488	525	551
MIN UNEXP. (F)	105	109	113	116	120	123	127	130	133	136	138	141	144
MAX UNEXP. (F)	1058	1084	1113	1144	1177	1212	1252	1286	1317	1343	1368	1384	1401

Test Data

	65	66	67	68	69	70	71	72	73	74	75	76	77
TIME (MIN)	1718	1720	1722	1725	1727	1735	1737	1738	1740	1741	1743	1744	1746
STND. TEMP.(F)	1664	1659	1656	1661	1664	1667	1671	1683	1691	1696	1699	1709	1717
FURN. TEMP. (F)	90710	92362	94016	95672	97330	98991	100660	102329	104000	105673	107347	109023	110700
STND. AREA (DEG-MIN)	88293	89886	91476	93067	94662	96259	97860	99470	101090	102717	104347	105984	107631
TEST AREA (DEG-MIN)	75	75	75	75	75	75	75	75	75	75	75	75	75
AMBIENT (F)	1656	1652	1648	1652	1656	1658	1663	1674	1681	1687	1691	1699	1709
FURN. 1 (F)	1651	1646	1643	1647	1650	1652	1656	1666	1674	1680	1683	1692	1700
FURN. 2 (F)	1658	1650	1648	1653	1656	1660	1664	1676	1684	1691	1692	1706	1713
FURN. 3 (F)	1684	1681	1677	1682	1687	1690	1694	1706	1713	1716	1719	1731	1738
FURN. 4 (F)	1653	1648	1645	1651	1654	1657	1661	1672	1681	1687	1690	1699	1707
FURN. 5 (F)	1685	1679	1677	1680	1683	1684	1688	1703	1712	1717	1719	1729	1737
FURN. 6 (F)	190	192	194	196	197	198	200	201	202	203	204	205	205
UNEXP. 1 (F)	166	170	174	177	180	183	185	187	188	189	190	190	191
UNEXP. 2 (F)	159	161	163	166	168	171	173	176	177	179	180	182	184
UNEXP. 3 (F)	203	205	207	209	211	213	214	216	217	219	220	221	222
UNEXP. 4 (F)	165	169	173	176	180	183	186	189	191	194	196	198	200
UNEXP. 5 (F)	147	151	155	158	162	166	169	172	175	177	180	183	185
UNEXP. 6 (F)	1354	1417	1477	1521	1551	1574	1584	1579	1586	1590	1594	1583	1568
UNEXP. 7 (F)	1319	1396	1466	1516	1548	1572	1584	1582	1591	1595	1600	1587	1571
UNEXP. 8 (F)	1424	1487	1534	1561	1579	1586	1592	1614	1633	1623	1616	1579	1550
UNEXP. 9 (F)	1664	1659	1656	1661	1664	1667	1671	1683	1691	1696	1699	1709	1717
AVG FURNACE (F)	1651	1646	1643	1647	1650	1652	1656	1666	1674	1680	1683	1692	1700
MIN FURNACE (F)	1685	1681	1677	1682	1687	1690	1694	1706	1713	1717	1719	1731	1738
MAX FURNACE (F)	570	594	616	631	642	650	654	657	662	663	664	659	653
AVG UNEXP. (F)	147	151	155	158	162	166	169	172	175	177	180	182	184
MIN UNEXP. (F)	1424	1487	1534	1561	1579	1586	1592	1614	1633	1623	1616	1587	1571
MAX UNEXP. (F)													

Test Data

	78	79	80	81	82	83	84	85	86	87	88	89	90
TIME (MIN)													
STND. TEMP.(F)	1747	1749	1750	1754	1758	1763	1767	1771	1775	1779	1784	1788	1792
FURN. TEMP. (F)	1721	1722	1727	1731	1733	1739	1735	1735	1733	1732	1736	1745	1750
STND. AREA (DEG-MIN)	112379	114059	115741	117426	119115	120808	122505	124207	125913	127623	129337	131055	132778
TEST AREA (DEG-MIN)	109283	110937	112594	114255	115921	117590	119259	120927	122593	124258	125924	127598	129279
AMBIENT (F)	75	75	75	75	75	75	73	75	75	75	75	75	76
FURN. 1 (F)	1712	1714	1718	1721	1724	1729	1723	1722	1722	1720	1726	1735	1741
FURN. 2 (F)	1705	1706	1710	1714	1716	1721	1719	1717	1716	1714	1716	1727	1733
FURN. 3 (F)	1717	1717	1723	1729	1728	1736	1733	1732	1725	1723	1726	1741	1745
FURN. 4 (F)	1739	1742	1744	1749	1752	1757	1750	1750	1749	1747	1756	1763	1769
FURN. 5 (F)	1711	1714	1718	1722	1724	1730	1727	1725	1724	1724	1728	1734	1738
FURN. 6 (F)	1741	1742	1747	1754	1755	1763	1761	1764	1763	1765	1766	1772	1775
UNEXP. 1 (F)	206	207	207	207	208	208	209	210	211	212	212	213	214
UNEXP. 2 (F)	192	193	194	195	195	196	198	199	200	201	202	203	204
UNEXP. 3 (F)	186	187	189	191	192	194	196	198	200	201	203	204	206
UNEXP. 4 (F)	223	224	225	225	226	227	229	231	232	234	235	237	240
UNEXP. 5 (F)	202	204	205	207	209	211	213	215	217	218	219	221	222
UNEXP. 6 (F)	188	189	192	194	196	199	202	206	209	211	214	216	219
UNEXP. 7 (F)	1558	1561	1558	1548	1530	1520	1522	1530	1543	1550	1564	1611	1629
UNEXP. 8 (F)	1563	1566	1561	1544	1527	1516	1519	1526	1528	1519	1529	1573	1587
UNEXP. 9 (F)	1533	1533	1517	1505	1496	1493	1492	1502	1514	1526	1559	1606	1610
AVG FURNACE (F)	1721	1722	1727	1731	1733	1739	1735	1735	1733	1732	1736	1745	1750
MIN FURNACE (F)	1705	1706	1710	1714	1716	1721	1719	1717	1716	1714	1716	1727	1733
MAX FURNACE (F)	1741	1742	1747	1754	1755	1763	1761	1764	1763	1765	1766	1772	1775
AVG UNEXP. (F)	650	652	650	646	642	641	642	646	650	652	660	676	681
MIN UNEXP. (F)	186	187	189	191	192	194	196	198	200	201	202	203	204
MAX UNEXP. (F)	1563	1566	1561	1548	1530	1520	1522	1530	1543	1550	1564	1611	1629

Test Data

	91	92	93	94	95	96	97	98
TIME (MIN)								
STND. TEMP.(F)	1794	1797	1799	1801	1804	1806	1808	1810
FURN. TEMP. (F)	1750	1750	1751	1748	1748	1754	1759	1761
STND. AREA (DEG-MIN)	134504	136232	137962	139695	141431	143167	144903	146640
TEST AREA (DEG-MIN)	130962	132644	134326	136008	137688	139372	141061	142754
AMBIENT (F)	76	77	77	76	76	78	78	77
FURN. 1 (F)	1742	1743	1744	1742	1744	1753	1757	1760
FURN. 2 (F)	1734	1734	1734	1733	1734	1740	1745	1747
FURN. 3 (F)	1746	1746	1746	1744	1745	1751	1757	1758
FURN. 4 (F)	1767	1769	1771	1769	1772	1782	1786	1789
FURN. 5 (F)	1736	1734	1736	1730	1729	1735	1740	1743
FURN. 6 (F)	1776	1773	1774	1767	1764	1765	1768	1766
UNEXP. 1 (F)	215	215	216	216	217	217	218	219
UNEXP. 2 (F)	204	205	206	206	207	208	209	209
UNEXP. 3 (F)	207	209	210	211	212	213	214	215
UNEXP. 4 (F)	245	254	267	277	300	323	349	404
UNEXP. 5 (F)	223	224	225	226	227	228	229	230
UNEXP. 6 (F)	221	223	225	226	228	229	231	232
UNEXP. 7 (F)	1624	1625	1625	1622	1621	1626	1632	1636
UNEXP. 8 (F)	1578	1578	1581	1577	1573	1580	1586	1591
UNEXP. 9 (F)	1605	1608	1617	1613	1606	1611	1617	1626
AVG FURNACE (F)	1750	1750	1751	1748	1748	1754	1759	1761
MIN FURNACE (F)	1734	1734	1734	1730	1729	1735	1740	1743
MAX FURNACE (F)	1776	1773	1774	1769	1772	1782	1786	1789
AVG UNEXP. (F)	680	682	686	686	688	693	698	707
MIN UNEXP. (F)	204	205	206	206	207	208	209	209
MAX UNEXP. (F)	1624	1625	1625	1622	1621	1626	1632	1636