TEST REPORT

REPORT NUMBER: 100585447SAT-002B
ORIGINAL ISSUE DATE: December 30, 2013
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RENDERED TO

Canadian Wood Council
99 Rue Bank Street
Suite 400
OTTAWA ON K1P 6B9
CANADA

PRODUCT EVALUATED: Cross-Laminated Timber Panels
EVALUATION PROPERTY: Fire Resistance

Report of Testing Cross-Laminated Timber Panels for compliance with the applicable requirements of the following criteria: *ASTM E119–12a Standard Test Methods for Fire Tests of Building Construction and Materials, January 2012 Edition, and CAN/ULC-S101-07 Standard Methods of Fire Endurance Tests of Building Construction and Materials.*

1 Table of Contents

2 Introduction

Intertek Testing Services NA, Inc. (Intertek) has conducted testing for the Canadian Wood Council, on Cross-Laminated Timber Panels, to evaluate their fire resistance. Testing was conducted in accordance with the applicable requirements, and following the standard methods, of **ASTM E119–12a Standard Test Methods for Fire Tests of Building Construction and Materials, January 2012 Edition, and CAN/ULC-S101-07 Standard Methods of Fire Endurance Tests of Building Construction and Materials.** This evaluation took place on December 19, 2013.

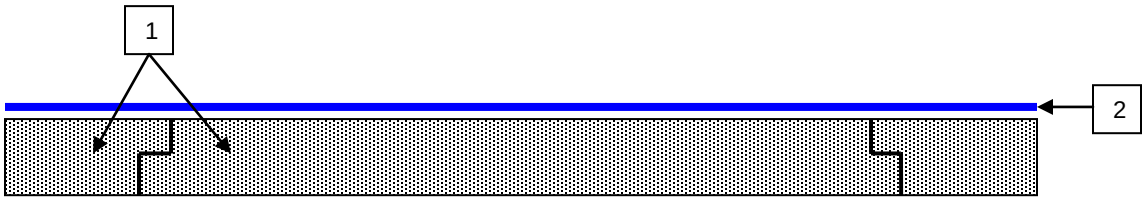
3 Test Samples

3.1. SAMPLE SELECTION

Samples were submitted to Intertek directly from the client. Samples were not independently selected for testing. Samples were received at the Evaluation Center on December 11, 2013 and assigned Intertek I.D. No. SAT1312111559-001.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

An asymmetrical, 10’ x 10’, load-bearing wall was constructed of gypsum board and Cross-Laminated Timber Panels (see Appendix A).



1. Wood Panels – Three (3) Cross-Laminated Panels with 1-15/16” (49mm) half lap joints; panels secured to each other using one bead of Loctite® PL® 400® construction adhesive and Wurth 6 x 100 mm long self-tapping screws spaced 12” (300mm) o.c. along the joint. The first fastener spaced 2-1/4” (60mm) from the bottom and the next spaced 7” (174mm) from the bottom, then 12” (300mm) thereafter (See Appendix A).

2. Cladding – 4’ x 10’ x 5/8” USG SheetRock® Firecode Core TYPE X™ gypsum board, installed with the long edge parallel to the panels, using 1-5/8” coarse thread screws spaced 16” o.c. around the perimeter and in the field; exposed seams and fasteners received a Level 2 finish.

4 Testing and Evaluation Methods

4.1. INSTRUMENTATION

The unexposed surface of the assembly was instrumented with a total of eleven, 24 GA, Type K, fiberglass jacketed thermocouples: TCs #1 - #9 were evenly distributed across the wall as described in the standard, and TCs #10 and #11 were installed on the vertical joints of the CLT. For additional information**,** see Appendix A. The output of the thermocouples and the furnace probes were monitored by a 100-channel Yokogawa, Inc., Darwin Data Acquisition Unit. The computer was programmed to scan every 6 seconds and save data every 30 seconds. Following the test, the files were imported into MS Excel for tabular and graphical display (presented in Appendix C).

4.2. TEST STANDARD

Testing was conducted in accordance with the applicable requirements, and following the standard methods, of **ASTM E119–12a Standard Test Methods for Fire Tests of Building Construction and Materials, January 2012 Edition, and CAN/ULC-S101-07 Standard Methods of Fire Endurance Tests of Building Construction and Materials.**

4.2.1. Deviation From Standard Method

No hose stream was conducted on the wall assembly after achieving the 60 minute rating due to structural failure.

The assembly was secured to the full-scale vertical furnace with the 5/8” thick Type X gypsum board exposed to the fire and was tested to the standard time-temperature curve described in the CAN/ULC S101 standard.

5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

The test was initiated on Thursday, December 19, 2013. Steve Craft, representing CHM Fire Consultants, Ltd., was present to witness the test. The ambient temperature at the time of the test was 73°F and the relative humidity was 66%. A superimposed load of 8,160 plf (total load of 81,600 lbs) was applied to the wall assembly and held for 30 minutes prior to testing, as specified by CAN/ULC-S101-07. Based upon these calculations (see Appendix B), it was determined by the client that this was 60% of the maximum design load for this specimen.

Observations made during the test are listed below:

Time (min:sec)	Observations
0:00	The test was initiated at 2:38 P.M.
2:40	The gypsum board paper on the exposed surface ignited and was consumed
10:30	The joint compound of the exposed surface began to flake
17:15	The joint compound continued to flake
21:00	The joint compound had all fallen completely off
22:30	There was flaming on the gypsum board joints
24:20	There were popping sounds from the wall
29:00	There was increased flaming at the gypsum board joints; there was a crack in the gypsum on the left board joint
34:30	The left gypsum joint opened to 1/2”
36:30	There was continued heavy flaming
49:30	The left vertical gypsum joint continued to open
54:00	The joints continued to open and flame heavily
60:00	The 1 hour mark was achieved and the test continued
68:00	The gypsum board fell on the exposed side
69:30	The joint of the panel opened on both sides
73:00	There was heavy flaming on the panel of the exposed side
76:30	There was structural failure and the test was terminated

The assembly withstood the effects of the fire test without passage of flame or gasses hot enough to ignite cotton waste. The heat conducted through the assembly did not cause the temperatures measured by the thermocouple to exceed the 250°F rise in average temperature or 325°F rise in individual temperatures over the initial starting temperatures. During the test, no suspected hot spots developed, meeting the requirements of section 5.3.1.1 of the CAN/ULC S 101 test method. At 76:30, the wall assembly was unable to maintain the load at which point it was deemed to have failed structurally. There was no hose stream test conducted.

Assembly drawings, the test data and photographs documenting the test are located in the Appendices of this test report.

5.2. EXAMINATION OF RESULTS

5.2.1. Correction Factor for the Fire Endurance Test

In accordance with the E119 test standard, a calculation for any correction to the indicated fire resistance period was done. The correction factor was then mathematically added to the indicated fire resistance period, yielding the fire resistance period achieved by this specimen:

Correction Factor for the Fire Endurance Test

ITEM	DESCRIPTION	TEST VALUE
C	correction factor	.00 minutes 0 seconds
I	indicated fire-resistance period	77 minutes
A	area under the curve of indicated average furnace temperature for the first three fourths of the indicated period	79073 (°F•min)
As	area under the standard furnace curve for the same part of the indicated period	79079 (°F•min)
ITEM	**DESCRIPTION**	**TEST VALUE**
L	lag correction	3240
	FIRE RESISTANCE PERIOD ACHIEVED BY THIS SPECIMEN ==>	76 minutes

Note: The standard specifies that the fire resistance be determined to the nearest integral minute. Consequently, if the correction factor is less than 30 seconds, and the test specimen met the criteria for the full indicated fire resistance period, no correction is deemed necessary.

5.2.2. Surface Deflection

The deflection of the unexposed surface was measured at 3 equidistant locations, 30”, 60”, and 90” from left to right, across the horizontal midline, during the span of the test. The amount of that deflection is presented in the table below.

Time (min)	Position 1 (in)	Position 2 (in)	Position 3 (in)
No load	0	0	0
Load Applied	0	1/8	0
15:00	0	0	1/16
30:00	0	0	0
45:00	1/8	0	0

6 Conclusion

Intertek Testing Services NA, Inc. (Intertek) has conducted testing for the Canadian Wood Council, on their Cross-Laminated Timber Panels, to evaluate their fire resistance. Testing was conducted in accordance with the applicable requirements, and following the standard methods, of **ASTM E119–12a Standard Test Methods for Fire Tests of Building Construction and Materials, January 2012 Edition, and CAN/ULC-S101-07 Standard Methods of Fire Endurance Tests of Building Construction and Materials.** This evaluation took place on December 19, 2013.

Based on the results of this test, the asymmetrical, load-bearing Cross-Laminated Timber Panel assembly, tested with a single layer of 5/8" thick Type X gypsum board exposed to the fire sustained the applied load of 8,160 plf (total load of 81,600 lbs, calculated by the client to be 60% of the maximum design load) and the effects of the fire for 76 minutes. There was no hose stream test conducted.

The conclusions of this test report may not be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

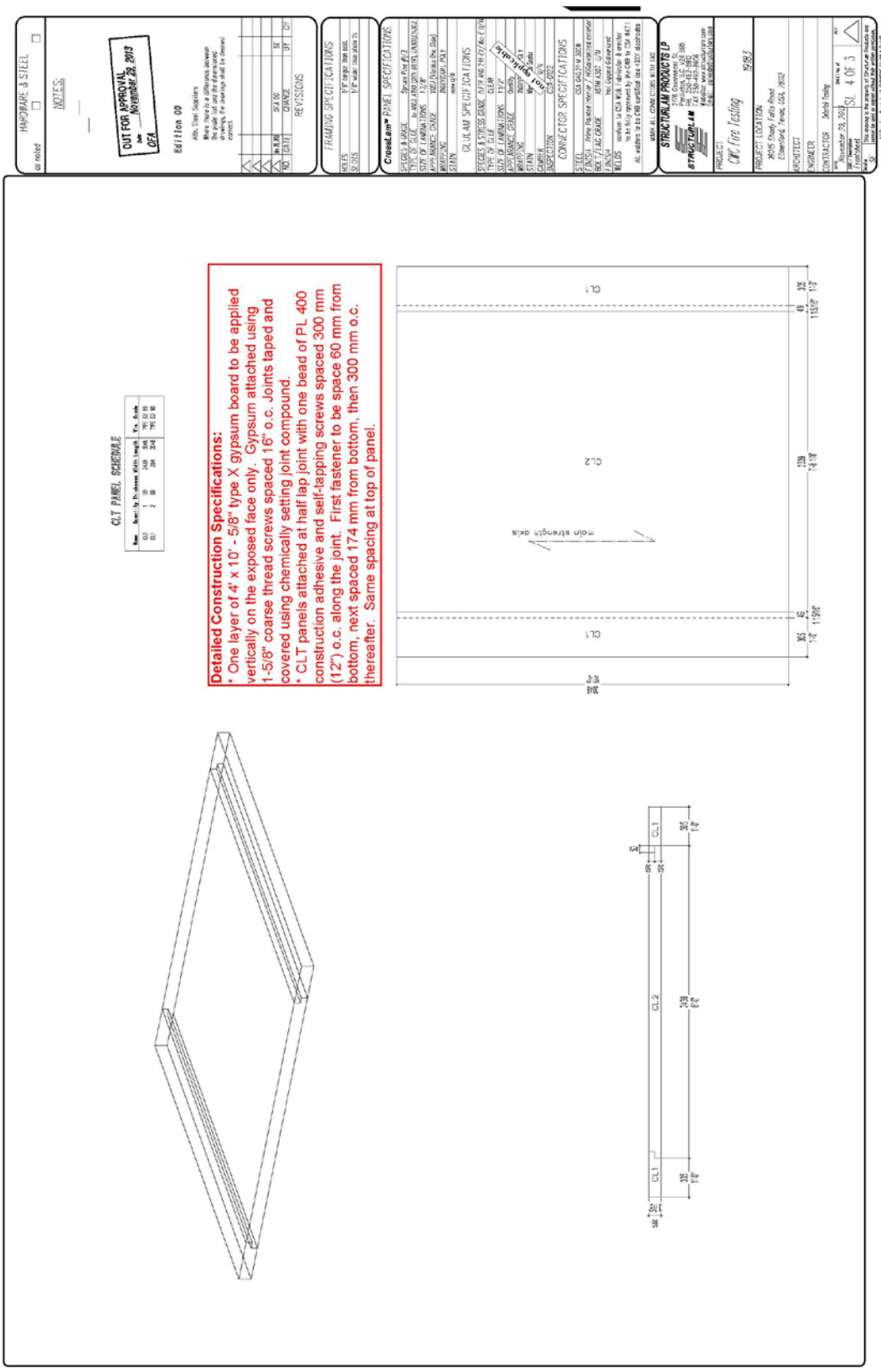
INTERTEK TESTING SERVICES NA, INC.

Tested by: _____
Jeffrey Patterson
Project Engineer

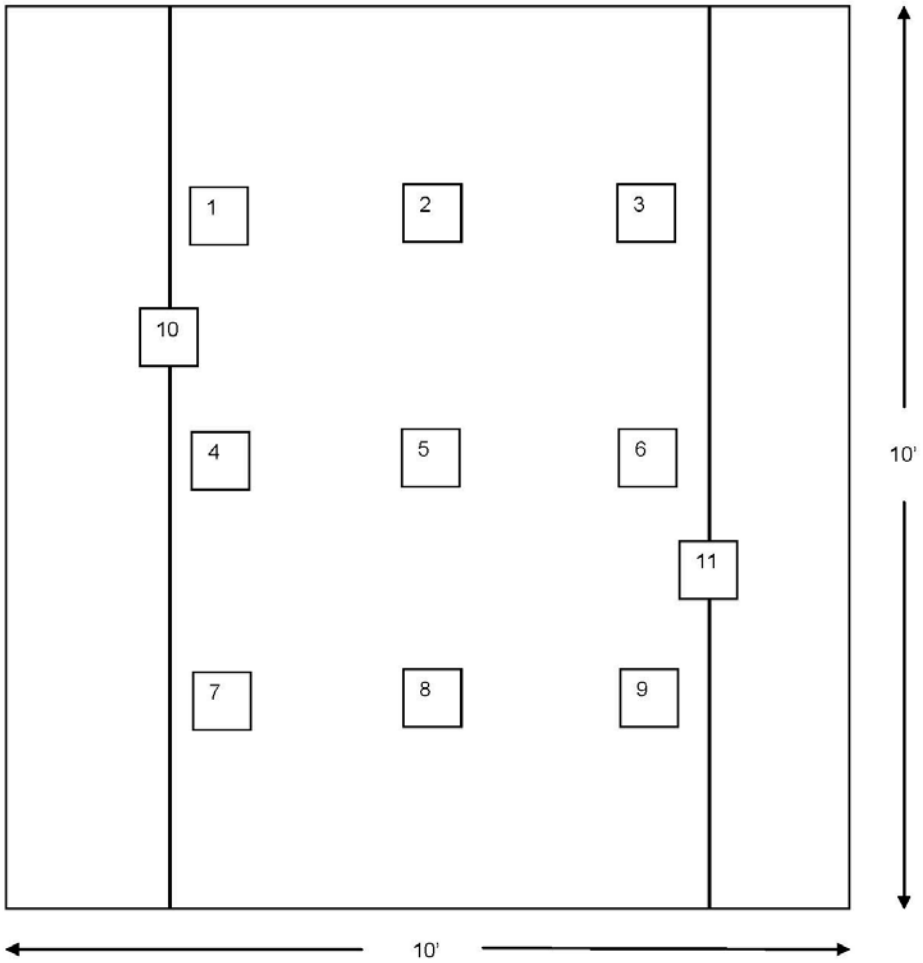
Reported by: _____
David Priest
Technical Writer

Reviewed by: _____
Victor M. Burgos
Project Engineer, Fire Resistance

APPENDIX A
Assembly Drawings


OUT FOR APPROVAL
November 29, 2013
CSA
Edition 09
CLT PANEL SCHEDULE
Detailed Construction Specifications:
• One layer of 4' x 10' - 5/8" type X gypsum board to be applied vertically on the exposed face only. Gypsum attached using 1-5/8" coarse thread screws spaced 16" o.c. Joints taped and covered using chemically setting joint compound.
• CLT panels attached at half lap joint with one bead of PL 400 construction adhesive and self-tapping screws spaced 300 mm (12") o.c. along the joint. First fastener to be space 60 mm from bottom, next spaced 174 mm from bottom, then 300 mm o.c. thereafter. Same spacing at top of panel.
CLT
CL1
CL2
STRUCTURLAM PRODUCTS LP

Thermocouple Layout



(Drawing Not To Scale)

APPENDIX B
Load Calculations

CHMfire Consultants Ltd

Load Calculation for Wall Assembly

Compressive Resistance Parallel to Grain

Structurlam's product literature specifies an axial capacity of **276** kN/m for a 3.0 m tall 3-ply (99 mm thick) wall. Their product line follows grade V2 in accordance with the product standard PRG-320.

Dead Load of Assembly

Dead load of CLT panels

4300 N/m^3 x 0.10 m thick x 3.048 m = 1.3 kN/m

Dead load of Gypsum Board (1 layer 16 mm type X)

750 kg/m^3 x 0.016 m x 3.048 m x 9.81 m/s^2 = 0.36 kN/m

Therefore, the total Dead Load = 1.66 kN/m

Applied Load (Full Specified Load Condition) on Assembly

$$P_S = {}^{P_r}/_{\alpha} - P_d$$

$$P_S = {}^{(276)}/_{(1.375)} - (1.66) = 199\ kN/m$$

$$\boldsymbol{P_S = 136,000\ lbs}$$ **(for 3.048 m or 10 ft. wall)**

Therefore 60% of design load is 81,600 lbf.

CALCULATION SHEET: PRESSURE IN HYDRAULIC LINES

Force (lbs) = W(bar) + W(blocks) + Design Load/stud or ft
W(bar) = Weight of Load Bar (lbs)
W(blocks) = Weight of Concrete Blocks (pounds)

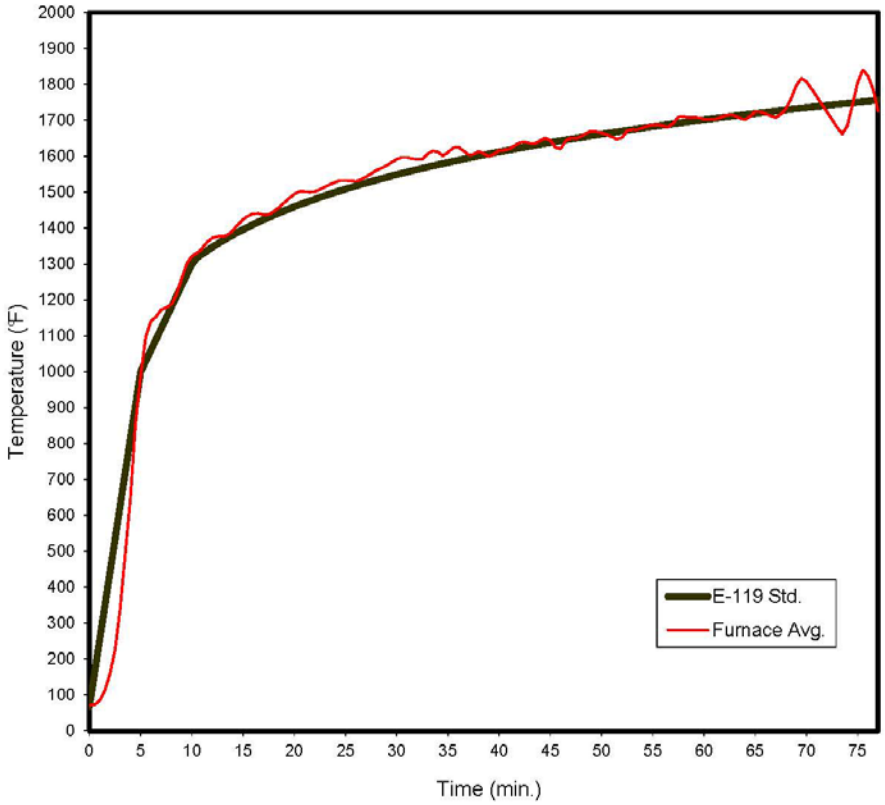
Total Force (pounds) = W(bar) + W(blocks)
+ Design Load x No. of Studs (or No. of Ft)

Pressure in Hydraulic Line (psi) = Total Force (lbs)/(18.665 sq.in.
x No. of Actuators)

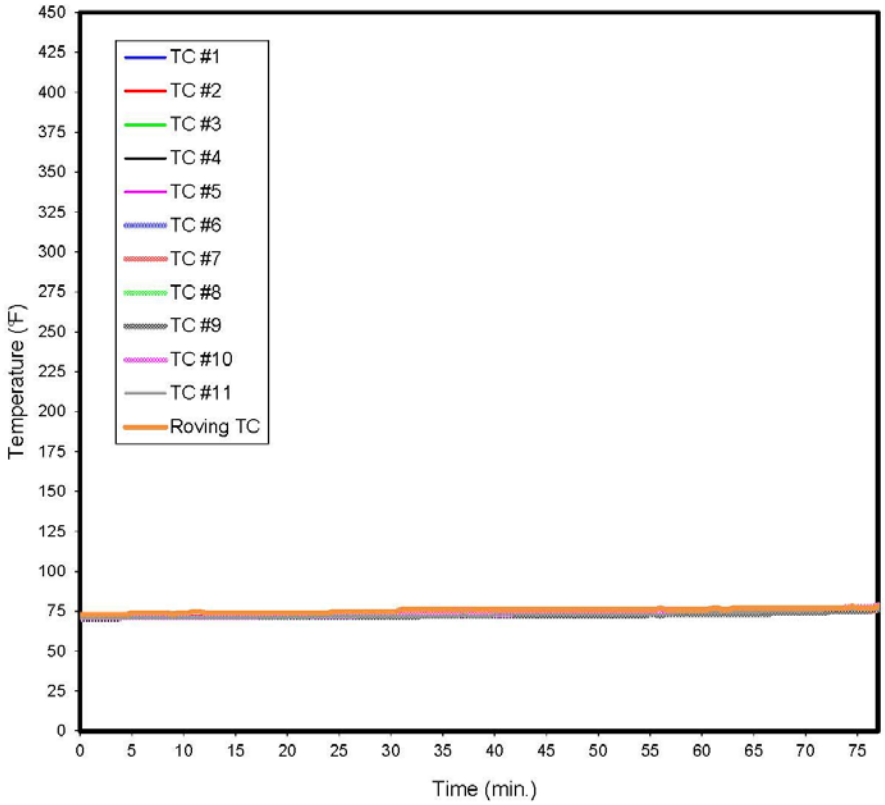
Desired Load per Stud (or foot) =	8160	lbs/stud (or foot)	
Height of Wall:	120	inches	
Width of Wall:	120	inches	
No. of Studs:	10	each	(Or LF)
Weight of Load Bar:	550	lbs	
Weight of Bottom & Side Blocks:	2875	lbs	
No. of Actuators:	6	(18.665 sq.in. each)	
Required Hydraulic Pressure ===>	**759**	**psi**	

APPENDIX C
Temperature Data

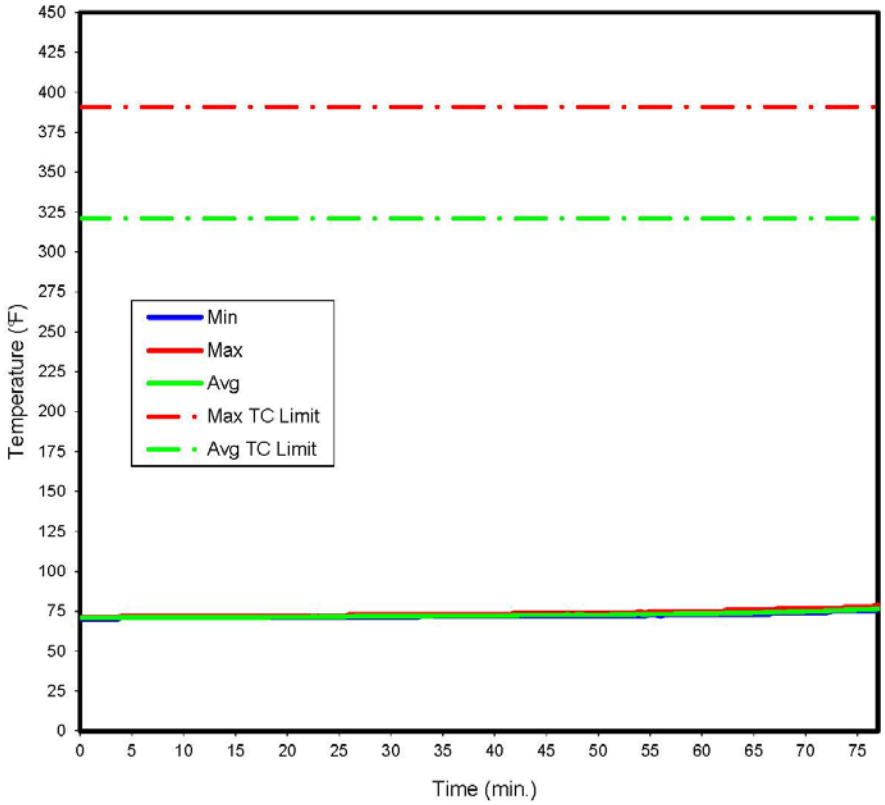
Canadian Wood Council
Project No. G100585447SAT-002B
19 December 2013
Furnace Interior Temperatures



Canadian Wood Council
Project No. G100585447SAT-002B
19 December 2013
Individual Cold Side Temperatures



Canadian Wood Council
Project No. G100585447SAT-002B
19 December 2013
Min, Avg, Max Cold Side Temperatures



Time (min)	E119 Std Average (°F)	Furnace Average (°F)	Integration of Furnace Average (°F•min)	Integration of E119 Std Average (°F•min)	Error (%)
0	68	72	0	0	0.00%
0.5	161	73	2	23	-90.08%
1	254	85	8	93	-91.71%
1.5	348	112	23	210	-89.08%
2	441	158	57	373	-84.84%
2.5	534	225	118	583	-79.68%
3	627	341	226	839	-73.08%
3.5	720	494	400	1142	-64.94%
4	814	647	652	1491	-56.30%
4.5	907	855	993	1887	-47.37%
5	1000	988	1420	2330	-39.06%
5.5	1030	1098	1907	2804	-31.97%
6	1060	1141	2433	3292	-26.10%
6.5	1090	1153	2972	3796	-21.69%
7	1120	1172	3519	4314	-18.42%
7.5	1150	1179	4073	4848	-15.97%
8	1180	1188	4631	5396	-14.18%
8.5	1210	1216	5198	5960	-12.78%
9	1240	1259	5782	6538	-11.56%
9.5	1270	1300	6388	7132	-10.42%
10	1300	1322	7010	7740	-9.43%
10.5	1317	1330	7639	8360	-8.63%
11	1328	1343	8273	8988	-7.95%
11.5	1337	1361	8915	9620	-7.33%
12	1347	1372	9564	10257	-6.75%
12.5	1356	1376	10218	10898	-6.25%
13	1364	1376	10872	11545	-5.83%
13.5	1373	1381	11527	12195	-5.48%
14	1381	1392	12186	12849	-5.16%
14.5	1388	1411	12853	13507	-4.84%
15	1396	1424	13528	14170	-4.53%
15.5	1403	1434	14208	14835	-4.23%
16	1410	1440	14893	15505	-3.95%
16.5	1417	1441	15579	16177	-3.70%
17	1424	1437	16264	16854	-3.50%
17.5	1430	1438	16949	17533	-3.33%
18	1436	1446	17636	18215	-3.18%
18.5	1442	1457	18328	18901	-3.03%
19	1448	1470	19026	19590	-2.88%
19.5	1454	1483	19730	20281	-2.72%
20	1459	1494	20441	20975	-2.55%
20.5	1465	1501	21156	21672	-2.38%
21	1470	1501	21872	22372	-2.23%
21.5	1475	1501	22589	23074	-2.11%
22	1480	1501	23305	23779	-1.99%
22.5	1485	1507	24023	24487	-1.89%
23	1490	1515	24745	25196	-1.79%
23.5	1495	1521	25470	25909	-1.69%
24	1499	1528	26198	26623	-1.60%
24.5	1504	1532	26929	27340	-1.50%

Time (min)	E119 Std Average (°F)	Furnace Average (°F)	Integration of Furnace Average (°F•min)	Integration of E119 Std Average (°F•min)	Error (%)
25	1508	1532	27661	28059	-1.42%
25.5	1513	1531	28393	28781	-1.35%
26	1517	1530	29124	29504	-1.29%
26.5	1521	1534	29856	30230	-1.24%
27	1525	1543	30592	30957	-1.18%
27.5	1529	1551	31331	31687	-1.12%
28	1533	1560	32075	32419	-1.06%
28.5	1537	1567	32823	33153	-1.00%
29	1541	1574	33574	33888	-0.93%
29.5	1545	1583	34329	34626	-0.86%
30	1549	1591	35089	35365	-0.78%
30.5	1552	1597	35852	36106	-0.71%
31	1556	1597	36616	36850	-0.63%
31.5	1559	1593	37380	37594	-0.57%
32	1563	1591	38142	38341	-0.52%
32.5	1566	1591	38903	39089	-0.48%
33	1570	1606	39669	39839	-0.43%
33.5	1573	1614	40440	40591	-0.37%
34	1576	1612	41213	41344	-0.32%
34.5	1579	1601	41982	42099	-0.28%
35	1583	1611	42751	42856	-0.24%
35.5	1586	1623	43525	43614	-0.20%
36	1589	1626	44304	44373	-0.16%
36.5	1592	1616	45080	45135	-0.12%
37	1595	1604	45851	45897	-0.10%
37.5	1598	1605	46619	46661	-0.09%
38	1601	1613	47390	47427	-0.08%
38.5	1604	1608	48161	48194	-0.07%
39	1606	1599	48929	48963	-0.07%
39.5	1609	1606	49696	49733	-0.07%
40	1612	1616	50467	50504	-0.07%
40.5	1615	1617	51241	51277	-0.07%
41	1617	1620	52017	52051	-0.06%
41.5	1620	1629	52795	52826	-0.06%
42	1623	1638	53578	53603	-0.05%
42.5	1625	1640	54363	54381	-0.03%
43	1628	1636	55148	55160	-0.02%
43.5	1631	1635	55932	55941	-0.02%
44	1633	1643	56718	56723	-0.01%
44.5	1636	1651	57507	57506	0.00%
45	1638	1644	58297	58290	0.01%
45.5	1640	1624	59080	59076	0.01%
46	1643	1621	59857	59863	-0.01%
46.5	1645	1642	60639	60651	-0.02%
47	1648	1651	61428	61440	-0.02%
47.5	1650	1649	62219	62230	-0.02%
48	1652	1655	63011	63022	-0.02%
48.5	1655	1664	63807	63815	-0.01%
49	1657	1670	64606	64608	0.00%
49.5	1659	1668	65407	65403	0.01%

Time (min)	E119 Std Average (°F)	Furnace Average (°F)	Integration of Furnace Average (°F•min)	Integration of E119 Std Average (°F•min)	Error (%)
50	1661	1664	66206	66199	0.01%
50.5	1663	1660	67003	66997	0.01%
51	1666	1653	67797	67795	0.00%
51.5	1668	1647	68588	68594	-0.01%
52	1670	1652	69379	69394	-0.02%
52.5	1672	1671	70176	70196	-0.03%
53	1674	1674	70978	70998	-0.03%
53.5	1676	1674	71781	71802	-0.03%
54	1678	1679	72585	72607	-0.03%
54.5	1680	1684	73392	73412	-0.03%
55	1682	1687	74200	74219	-0.02%
55.5	1684	1688	75010	75026	-0.02%
56	1686	1684	75819	75835	-0.02%
56.5	1688	1681	76627	76645	-0.02%
57	1690	1692	77436	77455	-0.02%
57.5	1692	1709	78252	78267	-0.02%
58	1694	1710	79073	79079	-0.01%
58.5	1696	1707	79894	79893	0.00%
59	1698	1708	80713	80707	0.01%
59.5	1700	1707	81533	81522	0.01%
60	1701	1703	82351	82338	0.02%
60.5	1703	1701	83168	83156	0.02%
61	1705	1703	83985	83974	0.01%
61.5	1707	1706	84803	84793	0.01%
62	1709	1713	85624	85612	0.01%
62.5	1710	1716	86447	86433	0.02%
63	1712	1713	87271	87255	0.02%
63.5	1714	1705	88091	88077	0.02%
64	1716	1701	88909	88901	0.01%
64.5	1717	1711	89728	89725	0.00%
65	1719	1724	90553	90550	0.00%
65.5	1721	1724	91381	91376	0.01%
66	1722	1718	92207	92203	0.00%
66.5	1724	1713	93031	93030	0.00%
67	1726	1707	93852	93859	-0.01%
67.5	1727	1717	94674	94688	-0.02%
68	1729	1732	95502	95518	-0.02%
68.5	1731	1760	96341	96349	-0.01%
69	1732	1796	97196	97181	0.02%
69.5	1734	1816	98065	98013	0.05%
70	1735	1807	98937	98847	0.09%
70.5	1737	1787	99802	99681	0.12%
71	1738	1767	100656	100515	0.14%
71.5	1740	1744	101500	101351	0.15%
72	1742	1723	102333	102187	0.14%
72.5	1743	1701	103155	103025	0.13%
73	1745	1680	103966	103863	0.10%
73.5	1746	1662	104768	104701	0.06%
74	1748	1685	105570	105541	0.03%
74.5	1749	1744	106394	106381	0.01%

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Time (min)	E119 Std Average (°F)	Furnace Average (°F)	Integration of Furnace Average (°F•min)	Integration of E119 Std Average (°F•min)	Error (%)
75	1751	1805	107247	107222	0.02%
75.5	1752	1840	108125	108063	0.06%
76	1753	1824	109007	108906	0.09%
76.5	1755	1787	109875	109749	0.12%
77	1756	1725	110719	110593	0.11%

Max Temp
Max Allowed

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Time (min)	Furnace Probe #1 (°F)	Furnace Probe #2 (°F)	Furnace Probe #3 (°F)	Furnace Probe #4 (°F)	Furnace Probe #5 (°F)	Furnace Probe #6 (°F)	Furnace Probe #7 (°F)	Furnace Probe #8 (°F)	Furnace Probe #9 (°F)	Furnace Probe #10 (°F)	Furnace Probe #11 (°F)
0	72	72	72	72	72	72	72	72	73	72	71
0.5	74	72	73	75	73	74	72	74	74	73	71
1	92	81	80	97	81	81	80	88	91	89	80
1.5	129	106	105	152	104	99	102	122	132	121	100
2	190	150	155	234	146	126	143	174	202	169	137
2.5	277	213	231	340	213	171	206	245	298	238	195
3	430	315	360	514	329	269	301	379	468	350	297
3.5	639	456	550	709	499	395	436	534	661	520	450
4	810	614	742	882	681	544	592	692	839	670	628
4.5	949	770	905	1023	853	695	747	841	981	831	811
5	1062	908	1030	1134	989	835	899	972	1092	974	969
5.5	1152	1026	1133	1222	1099	957	1036	1080	1176	1095	1099
6	1168	1086	1170	1236	1132	1033	1118	1105	1193	1148	1157
6.5	1169	1109	1170	1225	1136	1063	1151	1119	1192	1171	1176
7	1181	1133	1182	1230	1156	1085	1182	1141	1207	1201	1197
7.5	1181	1146	1186	1225	1162	1096	1199	1147	1209	1212	1204
8	1187	1156	1192	1228	1173	1103	1211	1160	1217	1224	1212
8.5	1219	1179	1217	1256	1207	1125	1238	1195	1246	1255	1238
9	1261	1217	1261	1299	1257	1165	1278	1243	1291	1297	1277
9.5	1301	1258	1306	1339	1303	1208	1320	1289	1330	1334	1317
10	1319	1287	1331	1355	1323	1235	1347	1309	1347	1351	1339
10.5	1324	1300	1340	1358	1330	1247	1358	1316	1351	1359	1348
11	1337	1314	1352	1369	1344	1260	1372	1331	1363	1373	1361
11.5	1353	1331	1370	1385	1363	1278	1390	1351	1380	1392	1377
12	1363	1344	1383	1396	1375	1291	1403	1363	1388	1399	1389
12.5	1364	1351	1387	1396	1380	1297	1409	1367	1390	1405	1393
13	1362	1354	1386	1394	1380	1300	1411	1366	1388	1405	1394
13.5	1366	1358	1390	1397	1385	1303	1416	1372	1394	1412	1398
14	1378	1367	1401	1410	1397	1312	1427	1384	1407	1425	1409
14.5	1395	1381	1419	1429	1419	1328	1445	1402	1427	1444	1427
15	1408	1394	1434	1441	1433	1342	1459	1416	1441	1457	1441
15.5	1418	1404	1443	1450	1443	1352	1469	1427	1450	1466	1451
16	1423	1412	1449	1455	1449	1360	1476	1434	1455	1471	1457
16.5	1424	1416	1449	1454	1450	1364	1477	1435	1454	1469	1458
17	1419	1415	1444	1448	1445	1364	1473	1432	1446	1461	1455
17.5	1420	1416	1443	1449	1446	1365	1473	1435	1448	1465	1456
18	1427	1423	1452	1458	1456	1372	1481	1443	1459	1474	1464
18.5	1438	1433	1463	1469	1469	1382	1491	1456	1470	1484	1475
19	1451	1444	1477	1483	1483	1392	1503	1470	1485	1497	1487
19.5	1464	1457	1490	1497	1497	1405	1516	1484	1498	1509	1499
20	1475	1468	1502	1507	1507	1417	1527	1496	1510	1519	1510
20.5	1481	1477	1509	1512	1514	1426	1534	1501	1517	1526	1517
21	1480	1479	1509	1511	1513	1431	1535	1499	1515	1525	1516
21.5	1478	1479	1508	1510	1512	1432	1534	1498	1515	1525	1515
22	1479	1480	1508	1511	1513	1433	1534	1498	1516	1525	1516
22.5	1486	1484	1513	1517	1518	1438	1539	1506	1523	1532	1521
23	1495	1490	1521	1526	1526	1445	1547	1515	1532	1539	1528
23.5	1502	1497	1529	1533	1533	1453	1553	1522	1535	1542	1535
24	1510	1503	1535	1540	1540	1461	1559	1529	1541	1547	1542
24.5	1512	1509	1539	1543	1545	1467	1563	1535	1546	1552	1546

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Time (min)	Furnace Probe #1 (°F)	Furnace Probe #2 (°F)	Furnace Probe #3 (°F)	Furnace Probe #4 (°F)	Furnace Probe #5 (°F)	Furnace Probe #6 (°F)	Furnace Probe #7 (°F)	Furnace Probe #8 (°F)	Furnace Probe #9 (°F)	Furnace Probe #10 (°F)	Furnace Probe #11 (°F)
25	1512	1510	1539	1542	1545	1468	1563	1533	1546	1552	1545
25.5	1510	1509	1538	1540	1543	1468	1562	1532	1547	1552	1543
26	1509	1508	1536	1538	1541	1466	1561	1530	1546	1552	1541
26.5	1513	1511	1541	1543	1546	1470	1565	1534	1553	1558	1545
27	1521	1518	1548	1552	1555	1476	1573	1542	1563	1567	1553
27.5	1530	1526	1556	1562	1564	1483	1582	1552	1572	1574	1562
28	1540	1535	1566	1571	1572	1492	1591	1561	1582	1583	1571
28.5	1547	1542	1573	1578	1579	1499	1596	1568	1589	1587	1577
29	1555	1548	1581	1585	1586	1506	1602	1576	1596	1592	1585
29.5	1564	1555	1591	1595	1594	1515	1610	1585	1607	1602	1594
30	1572	1564	1601	1603	1602	1523	1618	1593	1618	1609	1601
30.5	1577	1570	1606	1608	1608	1530	1624	1598	1625	1615	1606
31	1577	1571	1608	1607	1607	1534	1624	1595	1623	1610	1606
31.5	1573	1569	1606	1603	1603	1534	1620	1590	1618	1609	1603
32	1572	1569	1605	1602	1601	1535	1618	1587	1614	1601	1600
32.5	1573	1568	1605	1602	1602	1534	1616	1587	1614	1605	1600
33	1587	1579	1618	1618	1618	1544	1630	1605	1633	1621	1616
33.5	1597	1587	1628	1627	1626	1553	1638	1611	1641	1628	1622
34	1596	1587	1627	1624	1622	1555	1637	1603	1638	1625	1619
34.5	1586	1579	1617	1612	1611	1549	1626	1591	1624	1613	1608
35	1594	1584	1624	1623	1622	1551	1633	1605	1637	1626	1617
35.5	1607	1596	1638	1637	1635	1562	1646	1620	1649	1635	1630
36	1610	1600	1641	1639	1638	1567	1649	1620	1650	1639	1633
36.5	1601	1593	1631	1627	1626	1564	1640	1606	1635	1625	1623
37	1590	1582	1619	1614	1614	1556	1628	1590	1622	1614	1612
37.5	1590	1582	1619	1617	1617	1554	1627	1597	1624	1617	1613
38	1597	1590	1628	1624	1627	1561	1635	1608	1632	1623	1621
38.5	1592	1586	1623	1617	1620	1560	1631	1598	1625	1617	1616
39	1583	1579	1612	1608	1610	1553	1621	1590	1615	1608	1607
39.5	1589	1582	1616	1616	1619	1554	1626	1601	1626	1618	1614
40	1599	1592	1628	1627	1631	1564	1637	1611	1637	1626	1625
40.5	1601	1594	1630	1627	1631	1566	1639	1611	1637	1628	1625
41	1604	1597	1632	1631	1635	1567	1641	1618	1641	1631	1628
41.5	1611	1607	1641	1640	1645	1575	1650	1629	1649	1639	1637
42	1620	1616	1649	1648	1654	1583	1657	1639	1657	1647	1645
42.5	1622	1620	1650	1649	1654	1588	1659	1640	1658	1649	1647
43	1620	1617	1647	1645	1650	1587	1657	1633	1654	1646	1644
43.5	1618	1615	1644	1644	1648	1585	1655	1634	1653	1646	1642
44	1626	1622	1651	1653	1659	1591	1662	1646	1662	1654	1651
44.5	1634	1630	1659	1661	1667	1599	1668	1653	1669	1660	1658
45	1627	1627	1654	1651	1657	1598	1664	1641	1660	1651	1652
45.5	1609	1610	1634	1629	1635	1584	1645	1618	1638	1631	1634
46	1605	1603	1627	1627	1633	1577	1640	1620	1636	1632	1629
46.5	1626	1620	1649	1653	1658	1592	1660	1646	1660	1651	1650
47	1635	1631	1660	1661	1667	1603	1669	1653	1667	1658	1659
47.5	1632	1631	1657	1657	1663	1603	1667	1650	1664	1656	1657
48	1637	1636	1662	1664	1670	1607	1672	1659	1671	1663	1663
48.5	1647	1645	1671	1674	1679	1615	1682	1667	1679	1670	1673
49	1653	1651	1677	1679	1685	1621	1688	1672	1684	1677	1679
49.5	1651	1651	1675	1676	1682	1622	1688	1671	1680	1673	1677

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Time (min)	Furnace Probe #1 (°F)	Furnace Probe #2 (°F)	Furnace Probe #3 (°F)	Furnace Probe #4 (°F)	Furnace Probe #5 (°F)	Furnace Probe #6 (°F)	Furnace Probe #7 (°F)	Furnace Probe #8 (°F)	Furnace Probe #9 (°F)	Furnace Probe #10 (°F)	Furnace Probe #11 (°F)
50	1646	1648	1671	1671	1678	1620	1684	1667	1677	1671	1674
50.5	1642	1645	1667	1666	1674	1617	1680	1661	1672	1666	1670
51	1635	1640	1659	1659	1667	1613	1673	1654	1664	1658	1662
51.5	1630	1634	1654	1653	1661	1607	1667	1649	1658	1651	1656
52	1634	1636	1657	1659	1668	1608	1669	1658	1664	1657	1659
52.5	1652	1652	1675	1680	1691	1622	1688	1680	1685	1675	1679
53	1656	1658	1681	1682	1691	1630	1694	1679	1685	1677	1683
53.5	1655	1659	1679	1681	1690	1629	1692	1682	1685	1677	1682
54	1660	1663	1683	1687	1696	1633	1697	1690	1691	1682	1685
54.5	1664	1667	1688	1692	1702	1637	1702	1696	1697	1688	1690
55	1668	1670	1691	1695	1704	1641	1706	1698	1701	1693	1694
55.5	1669	1671	1694	1696	1704	1642	1708	1696	1702	1693	1695
56	1665	1668	1691	1690	1698	1639	1703	1691	1696	1688	1690
56.5	1664	1666	1689	1689	1696	1636	1700	1688	1693	1687	1687
57	1676	1674	1699	1702	1709	1644	1709	1701	1706	1698	1697
57.5	1692	1687	1717	1720	1728	1657	1727	1720	1724	1713	1714
58	1694	1694	1718	1720	1728	1663	1730	1720	1720	1711	1716
58.5	1691	1693	1715	1716	1724	1662	1726	1717	1716	1709	1713
59	1691	1694	1714	1716	1725	1664	1726	1715	1719	1712	1713
59.5	1690	1694	1712	1714	1723	1664	1725	1713	1718	1710	1711
60	1686	1690	1708	1710	1718	1661	1720	1710	1713	1705	1707
60.5	1685	1688	1706	1708	1716	1659	1718	1709	1712	1704	1704
61	1685	1690	1707	1710	1719	1660	1720	1711	1716	1707	1705
61.5	1689	1693	1711	1714	1724	1664	1723	1715	1719	1710	1708
62	1696	1699	1717	1721	1730	1670	1729	1722	1725	1715	1714
62.5	1699	1703	1721	1724	1734	1674	1733	1725	1727	1719	1717
63	1697	1700	1719	1720	1729	1672	1730	1720	1724	1716	1716
63.5	1689	1693	1711	1712	1720	1667	1723	1711	1717	1710	1707
64	1684	1688	1706	1708	1717	1663	1718	1709	1713	1706	1702
64.5	1694	1696	1715	1720	1728	1669	1727	1721	1725	1714	1711
65	1708	1708	1728	1735	1743	1680	1740	1735	1739	1727	1723
65.5	1708	1709	1730	1733	1740	1683	1741	1731	1737	1727	1723
66	1702	1704	1725	1726	1732	1679	1735	1723	1733	1722	1716
66.5	1697	1699	1719	1720	1727	1674	1730	1717	1728	1717	1711
67	1691	1694	1714	1714	1722	1669	1724	1711	1725	1712	1704
67.5	1701	1701	1724	1726	1733	1675	1731	1723	1740	1722	1713
68	1717	1714	1740	1743	1750	1688	1745	1738	1759	1734	1727
68.5	1749	1739	1770	1779	1778	1708	1771	1765	1787	1760	1751
69	1791	1776	1811	1823	1814	1738	1807	1794	1827	1794	1780
69.5	1813	1800	1840	1843	1834	1762	1830	1811	1837	1811	1800
70	1802	1803	1823	1824	1829	1766	1822	1808	1811	1800	1790
70.5	1782	1786	1798	1799	1807	1753	1803	1794	1784	1780	1770
71	1759	1767	1772	1775	1785	1739	1784	1779	1760	1760	1753
71.5	1735	1746	1746	1748	1763	1723	1761	1760	1733	1739	1734
72	1715	1725	1722	1727	1740	1704	1741	1740	1709	1718	1717
72.5	1692	1704	1699	1703	1717	1685	1720	1719	1684	1696	1697
73	1671	1682	1677	1680	1694	1665	1698	1700	1659	1676	1678
73.5	1651	1663	1658	1661	1676	1648	1678	1685	1639	1658	1661
74	1674	1676	1680	1695	1705	1662	1696	1714	1669	1685	1684
74.5	1732	1726	1747	1763	1766	1710	1752	1777	1737	1738	1740

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Time (min)	Furnace Probe #1 (°F)	Furnace Probe #2 (°F)	Furnace Probe #3 (°F)	Furnace Probe #4 (°F)	Furnace Probe #5 (°F)	Furnace Probe #6 (°F)	Furnace Probe #7 (°F)	Furnace Probe #8 (°F)	Furnace Probe #9 (°F)	Furnace Probe #10 (°F)	Furnace Probe #11 (°F)
75	1792	1783	1814	1827	1827	1770	1811	1838	1803	1794	1798
75.5	1828	1823	1853	1859	1857	1809	1849	1870	1834	1826	1833
76	1812	1818	1829	1835	1836	1801	1835	1854	1808	1813	1819
76.5	1775	1791	1784	1791	1798	1774	1803	1812	1764	1780	1783
77	1711	1741	1719	1716	1734	1726	1745	1746	1697	1709	1726
Max Temp											
Max Allowed											

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Time (min)	Cold Side TC #1 (°F)	Cold Side TC #2 (°F)	Cold Side TC #3 (°F)	Cold Side TC #4 (°F)	Cold Side TC #5 (°F)	Cold Side TC #6 (°F)	Cold Side TC #7 (°F)	Cold Side TC #8 (°F)	Cold Side TC #9 (°F)	Cold Side TC #10 (°F)	Cold Side TC #11 (°F)	Roving TC (°F)	Cold Side Min (°F)	Cold Side Avg (°F)	Cold Side Max (°F)
0	71	71	71	71	71	71	71	71	70	71	71	73	70	71	71
0.5	71	71	71	71	71	71	71	71	70	71	71	73	70	71	71
1	71	71	71	71	71	71	71	71	70	71	71	73	70	71	71
1.5	71	71	71	71	71	71	71	71	70	71	71	73	70	71	71
2	71	71	71	71	71	71	71	71	70	71	71	73	70	71	71
2.5	71	71	71	71	71	71	71	71	70	71	71	73	70	71	71
3	71	71	71	71	71	71	71	71	70	71	71	73	70	71	71
3.5	71	71	71	71	71	71	71	71	70	71	71	73	70	71	71
4	71	72	71	71	71	71	71	71	71	71	71	73	71	71	72
4.5	71	72	71	71	71	71	71	71	71	71	71	73	71	71	72
5	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
5.5	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
6	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
6.5	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
7	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
7.5	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
8	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
8.5	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
9	71	72	71	71	71	71	71	71	71	71	71	73	71	71	72
9.5	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
10	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
10.5	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
11	71	72	71	71	71	71	71	71	71	71	71	75	71	71	72
11.5	71	72	71	71	71	71	71	71	71	71	71	75	71	71	72
12	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
12.5	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
13	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
13.5	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
14	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
14.5	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
15	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
15.5	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
16	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
16.5	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
17	71	72	71	71	71	71	71	71	71	71	71	74	71	71	72
17.5	71	72	71	71	71	71	71	71	71	72	71	74	71	71	72
18	71	72	71	71	71	71	71	71	71	72	71	74	71	71	72
18.5	71	72	71	71	72	71	71	71	71	72	71	74	71	71	72
19	71	72	71	71	72	71	71	71	71	72	71	74	71	71	72
19.5	71	72	71	71	72	71	71	71	71	72	71	74	71	71	72
20	71	72	71	71	72	71	71	71	71	72	71	74	71	71	72
20.5	71	72	71	71	72	71	71	71	71	72	72	74	71	71	72
21	71	72	71	71	72	71	71	71	71	72	71	74	71	71	72
21.5	71	72	71	71	72	71	71	71	71	72	71	74	71	71	72
22	71	72	71	71	72	71	71	71	71	72	71	74	71	71	72
22.5	72	72	72	71	72	71	71	72	71	72	72	74	71	72	72
23	71	72	71	71	72	71	71	71	71	72	72	74	71	71	72
23.5	72	72	72	71	72	71	71	72	71	72	72	74	71	72	72
24	72	72	72	71	72	71	71	72	71	72	72	74	71	72	72
24.5	72	72	72	71	72	71	71	72	71	72	72	75	71	72	72

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Time (min)	Cold Side TC #1 (°F)	Cold Side TC #2 (°F)	Cold Side TC #3 (°F)	Cold Side TC #4 (°F)	Cold Side TC #5 (°F)	Cold Side TC #6 (°F)	Cold Side TC #7 (°F)	Cold Side TC #8 (°F)	Cold Side TC #9 (°F)	Cold Side TC #10 (°F)	Cold Side TC #11 (°F)	Roving TC (°F)	Cold Side Min (°F)	Cold Side Avg (°F)	Cold Side Max (°F)
25	72	72	72	71	72	71	71	72	71	72	72	75	71	72	72
25.5	72	72	72	71	72	71	71	72	71	72	72	75	71	72	72
26	72	73	72	71	72	72	72	72	71	72	72	75	71	72	73
26.5	72	73	72	71	72	72	72	72	71	72	72	75	71	72	73
27	72	73	72	71	72	72	72	72	71	73	72	75	71	72	73
27.5	72	73	72	71	72	72	72	72	71	73	72	75	71	72	73
28	72	73	72	72	72	72	72	72	71	73	72	75	71	72	73
28.5	72	73	72	71	72	72	72	72	71	73	72	75	71	72	73
29	72	73	72	71	72	72	72	72	71	73	72	75	71	72	73
29.5	72	73	72	72	72	72	72	72	71	73	72	75	71	72	73
30	72	73	72	72	72	72	72	72	71	73	72	75	71	72	73
30.5	72	73	72	72	72	72	72	72	71	73	72	75	71	72	73
31	72	73	72	72	72	72	72	72	71	73	72	76	71	72	73
31.5	72	73	72	72	72	72	72	72	71	73	72	76	71	72	73
32	72	73	72	72	72	72	72	72	71	73	72	76	71	72	73
32.5	72	73	72	72	72	72	72	72	71	73	72	76	71	72	73
33	72	73	72	72	72	72	72	72	72	73	72	76	72	72	73
33.5	72	73	72	72	72	72	72	72	72	73	72	76	72	72	73
34	72	73	72	72	72	72	72	72	72	73	72	76	72	72	73
34.5	72	73	72	72	73	72	72	72	72	73	72	76	72	72	73
35	72	73	72	72	73	72	72	72	72	73	72	76	72	72	73
35.5	72	73	72	72	73	72	72	72	72	73	72	76	72	72	73
36	72	73	72	72	73	72	72	72	72	73	72	76	72	72	73
36.5	72	73	72	72	73	72	72	72	72	73	72	76	72	72	73
37	72	73	72	72	73	72	72	72	72	73	73	76	72	72	73
37.5	72	73	72	72	73	72	72	72	72	73	72	76	72	72	73
38	72	73	72	72	73	72	72	72	72	73	72	76	72	72	73
38.5	72	73	72	72	73	72	72	72	72	73	72	76	72	72	73
39	72	73	72	72	73	72	72	72	72	73	72	76	72	72	73
39.5	72	73	72	72	73	72	72	72	72	73	72	76	72	72	73
40	72	73	72	72	73	72	72	72	72	73	73	76	72	72	73
40.5	72	73	72	72	73	72	72	72	72	73	73	76	72	72	73
41	72	73	72	72	73	72	72	72	72	73	73	76	72	72	73
41.5	72	73	72	72	73	72	72	72	72	73	73	76	72	72	73
42	72	73	72	72	73	72	72	72	72	74	73	76	72	72	74
42.5	73	73	73	72	73	72	72	73	72	74	73	76	72	73	74
43	73	73	73	72	73	72	72	73	72	74	73	76	72	73	74
43.5	73	73	73	72	73	72	72	73	72	74	73	76	72	73	74
44	73	73	73	72	73	72	72	73	72	74	73	76	72	73	74
44.5	73	73	73	72	73	72	72	73	72	74	73	76	72	73	74
45	73	73	73	72	73	72	72	73	72	74	73	76	72	73	74
45.5	73	73	73	72	73	72	72	73	72	74	73	76	72	73	74
46	73	73	73	72	73	72	72	73	72	74	73	76	72	73	74
46.5	73	73	73	72	73	72	72	73	72	74	73	76	72	73	74
47	73	74	73	72	73	73	72	73	72	74	73	76	72	73	74
47.5	73	74	73	72	73	72	72	73	72	74	73	76	72	73	74
48	73	74	73	72	73	73	72	73	72	74	73	76	72	73	74
48.5	73	74	73	72	73	73	72	73	72	74	73	76	72	73	74
49	73	73	73	72	73	72	72	73	72	74	73	76	72	73	74
49.5	73	73	73	72	73	72	72	73	72	74	73	76	72	73	74

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Time (min)	Cold Side TC #1 (°F)	Cold Side TC #2 (°F)	Cold Side TC #3 (°F)	Cold Side TC #4 (°F)	Cold Side TC #5 (°F)	Cold Side TC #6 (°F)	Cold Side TC #7 (°F)	Cold Side TC #8 (°F)	Cold Side TC #9 (°F)	Cold Side TC #10 (°F)	Cold Side TC #11 (°F)	Roving TC (°F)	Cold Side Min (°F)	Cold Side Avg (°F)	Cold Side Max (°F)
50	73	73	73	72	73	72	72	73	72	74	73	76	72	73	74
50.5	73	73	73	72	73	72	72	73	72	74	73	76	72	73	74
51	73	73	73	72	73	72	72	73	72	74	73	76	72	73	74
51.5	73	74	73	73	73	73	73	73	72	74	73	76	72	73	74
52	73	74	73	73	73	73	73	73	72	74	73	76	72	73	74
52.5	73	74	73	73	73	73	73	73	72	74	73	76	72	73	74
53	73	74	73	73	73	73	73	73	72	74	73	76	72	73	74
53.5	73	74	73	73	73	73	73	73	72	74	73	76	72	73	74
54	73	74	73	73	73	73	73	73	72	75	73	76	72	73	75
54.5	73	74	73	72	73	72	72	73	72	74	73	76	72	73	74
55	73	74	73	73	73	73	73	73	73	75	73	76	73	73	75
55.5	73	74	73	73	73	73	73	73	73	75	73	76	73	73	75
56	73	74	73	73	73	73	73	73	72	75	73	77	72	73	75
56.5	73	74	73	73	73	73	73	73	73	75	73	76	73	73	75
57	73	74	73	73	73	73	73	73	73	75	73	76	73	73	75
57.5	73	74	73	73	73	73	73	73	73	75	74	76	73	73	75
58	73	74	73	73	73	73	73	73	73	75	74	76	73	73	75
58.5	73	74	73	73	73	73	73	73	73	75	74	76	73	73	75
59	73	74	73	73	74	73	73	73	73	75	74	76	73	73	75
59.5	73	74	73	73	74	73	73	73	73	75	74	76	73	73	75
60	73	74	73	73	74	73	73	73	73	75	74	76	73	73	75
60.5	73	74	73	73	74	73	73	73	73	75	74	76	73	73	75
61	73	74	74	73	74	73	73	73	73	75	74	77	73	74	75
61.5	73	74	74	73	74	73	73	73	73	75	74	77	73	74	75
62	74	74	74	73	74	73	73	74	73	75	74	76	73	74	75
62.5	74	75	74	73	74	73	73	74	73	76	74	76	73	74	76
63	74	75	74	73	74	73	73	74	73	76	74	77	73	74	76
63.5	74	75	74	73	74	73	73	74	73	76	74	77	73	74	76
64	74	75	74	73	74	73	73	74	73	76	74	77	73	74	76
64.5	74	75	74	73	74	73	73	74	73	76	74	77	73	74	76
65	74	75	74	74	74	74	73	74	73	76	74	77	73	74	76
65.5	74	75	74	74	74	74	73	74	73	76	74	77	73	74	76
66	74	75	74	74	74	74	74	74	73	76	75	77	73	74	76
66.5	74	75	74	74	75	74	74	74	73	76	75	77	73	74	76
67	74	75	75	74	75	74	74	74	74	76	75	77	74	75	76
67.5	74	75	75	74	75	74	74	74	74	77	75	77	74	75	77
68	74	75	75	74	75	74	74	74	74	77	75	77	74	75	77
68.5	75	75	75	74	75	74	74	75	74	77	75	77	74	75	77
69	75	76	75	74	75	74	74	75	74	77	75	77	74	75	77
69.5	75	76	75	74	75	74	74	75	74	77	75	77	74	75	77
70	75	76	75	75	75	74	74	75	74	77	75	77	74	75	77
70.5	75	76	75	75	75	74	74	75	74	77	75	77	74	75	77
71	75	76	75	75	75	74	74	75	74	77	75	77	74	75	77
71.5	75	76	75	75	75	74	74	75	74	77	75	77	74	75	77
72	75	76	76	75	76	75	74	75	74	77	76	77	74	75	77
72.5	75	76	76	75	76	75	75	75	75	77	76	77	75	76	77
73	75	76	76	75	76	75	75	75	75	77	76	77	75	76	77
73.5	75	76	76	75	76	75	75	75	75	77	76	77	75	76	77
74	75	77	76	75	76	75	75	76	75	78	76	77	75	76	78
74.5	75	76	76	75	76	75	75	76	75	78	76	78	75	76	78

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Time (min)	Cold Side TC #1 (°F)	Cold Side TC #2 (°F)	Cold Side TC #3 (°F)	Cold Side TC #4 (°F)	Cold Side TC #5 (°F)	Cold Side TC #6 (°F)	Cold Side TC #7 (°F)	Cold Side TC #8 (°F)	Cold Side TC #9 (°F)	Cold Side TC #10 (°F)	Cold Side TC #11 (°F)	Roving TC (°F)	Cold Side Min (°F)	Cold Side Avg (°F)	Cold Side Max (°F)
75	76	77	76	76	76	75	75	76	75	78	76	77	75	76	78
75.5	76	77	76	76	76	75	75	76	75	78	76	77	75	76	78
76	76	77	76	76	76	75	75	76	75	78	76	77	75	76	78
76.5	76	77	77	76	76	75	75	76	76	78	76	77	75	76	78
77	76	77	77	76	77	76	76	76	76	79	76	78	76	77	79
Max Temp	76	77	77	76	77	76	76	76	76	79	76	78	76	77	79
Max Allowed	396	396	396	396	396	396	396	396	395	396	396	398	395	321	396

APPENDIX D
Photographs


12/18/2013 10:18


WÜRTH
12/18/2013 10:19


6,0 x 100/60
Ecofast ASSY 3.0 Schrauben
Senkfrästaschenkopf-AW 30
100
0170 360 100
12/18/2013 10:19
6,0 x 100/60
0170 360 100 100


Guaranteed, No Call Backs
Tested to 10 million steps
True all weather application
PL 400
PRO LINE
SUBFLOOR
CONSTRUCTION ADHESIVE
LOCTITE
EASIER
12/18/2013 10:22


12/18/2013 10:22


CWC Fire Testing
Intertek Fire Testing
19183
CL2
99mm x 2438mm x
3048mm
1pc.
12/18/2013 10:45


CWC Fire Testing
Intertek Tire Testing
19183
CL1
99mm x 354mm x 3048mm
1pc.
TOP
12/18/2013 10:45


12/18/2013 11:13

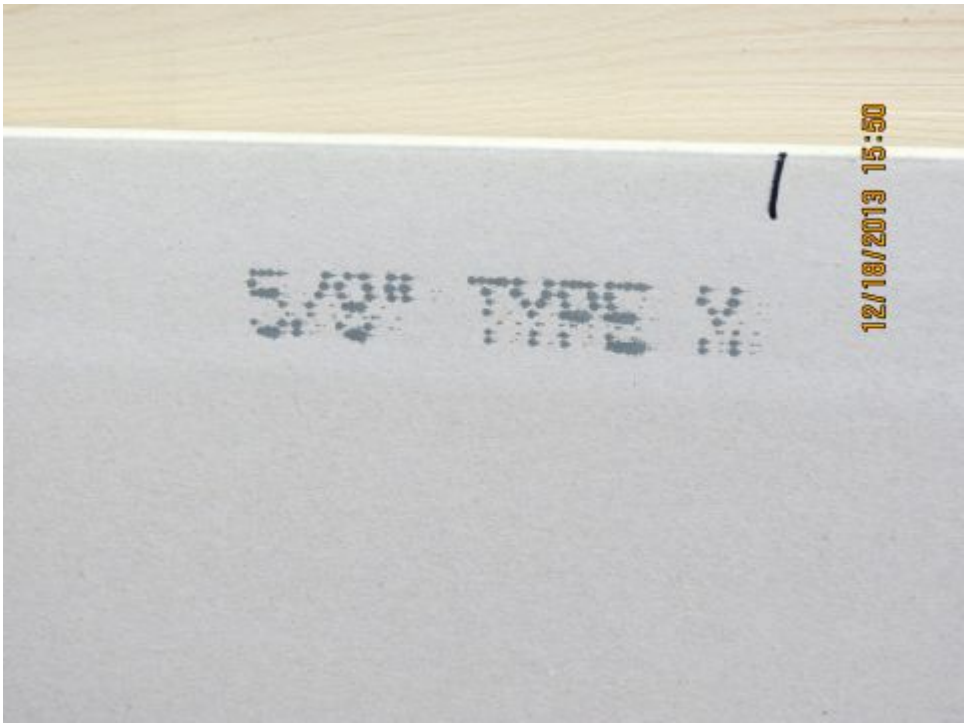

STANLEY
12/18/2013 11:17


12/18/2013 11:20


STANLEY
12/18/2013 11:20


12/18/2013 11:21


12/18/2013 15:50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12/18/2013 17:03


12/19/2013 14:44


G100585447
SAT-002
12/19/2013 14:44


12/19/2013 15:36


12/19/2013 15:41


12/19/2013 15:43


12/19/2013 15:49


12/19/2013 15:56


12/19/2013 16:03


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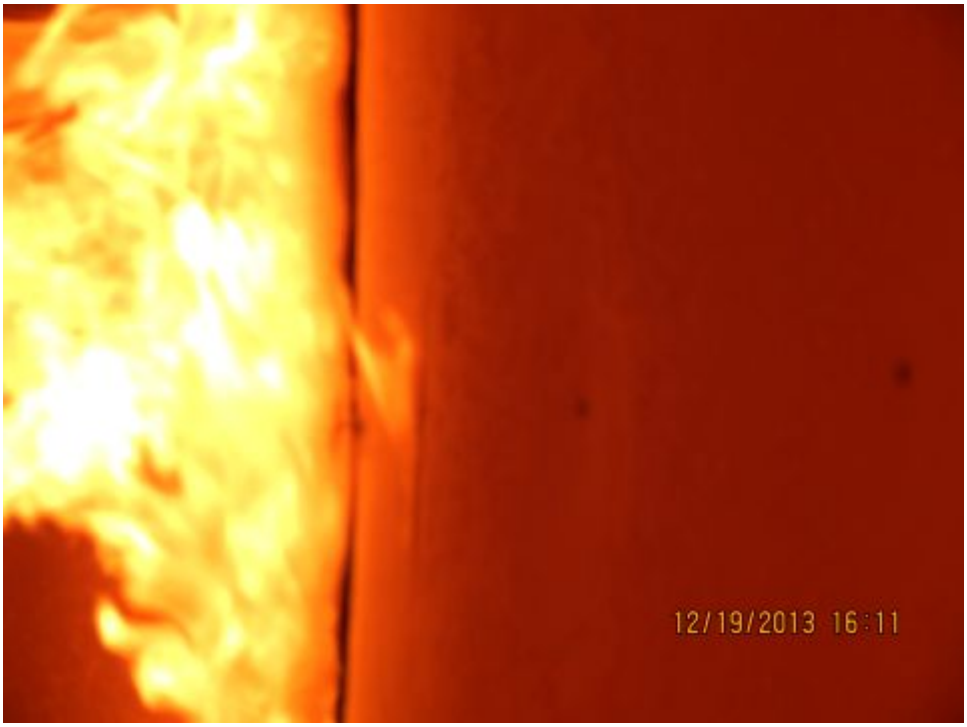
12/19/2013 16:03


12/19/2013 16:08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12/19/2013 16:13


12/19/2013 16:26


12/19/2013 16:28


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G100585447
SAT-002
12/19/2013 16:40


12/19/2013 16:41


12/19/2013 16:46


12/19/2013 16:48


12/19/2013 16:50


4
12/19/2013 16:50
7


12/19/2013 16:52


12/19/2013 16:55


12/19/2013 16:58


12/19/2013 16:58


12/19/2013 16:59


12/19/2013 16:59

CALIBRATED INSTRUMENTATION USED FOR TESTING

Description	Serial No.	Calibration Due Date
Thermo-Hygrometer	130548115	9/19/2015
100-Channel Data Acquisition System	99LE004	3/7/2014
Stop Watch	130176939	3/29/2015
Pressure Gauge Hose 0-100psi	06LE003	5/14/2014

REVISION SUMMARY

DATE	SUMMARY
December 30, 2013	Original Issue Date