TEST REPORT

REPORT NUMBER: 102506902SAT-009
ORIGINAL ISSUE DATE: July 26, 2016
REVISED DATE: N/A

EVALUATION CENTER
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RENDERED TO

Thermotex Industries
112 Sunbelt CT
Greer, SC 29650

PRODUCT EVALUATED: Thermo-Spec Fire Curtain Model FFB-06-37FCC
EVALUATION PROPERTY: Fire Resistance

Report of Testing a Fire Curtain for compliance with the applicable requirements of the following criteria: *NFPA 80, Standard for Fire Doors and Other Opening Protectives, Sections 20.2.1.14 through 20.2.1.14.5, 2016 Edition.*

1 Table of Contents

2 Introduction

Intertek Testing Services NA, Inc. (Intertek) has conducted testing for Thermotex Industries, on Thermo-Spec Fire Curtain Model FFB-06-37FCC, to evaluate its fire resistance. Testing was conducted in accordance with applicable requirements, following the standard methods of **NFPA 80, Standard for Fire Doors and Other Opening Protectives, Sections 20.2.1.14 through 20.2.1.14.5, 2016 Edition**. This evaluation took place on July 12, 2016.

3 Test Samples

3.1. SAMPLE SELECTION

Samples were witnessed by Rodney Wyatt of Intertek on June 21, 2016 at Thermotex Industries' manufacturing location located at 112 Sunbelt CT, Greer, SC. Samples (Intertek Sample ID No.SAT1606281216-001) were received at the Evaluation Center on June 28, 2016 in good condition. The test specimen identification is as provided by the client and Intertek accepts no responsibility for any inaccuracies therein.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

The test specimen consisted of a 12 ft. x 12 ft. fire resistant curtain, fabricated from three pieces of fiberglass fabric. The pieces were tan, white, and black in color. These three pieces were sewn together using a Kevlar wrapped stainless steel wire with 1-1/8 in. overlap, creating a total of three vertical seams. A 6-in. diameter pocket was stitched into the bottom of the curtain to hold a 10 ft. long 2-in. diameter schedule 40 steel pipe. The curtain was attached to the top of a 10 ft. x 10 ft. vertical fire resistance furnace frame. The frame was then pushed up against the furnace with the curtain fabric stretched tight on both sides, and the frame was clamped to the furnace, securing the curtain in place. Refer to Appendix C for photos.

4 Testing and Evaluation Methods

4.1. INSTRUMENTATION

No thermocouples were required on the unexposed side of the sample.

4.2. TEST STANDARD

Testing was conducted in accordance with the applicable requirements of, and following the standard methods of **NFPA 80, Standard for Fire Doors and Other Opening Protectives, Sections 20.2.1.14 through 20.2.1.14.5, 2016 Edition**.

The curtain was secured to the large scale vertical furnace and was tested to the standard time-temperature curve described in the E119 standard. The neutral pressure plane was established at a point one-third of the way up from the bottom of the specimen, so that the upper two-thirds of the specimen were under positive pressure.

5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

The test was initiated on July 12, 2016. John, Julie, and Lynn Snook of Thermotex Industries were present to witness the test. The ambient temperature at the time of the test was 82°F and the humidity was 78 % R.H.

Observations made during the test are listed below:

Time (min:sec)	Observation(s)
0:00	The test was initiated at 8:45 AM
0:30	Discoloration of the curtain; smoking
2:30	Heavy discoloration
4:30	Pressure established on upper 2/3 of furnace
18:00	Black color mostly faded from curtain panel
30:00	End of test

The curtain withstood the fire endurance test without passage of flame or smoke for 30 minutes.

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	0 minutes -29 seconds
I	indicated fire-resistance period	30 minutes
A	area under the curve of indicated average furnace temperature for the first three fourths of the indicated period	25312 (°F•min)
As	area under the standard furnace curve for the same part of the indicated period	26017 (°F•min)
ITEM	**DESCRIPTION**	**TEST VALUE**
L	lag correction	3240
	FIRE RESISTANCE PERIOD ACHIEVED BY THIS SPECIMEN ==>	30 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.

6 Conclusion

Intertek Testing Services NA, Inc. (Intertek) has conducted testing for Thermotex Industries, on Thermo-Spec Fire Curtain Model FFB-06-37FCC, to evaluate its fire resistance. Testing was conducted in accordance with applicable requirements, following the standard methods of **NFPA 80, Standard for Fire Doors and Other Opening Protectives, Sections 20.2.1.14 through 20.2.1.14.5, 2016 Edition**. This evaluation took place on July 12, 2016.

Based on the results of this test, the Fire Curtain achieved a fire resistance rating of 30 minutes.

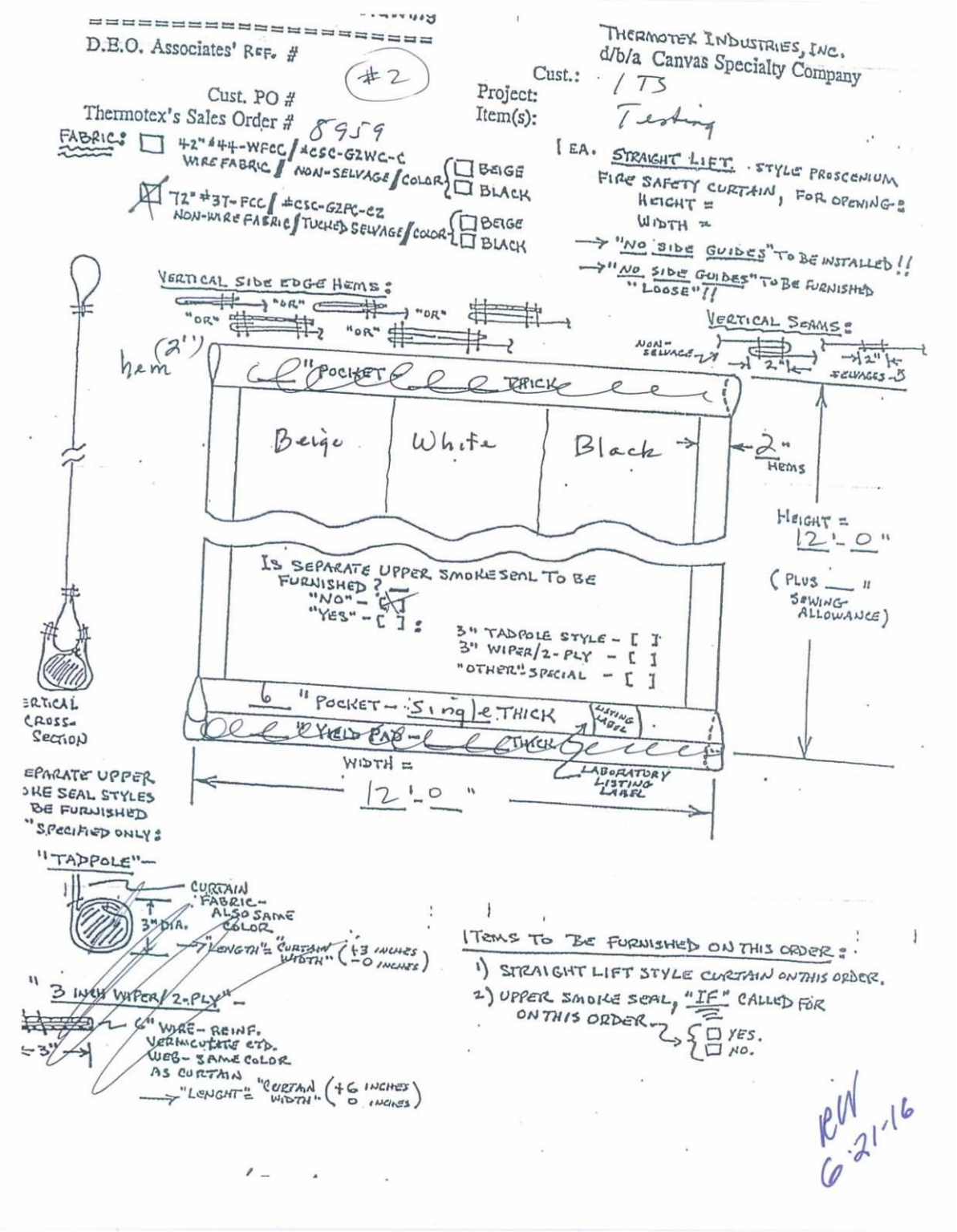
INTERTEK TESTING SERVICES NA, INC.

Tested and Reported by: Ryan Ferry
Engineer, Fire Resistance

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

APPENDIX A:

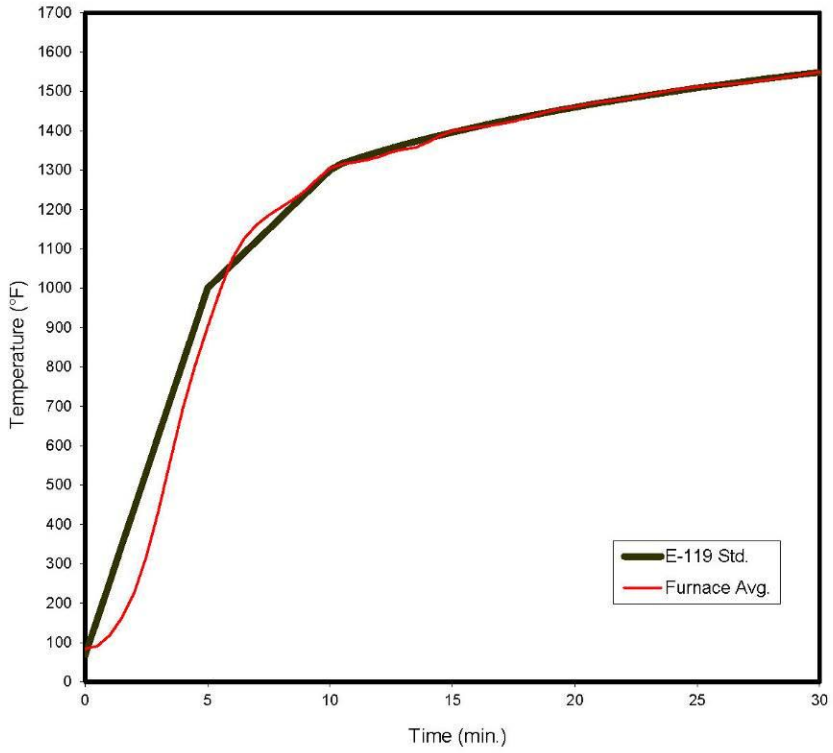
Assembly Drawings


D.E.O. Associates' Ref. #
#2
Cust. PO #
Thermotex's Sales Order # 8959
THERMOTEX INDUSTRIES, INC.
d/b/a Canvas Specialty Company
Cust.: ITS
Project:
Item(s): Testing
FABRIC:
42" #44-WFCC / #CSC-G2WC-C
WIRE FABRIC / NON-SELVAGE / COLOR { BEIGE, BLACK
72" #3T-FCC / #CSC-G2FC-C2
NON-WIRE FABRIC / TUCKED SELVAGE / COLOR { BEIGE, BLACK
1 EA. STRAIGHT LIFT STYLE PROSCENIUM FIRE SAFETY CURTAIN, FOR OPENING:
HEIGHT =
WIDTH =
→ "NO SIDE GUIDES" TO BE INSTALLED !!
→ "NO SIDE GUIDES" TO BE FURNISHED "LOOSE" !!
VERTICAL SIDE EDGE HEMS:
"OR" "OR" "OR" "OR"
hem (2")
VERTICAL SEAMS:
NON-SELVAGE
2" 2"
SELVAGES-S
6" POCKET - Single THICK
Beige White Black
2" Hems
HEIGHT = 12'-0"
(PLUS ___ " SEWING ALLOWANCE)
IS SEPARATE UPPER SMOKE SEAL TO BE FURNISHED ?
"NO" - [X]
"YES" - [ ]:
3" TADPOLE STYLE - [ ]
3" WIPER/2-PLY - [ ]
"OTHER" SPECIAL - [ ]
6" POCKET - Single THICK
LISTING LABEL
YELLOW TAB - THICK
WIDTH = 12'-0"
LABORATORY LISTING LABEL
VERTICAL CROSS-SECTION
SEPARATE UPPER SMOKE SEAL STYLES TO BE FURNISHED "SPECIFIED ONLY":
"TADPOLE" -
CURTAIN FABRIC - ALSO SAME COLOR
3" DIA.
"LENGTH" = "CURTAIN WIDTH" (+3 INCHES -0 INCHES)
" 3 INCH WIPER/2-PLY" -
6" WIRE-REINF. VERMICULITE CTD. WEB - SAME COLOR AS CURTAIN
3"
"LENGHT" = "CURTAIN WIDTH" (+6 INCHES 0 INCHES)
ITEMS TO BE FURNISHED ON THIS ORDER:
1) STRAIGHT LIFT STYLE CURTAIN ON THIS ORDER.
2) UPPER SMOKE SEAL, "IF" CALLED FOR ON THIS ORDER → { YES. NO.
RW 6-21-16

APPENDIX B:

Test Data

Thermotex
102506902SAT-009
12 July 2016
Furnace Interior Temperatures



Thermotex G102506902SAT-009 12 July 2016

Time (min)	E119 Std Average (°F)	Furnace Average (°F)	Integration of Furnace Average (°F•min)	Integration of E119 Std Average (°F•min)	Error (%)	Furnace Probe #1 (°F)	Furnace Probe #2 (°F)	Furnace Probe #3 (°F)
0	68	83.9167	0	0	0.00%	84	84	84
0.5	161.2	90.9167	44	57	-23.72%	97	89	88
1	254.4	118.167	96	161	-40.46%	139	115	109
1.5	347.6	163.083	166	312	-46.65%	180	164	152
2	440.8	227	264	509	-48.15%	221	234	216
2.5	534	319.417	400	753	-46.79%	303	324	302
3	627.2	437	590	1043	-43.47%	426	438	410
3.5	720.4	569.083	841	1380	-39.04%	571	571	533
4	813.6	696.667	1157	1763	-34.35%	716	698	649
4.5	906.8	805.917	1533	2193	-30.10%	843	803	749
5	1000	901.833	1960	2670	-26.59%	948	895	841
5.5	1030	993.083	2434	3178	-23.41%	1047	985	927
6	1060	1074	2951	3700	-20.26%	1128	1063	1010
6.5	1090	1126.33	3501	4238	-17.39%	1172	1111	1070
7	1120	1160.83	4072	4790	-14.98%	1198	1143	1114
7.5	1150	1185.75	4659	5358	-13.04%	1216	1168	1147
8	1180	1205.33	5257	5940	-11.50%	1229	1189	1171
8.5	1210	1225.17	5864	6538	-10.29%	1247	1209	1193
9	1240	1248.67	6483	7150	-9.33%	1269	1232	1218
9.5	1270	1278.17	7115	7778	-8.52%	1298	1263	1246
10	1300	1304.75	7760	8420	-7.83%	1322	1290	1274
10.5	1317.35	1315.25	8415	9074	-7.26%	1329	1300	1288
11	1327.6	1319.92	9074	9736	-6.79%	1330	1305	1295
11.5	1337.39	1325	9735	10402	-6.41%	1333	1312	1301
12	1346.77	1333.67	10400	11073	-6.08%	1340	1321	1309
12.5	1355.77	1345.58	11070	11748	-5.78%	1352	1332	1321
13	1364.41	1352.5	11744	12429	-5.50%	1358	1340	1330
13.5	1372.72	1357.25	12422	13113	-5.27%	1361	1345	1335
14	1380.74	1370.58	13104	13801	-5.05%	1374	1358	1348
14.5	1388.47	1387.17	13793	14493	-4.83%	1393	1374	1363
15	1395.94	1398.83	14490	15190	-4.61%	1403	1386	1375
15.5	1403.16	1404.08	15190	15889	-4.40%	1408	1391	1381
16	1410.16	1408.42	15894	16593	-4.21%	1413	1395	1387
16.5	1416.94	1412.42	16599	17299	-4.05%	1416	1400	1391
17	1423.52	1417.25	17306	18010	-3.91%	1421	1405	1397
17.5	1429.9	1423.58	18016	18723	-3.77%	1426	1413	1402
18	1436.11	1432.25	18730	19439	-3.65%	1434	1422	1411
18.5	1442.15	1441.83	19449	20159	-3.52%	1443	1431	1420
19	1448.02	1450.25	20172	20882	-3.40%	1451	1438	1429
19.5	1453.75	1456.42	20899	21607	-3.28%	1457	1445	1436
20	1459.32	1460.83	21628	22335	-3.17%	1461	1450	1441
20.5	1464.77	1467	22360	23066	-3.06%	1469	1456	1447
21	1470.07	1472.17	23095	23800	-2.96%	1474	1460	1451
21.5	1475.26	1475.75	23832	24536	-2.87%	1477	1464	1456
22	1480.32	1479.33	24570	25275	-2.79%	1479	1469	1460
22.5	1485.28	1485.42	25312	26017	-2.71%	1487	1475	1465
23	1490.12	1491.08	26056	26760	-2.63%	1492	1481	1470
23.5	1494.86	1497.17	26803	27507	-2.56%	1498	1487	1476
24	1499.5	1503.17	27553	28255	-2.49%	1504	1492	1482
24.5	1504.04	1507.08	28305	29006	-2.42%	1508	1497	1487
25	1508.49	1511.42	29060	29759	-2.35%	1511	1501	1493
25.5	1512.85	1514.75	29817	30515	-2.29%	1514	1506	1496
26	1517.13	1517	30575	31272	-2.23%	1517	1508	1498
26.5	1521.33	1519.08	31334	32032	-2.18%	1520	1509	1501
27	1525.45	1521.67	32094	32793	-2.13%	1523	1512	1503
27.5	1529.49	1526.08	32856	33557	-2.09%	1527	1516	1508
28	1533.46	1530.5	33620	34323	-2.05%	1531	1520	1513

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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 (%)	Furnace Probe #1 (°F)	Furnace Probe #2 (°F)	Furnace Probe #3 (°F)
28.5	1537.36	1535	34386	35091	-2.01%	1535	1524	1517
29	1541.19	1539.75	35155	35860	-1.97%	1539	1530	1521
29.5	1544.96	1544.58	35926	36632	-1.93%	1543	1536	1526
30	1548.66	1549.42	36699	37405	-1.89%	1548	1540	1531

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Time (min)	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)	Furnace Probe #12 (°F)
0	84	84	84	84	84	84	85	83	83
0.5	91	90	88	101	89	87	92	89	90
1	115	119	104	141	115	103	121	122	115
1.5	157	173	134	174	163	136	176	185	163
2	211	248	179	209	235	187	256	282	246
2.5	287	345	242	306	331	256	362	413	362
3	398	463	324	439	448	344	496	573	485
3.5	526	591	423	595	583	451	640	737	608
4	658	713	526	748	715	565	772	876	724
4.5	777	817	625	875	834	674	879	976	819
5	884	909	719	977	939	779	971	1055	905
5.5	984	998	815	1068	1028	884	1059	1131	991
6	1072	1079	911	1142	1107	978	1132	1197	1069
6.5	1128	1131	989	1184	1157	1047	1177	1230	1120
7	1165	1162	1046	1210	1189	1095	1202	1250	1156
7.5	1192	1184	1086	1229	1210	1131	1222	1263	1181
8	1213	1202	1117	1245	1226	1159	1240	1272	1201
8.5	1232	1221	1144	1261	1244	1183	1258	1287	1223
9	1254	1244	1172	1281	1267	1209	1279	1309	1250
9.5	1282	1273	1204	1308	1296	1237	1307	1340	1284
10	1308	1299	1234	1334	1321	1265	1333	1366	1311
10.5	1320	1308	1254	1343	1330	1281	1340	1370	1320
11	1324	1312	1267	1347	1333	1290	1342	1369	1325
11.5	1329	1317	1277	1351	1336	1300	1348	1368	1328
12	1337	1325	1288	1359	1344	1311	1357	1375	1338
12.5	1348	1336	1302	1370	1355	1324	1369	1388	1350
13	1356	1341	1312	1378	1361	1332	1374	1392	1356
13.5	1361	1347	1320	1382	1364	1338	1379	1395	1360
14	1373	1361	1331	1395	1376	1350	1394	1410	1377
14.5	1388	1378	1347	1411	1393	1364	1409	1429	1397
15	1399	1387	1362	1422	1407	1375	1418	1441	1411
15.5	1405	1391	1370	1426	1412	1383	1422	1444	1416
16	1408	1395	1378	1429	1417	1386	1423	1447	1423
16.5	1411	1400	1384	1431	1422	1390	1424	1451	1429
17	1415	1405	1391	1436	1426	1395	1429	1455	1432
17.5	1421	1412	1398	1442	1431	1403	1437	1461	1437
18	1430	1420	1405	1451	1438	1413	1448	1469	1446
18.5	1440	1429	1414	1461	1447	1424	1459	1478	1456
19	1449	1437	1422	1470	1454	1434	1469	1486	1464
19.5	1455	1444	1429	1476	1459	1442	1475	1490	1469
20	1460	1448	1434	1480	1462	1450	1481	1492	1471
20.5	1464	1455	1441	1485	1470	1454	1484	1499	1480
21	1469	1460	1448	1489	1476	1458	1489	1505	1487
21.5	1473	1463	1453	1492	1479	1463	1493	1507	1489
22	1477	1467	1457	1496	1481	1467	1496	1510	1493
22.5	1482	1473	1463	1502	1489	1470	1499	1518	1502
23	1488	1479	1469	1508	1494	1476	1506	1524	1506
23.5	1494	1484	1476	1513	1500	1482	1511	1530	1515
24	1500	1490	1483	1519	1508	1486	1515	1536	1523
24.5	1504	1494	1487	1523	1511	1491	1519	1539	1525
25	1508	1498	1492	1527	1515	1497	1524	1542	1529
25.5	1511	1502	1495	1530	1517	1501	1528	1545	1532
26	1513	1504	1498	1532	1520	1503	1529	1548	1534
26.5	1515	1507	1502	1533	1523	1503	1529	1550	1537
27	1516	1509	1506	1535	1527	1505	1530	1553	1541
27.5	1521	1513	1509	1540	1531	1509	1536	1557	1546
28	1526	1517	1513	1545	1534	1515	1542	1561	1549

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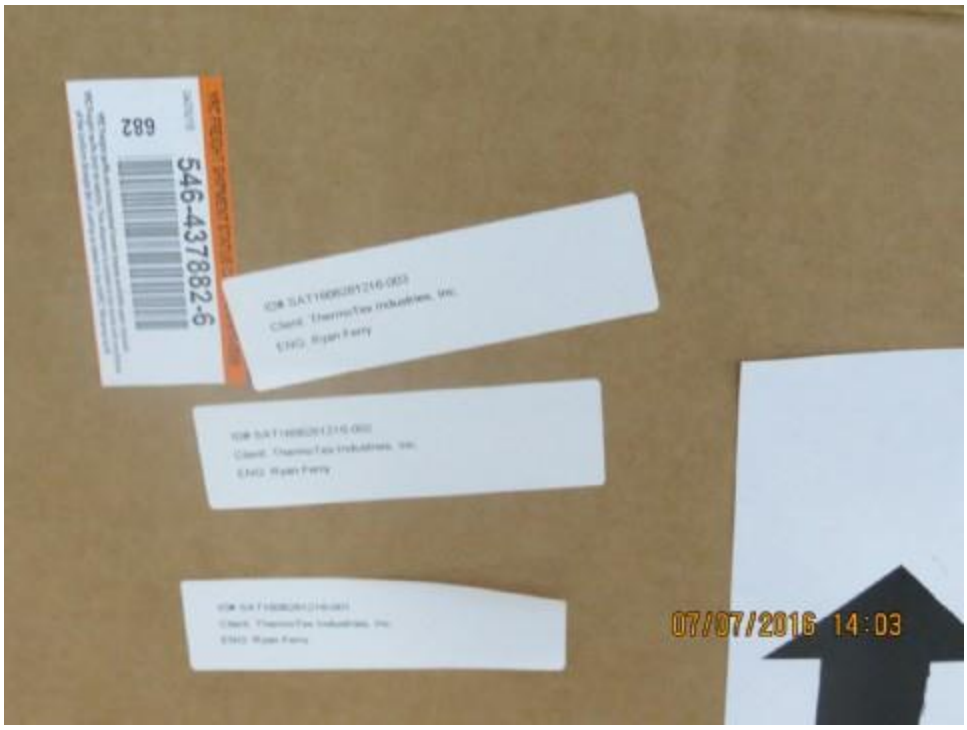
Time (min)	Furnace Probe #4 (°F)	Furnace Probe #5 (°F)	Furnace Probe #6 (°F)	Furnace Probe #7 (°F)	Furnace Probe #8 (°F)	Furnace Probe #9 (°F)	Furnace Probe #10 (°F)	Furnace Probe #11 (°F)	Furnace Probe #12 (°F)
28.5	1531	1522	1518	1549	1537	1521	1548	1565	1553
29	1536	1527	1522	1555	1541	1527	1554	1569	1556
29.5	1541	1533	1526	1560	1544	1535	1562	1571	1558
30	1546	1537	1531	1565	1548	1540	1567	1576	1564

APPENDIX C:
Photos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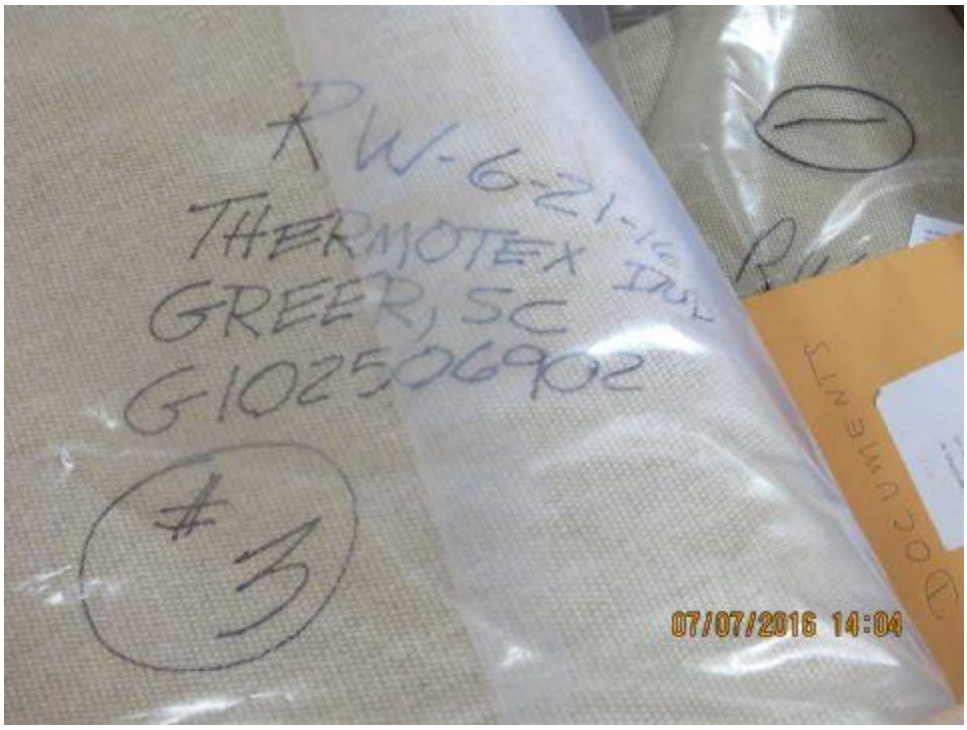
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THERMOTEX IND
GREER, SC
G102506902
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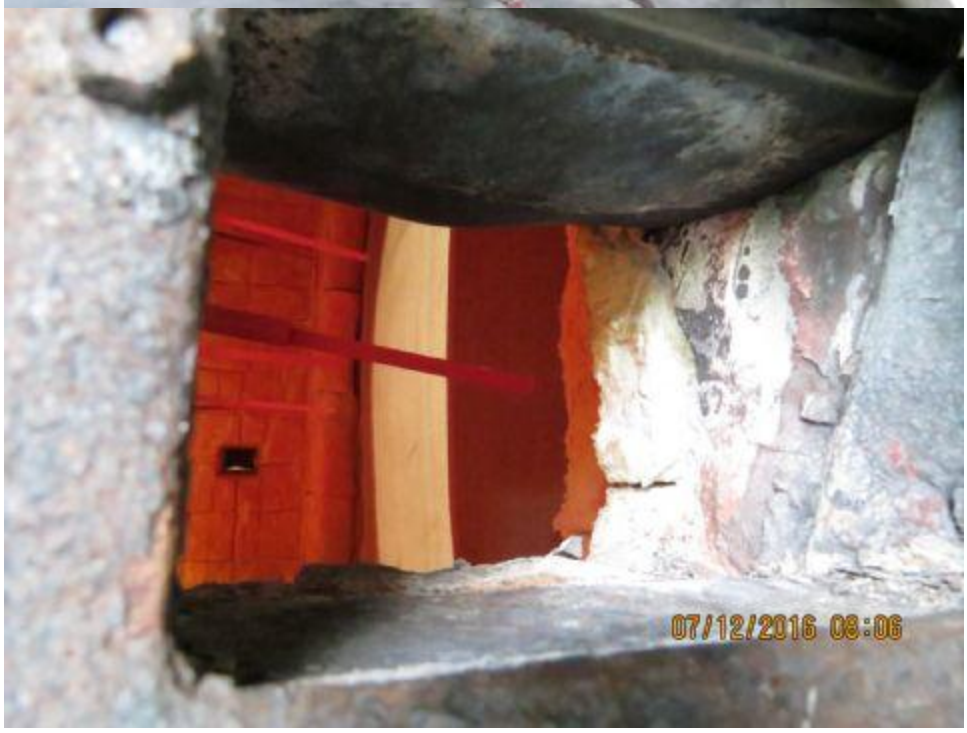
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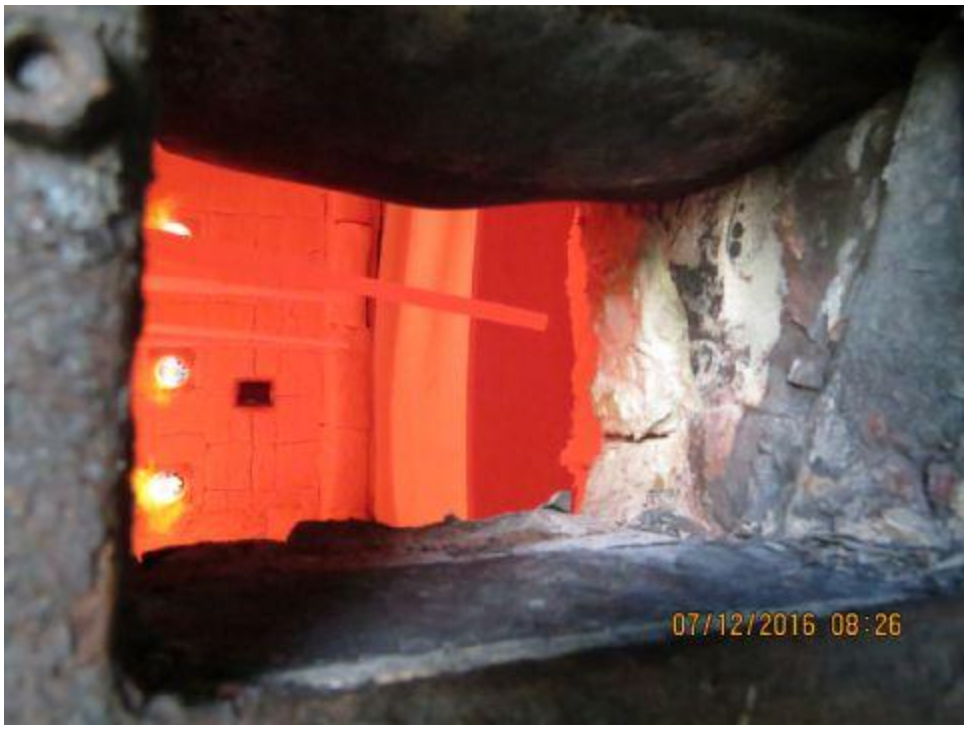
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07/12/2016 09:46

CALIBRATED INSTRUMENTATION USED FOR TESTING

Description	Serial No.	Calibration Due Date
100-Channel Data Acquisition System	99LE004	9/22/2016
Manometer	01LE013	10/26/2016
Thermo/Hygrometer	151860229	10/23/2017
Stop Watch	151950635	12/17/17

REVISION SUMMARY

DATE	SUMMARY
July 26, 2016	Original Issue Date