



Product Evaluation for Safti-Seal Inc
Report #: 08312020_HW-STS-080420-01
Date: August 31, 2020

Rectorseal Fire Test Laboratory
3300 Produce Row
Houston, TX 77023
(713) 921.5926

Safti-Seal Inc Product Evaluation

Product Evaluated

STS-FRG 75

Evaluation Standard

ANSI/UL 2079

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1 Introduction

Rectorseal Fire Test Laboratory (Rectorseal) is conducting a product evaluation for Safti-Seal Inc, on Safti-Seal STS-FRG 75 to evaluate its firestop properties. The evaluation is being conducted to determine if the STS-FRG 75 will meet acceptance criteria for a 2-hr F Rating (ANSI/UL 2079) when installed at Bottom of Wall for a 2-hr gypsum wall.

2 Product and Assembly Description

2.1 Product Description:

The material is a “peel & stick” gasket composed of a foam material and an intumescent strip. The product is designed to be used in the following applications: Bottom of Wall and Joints within gypsum wall assemblies. The product is adhered to a stud framing member, top track/header, or bottom track/footer by removing the release paper to expose a pressure sensitive adhesive (PSA). The material is packaged in rolls of 1.00-in widths.

2.2 Assembly Description:

A 2-hr UL V450 gypsum wall was constructed using nominal 3-1/2 inch steel framing (20-GA). The assembly was built with both a Head of Wall and Bottom of Wall joint installed. This report is on the performance of the Bottom of Wall joint, therefore details of the Head of Wall are left out for clarity. The wall was constructed within a 4-ft X 4-ft steel test frame. Steel studs were spaced 16 inch on center (OC). The floor runner (track) was 25-GA galvanized steel with standard 1-1/4 inch legs, attached to a 4-1/2 inch thick lightweight concrete deck with concrete anchors spaced 24 inch OC. Owens Corning R19 fiberglass insulation was installed within the stud cavity. A 4-in wide 4.0-pcf mineral wool plug was installed 9 inches above the Bottom of Wall joint to isolate the HW and BW inside the wall cavity. See Figure 1 for more detail:



Figure 1: 1-1/4 inch leg floor runner (25-GA) and nom. 3-1/2 inch steel stud framing (20-GA, 16 inch OC) used to construct the wall. R19 fiberglass insulation fills the wall cavity.

A 1 inch wide specimen of STS-FRG 75 was installed on the floor runner legs on both sides of the assembly (Fig 2). Figure 3 is a CAD produced rendering of the Bottom of Wall joint.



Figure 2: On the left the STS-FRG 75 is shown to be 1 inch wide. On the right the STS-FRG 75 is shown adhered to the floor runner/bottom track.

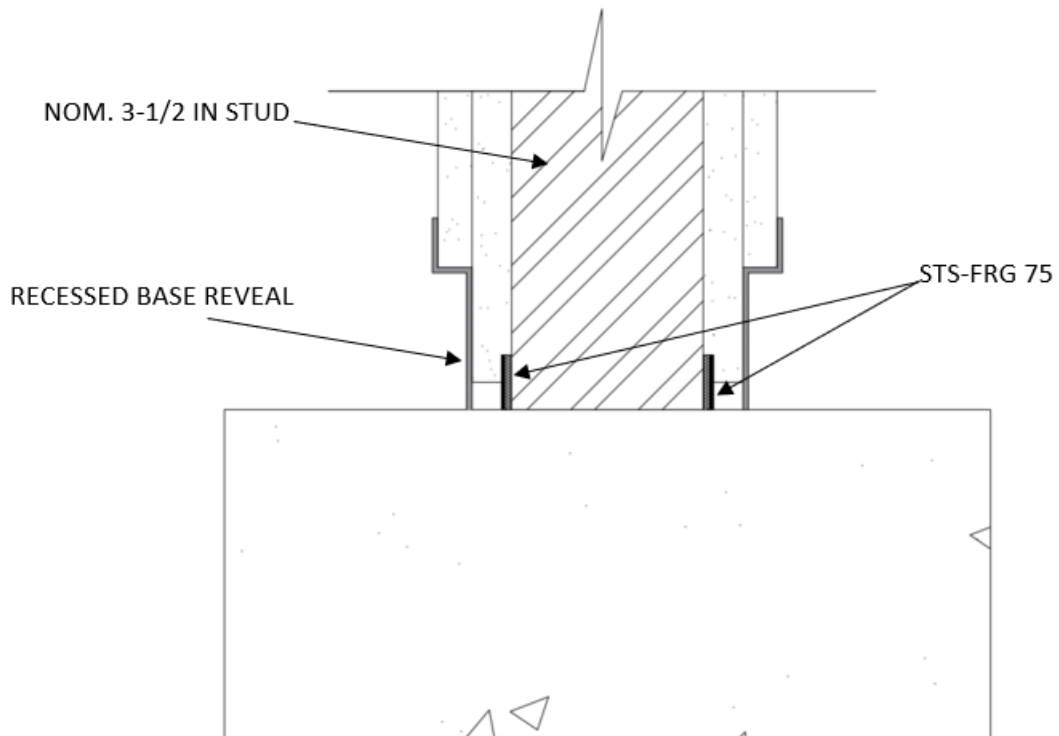


Figure 3: CAD rendering of bottom of wall joint showing the STS-FRG 75 installed on both legs of floor runner behind the steel recessed reveals.

Two layers of 5/8 inch CertainTeed Type X gypsum wallboard were installed on each side of the assembly. The wallboard was installed using 1-5/8 inch No. 6 drywall screws 12 inch OC with the first screw located 4 inches below to edge of the gypsum wallboard on each side of the wall. A steel recessed base reveal was installed over the ½ inch bottom of wall joint to complete installation (Fig 4).



Figure 4: The bottom of wall joint was covered by a 2-1/2 inch tall recessed steel base reveal.

Authorities Having Jurisdiction (AHJ) should be consulted in all cases as to the particular requirements covering the installation and use of certified products, equipment, systems, devices, and materials. The AHJ should be consulted before construction. Smoke and sound resistant assemblies and products are developed by the design submitter and have been investigated by Rectorseal for compliance with specific requirements. The published information cannot always address every construction nuance encountered in the field. When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire rated assemblies are advised to consult the test standard referenced for each certified product. The test standard includes specifics concerning alternate materials and alternate methods of construction.

3 Reference Documents

As part of this evaluation, Rectorseal has directly or indirectly used the following referenced documents:

- ANSI/UL 2079 5th ed, Tests for Fire Resistance of Building Joint Systems
- Rectorseal Test Data AA0820048

4 Evaluation Method

The test assembly was mounted onto the wall furnace for a 2 hour fire endurance exposure. Positive pressure was established within the furnace within five minutes and maintained for the duration of the test (Fig 5). Two furnace pressure taps recorded the differential pressure of the furnace and laboratory. The “Top” pressure tap, PRESSURE 1, was located ½ inch below the Head of Wall joint and the “Bottom” pressure tap, PRESSURE 2, was located 1/2 inch below the bottom of wall joint.

The furnace temperature was controlled to follow the ASTM E119 Time/Temperature Curve (Fig 6). The area under the curve for the first 60 minutes was 99% of the standard curve and the area under the curve at the completion of the test (120 minutes) was 101% of the standard curve. The furnace temperatures are validated for the test since the area under of the curve is greater than 92.5% of the standard time/temperature curve for the duration (ANSI/UL 2079 sec 13.8b).

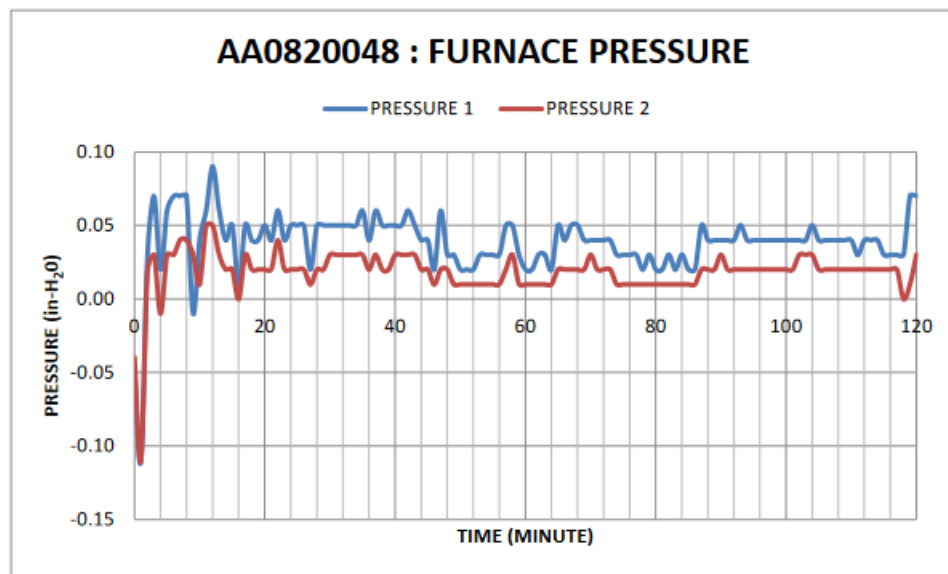


Figure 5: The differential furnace pressure showing a minimum 0.01-in H₂O pressure was established at 5-min elapsed time and maintained for the duration of the fire exposure.

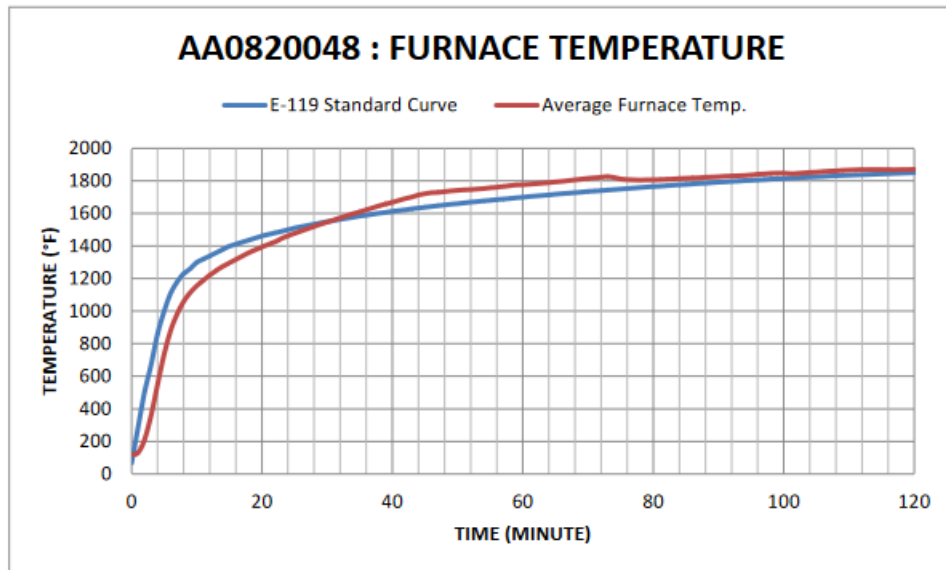


Figure 6: The average furnace temperature and standard ASTM E119 curve.

Observations of the cold face of the assembly during the test found no significant deterioration of the bottom of wall firestop assembly. The highest recorded temperature on the cold face at 60 minutes into the test was 170.3°F and some moisture was observed at the base reveal and concrete interface (Fig 7).



Figure 7: Moisture is visible at the base reveal and concrete interface, evidenced by the dark areas on the concrete shown in the image.

At the completion of the fire exposure (120 minutes), the highest recorded temperature on the cold face of the bottom of wall joint assembly was 199.5°F. No thermocouples on the cold face of the assembly reached the temperature limit within the test duration. The cold face temperatures are recorded in figure 8 below:

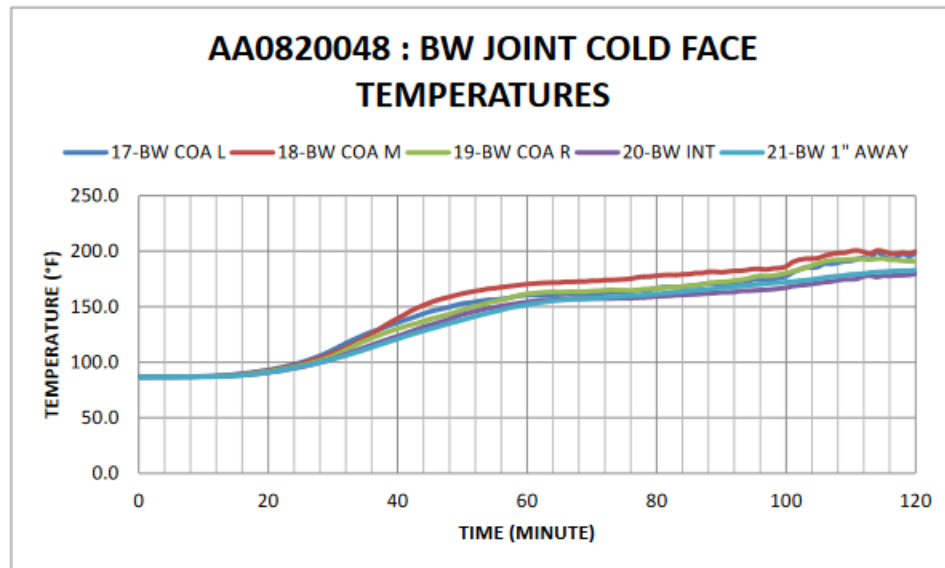


Figure 8: The cold face temperatures on the bottom of wall (BW) joint during the fire endurance test.

The temperatures on the cold face of the assembly were measured using thermocouples placed under 2 inch by 2 inch pads according to Appendix B of ANSI/UL 2079. The placement of the thermocouples was determined using guidance found in section 15.3 of the standard, and in consideration of where the weakest points of the assembly may be found. A CAD rendering of the assembly showing the relative locations of the thermocouples is shown in figure 9.

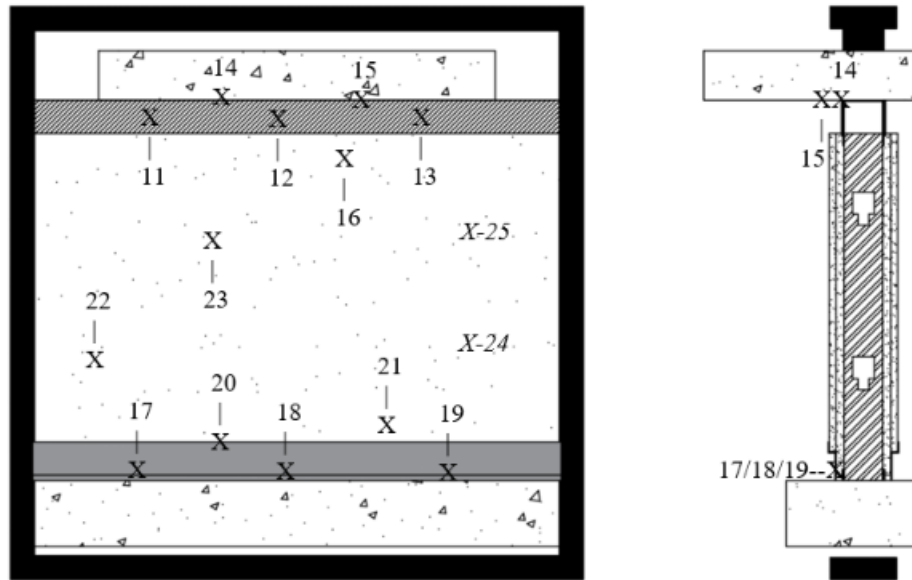


Figure 9: The cold face thermocouples are placed under pads in the relative locations as shown above. Thermocouples #17-22 are recording temperatures about the Bottom of Wall joint and are discussed in this report.

After the 2-hour fire exposure, the assembly was taken off the furnace and positioned for a hose stream test. 2 minutes and 27 seconds after the furnace burner was shut off, the test assembly was exposed to a 30-psi hose stream for 24-s (Fig 10).



Figure 10: The test assembly was exposed to a 30-psi hose stream for 24-s per Table 19.1 in UL 2079.

After the hose stream exposure, the assembly was inspected for any evidence of water passing through the firestop assembly:



Figure 11: The assembly after hose stream exposure. The exposed side of assembly is on the left, and unexposed side on the right. The base reveal remained firmly in place on the unexposed side of the assembly throughout hose stream exposure. Observations show that there was no evidence for water passing through the Bottom of Wall firestop system.

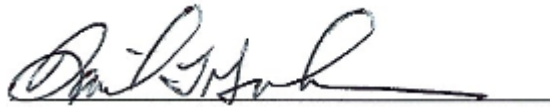
5 Conclusion

Rectorseal has conducted this product evaluation for Safti-Seal Inc, on STS-FRG 75 to evaluate its fire stopping performance. The evaluation was conducted to test the product effectiveness when installed in a static Bottom of Wall joint within a fire rated gypsum wall.

Based on the test data contained within this report, the tested assembly satisfied the ANSI/UL 2079 test standard acceptance criteria for a 2 hr F-Rating.

Rectorseal Fire Test Laboratory

Reported by:



David Graham

Manager, Rectorseal Fire Test Laboratory

Reviewed by:



Eva Ackerman, PhD

Vice President, Research & Technology



6 Appendix

TEST FILE: AA0820048		Fire Exposure Correction						
PROJECT: HW-STS-080420-01		C = [2I (A _s - A _a)] / [3 (A _s + L)]						
TEST DATE: 8/20/2020		I =	120.0	min	C =		0.4	
START TIME: 9:35		Aa =	133369.6	°F-min				
FINISH TIME: 11:35		As =	132760.0	°F-min				
		L =	3240.0	°F-min				
Percent Area Under E-119 Curve								
1-hr (≥ -10%):		-1%						
1.5-hr (≥ -10%):		0%						
2-hr (≥ -7.5%):		1%						
Furnace Temperature (°F)								
Elapsed Time (min)	Area _s (°F-min)	Area _a (°F-min)	E-119 Standard Curve	1-050219F	2-050219B	3-050219D	4-DDCFB8 NOT USED	Average Furnace Temp.
0	0	0	68	125.3	110.4	123.5	117.1	119.1
1			285	143.9	112.7	144.0	121.4	130.5
2			500	249.2	139.3	269.7	183.2	210.4
3			670	437.5	217.0	478.6	301.9	358.8
4			860	670.2	352.1	707.1	463.1	548.1
5	2330	1797	1000	882.2	528.0	899.2	633.2	735.7
6			1110	1027.2	700.0	1017.6	776.5	880.3
7			1180	1117.3	846.9	1090.8	881.6	984.2
8			1230	1178.1	959.5	1140.6	959.3	1059.4
9			1260	1220.0	1040.3	1177.8	1019.8	1114.5
10	7740	6184	1300	1250.6	1097.5	1206.8	1065.8	1155.2
11			1320	1278.2	1141.3	1232.1	1104.7	1189.1
12			1340	1304.2	1181.7	1258.6	1141.0	1221.4
13			1359	1328.7	1216.0	1282.9	1172.9	1250.1
14			1379	1349.9	1244.8	1304.3	1202.8	1275.5
15	14150	11973	1399	1368.2	1267.8	1322.6	1226.7	1296.3
16			1412	1386.6	1289.4	1340.9	1251.8	1317.2
17			1424	1404.4	1313.5	1359.8	1278.7	1339.1
18			1437	1421.0	1334.8	1377.1	1303.2	1359.0
19			1449	1437.0	1354.4	1393.9	1324.2	1377.4
20	20970	18360	1462	1451.5	1373.3	1409.2	1345.1	1394.8
21			1472	1465.3	1390.9	1424.1	1361.1	1410.4
22			1481	1479.4	1406.0	1437.7	1377.4	1425.1
23			1491	1495.0	1428.6	1453.9	1404.9	1445.6
24			1500	1510.1	1447.1	1470.4	1423.8	1462.9
25	28050	25203	1510	1524.3	1463.4	1484.6	1440.3	1478.2
26			1518	1537.5	1478.3	1498.4	1454.8	1492.3
27			1526	1549.9	1494.3	1510.7	1470.9	1506.5
28			1534	1562.6	1508.2	1523.4	1485.8	1520.0
29			1542	1574.9	1522.2	1536.7	1501.2	1533.8
30	35360	32425	1550	1586.9	1536.2	1549.0	1514.8	1546.7



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Elapsed Time (min)	Area _s (°F-min)	Area _a (°F-min)	E-119 Standard Curve	Furnace Temperature (°F)					Average Furnace Temp.
				1-050219F	2-050219B	3-050219D	4-DDCFB8	NOT USED	
31			1557	1598.1	1550.0	1561.2	1530.4		1559.9
32			1564	1610.4	1564.6	1574.1	1543.4		1573.1
33			1570	1622.9	1578.6	1586.6	1557.4		1586.4
34			1577	1634.4	1592.4	1598.7	1570.1		1598.9
35	42860	39978	1584	1645.0	1605.0	1610.3	1582.4		1610.7
36			1590	1657.0	1615.5	1623.0	1594.0		1622.4
37			1596	1669.9	1629.2	1636.1	1606.0		1635.3
38			1601	1680.3	1641.3	1647.6	1619.7		1647.2
39			1607	1690.5	1652.8	1657.6	1631.6		1658.1
40	50510	47836	1613	1700.6	1663.3	1667.9	1641.6		1668.4
41			1618	1711.5	1675.2	1680.8	1654.4		1680.5
42			1623	1722.1	1686.5	1692.1	1665.8		1691.6
43			1628	1732.2	1697.4	1701.9	1674.9		1701.6
44			1633	1742.9	1715.6	1711.4	1683.3		1713.3
45	58300	55969	1638	1749.6	1726.7	1717.6	1689.4		1720.8
46			1643	1756.6	1733.8	1724.2	1695.3		1727.5
47			1647	1762.3	1728.3	1729.7	1699.5		1730.0
48			1652	1768.6	1729.5	1734.9	1705.4		1734.6
49			1656	1771.4	1734.2	1736.7	1712.1		1738.6
50	66200	64285	1661	1774.5	1737.8	1739.1	1715.1		1741.6
51			1665	1776.3	1741.8	1740.8	1718.8		1744.4
52			1669	1778.7	1743.6	1743.5	1719.7		1746.4
53			1673	1781.8	1746.6	1746.7	1723.5		1749.7
54			1677	1785.7	1749.7	1750.2	1727.1		1753.2
55	74220	72693	1681	1789.7	1754.1	1754.8	1730.9		1757.4
56			1685	1793.4	1758.5	1758.7	1735.2		1761.5
57			1689	1798.0	1763.7	1762.8	1741.2		1766.4
58			1692	1802.2	1768.1	1767.7	1744.8		1770.7
59			1696	1806.3	1772.8	1772.2	1750.2		1775.4
60	82330	81187	1700	1808.4	1773.5	1773.8	1750.7		1776.6
61			1704	1811.2	1775.7	1776.2	1753.6		1779.2



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				1-050219F	2-050219B	3-050219D	4-DDCFB8	NOT USED	
62			1707	1814.2	1778.8	1779.4	1756.9		1782.3
63			1711	1817.3	1782.0	1783.1	1760.1		1785.6
64			1714	1820.8	1785.3	1787.0	1763.3		1789.1
65	90540	89772	1718	1824.9	1789.5	1791.2	1767.6		1793.3
66			1721	1828.9	1793.9	1795.1	1771.9		1797.5
67			1725	1832.9	1799.0	1799.9	1777.8		1802.4
68			1728	1837.7	1803.8	1804.3	1783.0		1807.2
69			1732	1842.0	1808.5	1808.1	1787.1		1811.4
70	98830	98454	1735	1845.6	1812.5	1812.3	1791.1		1815.4
71			1738	1849.5	1816.1	1816.3	1794.5		1819.1
72			1741	1853.3	1819.5	1820.0	1797.2		1822.5
73			1744	1856.3	1823.5	1823.4	1801.8		1826.3
74			1747	1853.2	1817.0	1821.1	1791.6		1820.7
75	107200	107181	1750	1846.7	1805.3	1814.6	1779.8		1811.6
76			1753	1843.5	1800.4	1811.7	1774.9		1807.6
77			1756	1841.8	1798.5	1810.7	1773.0		1806.0
78			1759	1841.4	1798.1	1810.4	1772.7		1805.7
79			1762	1841.7	1798.8	1811.0	1773.3		1806.2
80	115650	115888	1765	1842.3	1799.7	1812.1	1774.0		1807.0
81			1768	1843.5	1801.2	1813.3	1775.8		1808.5
82			1771	1844.6	1803.2	1815.3	1777.3		1810.1
83			1773	1846.0	1805.0	1817.1	1779.4		1811.9
84			1776	1847.8	1807.0	1818.8	1782.0		1813.9
85	124180	124605	1779	1849.2	1808.9	1820.8	1784.0		1815.7
86			1782	1851.1	1811.1	1822.6	1786.5		1817.8
87			1784	1853.2	1813.4	1824.1	1788.5		1819.8
88			1787	1855.3	1815.7	1826.5	1790.8		1822.1
89			1789	1856.4	1817.9	1828.9	1793.1		1824.1
90	132760	133370	1792	1858.4	1820.0	1830.7	1795.7		1826.2
91			1794	1860.1	1822.4	1832.6	1798.1		1828.3
92			1797	1862.1	1824.7	1834.6	1800.1		1830.4



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				1-050219F	2-050219B	3-050219D	4-DDCFB8	NOT USED	
93			1799	1863.6	1826.9	1836.3	1802.6		1832.4
94			1802	1865.1	1828.8	1837.9	1804.5		1834.1
95	141420	142185	1804	1865.9	1830.8	1839.2	1808.0		1836.0
96			1806	1868.4	1833.9	1839.8	1821.0		1840.8
97			1808	1870.2	1835.8	1840.6	1826.4		1843.3
98			1811	1872.2	1837.9	1842.6	1828.3		1845.3
99			1813	1873.6	1839.6	1844.0	1829.9		1846.8
100	150120	151054	1815	1874.2	1841.0	1843.4	1831.2		1847.5
101			1817	1872.1	1839.1	1842.6	1820.7		1843.6
102			1819	1874.5	1839.8	1846.6	1821.2		1845.5
103			1822	1878.1	1842.9	1850.0	1824.4		1848.9
104			1824	1880.3	1845.9	1853.1	1828.1		1851.9
105	158890	159968	1826	1882.6	1848.5	1855.9	1830.9		1854.5
106			1828	1884.9	1851.1	1858.2	1834.6		1857.2
107			1830	1886.7	1853.5	1860.2	1838.7		1859.8
108			1831	1889.3	1856.1	1862.2	1840.7		1862.1
109			1833	1890.9	1858.1	1864.0	1844.7		1864.4
110	167700	168930	1835	1892.5	1860.0	1865.9	1846.5		1866.2
111			1837	1893.1	1861.5	1867.4	1846.9		1867.2
112			1838	1895.1	1863.0	1868.8	1848.5		1868.9
113			1840	1894.8	1863.3	1868.3	1848.5		1868.7
114			1841	1895.4	1864.7	1868.4	1849.5		1869.5
115	176550	177928	1843	1894.4	1863.8	1867.6	1849.4		1868.8
116			1844	1894.1	1864.0	1866.6	1850.2		1868.7
117			1846	1894.0	1864.2	1866.1	1850.4		1868.7
118			1847	1894.3	1864.9	1865.9	1852.2		1869.3
119			1849	1894.9	1865.6	1866.4	1852.5		1869.9
120	185440	186937	1850	1896.4	1866.9	1866.7	1853.4		1870.9



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TEST FILE:	AA0820048
PROJECT:	HW-STS-080420-01
TEST DATE:	8/20/2020
START TIME:	9:35
FINISH TIME:	11:35

PRESSURE TRANSDUCER ID#	
PRESSURE 1:	9125704
PRESSURE 2:	9125705
PRESSURE 3:	NOT USED

Furnace Pressure (in-H ₂ O)				
Elapsed Time (min)	PRESSURE 1	PRESSURE 2	NOT USED	Average Furnace Pressure
0	-0.05	-0.04		-0.05
1	-0.11	-0.11		-0.11
2	0.03	0.02		0.03
3	0.07	0.03		0.05
4	0.02	-0.01		0.01
5	0.06	0.03		0.05
6	0.07	0.03		0.05
7	0.07	0.04		0.06
8	0.07	0.04		0.06
9	-0.01	0.03		0.01
10	0.04	0.01		0.03
11	0.06	0.05		0.06
12	0.09	0.05		0.07
13	0.06	0.03		0.05
14	0.04	0.02		0.03
15	0.05	0.02		0.04
16	0.01	0.00		0.01
17	0.05	0.03		0.04
18	0.04	0.02		0.03
19	0.04	0.02		0.03
20	0.05	0.02		0.04
21	0.04	0.02		0.03
22	0.06	0.04		0.05
23	0.04	0.02		0.03
24	0.05	0.02		0.04
25	0.05	0.02		0.04
26	0.05	0.02		0.04
27	0.02	0.01		0.02
28	0.05	0.02		0.04
29	0.05	0.02		0.04
30	0.05	0.03		0.04
31	0.05	0.03		0.04
32	0.05	0.03		0.04
33	0.05	0.03		0.04
34	0.05	0.03		0.04
35	0.06	0.03		0.05



A CSW Industrials Company

Product Evaluation for Safti-Seal Inc
Report #: 08312020_HW-STS-080420-01
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Rectorseal Fire Test Laboratory
3300 Produce Row
Houston, TX 77023
(713) 921.5926

Elapsed Time (min)	Furnace Pressure (in-H ₂ O)			Average Furnace Pressure
	PRESSURE 1	PRESSURE 2	NOT USED	
36	0.04	0.02		0.03
37	0.06	0.03		0.05
38	0.05	0.02		0.04
39	0.05	0.02		0.04
40	0.05	0.03		0.04
41	0.05	0.03		0.04
42	0.06	0.03		0.05
43	0.05	0.03		0.04
44	0.04	0.02		0.03
45	0.04	0.02		0.03
46	0.02	0.01		0.02
47	0.06	0.02		0.04
48	0.03	0.02		0.03
49	0.03	0.01		0.02
50	0.02	0.01		0.02
51	0.02	0.01		0.02
52	0.02	0.01		0.02
53	0.03	0.01		0.02
54	0.03	0.01		0.02
55	0.03	0.01		0.02
56	0.03	0.01		0.02
57	0.05	0.02		0.04
58	0.05	0.03		0.04
59	0.03	0.01		0.02
60	0.02	0.01		0.02
61	0.02	0.01		0.02
62	0.03	0.01		0.02
63	0.03	0.01		0.02
64	0.02	0.01		0.02
65	0.05	0.02		0.04
66	0.04	0.02		0.03
67	0.05	0.02		0.04
68	0.05	0.02		0.04
69	0.04	0.02		0.03
70	0.04	0.03		0.04
71	0.04	0.02		0.03



A CSW Industrials Company

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Houston, TX 77023
(713) 921.5926

Elapsed Time (min)	Furnace Pressure (in-H ₂ O)			Average Furnace Pressure
	PRESSURE 1	PRESSURE 2	NOT USED	
72	0.04	0.02		0.03
73	0.04	0.02		0.03
74	0.03	0.01		0.02
75	0.03	0.01		0.02
76	0.03	0.01		0.02
77	0.03	0.01		0.02
78	0.02	0.01		0.02
79	0.03	0.01		0.02
80	0.02	0.01		0.02
81	0.02	0.01		0.02
82	0.03	0.01		0.02
83	0.02	0.01		0.02
84	0.03	0.01		0.02
85	0.02	0.01		0.02
86	0.02	0.01		0.02
87	0.05	0.02		0.04
88	0.04	0.02		0.03
89	0.04	0.02		0.03
90	0.04	0.03		0.04
91	0.04	0.02		0.03
92	0.04	0.02		0.03
93	0.05	0.02		0.04
94	0.04	0.02		0.03
95	0.04	0.02		0.03
96	0.04	0.02		0.03
97	0.04	0.02		0.03
98	0.04	0.02		0.03
99	0.04	0.02		0.03
100	0.04	0.02		0.03
101	0.04	0.02		0.03
102	0.04	0.03		0.04
103	0.04	0.03		0.04
104	0.05	0.03		0.04
105	0.04	0.02		0.03
106	0.04	0.02		0.03
107	0.04	0.02		0.03



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Product Evaluation for Safti-Seal Inc
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Elapsed Time (min)	Furnace Pressure (in-H ₂ O)			Average Furnace Pressure
	PRESSURE 1	PRESSURE 2	NOT USED	
108	0.04	0.02		0.03
109	0.04	0.02		0.03
110	0.04	0.02		0.03
111	0.03	0.02		0.03
112	0.04	0.02		0.03
113	0.04	0.02		0.03
114	0.04	0.02		0.03
115	0.03	0.02		0.03
116	0.03	0.02		0.03
117	0.03	0.02		0.03
118	0.03	0.00		0.02
119	0.07	0.01		0.04
120	0.07	0.03		0.05



Product Evaluation for Safti-Seal Inc
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Rectorseal Fire Test Laboratory
 3300 Produce Row
 Houston, TX 77023
 (713) 921.5926

Cold Face Temperature (°F)			
		17-BW	18-BW
TC LABEL:		COA L	COA M
START TEMP:		86.8	86.8
LIMIT TEMP:		411.8	411.8
LIMIT TIME (min):		N/A	N/A
Elapsed Time (min)		17-BW	18-BW
		COA L	COA M
0		86.8	86.8
1		86.8	86.8
2		86.8	86.9
3		86.8	86.9
4		86.9	86.9
5		86.9	86.9
6		86.9	87.0
7		87.0	87.0
8		87.0	87.0
9		87.2	87.1
10		87.3	87.2
11		87.5	87.4
12		87.8	87.6
13		88.2	87.9
14		88.6	88.3
15		89.2	88.7
16		89.8	89.3
17		90.5	90.0
18		91.3	90.7
19		92.2	91.5
20		93.1	92.3
21		94.2	93.3
22		95.3	94.4
23		96.6	95.7
24		98.1	97.1
25		99.7	98.6
26		101.6	100.2
27		103.6	102.0
28		105.8	103.9
29		108.3	106.0
30		111.2	108.3



Cold Face Temperature (°F)			
TC LABEL:		17-BW	18-BW
START TEMP:		COA L	COA M
LIMIT TEMP:		86.8	86.8
LIMIT TIME (min):		411.8	411.8
		N/A	N/A
Elapsed Time (min)		17-BW	18-BW
		COA L	COA M
31		114.2	110.8
32		117.2	113.4
33		120.1	116.2
34		122.7	119.1
35		125.1	122.3
36		127.4	125.8
37		129.4	129.3
38		131.6	133.0
39		133.6	136.5
40		135.7	139.7
41		137.8	142.8
42		139.7	146.1
43		141.7	148.9
44		143.8	151.4
45		145.7	153.8
46		147.2	155.8
47		148.4	157.4
48		149.9	158.9
49		151.5	160.4
50		152.9	161.8
51		153.5	163.0
52		154.4	164.2
53		155.4	165.2
54		156.3	166.3
55		156.4	166.8
56		157.1	167.6
57		157.6	168.3
58		159.2	169.1
59		160.0	169.7
60		160.4	170.3
61		160.7	170.9



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 3300 Produce Row
 Houston, TX 77023
 (713) 921.5926

Cold Face Temperature (°F)			
TC LABEL:		17-BW	18-BW
START TEMP:		COA L	COA M
LIMIT TEMP:		86.8	86.8
LIMIT TIME (min):		411.8	411.8
		N/A	N/A
Elapsed Time (min)		17-BW	18-BW
		COA L	COA M
62		160.8	171.3
63		160.6	171.5
64		160.9	171.7
65		161.0	171.9
66		161.6	172.5
67		161.5	172.4
68		161.5	172.8
69		161.4	172.8
70		161.9	173.4
71		162.0	173.3
72		162.5	174.0
73		162.8	174.2
74		163.2	174.4
75		163.0	174.7
76		163.2	175.3
77		165.0	176.5
78		165.1	177.0
79		165.4	177.2
80		166.8	178.0
81		167.6	178.4
82		167.8	178.7
83		167.5	178.5
84		167.8	179.2
85		168.9	179.3
86		169.0	180.3
87		170.1	180.4
88		171.1	181.4
89		170.8	181.4
90		170.9	181.0
91		170.7	181.7
92		172.1	182.4



Cold Face Temperature (°F)			
TC LABEL:		17-BW	18-BW
START TEMP:		COA L	COA M
LIMIT TEMP:		86.8	86.8
LIMIT TIME (min):		411.8	411.8
		N/A	N/A
Elapsed Time (min)		17-BW	18-BW
		COA L	COA M
93		172.8	182.4
94		172.5	183.2
95		174.8	184.1
96		174.0	184.0
97		174.1	183.5
98		174.7	184.4
99		176.1	184.9
100		177.5	186.4
101		180.9	190.2
102		183.3	192.3
103		185.6	193.3
104		185.2	193.3
105		186.1	193.9
106		189.0	196.1
107		188.6	197.3
108		189.8	198.5
109		190.9	198.6
110		191.3	200.1
111		193.0	200.7
112		194.0	199.2
113		192.9	197.6
114		199.5	200.6
115		195.5	200.0
116		193.1	198.1
117		193.5	197.6
118		198.1	198.8
119		195.3	198.2
120		198.7	199.5



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Cold Face Temperature (°F)					
	19-BW	20-BW	21-BW 1"		
TC LABEL:	COA R	INT	AWAY	22-BW CF	23-HW CF
START TEMP:	86.7	86.7	86.6	86.6	86.7
LIMIT TEMP:	411.7	411.7	411.6	411.6	411.7
LIMIT TIME (min):	N/A	N/A	N/A	N/A	N/A
	19-BW	20-BW	21-BW 1"		
Elapsed Time (min)	COA R	INT	AWAY	22-BW CF	23-HW CF
0	86.7	86.7	86.6	86.6	86.7
1	86.8	86.7	86.6	86.6	86.7
2	86.8	86.8	86.7	86.7	86.7
3	86.8	86.8	86.7	86.7	86.7
4	86.8	86.8	86.7	86.7	86.7
5	86.9	86.8	86.8	86.8	86.8
6	86.9	86.9	86.8	86.8	86.8
7	87.0	86.9	86.8	86.8	86.8
8	87.0	86.9	86.8	86.8	86.9
9	87.1	87.0	86.9	86.9	86.9
10	87.2	87.0	87.0	86.9	86.9
11	87.3	87.1	87.1	87.0	87.0
12	87.4	87.2	87.2	87.0	87.1
13	87.7	87.4	87.4	87.1	87.1
14	88.0	87.7	87.6	87.1	87.2
15	88.4	88.0	88.0	87.2	87.4
16	88.9	88.4	88.4	87.3	87.6
17	89.5	88.9	88.9	87.4	87.9
18	90.2	89.4	89.5	87.5	88.2
19	90.9	90.1	90.2	87.7	88.6
20	91.8	90.8	91.0	88.0	89.1
21	92.7	91.6	91.9	88.3	89.7
22	93.6	92.5	92.8	88.7	90.4
23	94.7	93.5	93.9	89.2	91.1
24	95.9	94.6	95.0	89.8	91.9
25	97.1	95.7	96.2	90.4	92.7
26	98.5	97.0	97.4	91.1	93.5
27	99.9	98.4	98.7	91.9	94.4
28	101.5	99.9	100.1	92.8	95.3
29	103.4	101.5	101.5	93.7	96.2
30	105.8	103.3	103.0	94.7	97.1



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Cold Face Temperature (°F)					
	19-BW	20-BW	21-BW 1"		
TC LABEL:	COA R	INT	AWAY	22-BW CF	23-HW CF
START TEMP:	86.7	86.7	86.6	86.6	86.7
LIMIT TEMP:	411.7	411.7	411.6	411.6	411.7
LIMIT TIME (min):	N/A	N/A	N/A	N/A	N/A
Elapsed Time (min)	19-BW COA R	20-BW INT	21-BW 1" AWAY	22-BW CF	23-HW CF
31	108.3	105.2	104.5	95.8	98.1
32	111.0	107.3	106.1	97.0	99.1
33	114.0	109.4	107.9	98.3	100.1
34	117.0	111.5	109.7	99.7	101.2
35	119.5	113.7	111.6	101.2	102.3
36	122.0	115.8	113.5	102.8	103.5
37	124.1	117.7	115.4	104.5	104.6
38	126.4	119.7	117.3	106.3	105.8
39	128.4	121.6	119.2	108.2	106.9
40	130.2	123.6	121.1	110.1	108.1
41	132.1	125.7	123.0	112.1	109.2
42	133.7	127.6	124.9	114.1	110.4
43	135.3	129.8	126.6	116.2	111.5
44	137.1	132.0	128.3	118.2	112.7
45	138.9	133.8	130.0	120.1	113.8
46	140.5	135.3	131.7	122.0	114.9
47	142.0	137.1	133.4	123.8	116.0
48	143.5	139.0	135.0	125.5	117.1
49	145.4	141.1	136.6	127.2	118.4
50	147.2	142.9	138.2	128.7	119.6
51	149.0	144.5	139.9	130.1	120.7
52	150.4	145.9	141.4	131.3	121.6
53	151.9	147.4	142.9	132.4	122.7
54	153.7	148.7	144.4	133.4	123.8
55	155.0	149.7	145.8	134.3	124.7
56	156.2	150.7	147.2	135.1	125.5
57	157.4	151.6	148.6	135.8	126.4
58	159.1	152.6	149.8	136.5	127.3
59	160.7	153.5	150.9	137.1	128.3
60	161.6	154.2	152.0	137.5	129.0
61	162.1	155.1	152.9	138.1	129.7



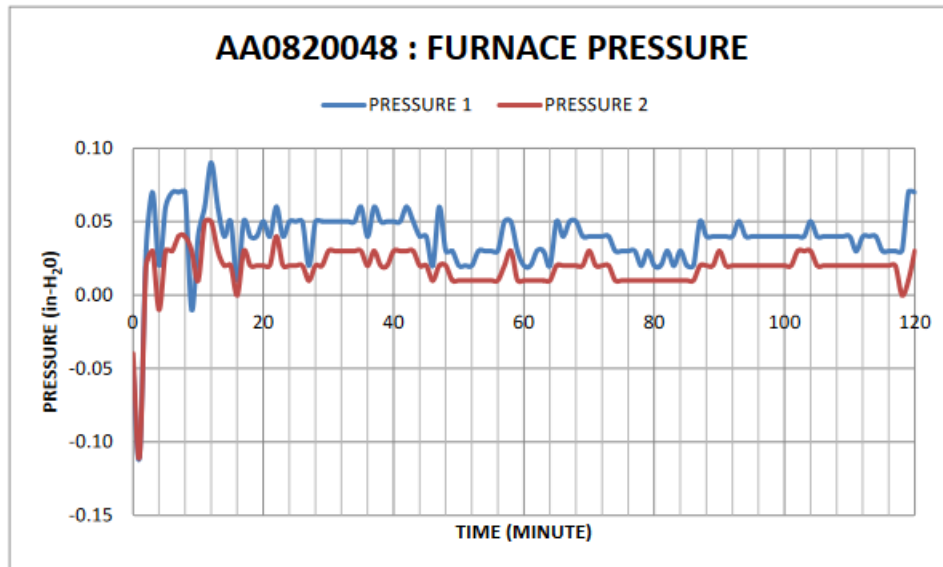
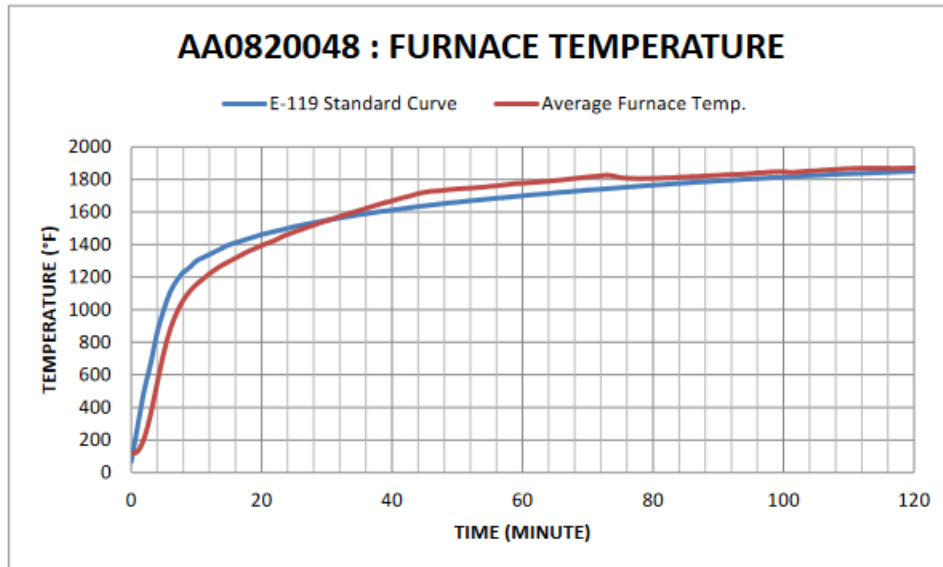
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3300 Produce Row
Houston, TX 77023
(713) 921.5926

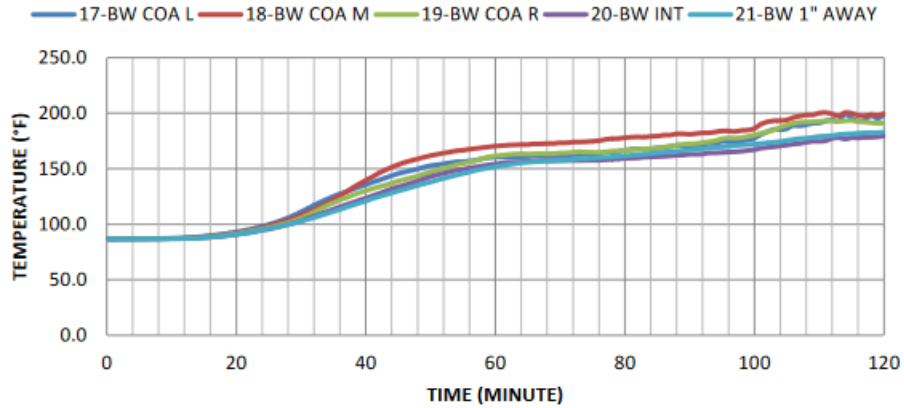
Cold Face Temperature (°F)					
	19-BW	20-BW	21-BW 1"		
TC LABEL:	COA R	INT	AWAY	22-BW CF	23-HW CF
START TEMP:	86.7	86.7	86.6	86.6	86.7
LIMIT TEMP:	411.7	411.7	411.6	411.6	411.7
LIMIT TIME (min):	N/A	N/A	N/A	N/A	N/A
Elapsed Time (min)	19-BW COA R	20-BW INT	21-BW 1" AWAY	22-BW CF	23-HW CF
62	162.7	155.8	153.8	138.5	130.3
63	163.2	156.0	154.5	138.9	130.9
64	163.5	156.3	155.3	139.1	131.4
65	163.3	156.6	155.9	139.3	131.9
66	163.5	157.1	156.4	139.4	132.4
67	163.7	157.3	156.7	139.5	132.9
68	163.5	157.3	157.1	139.4	133.1
69	163.8	157.3	157.3	139.2	133.3
70	164.2	157.4	157.5	139.0	133.4
71	164.3	157.5	157.8	138.8	133.5
72	164.9	157.4	158.2	138.5	133.6
73	165.3	157.5	158.8	138.3	133.8
74	164.9	157.6	159.2	138.0	134.1
75	164.8	157.8	159.6	137.8	134.4
76	164.6	157.7	160.0	137.6	134.8
77	165.2	158.1	160.3	137.4	135.3
78	165.8	158.4	160.8	137.2	135.8
79	166.1	158.8	161.2	137.0	136.4
80	166.4	159.3	161.6	136.9	137.1
81	167.0	159.6	162.1	136.8	137.9
82	167.6	159.8	162.6	136.8	138.5
83	167.7	160.4	163.1	136.8	139.2
84	168.3	160.6	163.7	136.9	139.9
85	168.6	161.0	164.3	137.0	140.7
86	169.4	161.2	164.8	137.0	141.4
87	170.2	161.7	165.3	137.1	142.1
88	171.3	162.1	165.8	137.1	142.9
89	172.1	162.3	166.4	137.4	143.5
90	172.5	163.0	167.1	137.5	144.2
91	172.7	163.0	167.6	137.9	144.9
92	173.7	163.3	168.2	138.1	145.5



Cold Face Temperature (°F)					
	19-BW	20-BW	21-BW 1"		
TC LABEL:	COA R	INT	AWAY	22-BW CF	23-HW CF
START TEMP:	86.7	86.7	86.6	86.6	86.7
LIMIT TEMP:	411.7	411.7	411.6	411.6	411.7
LIMIT TIME (min):	N/A	N/A	N/A	N/A	N/A
Elapsed Time (min)	19-BW COA R	20-BW INT	21-BW 1" AWAY	22-BW CF	23-HW CF
93	174.3	164.3	168.7	138.3	146.0
94	175.2	164.3	169.2	138.7	146.6
95	177.2	164.7	169.7	138.9	147.3
96	177.9	165.2	170.2	139.3	147.9
97	177.6	165.4	170.9	139.8	148.6
98	178.0	165.8	171.4	140.2	149.2
99	179.2	166.4	171.8	140.5	149.7
100	180.4	167.2	172.3	140.9	150.2
101	181.9	168.5	172.7	141.3	150.9
102	183.5	169.3	173.4	141.7	151.4
103	184.9	169.7	173.8	142.1	151.8
104	187.3	170.7	174.6	142.7	152.2
105	189.3	171.4	175.5	143.4	152.6
106	190.9	172.2	176.4	143.8	153.0
107	191.8	172.8	177.2	144.2	153.2
108	192.0	173.8	177.6	144.5	153.6
109	192.4	174.7	178.2	144.7	154.2
110	192.9	174.8	179.1	145.1	154.7
111	193.2	175.2	179.5	145.3	155.2
112	193.1	177.3	179.9	145.8	155.8
113	192.5	178.1	180.7	146.5	156.3
114	193.2	176.7	181.3	146.6	156.7
115	193.4	178.0	181.6	147.1	157.1
116	192.4	177.7	182.0	147.3	157.2
117	192.0	178.2	182.3	147.8	157.6
118	191.5	178.3	182.6	148.2	158.0
119	191.0	178.7	182.6	148.6	158.4
120	190.9	179.7	183.1	149.1	158.9



AA0820048 : BW JOINT COLD FACE TEMPERATURES



AA0820048 : COLD FACE TEMPERATURES

