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Our Ref: Chilt/IF11025

5th June 2011

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Complete Fire Protection Ltd
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BS2 0XW

Secondary Sponsor
Concept Conversions Ltd
Unit 6/7, Hill Farm Estate
Irthlingborough
Little Addington
Northants. NN14 4AS

Re: Indicative Fire Resistance Test Chilt/IF11025

This letter report is to confirm the results of an indicative fire resistance test undertaken on 14th April 2011.

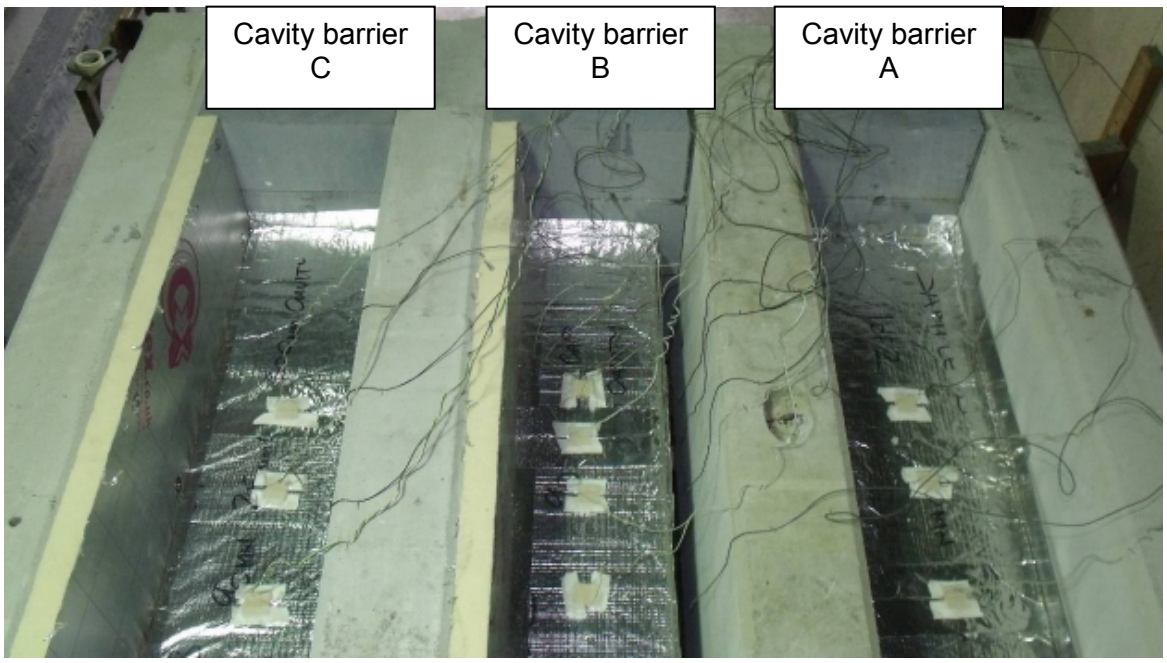
The specimen consisted of 3 No. horizontal ventilated type cavity fire barrier seals.

The test was conducted to the general principles of fire resistance testing given in 1363-1:1999 utilising the principles of test method stated in EOTA TR31: 2008

Details of the test specimen

The overall size of aperture exposed to the furnace was 300mm wide x 1000mm long x 600mm deep.

Unexposed face prior to testing – viewed from rear of furnace



1 Introduction

Two intumescent ventilation grills and three ventilated type cavity barriers were supplied for test. The cavity fire barriers only are subject to this letter report.

Three ventilated type cavity fire barrier sealing systems were installed into a horizontal supporting construction and tested to evaluate their fire resistance.

2 Specimen verification

The specimens were delivered to Chiltern International Fire Ltd (CIFL) during April 2011. CIFL fabricated the supporting construction, and the client, with assistance as required from CIFL, installed the specimens into the supporting construction.

3 Description of supporting constructions

Horizontal supporting construction

The supporting construction comprised lightweight reinforced aerated autoclaved concrete floor slabs, 150mm thick x 1350mm wide x 600mm deep, with 1100mm x 1100mm exposed to the furnace.

The exposed area of the supporting construction included 3No apertures, 300mm wide x 1000mm long x 600mm deep, to accept the cavity fire barrier seals.

4 Description of specimen

Details of the specimens are shown in Appendix 1. All measurements are in mm and the descriptions are written viewing the specimens from the unexposed face unless stated otherwise.

4.1 Cavity fire barrier sealing systems

Each barrier system was installed into its corresponding aperture within the supporting construction.

Cavity seal A

The cavity barrier system comprised a 100mm thick x 250mm wide x 1000mm long foil wrapped Knauf rock mineral fibre batt (density 100kg/m^3), faced with 2 No. foil wrapped 2.3mm thick x 75mm wide Fireplug intumescent strips fitted flush with the upper edge of the batt. The system incorporated a butt joint 750mm from the front of the furnace. The Fireplug intumescent was fixed to the edge of the rock fibre batt with double sided self adhesive tape and 110mm long steel pins fitted through 50mm wide x 50mm high steel plates, fitted 250mm from the ends at 250mm centres.

The system was fitted centrally within the cavity, and held in place on 'L' shaped steel brackets (with a spiked return at the end) 3mm thick x 25mm wide x 250mm long (providing support at the underside of the batt) x 175mm high (fixed to the blockwork with 3 No. masonry nails) fitted 250mm from the ends and at 500mm centres (or central if less than 500mm).

The upper edge of the batt was sealed to the blockwork with 60mm wide foil tape.

The free air gap of the cavity was 50mm wide.

Cavity seal B

The cavity barrier system comprised a 100mm thick x 250mm wide x 1000mm long foil wrapped Knauf rock mineral fibre batt (density 100kg/m^3), faced with 2 No. foil wrapped 2.3mm thick x 60mm wide Fireplug intumescent strips fitted flush with the upper edge of the batt. The system incorporated a butt joint 250mm from the front of the furnace. The Fireplug intumescent was fixed to the edge of the rock fibre batt with double side adhesive tape and 110mm long steel pins fitted through 50mm wide x 50mm high steel plates, fitted 250mm from the ends at 250mm centres.

The system was fitted centrally within the cavity, and held in place on 'L' shaped steel brackets (with a spiked return at the end) 3mm thick x 25mm wide x 250mm long (providing support at the underside of the batt) x 175mm high (fixed to the blockwork with 3 No. masonry nails) fitted 250mm from the ends and at 500mm centres (or central if less than 500mm).

The upper edge of the batt was sealed to the blockwork with 60mm wide foil tape.

40mm thick Celotex insulation was fitted butted up to the batt on both faces and finishing flush with the top and bottom edges of the cavity. The Celotex was fixed to the blockwork with 80mm long masonry screws at 500mm centres.

The free air gap of the cavity was 50mm wide.

Cavity seal C

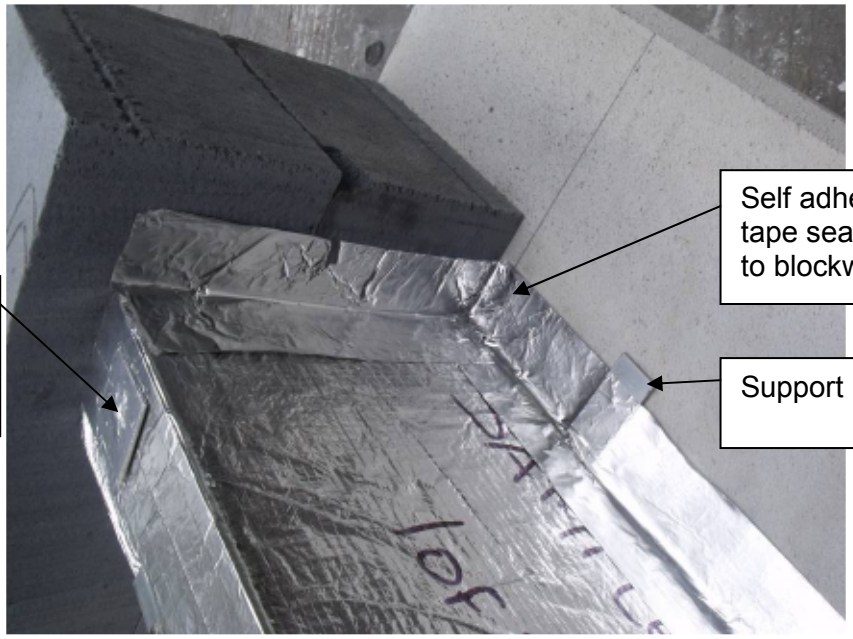
The cavity barrier system comprised a 100mm thick x 275mm wide x 1000mm long foil wrapped Knauf rock mineral fibre batt (density 100kg/m^3), faced with 1 No. foil wrapped 2.3mm thick x 30mm wide Fireplug intumescent strips fitted flush with the upper edge of the batt. The system incorporated a butt joint 350mm from the front of the furnace. The Fireplug intumescent was fixed to the edge of the rock fibre batt with double side adhesive tape and 60mm long steel pins fitted through 25mm wide x 25mm high steel plates, fitted 250mm from the ends at 250mm centres.

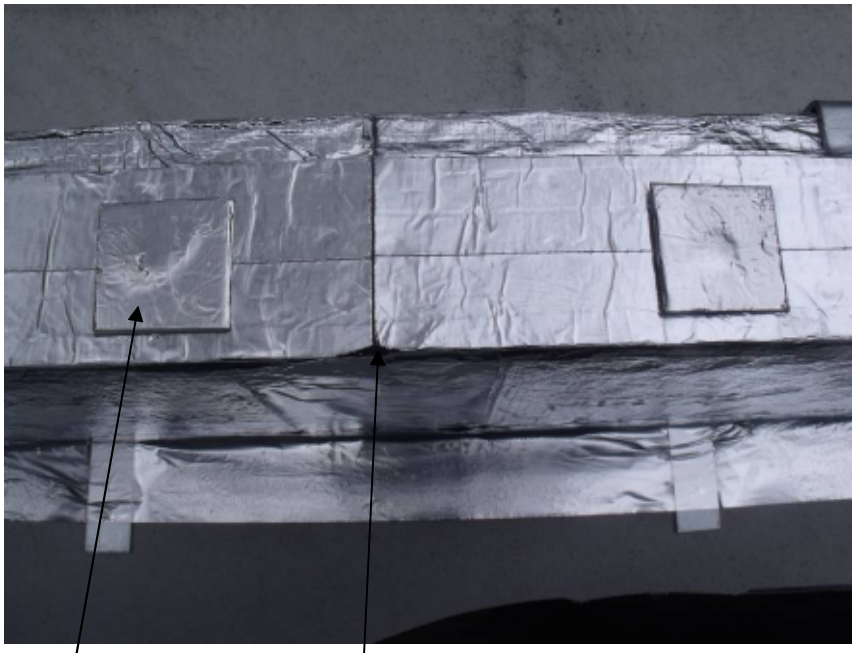
The system was fitted centrally within the cavity, and held in place on 'L' shaped steel brackets (with a spiked return at the end) 3mm thick x 25mm wide x 275mm long (providing support at the underside of the batt) x 175mm high (fixed to the blockwork with 3 No. masonry nails) fitted 250mm from the ends and at 500mm centres (or central if less than 500mm).

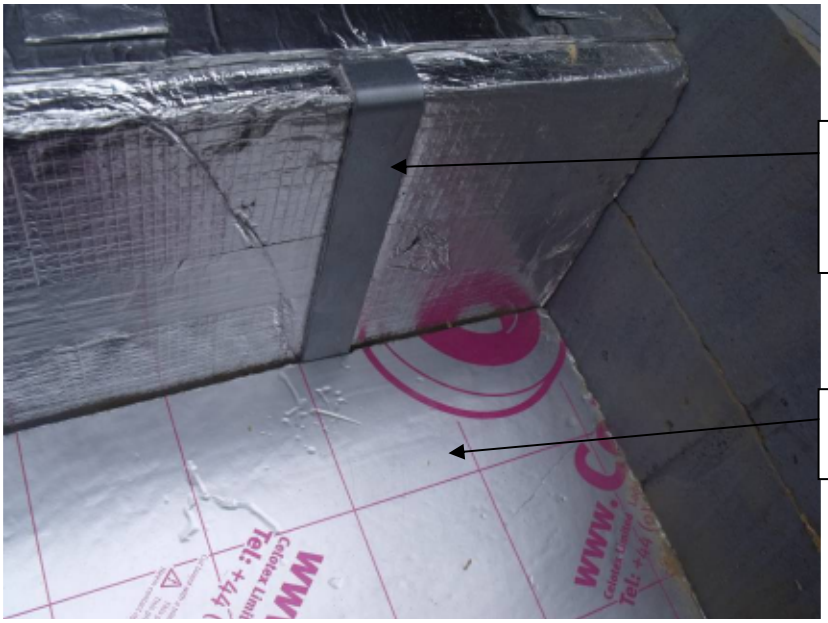
The upper edge of the batt was sealed to the blockwork with 60mm wide foil tape.

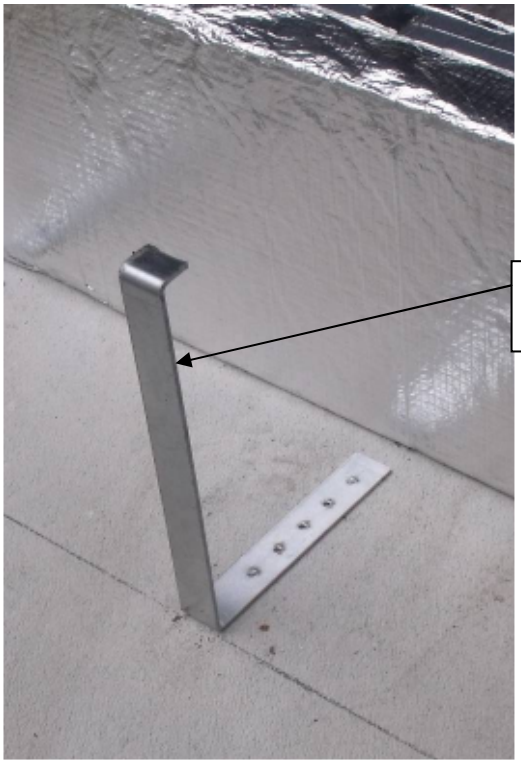
40mm thick Celotex insulation was fitted butted up to the batt on both faces and finishing flush with the top and bottom edges of the cavity. The Celotex was fixed to the blockwork with 80mm long masonry screws at 500mm centres.

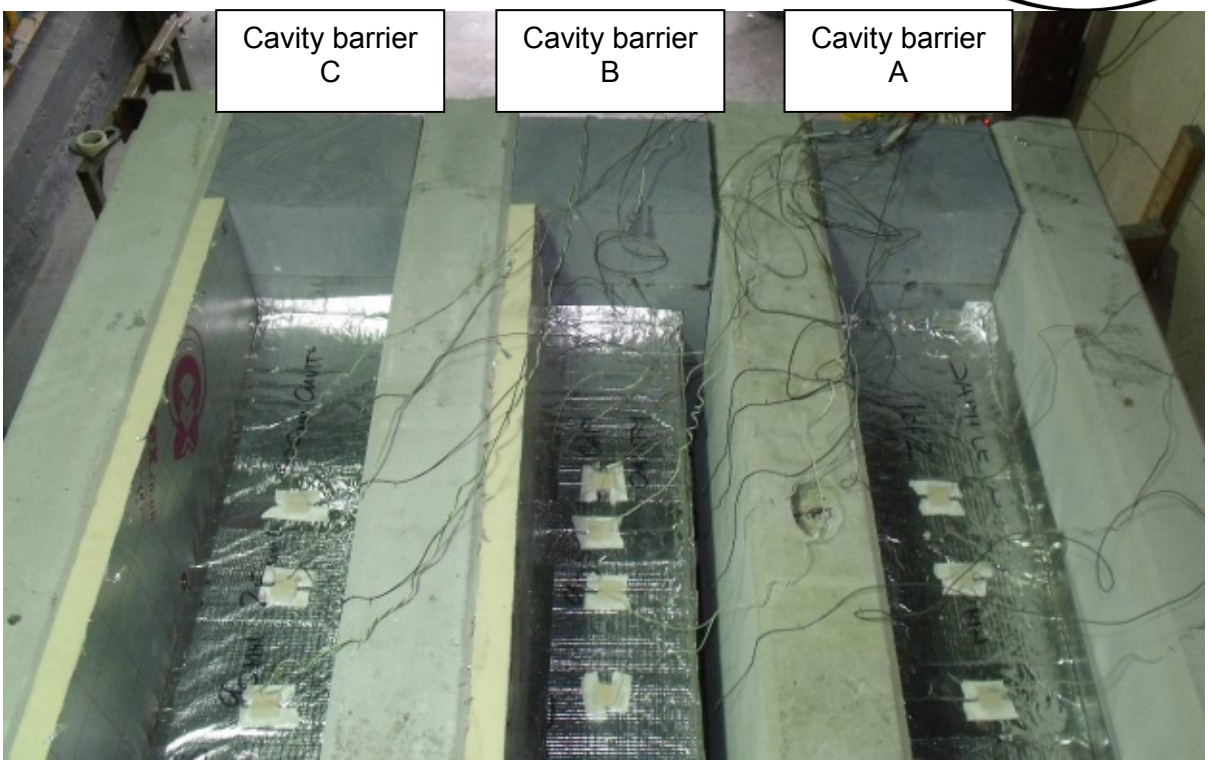
The free air gap of the cavity was 25mm wide.


Self adhesive foil tape sealing batt to blockwork
Steel plate and spike fixing intumescent to batt
Support bracket

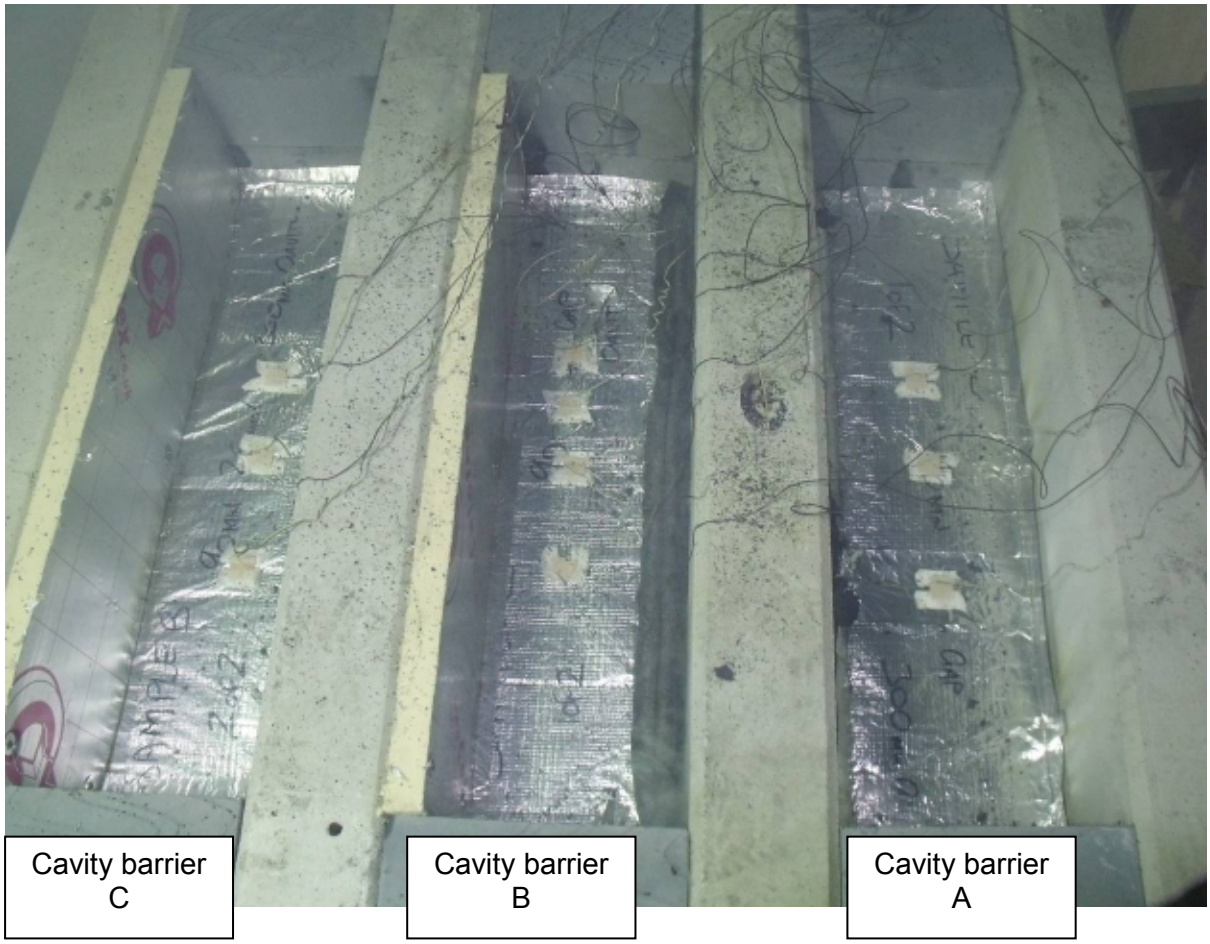

Steel plate and spike fixing intumescent to batt
Butt joint in batt and intumescent


Support bracket fitted supporting the underside of the batt
Celotex insulation


Support bracket



Before start of test – viewed from rear of furnace



After 75 minutes – viewed from rear of furnace

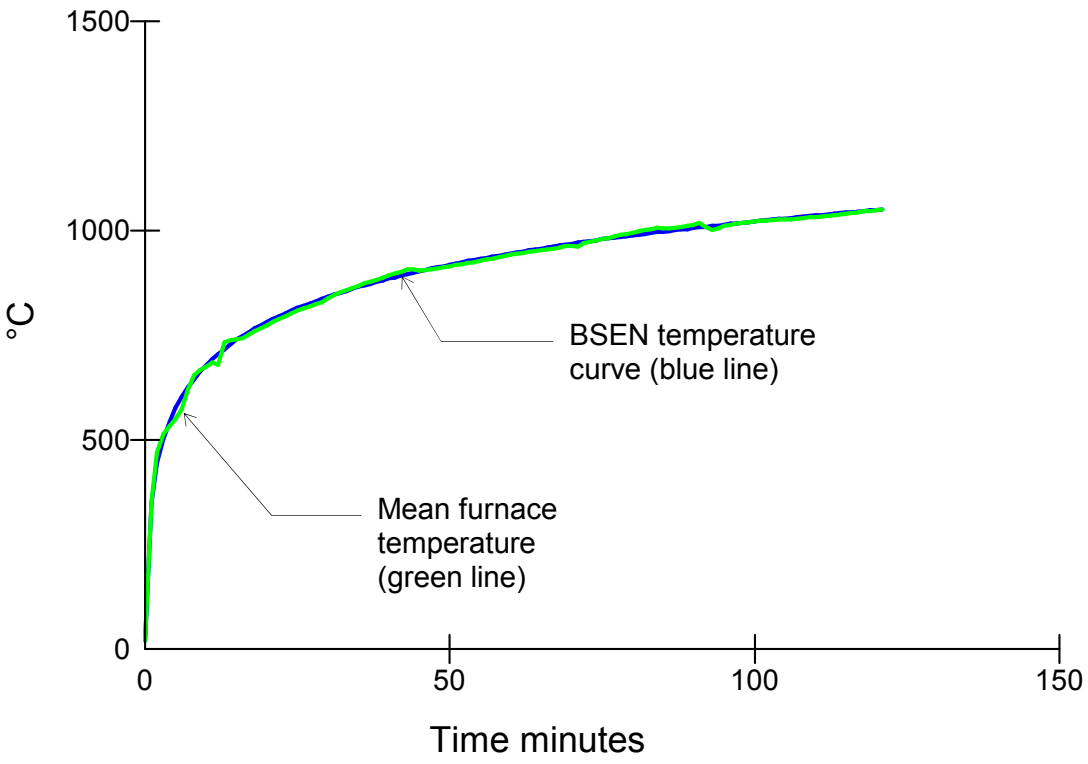
5 Test conditions

5.1 Ambient temperature

The ambient temperature of the test area at commencement of test was 13ºC. The ambient temperature for the duration of the test has been tabulated in Appendix 2.

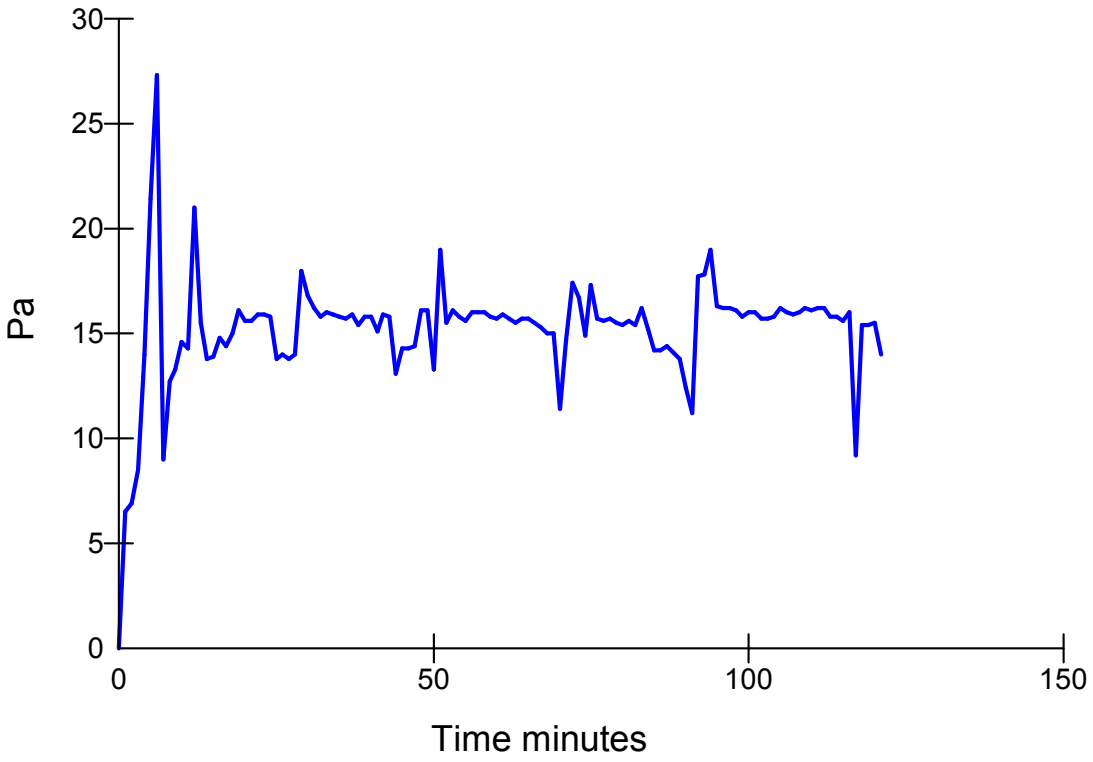
5.2 Furnace temperature

The furnace was controlled to follow the temperature/time relationship specified in BSEN 1363-1, 1999, as closely as possible, using the average of four plate thermocouples suitably distributed within the furnace. The furnace temperatures for the duration of the test have been tabulated in Appendix 2 and are shown graphically below:



5.3 Pressure readings

After the first 5 minutes of the test, the furnace pressure was maintained at 17 ± 5 Pa and after 10 minutes was maintained at 17 ± 3 Pa with respect to atmosphere, at a point approximately 0.3m from the underside of the specimens equating to 20pa at the underside of the specimens. The pressure readings have been tabulated in Appendix 2 and are shown graphically below:

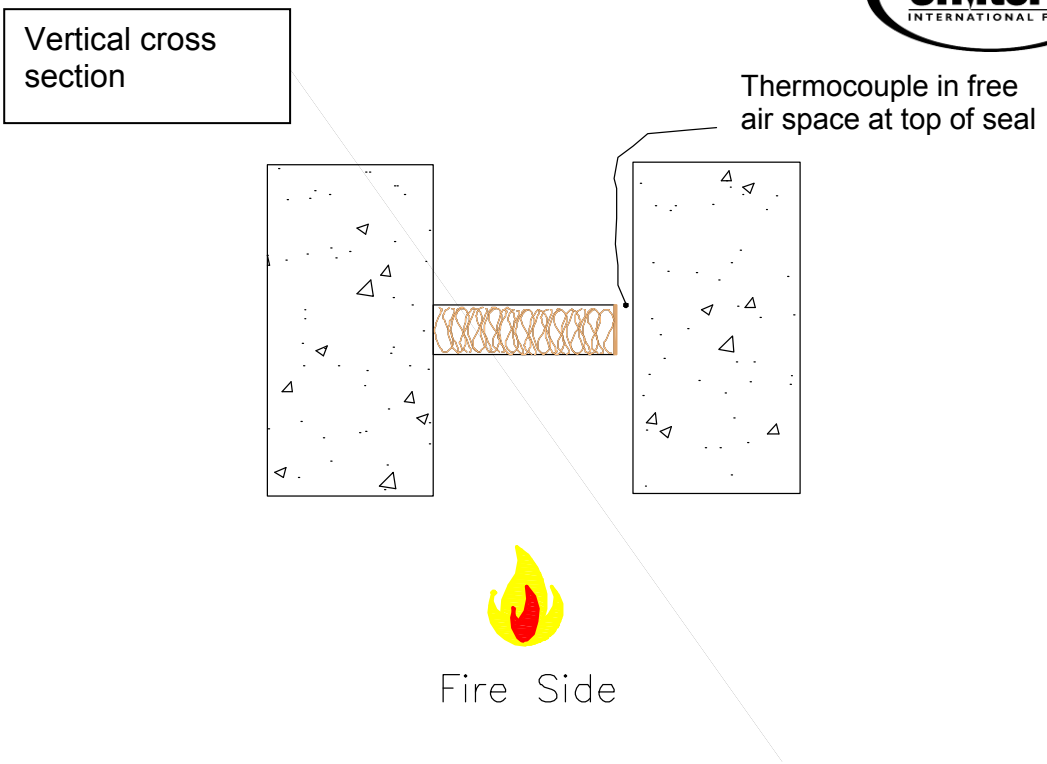


Due to the nature of the specimen, positive pressure can only be achieved once the ventilated cavity fire barriers have reacted, and sealed the cavities.

5.4 Thermocouple positions

The temperature of the unexposed face was monitored by means of the following thermocouples attached to the specimens in the positions detailed below: (see Appendix 1 figure 3)

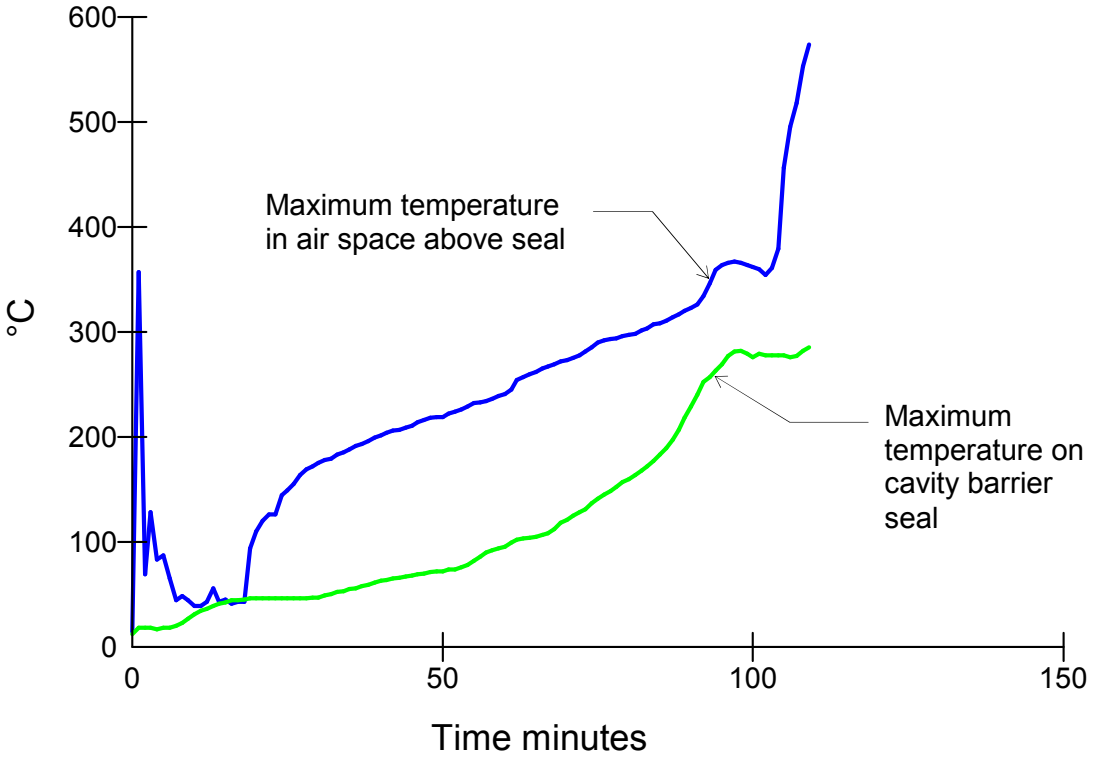
Specimen Identification	Thermocouple number	Position
-	1-4	Furnace thermocouples
A	11	Central in the cavity free air space at the top of the seal 330mm from the front of the aperture
A	12	Central in the cavity free air space at the top of the seal mid way along the aperture
A	13	Central in the cavity free air space at the top of the seal joint 660mm from front of the aperture
A	14	On the seal 330mm from the front of the aperture
A	15	On the seal mid way along the aperture
A	16	On the seal joint 660mm from the front of the aperture
B	17	Central in the cavity free air space at the top of the seal 250mm from the front of the aperture
B	18	Central in the cavity free air space at the top of the seal joint 330mm from front of the aperture
B	19	Central in the cavity free air space at the top of the seal mid way along the aperture
B	20	Central in the cavity free air space at the top of the seal 660mm from the front of the aperture
B	21	On the seal joint 250mm from the front of the aperture
B	22	On the seal 330mm from the front of the aperture
B	23	On the seal mid way along the aperture
B	24	On the seal 660mm from the front of the aperture
C	25	Central in the cavity free air space at the top of the seal joint 330mm from the front of the aperture
C	26	Central in the cavity free air space at the top of the seal mid way along the aperture
C	27	Central in the cavity free air space at the top of the seal 600mm from the front of the aperture
C	28	On the seal joint 330mm from the front of the aperture
C	29	On the seal mid way along the aperture
C	30	On the seal 660mm from the front of the aperture
-	41	Laboratory ambient



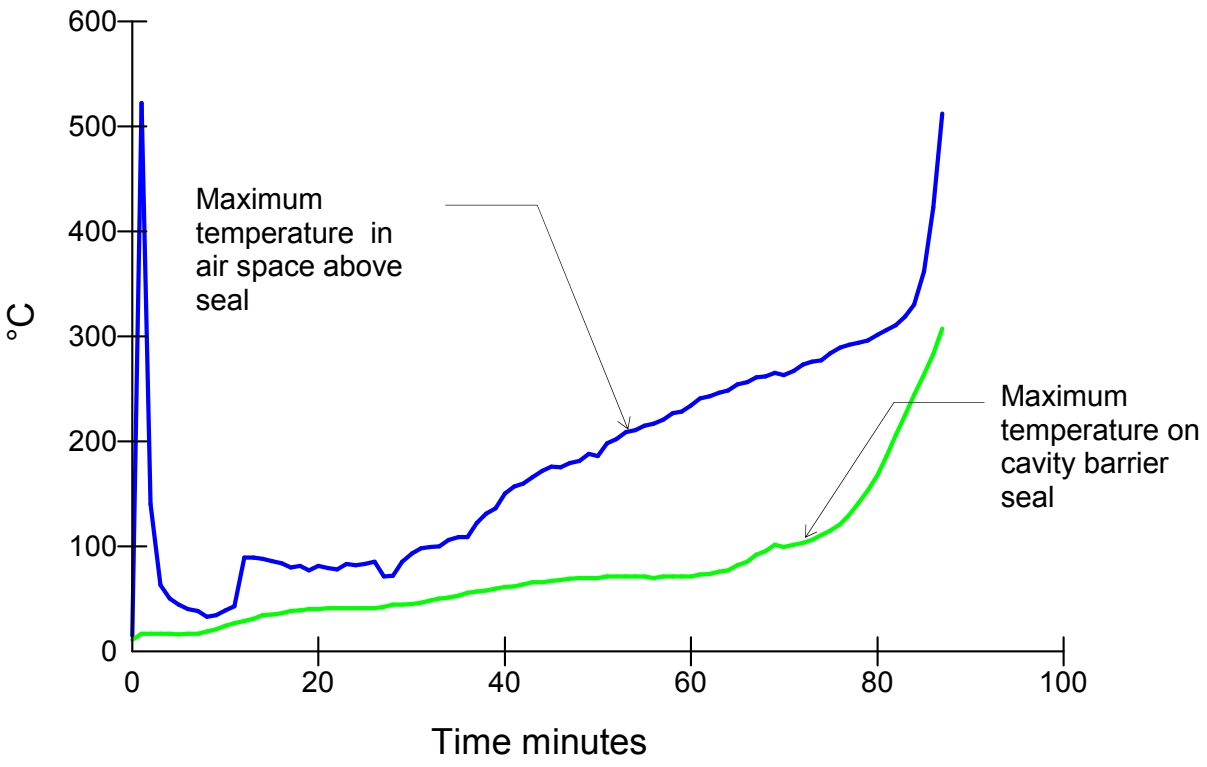
5.5 Unexposed face temperatures

Due to the nature of ventilated cavity barrier seals, an initial spike in temperature is recorded by the thermocouples adjacent to each seal as it is open to the furnace. The temperature is rapidly reduced once the seals react and fill the whole cavity.

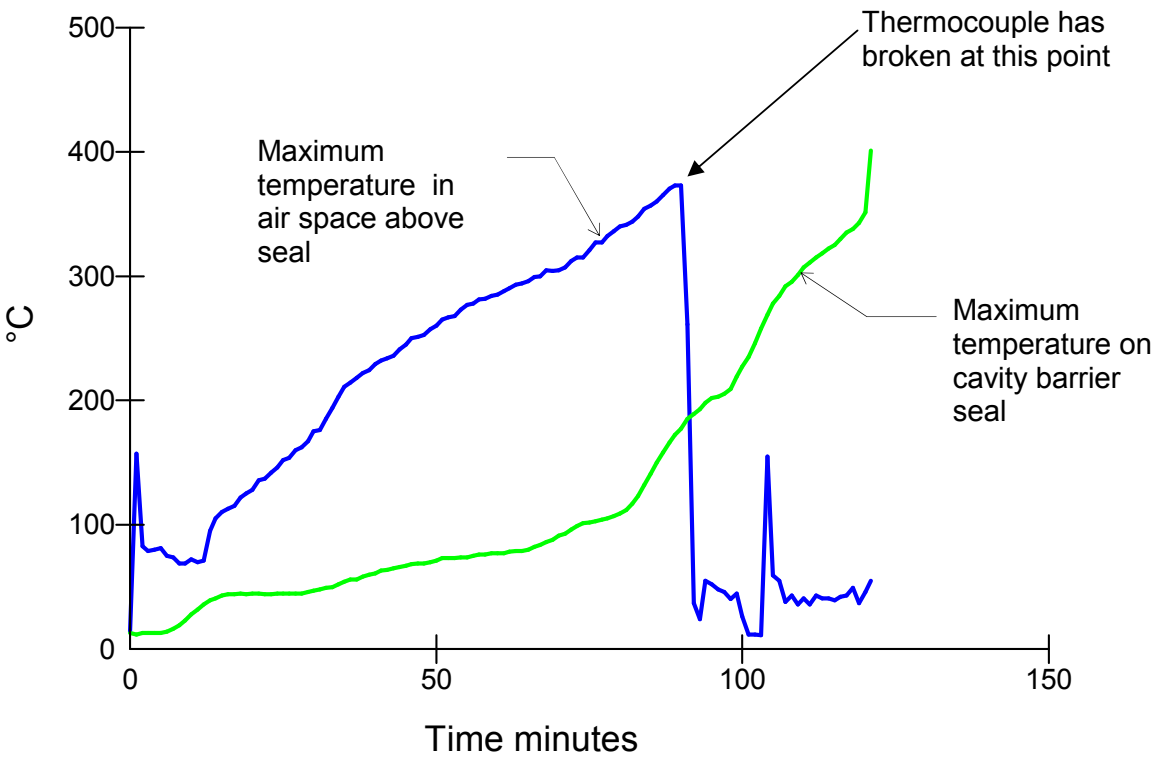
Cavity fire barrier seal A



Cavity fire barrier seal B



Cavity fire barrier seal C



6 Observations

All observations relate to the unexposed face unless otherwise stated.

Time (minutes)	Seal	Comments
0.00		Test started.
0.20	A/B	There are flames visible through the cavity gap.
01.00	A/B/C	The specimens are starting to react. The flames visible through the cavity gap have stopped.
01.30	A	The cavity gap is fully sealed off.
02.42	B	The cavity gap is fully sealed off.
03.20	C	The cavity gap is fully sealed off.
88.30	B	There is continuous flaming from the butt join.
100.00	A/C	No change.
108.45	A	A cotton pad integrity test was performed on the centre of the barrier around the intumescent area, no failure.
109.00	A	There is a glow visible from the centre of the barrier at the intumescent area.
110.00	A	A cotton pad integrity test was performed on the centre of the barrier above the intumescent area, which resulted in ignition of the cotton pad.
	C	There is a glow visible from the joint between the batt and intumescent.
115.00	C	There is a glow visible between the intumescent and wall one third along from the back of the furnace.
120.05	C	A cotton pad integrity test was performed on the glow visible between the intumescent and wall, one third along from the back of the furnace, no failure.
121.10	C	There is continuous flaming from the butt joint area of the specimen.
122.00		Test terminated.

7 Primary Observations

Time (minutes)	Seal	Comments
88.30	B	There is continuous flaming from the butt join.
110.00	A	A cotton pad integrity test was performed on the centre of the barrier above the intumescent area, which resulted in ignition of the cotton pad.
121.10	C	There is continuous flaming from the butt joint area of the specimen.
122.00		Test terminated

Whilst this report relates to an investigation, which utilised the exposure conditions given in BSEN 1363-1: 1999, the full requirements of the test standard were not complied with. The information is provided for the test sponsor's information and should not be used to demonstrate performance against the Standard nor compliance with regulatory requirements.

The test was not conducted under the requirement of UKAS accreditation.

Ross Newman
Principal Test Engineer

Vincent Kerrigan
Technical Manager

07-07-2011

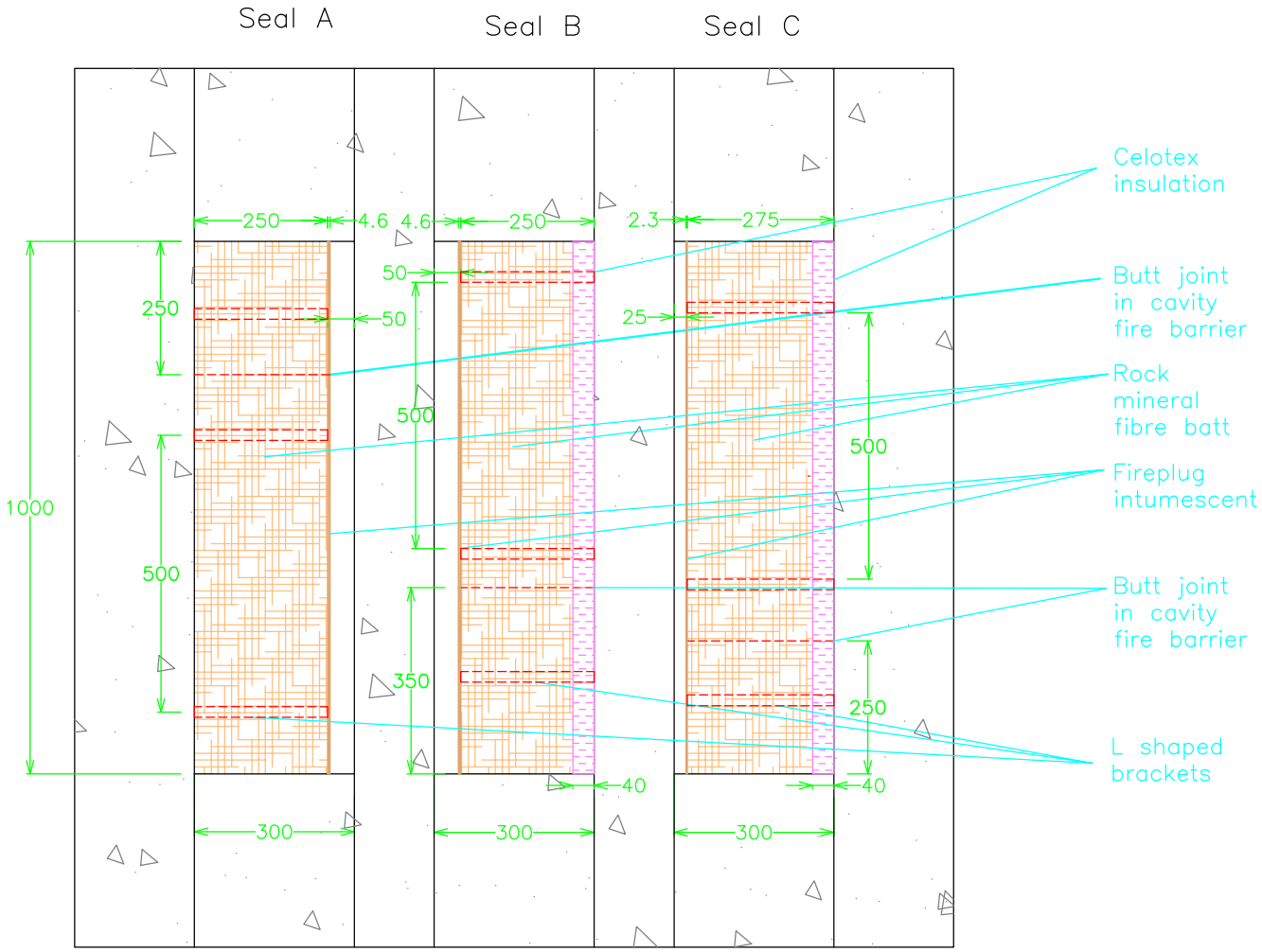
Appendix 1 – figures 1 – 3

Key to figures

1. 2 No. 75mm wide x 2.3mm thick strips Fireplug intumescent
2. 2 No. 60mm wide x 2.3mm thick strips Fireplug intumescent
3. 30mm wide x 2.3mm thick strip Fireplug intumescent
4. 110mm long steel pins through a 50mm x 50mm square washer
5. 110mm long steel pin through a 25mm x 25mm square washer
6. 3mm thick x 25mm wide x 250mm long x 175mm high steel bracket
7. 3mm thick x 25mm wide x 275mm long x 175mm high steel bracket
8. 3 No. masonry nails per bracket
9. 100mm thick x 250mm wide Knauf rock mineral fibre batt
10. 100mm thick x 275mm wide Knauf rock mineral fibre batt
11. 40mm thick Celotex insulation

Primary Sponsor: Complete Fire Protection Ltd
Secondary Sponsor: Concept Conversions Ltd

Cavity fire barrier



Front of furnace

Viewed from unexposed face

Chiltern International Fire
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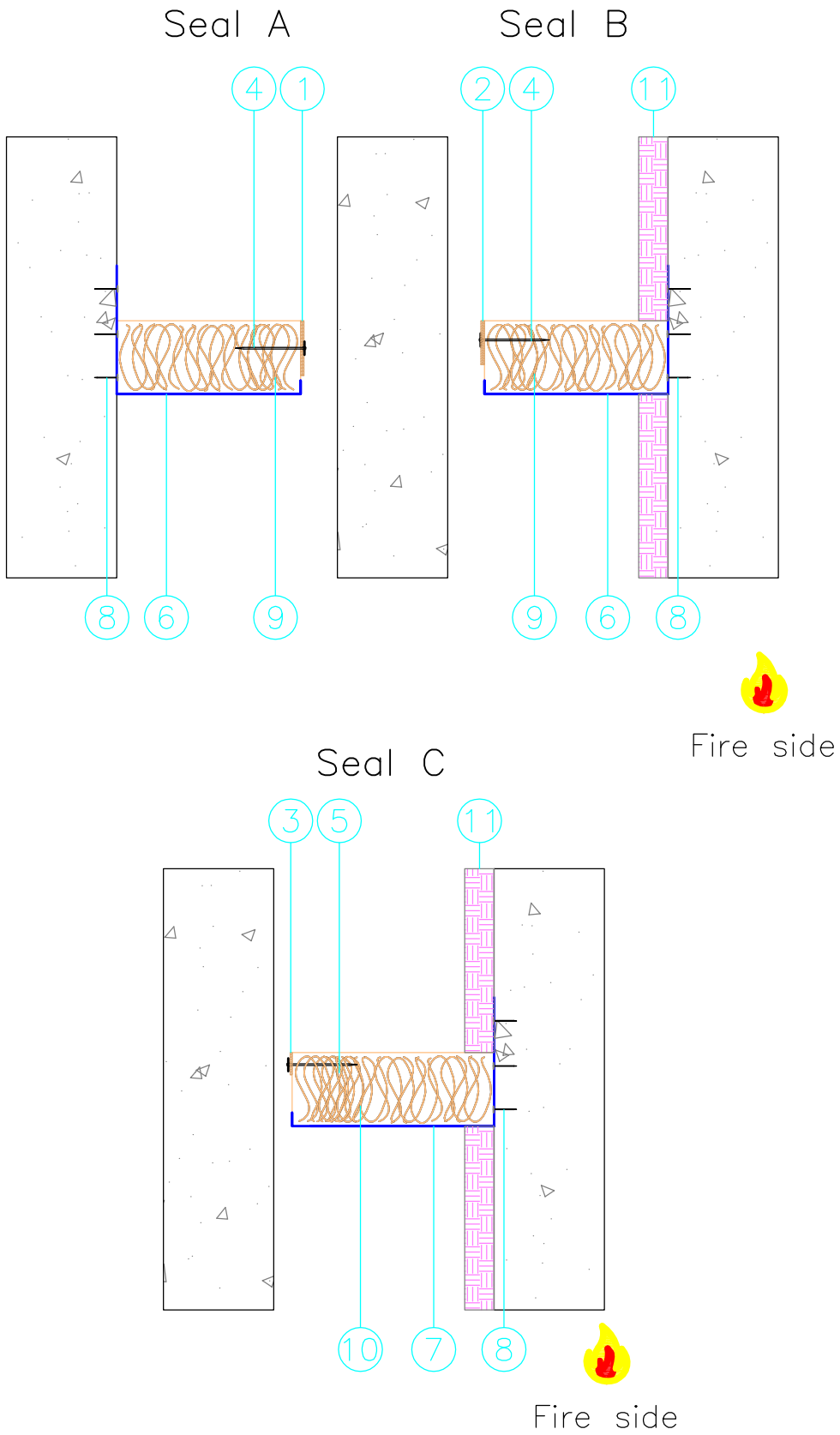
Title		
Unexposed face (All dimensions in mm)		
Date Drawn 02/06/11	Drawn By ARD	Scale NTS
Project No. Chilt/IF11025		Appendix 1

Figure 2 of 3	Primary Sponsor: Complete Fire Protection Ltd Secondary Sponsor: Concept Conversions Ltd



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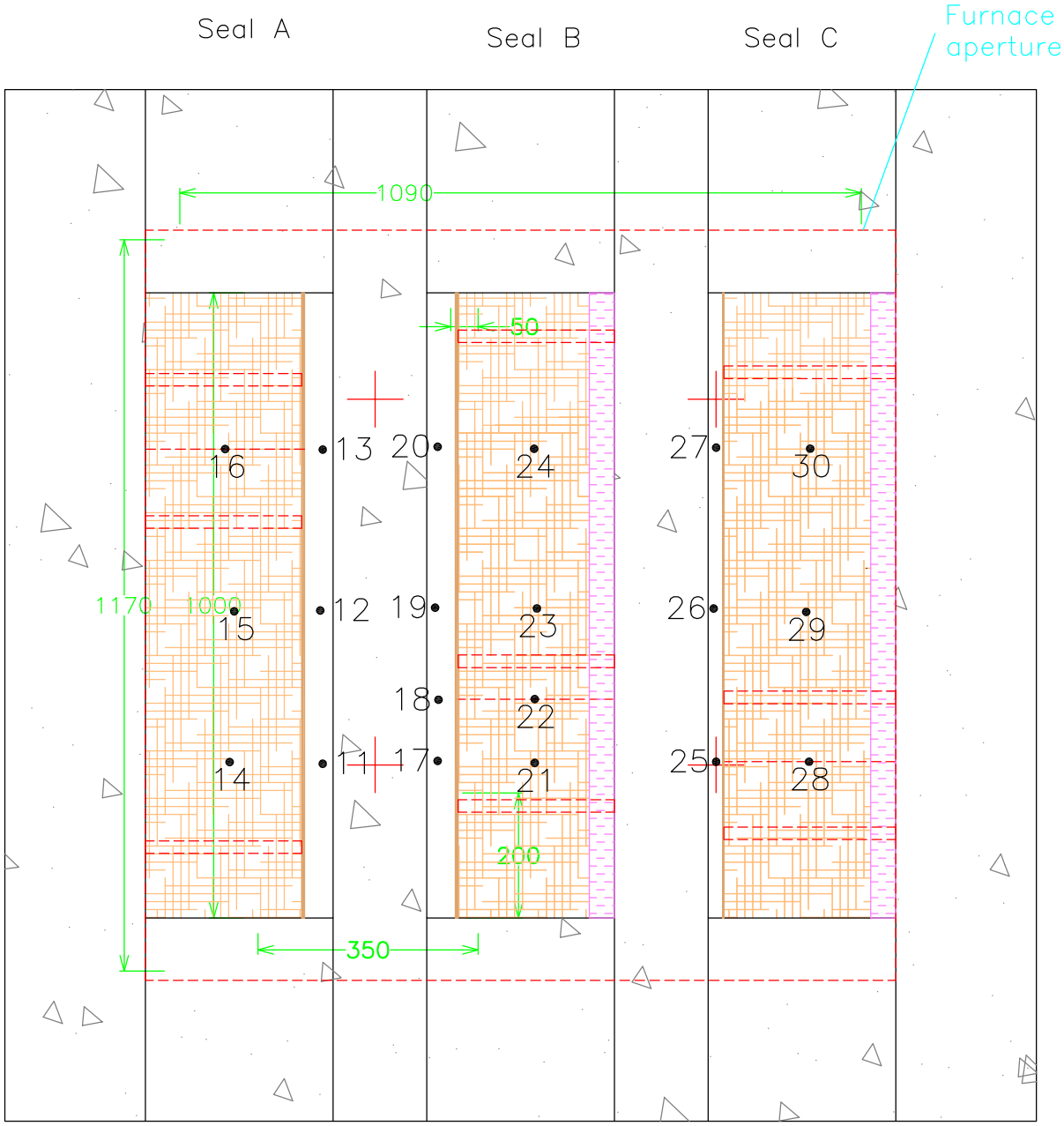
Title		
Cross sections of cavity barrier seals (All dimensions in mm)		
Date Drawn 02/06/11	Drawn By ARD	Scale NTS
Project No. Chilt/IF11025		Appendix 1

Figure 3 of 3	Primary Sponsor: Complete Fire Protection Ltd Secondary Sponsor: Concept Conversions Ltd

Cavity fire barrier



Front of furnace

Furnace thermocouples

• Unexposed face thermocouples

Viewed from unexposed face

Chiltern International Fire

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Title	Unexposed face elevations showing thermocouple positions (All dimensions in mm)	
Date Drawn 02/06/11	Drawn By ARD	Scale NTS
Project No. Chilt/IF11025		Appendix 1

Appendix 2 - raw test data (9 pages)

(see Figure 3 of Appendix 1 for channel locations)

Time	Chan 0	Chan 1	Chan 2	Chan 3	Chan 4	Chan 11	Chan 12	Chan 13	Chan 14	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
0	0	15	18	15	15	14	14	15	13	14	12	15	15	15	14	11	12	12
1	6.5	480	351	220	362	193	357	131	20	22	18	137	94	522	86	17	17	17
2	6.9	568	429	385	498	36	69	49	21	22	18	66	47	140	34	17	18	18
3	8.5	596	469	443	545	28	128	155	20	21	18	41	42	63	29	17	17	18
4	14	604	493	460	575	34	83	157	20	20	17	45	44	50	35	17	17	17
5	21.4	619	512	476	588	40	87	147	20	20	18	44	46	44	31	16	17	17
6	27.3	648	545	506	591	46	65	167	20	20	18	46	63	40	33	17	17	17
7	9	700	621	539	625	36	44	103	20	21	20	45	45	38	25	17	19	18
8	12.7	723	683	588	626	40	48	92	21	21	23	41	40	33	32	19	21	19
9	13.3	729	699	607	629	42	44	104	21	21	27	35	42	34	30	21	25	23
10	14.6	735	709	622	631	35	39	72	22	23	31	42	50	39	33	24	28	26
11	14.3	742	719	634	648	36	39	62	24	25	34	47	116	43	37	27	31	29
12	21	745	686	628	658	34	43	57	26	27	36	100	133	89	46	29	34	31
13	15.5	776	742	691	726	40	56	75	28	30	39	111	137	89	97	31	36	33
14	13.8	779	744	695	737	34	43	94	30	33	41	117	132	88	114	34	39	36
15	13.9	785	743	691	740	36	45	100	32	35	42	121	130	86	140	35	40	37
16	14.8	788	747	696	746	34	41	101	34	37	44	123	130	84	157	36	41	38
17	14.4	797	750	704	755	30	43	106	35	38	44	126	131	80	160	38	41	39
18	15	807	759	712	763	33	43	120	37	39	45	124	129	81	162	39	42	40

Time	Chan 0	Chan 1	Chan 2	Chan 3	Chan 4	Chan 11	Chan 12	Chan 13	Chan 14	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
19	16.1	811	767	723	768	38	94	129	38	41	46	130	132	77	164	40	43	40
20	15.6	819	772	733	775	36	110	140	39	42	46	135	127	81	168	40	43	40
21	15.6	824	780	741	783	42	120	144	40	42	46	150	126	79	173	41	44	41
22	15.9	832	787	751	787	75	126	142	41	43	46	159	126	78	176	41	43	40
23	15.9	838	796	760	793	88	126	153	41	43	46	162	123	83	179	41	43	40
24	15.8	842	801	765	800	95	144	162	42	44	46	164	124	82	182	41	43	41
25	13.8	848	808	772	805	100	149	164	43	44	46	167	129	83	184	41	43	41
26	14	855	813	774	812	106	155	159	43	44	46	168	127	85	128	41	43	41
27	13.8	862	818	779	818	111	164	150	44	45	46	171	134	71	125	42	44	42
28	14	867	823	782	825	117	169	136	45	45	46	173	134	72	128	44	46	43
29	18	870	828	791	827	119	172	136	45	46	47	176	141	85	134	44	46	44
30	16.8	874	838	806	835	123	175	127	46	46	47	180	149	93	141	45	47	45
31	16.2	880	846	816	842	121	178	132	47	47	49	180	150	98	139	46	48	46
32	15.8	887	851	824	847	128	179	122	48	48	50	183	151	99	142	48	49	48
33	16	890	859	830	853	131	183	116	49	50	52	187	155	100	146	50	52	50
34	15.9	895	863	835	858	137	185	114	50	52	53	187	157	106	144	51	53	52
35	15.8	899	869	843	863	138	188	109	52	54	55	189	159	109	150	53	55	53
36	15.7	905	875	849	868	149	191	110	54	56	56	192	162	109	155	56	57	56
37	15.9	909	879	854	871	150	193	111	55	58	58	193	165	122	154	57	58	58
38	15.4	914	883	859	879	154	196	110	57	60	59	196	166	131	158	58	59	59
39	15.8	917	888	866	883	158	199	109	59	61	61	201	171	136	158	60	62	62
40	15.8	920	894	870	889	173	201	110	60	63	63	203	174	150	163	61	63	63
41	15.1	924	897	876	892	175	204	108	62	65	64	199	174	157	167	62	64	64
42	15.9	928	900	881	895	180	206	109	63	66	65	198	177	160	172	64	66	67

Time	Chan 0	Chan 1	Chan 2	Chan 3	Chan 4	Chan 11	Chan 12	Chan 13	Chan 14	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
43	15.8	935	905	887	902	181	207	107	65	67	66	198	182	166	178	66	67	68
44	13.1	935	907	886	903	184	209	108	66	68	67	200	182	172	180	66	68	69
45	14.3	936	903	880	901	186	211	106	67	70	68	197	183	176	180	67	68	69
46	14.3	938	904	881	901	189	214	111	68	71	69	198	185	175	182	68	69	70
47	14.4	938	905	884	902	192	216	111	70	72	70	198	188	179	185	69	71	72
48	16.1	939	907	887	905	194	218	118	71	73	71	202	192	181	185	70	72	73
49	16.1	943	911	889	907	198	219	114	72	73	72	204	197	188	189	70	72	73
50	13.3	943	915	894	909	197	219	119	73	74	72	203	199	186	189	70	73	73
51	19	945	918	895	912	203	222	133	74	74	74	207	208	198	195	71	74	74
52	15.5	947	922	897	914	205	224	126	75	75	74	210	214	202	200	71	73	74
53	16.1	950	923	899	918	207	226	145	76	76	76	211	219	209	201	71	74	74
54	15.8	953	926	904	920	210	229	129	78	78	78	213	221	211	204	71	74	75
55	15.6	956	929	907	922	212	232	132	82	82	82	216	223	215	207	71	75	75
56	16	957	932	911	926	213	233	131	86	88	86	219	225	217	208	70	74	74
57	16	960	934	913	928	214	234	133	91	94	90	220	230	221	212	71	75	75
58	16	963	935	916	930	215	236	131	96	99	92	221	235	227	214	71	76	75
59	15.8	964	940	919	934	216	239	139	100	101	94	225	239	228	215	71	77	76
60	15.7	968	942	922	936	217	241	144	101	103	95	225	243	234	217	71	79	76
61	15.9	970	945	924	938	220	245	140	103	104	99	225	250	241	221	73	83	78
62	15.7	972	947	926	942	222	254	139	103	105	102	230	252	243	225	74	88	79
63	15.5	974	950	930	944	223	257	141	104	105	103	232	256	246	228	76	93	81
64	15.7	975	952	932	947	223	260	146	105	106	104	238	260	248	229	77	96	83
65	15.7	977	953	935	948	225	262	146	105	107	105	238	265	254	231	82	99	87
66	15.5	979	957	938	949	226	265	153	106	108	107	244	269	256	234	85	101	91

Time	Chan 0	Chan 1	Chan 2	Chan 3	Chan 4	Chan 11	Chan 12	Chan 13	Chan 14	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
67	15.3	982	959	938	952	227	267	149	107	109	108	243	275	261	237	92	102	95
68	15	984	962	942	954	228	269	165	107	110	112	249	279	262	239	95	103	98
69	15	986	964	944	958	231	272	171	109	112	118	248	284	265	241	101	109	100
70	11.4	990	962	943	957	231	273	161	109	114	121	251	287	263	243	99	119	100
71	14.7	985	963	941	957	230	275	172	110	116	125	258	294	267	248	101	133	100
72	17.4	989	973	951	963	232	278	176	111	118	128	265	304	273	255	103	146	101
73	16.7	996	975	956	967	236	281	199	113	120	131	263	311	276	258	106	163	103
74	14.9	999	978	960	972	240	285	204	115	122	137	262	315	277	261	111	180	108
75	17.3	1002	981	962	973	242	290	206	118	125	141	271	323	284	267	115	193	113
76	15.7	1005	983	967	976	243	292	209	121	128	145	282	331	289	273	121	203	119
77	15.6	1007	987	970	980	244	293	212	124	130	148	282	335	292	274	130	213	125
78	15.7	1010	991	973	984	245	294	222	127	132	152	288	340	294	277	141	226	132
79	15.5	1012	993	976	986	246	296	226	129	134	157	291	345	296	278	153	234	137
80	15.4	1016	996	979	990	247	297	227	131	135	160	298	352	301	281	168	247	144
81	15.6	1017	1000	983	992	248	298	229	133	137	164	303	359	306	283	186	261	151
82	15.4	1021	1002	986	995	252	301	231	136	139	168	305	365	311	282	206	277	161
83	16.2	1023	1003	990	999	254	303	238	138	141	172	315	371	319	287	225	290	170
84	15.2	1028	1007	992	1001	256	307	249	140	144	177	316	378	330	293	244	305	182
85	14.2	1026	1005	989	1000	257	308	251	142	145	183	323	393	362	305	264	319	193
86	14.2	1026	1006	990	1000	259	311	255	144	147	189	317	414	423	331	283	332	204
87	14.4	1028	1007	992	1003	264	314	260	146	150	197	313	461	512	468	307	352	223
88	14.1	1029	1009	993	1003	266	317	274	148	153	207	324	505	638	564	364	381	259
89	13.8	1035	1010	992	1007	265	320	285	151	156	218	419	599	615	610	456	492	286
90	12.4	1038	1014	995	1009	263	323	289	154	161	229	588	825	129	633	536	792	229

Time	Chan 0	Chan 1	Chan 2	Chan 3	Chan 4	Chan 11	Chan 12	Chan 13	Chan 14	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
91	11.2	1040	1022	999	1012	261	326	298	157	168	240	545	66	23	101	1231	-1233	125
92	17.7	1035	1009	985	1006	270	334	319	163	178	252	865	32	35	84	720	63	74
93	17.8	1031	1001	975	1000	276	346	348	165	183	257	856	39	36	91	747	62	51
94	19	1032	1004	980	1005	275	359	363	168	189	263	827	35	45	93	706	55	37
95	16.3	1037	1010	989	1009	267	364	365	170	194	269	828	31	40	90	707	59	34
96	16.2	1039	1013	992	1013	264	366	373	174	200	277	823	33	41	95	717	59	33
97	16.2	1043	1016	994	1014	261	367	380	177	205	281	823	34	41	98	720	56	31
98	16.1	1043	1017	997	1016	254	366	384	179	209	282	823	37	40	96	729	53	30
99	15.8	1047	1019	999	1018	237	364	388	181	212	279	826	33	37	93	730	54	30
100	16	1048	1020	999	1017	229	362	390	182	216	276	835	32	35	108	744	-219	31
101	16	1051	1021	1002	1020	225	360	396	186	219	279	823	29	35	145	-1233	-58	33
102	15.7	1051	1022	1002	1023	218	354	407	188	222	278	816	32	37	154	-1233	271	30
103	15.7	1053	1023	1003	1023	214	361	427	190	224	278	809	29	33	153	-1233	-1234	30
104	15.8	1054	1023	1003	1025	203	379	446	192	227	278	802	27	32	136	-1233	-1233	30
105	16.2	1054	1024	1005	1025	185	456	463	193	229	278	801	30	34	156	-1233	-1233	37
106	16	1055	1025	1006	1023	171	495	491	194	232	276	805	30	33	149	-1233	-1234	50
107	15.9	1056	1027	1006	1025	171	518	527	196	237	277	813	29	33	156	-1233	-1234	57
108	16	1059	1028	1008	1027	176	553	582	199	240	282	817	29	30	150	-1233	-1234	62
109	16.2	1058	1030	1009	1028	154	574	622	202	247	285	811	30	33	171	-1233	-212	69
110	16.1	1058	1032	1011	1029	157	595	668	202	250	282	817	31	34	176	-1233	43	71
111	16.2	1061	1032	1012	1029	99	-281	129	185	182	171	347	26	25	46	-1233	3	67
112	16.2	1062	1035	1015	1031	76	-373	20	131	101	75	53	20	23	13	-1233	-2	46
113	15.8	1064	1037	1016	1033	80	-388	17	101	71	39	39	21	25	13	-1233	21	36
114	15.8	1067	1038	1017	1035	74	-383	17	87	60	27	40	22	24	13	-1233	23	32

Time	Chan 0	Chan 1	Chan 2	Chan 3	Chan 4	Chan 11	Chan 12	Chan 13	Chan 14	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
115	15.6	1068	1039	1018	1037	82	-395	18	82	59	23	41	23	24	13	-1233	21	31
116	16	1069	1041	1020	1038	71	-380	18	79	59	22	39	23	23	13	-1233	22	31
117	9.2	1075	1041	1019	1042	80	-375	17	78	58	21	50	19	21	12	-1233	-9	30
118	15.4	1078	1042	1019	1047	132	-365	18	79	60	20	94	44	24	37	-1233	-9	29
119	15.4	1078	1044	1020	1048	161	-344	17	81	61	22	131	11	19	52	-1233	-11	28
120	15.5	1079	1045	1022	1049	146	-331	18	82	62	23	111	9	24	63	-1233	-12	29
121	14	1079	1047	1023	1051	137	-308	18	82	63	22	89	14	19	57	-1233	-13	29
122	8.2	958	961	937	962	152	-284	16	84	58	21	98	9	12	44	-1233	-12	27
123	12.1	837	853	804	861	165	115	17	84	56	20	101	9	16	41	1231	1230	28
124	2.1	696	735	83	729	125	38	16	84	52	19	76	10	12	39	1231	1230	28
125	3.3	575	619	97	580	145	6	15	85	51	18	68	7	11	36	570	1230	26
126	2.9	472	529	96	471	134	22	14	84	51	18	58	6	11	34	937	1061	26
127	2.7	426	482	98	440	138	-13	16	85	51	20	64	12	14	35	575	1056	28
128	2.7	404	452	97	427	135	-7	16	86	50	19	67	11	14	33	209	956	28

Time	Chan 24	Chan 25	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 41
min	°C	°C	°C	°C	°C	°C	°C	°C
0	12	14	14	14	13	13	12	13
1	20	80	157	85	12	13	12	13
2	21	57	83	45	13	13	13	13
3	20	61	79	43	13	14	13	13
4	20	62	80	50	13	14	13	13
5	19	61	81	59	13	14	13	13
6	20	59	75	52	14	14	13	13
7	21	51	74	53	16	15	15	13
8	23	57	69	46	19	17	16	13
9	26	56	69	47	23	19	19	13
10	29	55	72	51	28	22	21	13
11	31	47	70	47	32	26	24	13
12	33	55	71	52	36	29	28	12
13	35	71	95	51	39	33	31	12
14	37	65	105	53	41	35	33	12
15	38	67	110	49	43	37	34	12
16	39	64	113	52	44	38	35	12
17	40	66	115	51	44	39	36	12
18	41	62	122	57	45	40	37	12
19	41	62	125	51	44	40	37	12
20	42	61	128	55	45	40	37	12
21	42	64	136	57	45	41	37	12
22	42	67	137	59	44	40	37	12

Time	Chan 24	Chan 25	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 41
min	°C	°C	°C	°C	°C	°C	°C	°C
23	43	68	142	65	44	41	37	12
24	44	67	146	66	45	41	37	12
25	45	69	152	66	45	41	38	12
26	46	68	154	64	45	42	38	12
27	48	75	160	59	45	42	39	12
28	51	77	162	66	45	42	39	12
29	52	76	167	69	46	42	39	12
30	53	83	175	74	47	43	40	11
31	54	72	176	74	48	44	41	12
32	56	54	185	73	49	45	42	12
33	58	62	194	76	50	47	43	12
34	59	65	203	81	52	49	46	12
35	61	84	211	81	54	51	48	12
36	63	90	214	79	56	52	50	12
37	64	89	218	77	56	54	51	12
38	66	89	222	81	58	56	53	12
39	68	92	224	85	60	58	55	12
40	70	96	229	86	61	60	57	12
41	70	95	232	83	63	62	59	12
42	73	97	234	85	64	63	61	12
43	74	93	236	85	65	65	62	12
44	75	109	241	86	66	66	63	12
45	76	108	245	87	67	68	64	12

Time	Chan 24	Chan 25	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 41
min	°C	°C	°C	°C	°C	°C	°C	°C
46	76	114	250	87	68	69	65	12
47	77	121	251	87	69	69	65	12
48	78	116	253	93	69	70	65	12
49	78	132	257	99	70	71	66	12
50	79	120	260	95	71	72	68	12
51	80	134	265	109	73	74	70	12
52	79	132	267	112	73	74	70	12
53	80	141	268	108	73	74	70	12
54	80	152	273	110	74	74	69	12
55	81	162	277	111	74	75	70	12
56	80	174	278	116	75	76	71	12
57	82	175	281	117	76	76	71	12
58	82	176	282	122	76	77	71	12
59	81	183	284	121	77	77	72	12
60	82	185	285	123	77	78	72	12
61	84	189	288	124	77	78	72	12
62	84	186	290	125	78	78	73	12
63	85	186	293	131	79	78	73	12
64	86	189	294	127	79	78	73	12
65	90	191	296	129	80	78	72	12
66	94	193	299	134	82	78	73	12
67	96	194	300	134	84	78	73	12
68	98	184	305	138	86	78	73	12
69	101	197	304	135	88	78	73	12

Time	Chan 24	Chan 25	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 41
min	°C	°C	°C	°C	°C	°C	°C	°C
70	101	191	305	139	91	79	73	12
71	101	194	307	139	93	79	74	12
72	102	199	312	146	96	79	75	11
73	103	201	315	145	99	80	75	11
74	105	200	315	144	101	81	76	11
75	106	207	321	149	102	82	77	11
76	108	211	327	152	103	84	79	11
77	111	205	327	155	104	86	79	11
78	115	214	332	156	105	89	81	11
79	120	216	336	159	107	92	83	11
80	124	218	340	161	109	94	85	11
81	129	229	341	159	112	97	88	11
82	134	237	344	161	117	99	91	12
83	140	239	348	161	123	100	93	12
84	146	244	354	165	132	102	96	12
85	152	248	357	165	141	103	99	12
86	158	258	360	162	150	105	101	12
87	168	265	365	166	158	106	103	12
88	179	263	370	170	166	107	103	12
89	204	270	373	174	172	110	107	12
90	149	269	373	176	177	114	109	12
91	84	279	261	176	185	118	112	12
92	59	252	37	181	189	122	113	12
93	50	278	24	188	193	127	283	12

Time	Chan 24	Chan 25	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 41
min	°C	°C	°C	°C	°C	°C	°C	°C
94	48	294	55	193	198	132	119	12
95	46	288	52	189	202	136	258	12
96	44	286	48	188	203	138	124	11
97	46	290	46	186	205	142	284	12
98	48	295	40	189	209	145	307	12
99	51	306	45	200	219	150	327	12
100	49	313	26	203	227	155	246	12
101	50	322	12	206	235	160	192	12
102	51	323	12	218	246	168	141	11
103	52	341	11	222	258	177	127	12
104	59	347	155	228	269	187	121	12
105	76	354	59	234	278	199	119	12
106	55	361	55	239	284	212	117	12
107	48	360	38	243	292	225	116	12
108	46	360	43	242	295	236	116	12
109	46	363	36	246	301	249	115	12
110	46	365	41	245	307	257	115	12
111	46	364	36	245	311	261	117	12

Time	Chan 24	Chan 25	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 41
min	°C	°C	°C	°C	°C	°C	°C	°C
112	49	363	43	246	315	267	116	12
113	50	367	41	247	318	271	116	12
114	51	373	41	243	322	274	116	12
115	53	375	39	243	325	278	117	12
116	55	379	42	245	330	283	117	12
117	56	373	43	239	335	289	114	12
118	59	390	49	248	338	292	120	12
119	61	431	37	258	343	297	123	11
120	63	719	46	274	351	307	125	12
121	67	662	55	524	401	355	128	12
122	66	604	42	697	623	569	157	12
123	43	12	21	11	366	69	7	11
124	28	9	11	10	90	11	5	11
125	22	12	15	11	27	16	5	13
126	19	109	10	62	18	13	4	12
127	18	94	12	75	18	17	6	12
128	16	76	12	96	16	15	5	12