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Testing. Advising. Assuring.

Title:

The fire resistance performance of a partially insulated, single-acting single-leaf access door when tested generally in accordance with BS 476: Part 22: 1987, Clause 7.

WF Report No:

185754

Prepared for:

Timloc Building Products Limited

Rawcliffe Road
Goole
East Yorkshire
DN14 6UQ

Date:

10th November 2009

Notified Body No:

0833

UKAS TESTING
0249

Summary

Objective

To determine the fire resistance performance of a partially insulated, single-acting, single-leaf access door when tested generally in accordance with BS 476: Part 22: 1987, Clause 7.

Sponsor

Timloc Building Products Limited, Rawcliffe Road, Goole, East Yorkshire DN14 6UQ.

Summary of the Tested Specimen

The specimen had overall nominal dimensions of 1250 mm high by 650 mm wide and comprised a Zintec steel access door leaf of overall dimensions of 1200 mm high by 596 mm wide by 22 mm thick. The specimen incorporated a layer of foil faced mineral wool insulation fitted to the unexposed face. The leaf included two locks which were engaged for the duration of the test.

The specimen was orientated such that the door leaf opened towards the furnace.

The evaluation of the access door against the requirements of BS 476: Part 22: 1987, Clause 7 showed that it satisfied the requirements the period stated below:

Test Results:

Integrity	60 minutes*
Insulation	11 minutes

* The test duration. The test was discontinued after a period of 60 minutes.

Date of Test 14th August 2009

Signatories

Responsible Officer
N. Howard*
Testing Officer

Approved
D. Hankinson*
Senior Certification Engineer

* For and on behalf of **Exova Warringtonfire**.

Report Issued

Date : 10th November 2009

This is copy No.1 of Test Report WF No. 185754 which has been issued at the request of the sponsor

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Test Procedure

Introduction

The access door was of a partially insulated construction and the test was therefore conducted generally in accordance with Clause 7 of BS 476: Part 22: 1987 'Methods for determination of the fire resistance of non-loadbearing elements of construction'. This test report should be read in conjunction with that Standard and with BS 476: Part 20: 1987, 'Methods for determination of the fire resistance of elements of construction (general principles)'.

The specimen was judged on its ability to comply with the performance criteria for integrity and insulation, as required by BS 476: Part 22: 1987, Clause 7.

Fire Test Study Group/EGOLF

Certain aspects of some fire test specifications are open to different interpretations. The Fire Test Study Group and EGOLF have identified a number of such areas and have agreed Resolutions which define common agreement of interpretations between fire test laboratories which are members of the Groups. Where such Resolutions are applicable to this test they have been followed.

Instruction To Test

The test was conducted on the 14th August 2009 at the request of **Timloc Building Products Limited** the test sponsor.

Test Specimen Construction

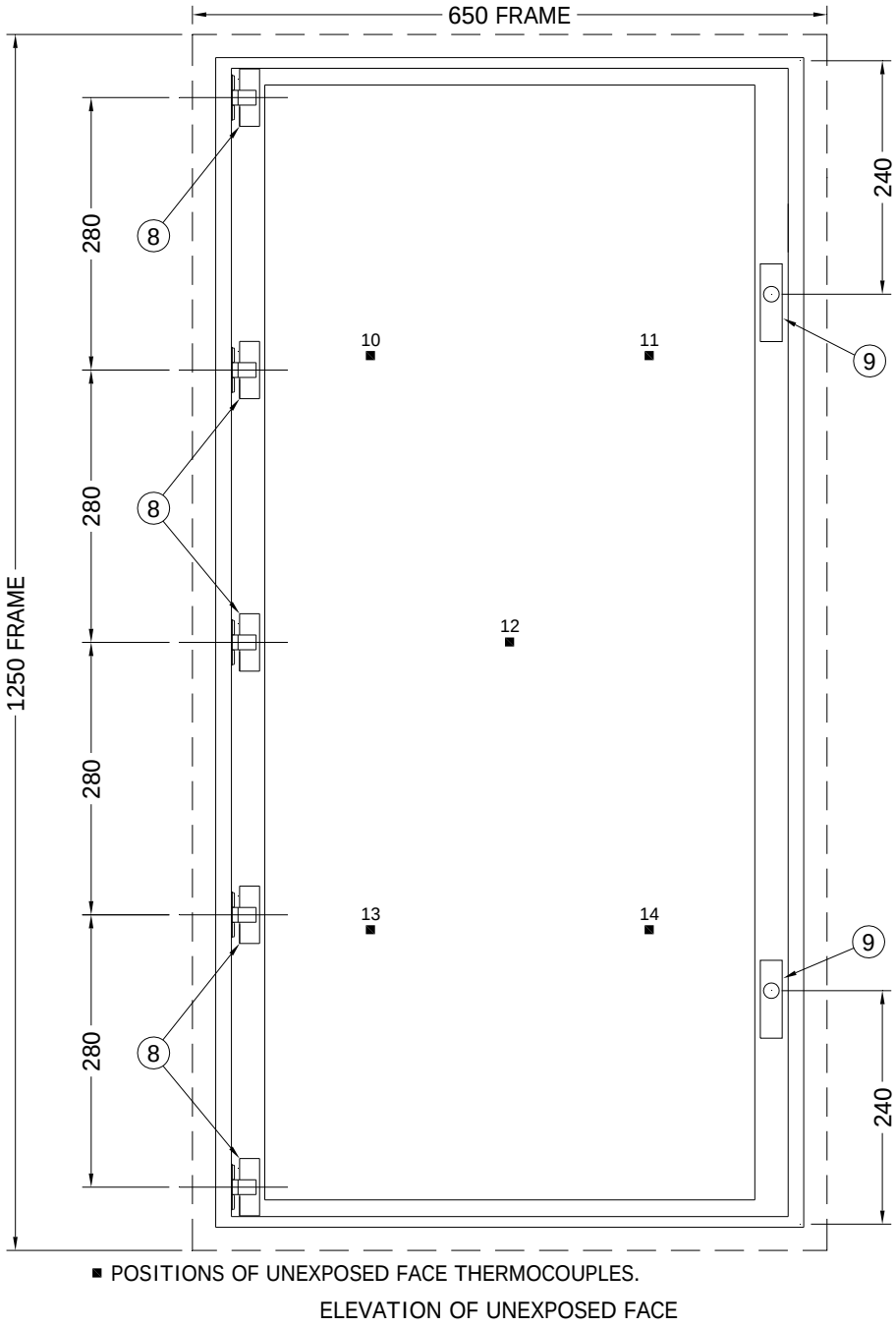
A comprehensive description of the test construction is given in the Schedule of Components. The description is based on a detailed survey of the specimen and information supplied by the sponsor of the test.

Installation

The access door was mounted within an aperture provided in a blockwork wall construction by a representative of **Exova Warringtonfire** on the 13th and 14th August 2009.

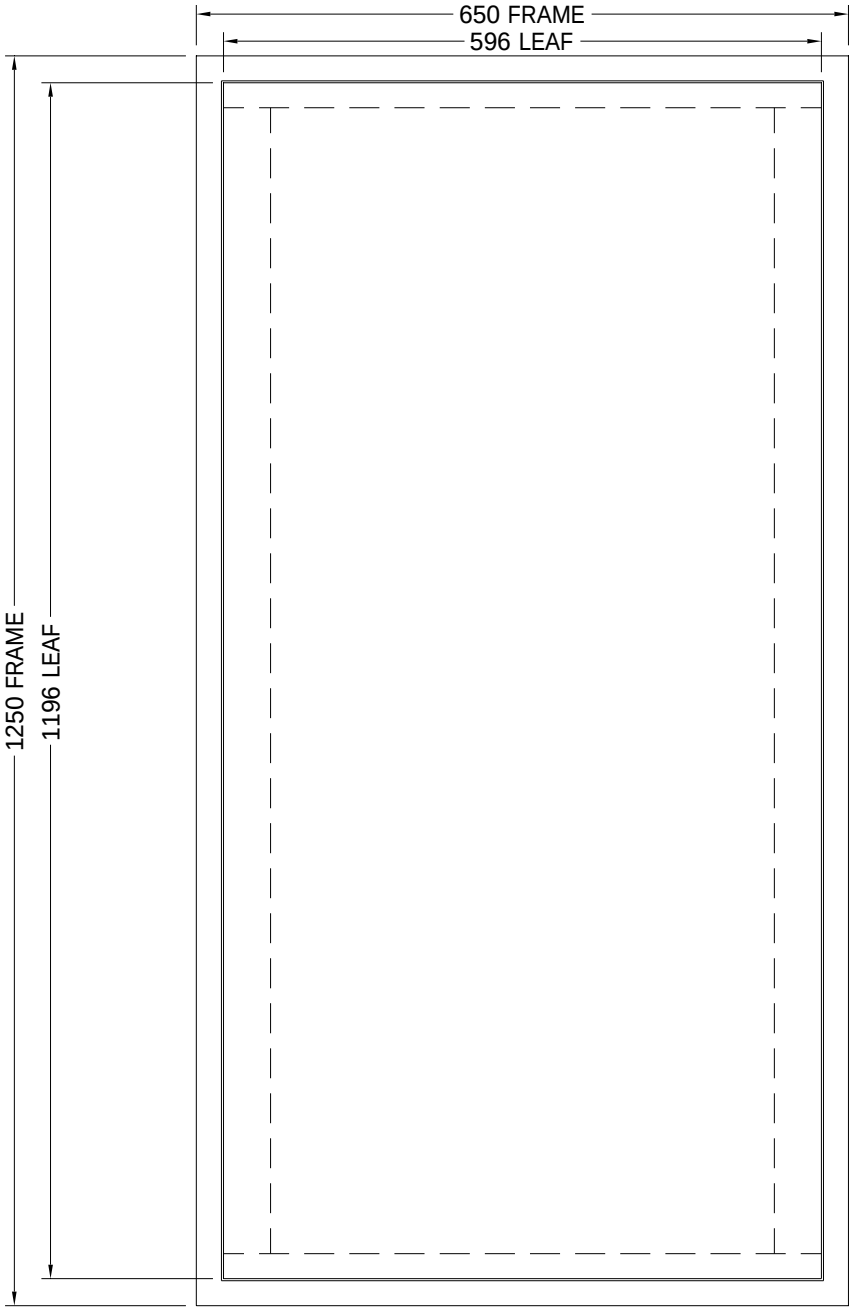
Test Specimen

Figure 1- General elevation of the unexposed face of the specimen



Do not scale. All dimensions are in mm

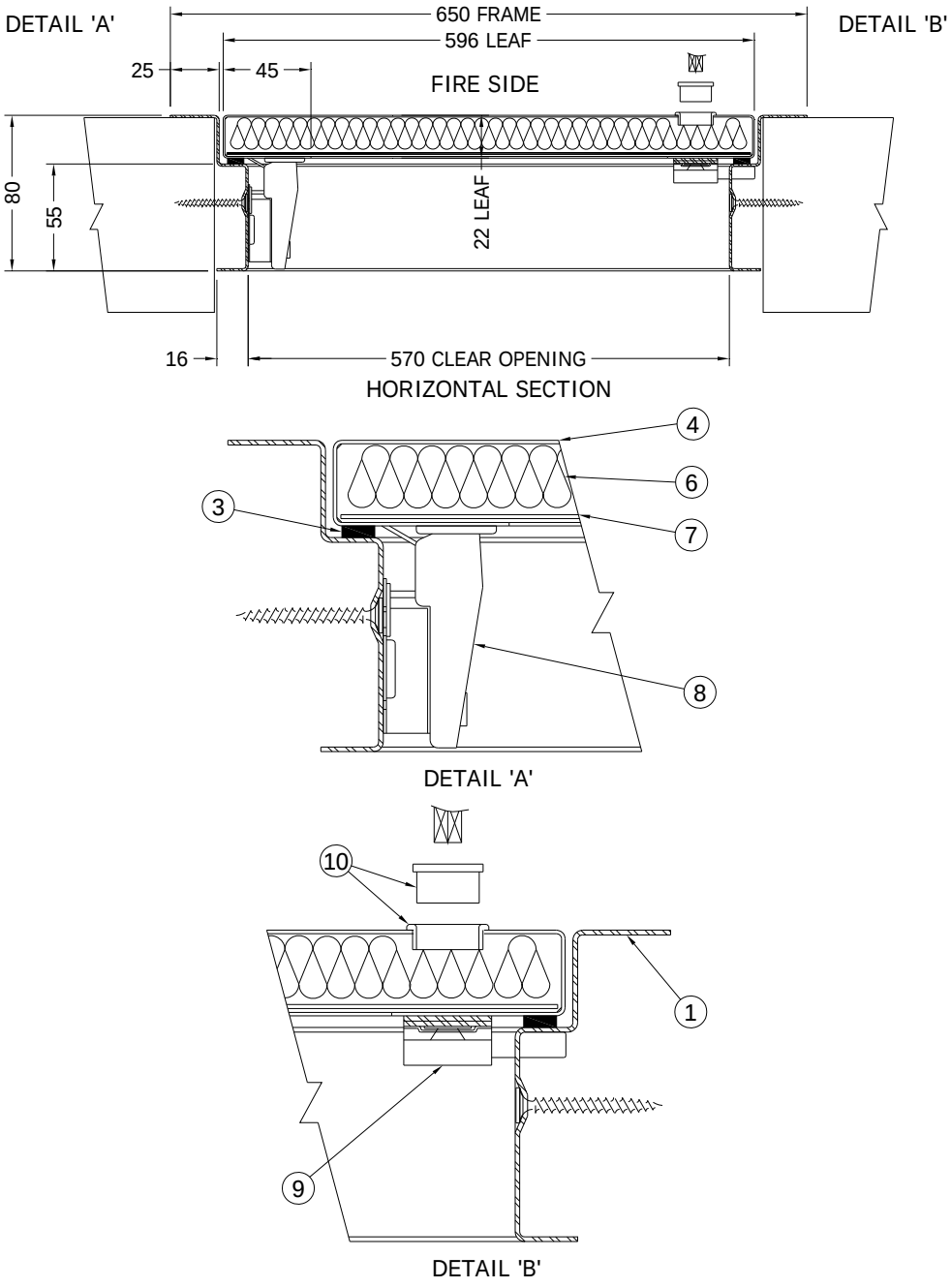
Figure 2 – Elevation of exposed face



ELEVATION OF EXPOSED FACE

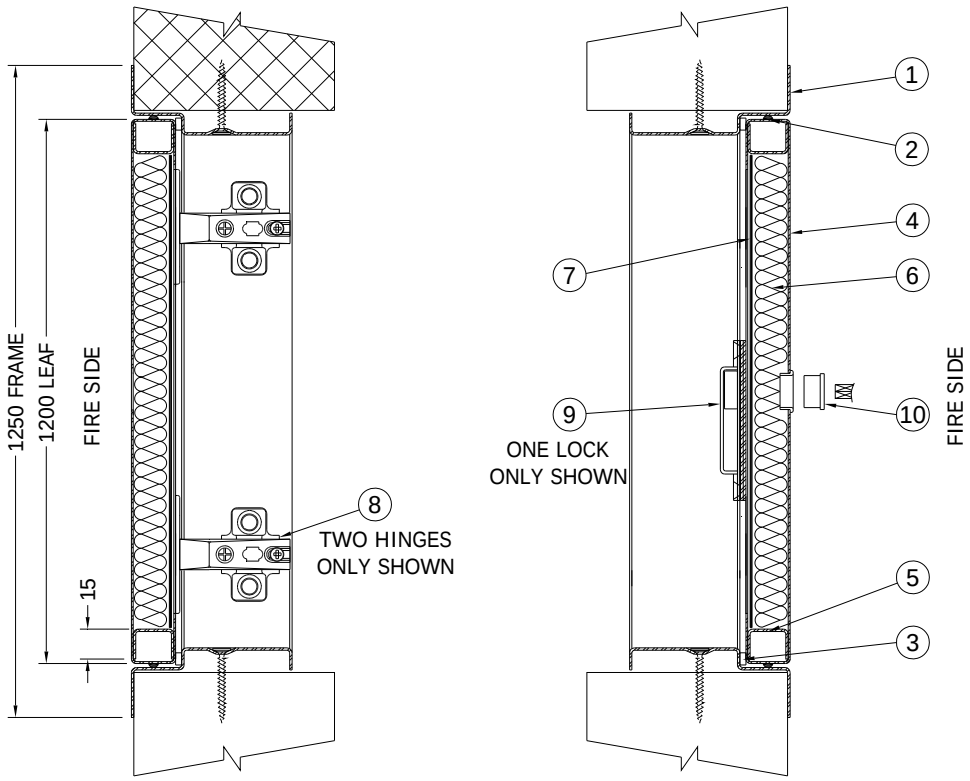
Do not scale. All dimensions are in mm

Figure 3 – Horizontal sections



Do not scale. All dimensions are in mm

Figure 4 – Vertical sections



VERTICAL SECTION
VIEW TOWARDS HINGES

VERTICAL SECTION VIEW
TOWARDS LOCK

Do not scale. All dimensions are in mm

Schedule of Components

(Refer to Figures 1 to 4)
(All values are nominal unless stated otherwise)
(All other details are as stated by the sponsor)

Item		Description
1. Door frame		
Material	:	Zintec steel
Thickness	:	1.2 mm
Size	:	80 mm wide, with a 15 mm deep rebate
Fixing method	:	Screw fixed to wall
2. Door Location Bung		
Manufacturer	:	Plastic Parts
Reference	:	460392
Material	:	Neoprene rubber bulb gasket
Fixing method	:	Self adhesive to the top and bottom edges of the door leaf
3. Dust Gasket		
Manufacturer	:	CB Frost
Reference	:	8 mm x 3 mm Grey
Material	:	Polyurethane
Fixing method	:	Self adhesive to the stop face of the frame
4. Door Leaf Skin (unexposed face)		
Material	:	Zintec steel
Thickness	:	1.2 mm
Sizes	:	The top and bottom edges were returned a distance of 15 mm. The vertical edges were returned a distance of 45 mm
5. Top and Bottom Channels		
Material	:	Zintec steel
Thickness	:	1.2 mm
Sizes	:	15 mm x 20 mm x 19 mm
Fixing	:	Spot welds
6. Door Leaf Cavity Insulation		
Manufacturer	:	FGF
Reference	:	Size
Material	:	Mineral wool insulation
Density	:	60kg/m^3
7. Door Leaf Backing (fire side)		
Manufacturer	:	FGF
Reference	:	Reflective ‘O’ foil sheet
Material	:	Aluminium sheet
Thickness	:	0.2

8. Hinge

Manufacturer		Haffle
Manufacturer's reference		Mech 323-21-609/Back 323-80-706
Material	:	Steel
Number off	:	5
Fixing method	:	2 No. screws per hinge flap
Manufacturer's reference		Mech 323-21-609/Back 323-80-706
Fixings		
i. to door frame	:	M4 x 12 mm Screw
ii. to door leaf	:	M4 x 12 mm Screw

9. Lock Assembly

Manufacturer		Emka
Reference		Budget lock
Material	:	Steel
Number off	:	2
Overall casing size	:	24 mm x 80 mm
Fixing method	:	Screw fixed to door leaf
Fixings	:	M4 x 25 mm screws
Operation of lock	:	Engaged M4 x 25 mm screws

10. Bung

Manufacturer	:	Anixter
Reference	:	Hinged Collar & Bund
Material	:	Polyvinyl chloride (pvc)

Instrumentation

General

The instrumentation was provided in accordance with the requirements of the Standard.

Furnace

The furnace was controlled so that its mean temperature complied with the requirements of BS 476: Part 20: 1987, Clause 3.1. using four mineral insulated thermocouples distributed over a plane 100 mm from the surface of the test construction.

Thermocouple Allocation

Thermocouples were provided to monitor the unexposed surface of the specimen and the output of all instrumentation was recorded at no less than one minute intervals as follows:

Thermocouples 10 to 14

At five positions on the unexposed surface of the doorset, one approximately at the centre and one at approximately the centre of each quarter section of the doorset.

The locations and reference numbers of the various unexposed surface thermocouples are shown in Figure 1.

Roving Thermocouple

A roving thermocouple was available to measure temperatures on the unexposed surface of the specimen at any position, which might appear to be hotter than the temperatures indicated by the fixed thermocouples.

Integrity criteria

Gap gauges were available to evaluate the impermeability of the specimen to hot gases.

Furnace Pressure

After the first five minutes of testing and for the remainder of the test, the furnace atmospheric pressure was controlled so that it complied with the requirements of BS 476: Part 20: 1987, Clause 3.2.2. The calculated pressure differential relative to the laboratory atmosphere at the top of the specimen was 10 (±2) Pa.

Test Observations

Time		All observations are from the unexposed face unless noted otherwise.
mins	**secs**	The ambient air temperature in the vicinity of the test construction was 12ºC at the start of the test with a maximum variation of -1ºC during the test.
00	**00**	**The test commences.**
03	**00**	Slight smoke release is evident from the head of the door leaf.
04	**00**	The door leaf begins to distort particularly along its leading edge.
05	**00**	Crackling sounds are heard from the doorset.
06	**00**	The smoke release increases in volume from the top third of the doorset.
11	**00**	The outer layer of foil becomes detached from the left side of the head of the door leaf. The maximum temperature rise is exceeded from thermocouple number 10. **Insulation failure is deemed to occur.**
22	**00**	The top 100 mm of the leading edge of the door leaf begins to glow a dull red in colour.
30	**00**	The doorset continues to satisfy the integrity criteria of the test.
40	**00**	No further significant visible change.
50	**00**	No further significant visible change.
60	**00**	The doorset continues to satisfy the integrity criteria of the test. **The test is discontinued.**

Test Photographs

The exposed face of the specimen prior to testing

The unexposed face of the specimen prior to testing

The unexposed face of the specimen after 10 minutes of testing

The unexposed face of the specimen after 55 minutes of testing

The unexposed face of the specimen after 60 minutes of testing

The exposed face of the specimen immediately after testing

Temperature and Deflection Data

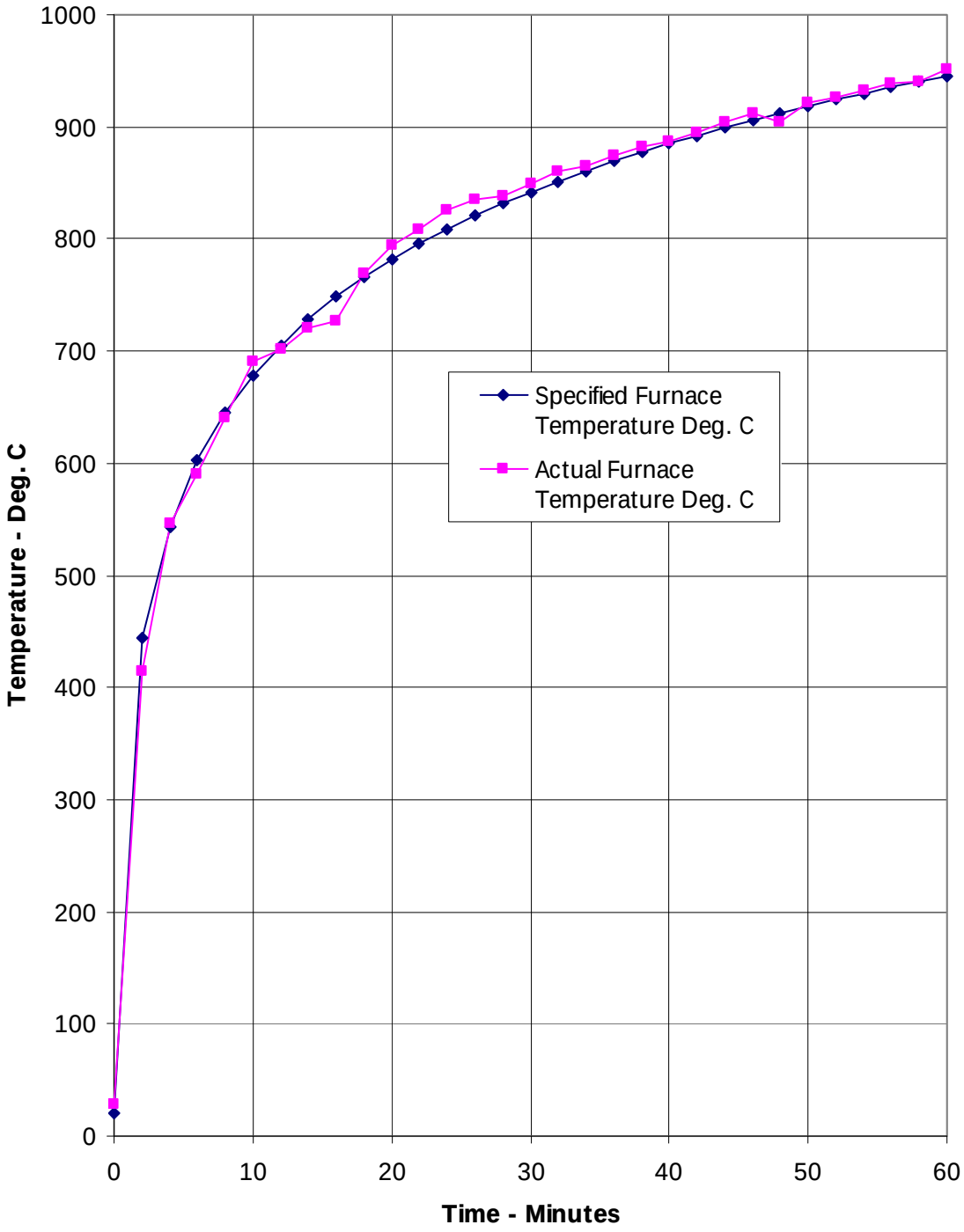
Mean Furnace Temperature, Together With The Temperature/Time Relationship Specified In The Standard

Time Mins	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	28
2	445	414
4	544	546
6	603	591
8	645	640
10	678	691
12	705	702
14	728	721
16	748	726
18	766	769
20	781	794
22	796	809
24	809	826
26	820	835
28	832	839
30	842	849
32	851	860
34	860	865
36	869	874
38	877	882
40	885	888
42	892	895
44	899	904
46	906	912
48	912	904
50	918	922
52	924	927
54	930	932
56	935	940
58	940	941
60	945	952

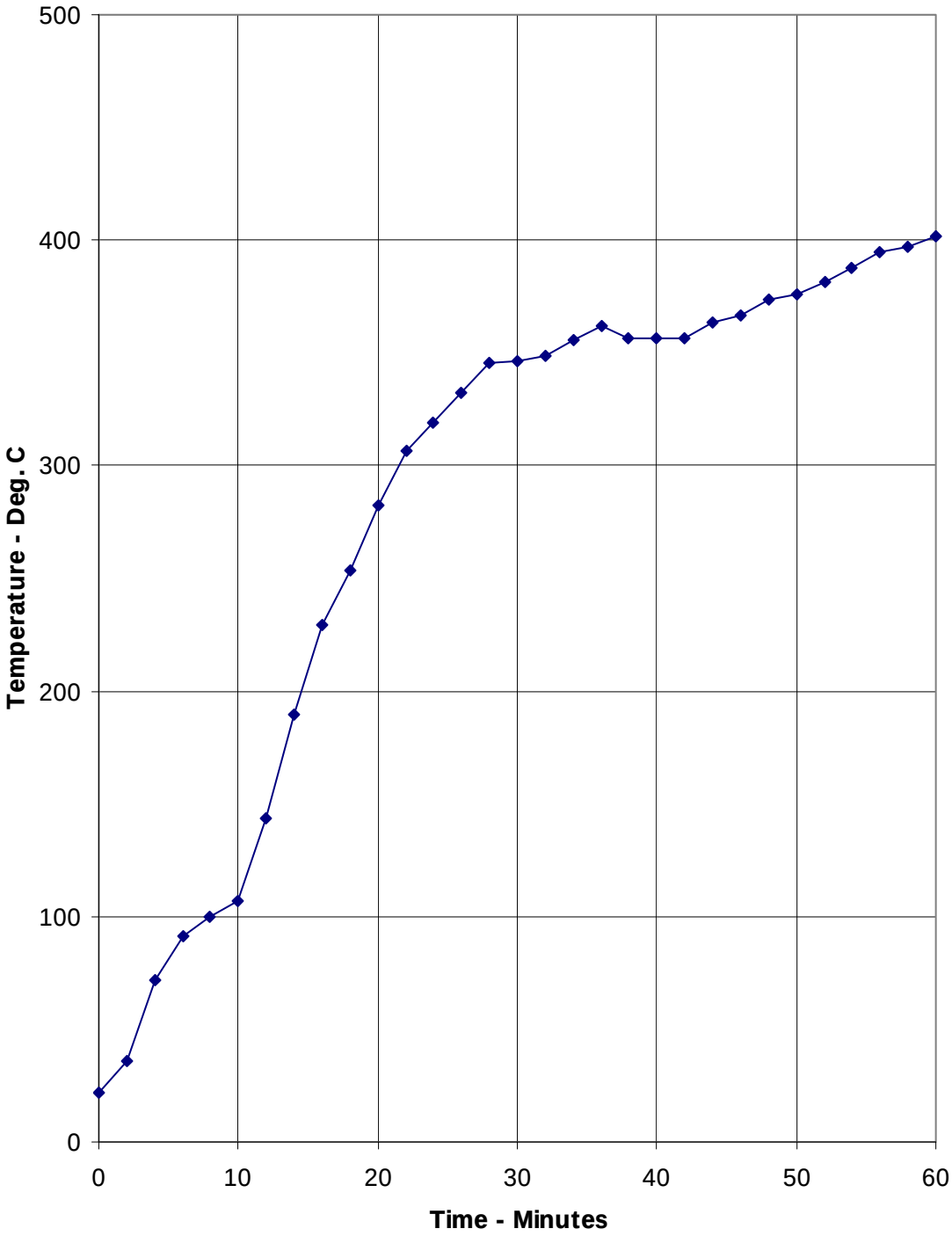
Individual and Mean Temperatures Recorded On The Unexposed Surface Of The Door Leaf

Time Mins	T/C Number 10 Deg. C	T/C Number 11 Deg. C	T/C Number 12 Deg. C	T/C Number 13 Deg. C	T/C Number 14 Deg. C	Mean Temp. Deg. C
0	22	22	23	22	22	22
2	46	48	39	24	24	36
4	79	79	76	61	65	72
6	94	92	93	87	92	92
8	106	100	99	97	98	100
10	124	106	110	100	94	107
12	207	136	157	111	105	143
14	253	203	231	142	120	190
16	268	227	252	219	182	230
18	273	238	263	255	239	254
20	293	260	290	287	281	282
22	317	279	315	310	312	307
24	332	292	334	330	307	319
26	341	304	362	350	306	333
28	354	312	385	368	308	345
30	364	317	375	370	305	346
32	375	327	378	363	300	349
34	386	338	380	371	303	356
36	383	353	385	380	309	362
38	371	354	383	361	312	356
40	365	356	387	360	314	356
42	367	355	388	363	311	357
44	369	358	398	371	321	363
46	368	358	402	378	328	367
48	368	363	409	385	345	374
50	369	365	413	390	341	376
52	373	369	423	400	343	382
54	377	376	431	408	348	388
56	381	382	440	412	360	395
58	384	384	445	413	361	397
60	389	389	451	416	365	402

Graph Showing Specified And Actual Furnace Temperatures



Graph Showing Individual and Mean Temperatures Recorded On The Unexposed Surface Of The Door Leaf



Performance Criterion and Test Results

Integrity

It is required that there is no collapse of the specimen, no sustained flaming on the unexposed surface and no loss of impermeability. The specimen satisfied these requirements for the 60 minute test duration.

Insulation

It is required that the mean temperature rise of the unexposed surface shall not be greater than 140°C and that the maximum temperature rise shall not be greater than 180°C. Insulation failure also occurs simultaneously with integrity failure. These requirements were satisfied for a period of 11 minutes after which time the maximum temperature rise was exceeded.

Ongoing Implications

Limitations

The results relate only to the behaviour of the specimen of the element of construction under the particular conditions of test. They are not intended to be the sole criteria for assessing the potential fire performance of the element in use, nor do they reflect the actual behaviour in fires.

The test results relate only to the specimens tested. Appendix A of BS 476: Part 20: 1987 provides guidance information on the application of fire resistance tests and the interpretation of test data. Application of the result to doorsets of different dimensions or supported other than by a masonry wall or incorporating different components should be the subject of a design appraisal.

Review

The specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over five years old should be considered by the user. The laboratory that issued the report will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test report.

Conclusions

Evaluation against objective

A specimen of a partially insulated, single-acting, single-leaf access door, mounted within a blockwork wall which opened towards the heating conditions of the test has been subjected to a fire resistance test generally in accordance with BS 476: Part 22: 1987, Clause 7.

The evaluation of the access door against the requirements of BS 476: Part 22: 1987, Clause 7 showed that it satisfied the requirements the periods stated below:

Test Results:

Integrity	60 minutes*
Insulation	11 minutes

* The test duration. The test was discontinued after a period of 60 minutes.