

THE PROFESSIONALS IN FIRE SAFETY •

Warrington
FIRE
research
 CONSULTANCY • TESTING

3M Coatings UK Plc
 Customer Technical Centre
 Easthampstead Road
 Bracknell
 Berks
 RG12 1JE

21 March 1995

Dear Sir

INDICATIVE FIRE TEST

We have pleasure in enclosing the information obtained from the indicative fire test conducted on your behalf on the polyester film coated Georgian wired glass.

The information enclosed relates to an investigation which utilized the test methodology given in BS 476: Part 20: 1987, the full requirements of the Standard were not, however, complied with. The information is provided for the test sponsor's information only and should not be used to demonstrate performance against the Standard nor compliance with a regulatory requirement.

The test was not conducted under the requirements of NAMAS accreditation.

The purpose of the investigation was to provide an indication of the performance of polyester film coated Georgian wired glass when it is subjected on one face to the heating conditions specified in BS 476: Part 20: 1987.

The test construction comprised:-

6mm thick Georgian wired glass (1175mm x 1175mm) coated on the exposed face with 1 coat polyester film - 100um thick (1117mm x 1111mm).

The specimen was positioned such that it formed the front vertical face of a one metre cubed gas fired furnace chamber.

The following information relating to the test is enclosed.

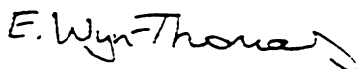
- Figure 1 - Graph of actual mean furnace temperature/BS476 curve.
- Table 1 - Specified and actual furnace temperature rises and percentage tolerances.
- Table 2 - Individual temperatures recorded on the unexposed surface of the glazing.
- Figure 2 - Graph of furnace pressure.
- Figure 3 - Graph of heat flux as measured by the water - cooled foil heat-fluxmeter.

Observations on the general behavior of the specimen during the test.

Photographs which show the specimen before, during and after the test.

We trust that the information obtained from the test will be useful to you.

Yours faithfully



MISS E. WYN-THOMAS

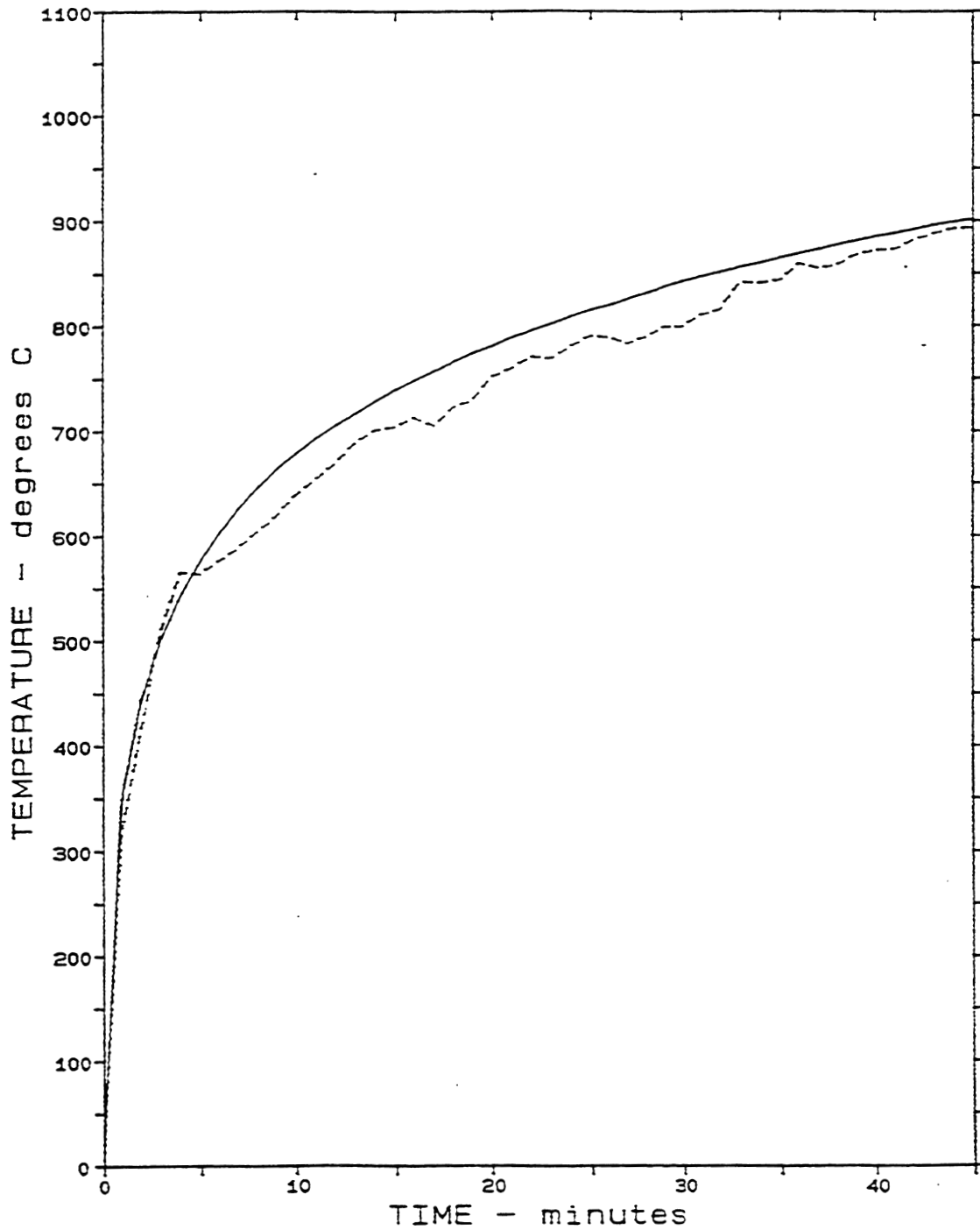
UNITED KINGDOM TEST REPORTS

ANNEX A

DATA RECORDED DURING THE TEST

FIGURE 1

FURNACE TEMPERATURE/TIME CURVES



— BS476: Part 20 Standard curve
- - - Actual Mean Furnace Temperature



ANNEX A (Continued)**TABLE 1****Variation between specified and actual time temperature curve.**

TIME	B.S.475 FURNACE TEMP.	ACTUAL FURNACE TEMP.	AREA UNDER STANDARD CURVE	AREA UNDER ACTUAL CURVE	PERCENTAGE DIFFERENCE	PERCENTAGE TOLERANCE + or -
mins	Deg C	Deg C	Deg C min	Deg C min		
0	20	9				
1	349	314				
2	445	417				
3	502	511				
4	544	566				
5	576	564				
6	603	578				
7	626	590				
8	645	604				
9	663	619				
10	678	639	5302	5087	-4.1	15
12	705	669				
14	728	701				
16	748	714				
18	766	723				
20	781	752				
22	796	772				
24	809	781				
26	820	789				
28	831	790				
30	842	800	15488	14821	-4.3	10
35	865	844				
40	885	872				
45	902	894	13110	12815	2.3	5

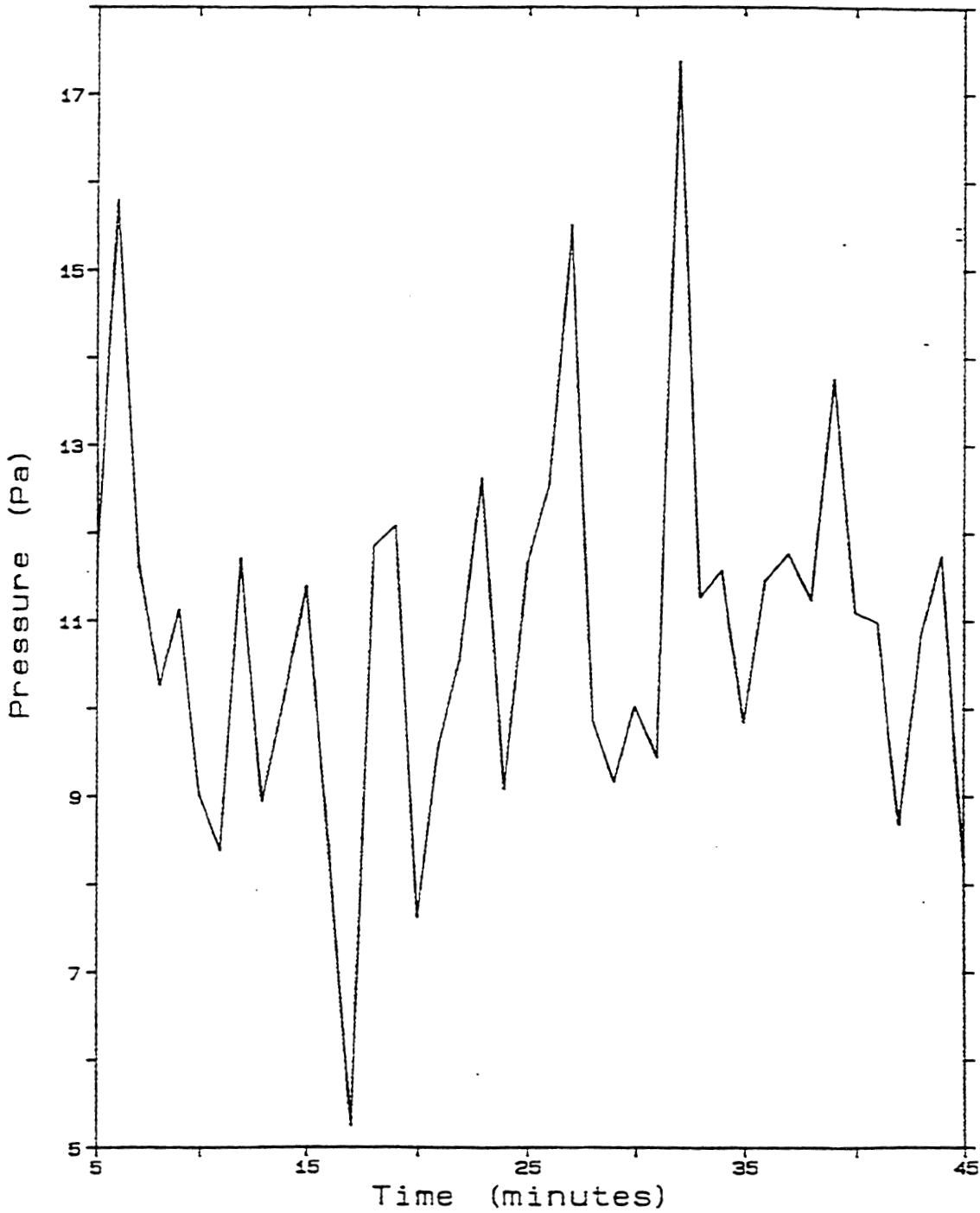
ANNEX A (Continued)**TABLE 2****INDIVIDUAL TEMPERATURES RECORDED ON THE
UNEXPOSED SURFACE OF THE GLAZING**

TIME	CHAN 36	CHAN 37	CHAN 38	CHAN 39	CHAN 40
0.00	9	9	9	10	9
1.00	25	19	24	27	21
2.00	59	45	57	71	54
3.00	99	77	114	116	114
4.00	129	105	149	151	146
5.00	158	122	185	192	106
6.00	185	142	218	91	129
7.00	215	167	83	43	53
8.00	74	158	36	25	37
9.00	24	103	19	16	24
10.00	14	79	14	15	19
11.00	13	73	13	17	18
12.00	12	68	13	17	18
13.00	13	28	17	18	21
14.00	13	17	20	20	23
15.00	14	16	22	21	25
16.00	13	15	18	20	25
17.00	15	17	19	22	28
18.00	13	18	28	17	32
19.00	14	20	33	18	34
20.00	14	19	34	17	36
21.00	15	20	35	18	38
22.00	15	22	39	18	39
23.00	16	23	41	19	42
24.00	16	23	42	19	42
25.00	16	23	43	20	44
26.00	16	24	45	20	46
27.00	17	25	46	21	47
28.00	17	25	47	21	48
29.00	17	25	48	21	49
30.00	17	26	49	22	49
31.00	19	28	51	23	50
32.00	19	28	53	24	51
33.00	19	28	55	23	54
34.00	19	29	58	24	56
35.00	20	31	59	25	59
36.00	20	32	62	25	50
37.00	23	34	64	28	60
38.00	22	34	65	27	65
39.00	22	34	64	26	66
40.00	22	41	67	27	67
41.00	23	42	70	28	70
42.00	24	50	71	29	72
43.00	22	52	71	27	73
44.00	23	52	72	27	74
45.00	25	52	73	28	74

ANNEX A (Continued)

FIGURE 2

FURNACE PRESSURE/TIME GRAPH



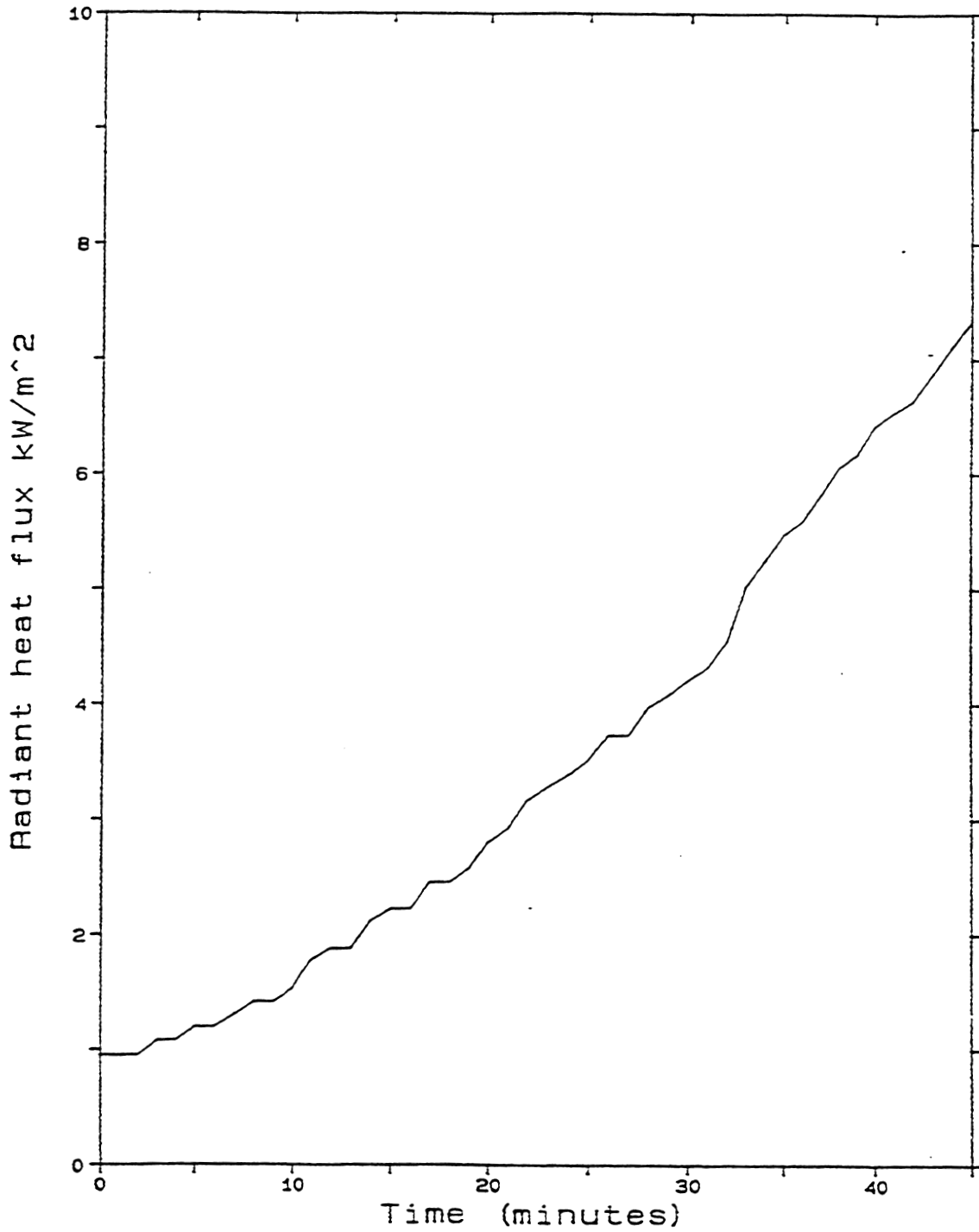
— Furnace pressure at mid-height (Pa).



ANNEX A (Continued)

FIGURE 3

RADIOMETER HEAT FLUX/TIME CURVE



— Radiant heat flux (kW/m²) at 1.6m



ANNEX B**OBSERVATIONS MADE DURING THE TEST**

The following observations were made during the test by Warrington Fire Research Centre

E - Observations from exposed side

U - Observations from unexposed side

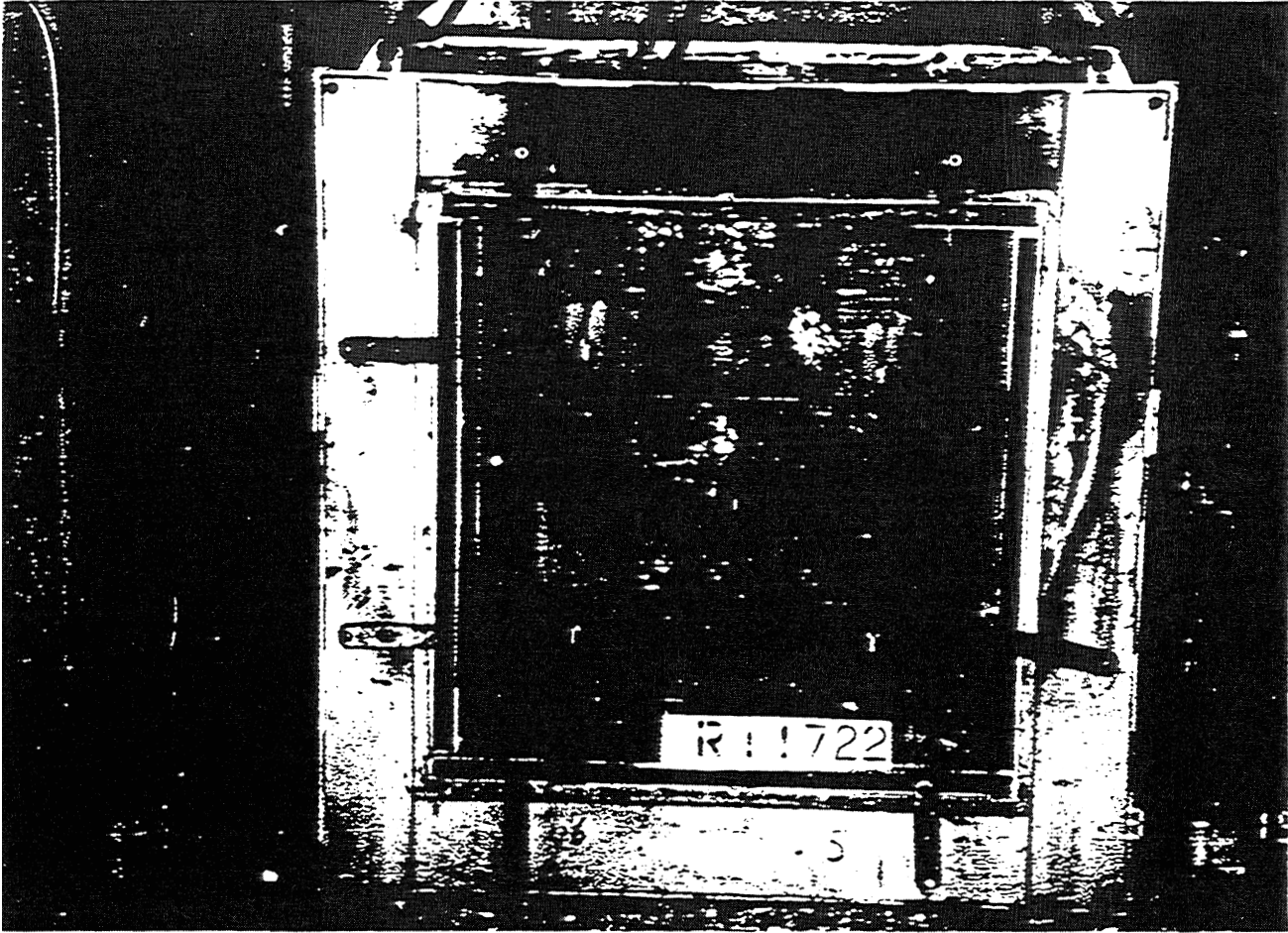
Time			
mins	secs		
00	00		Test commences.
01	00	U	The glass cracked.
05	00	U	Thermocouples No. 4 fell off the glass.
06	00	U	Thermocouples No. 3 and No. 5 fell off the glass.
07	00	U	The polyester film at the bottom right hand corner began to melt.
08	00	U	Discolouring and trickling of the film was observed to be spreading from right to left.
10	00	U	The film was blackening.
12	00	U	The film was bubbling and sliding down the glazing.
14	00	U	The glass become completely blackened.
22	00	U	The film began to harden and flake off the glazing.
27	00	U	Nearly all the film had flaked away from the glass and the glazing once more became clear.
28	00	U	The glazing was bowing into the furnace.
37	00	U	No film was left on the glazing.
45	00	U	The test was terminated.

ANNEX C

PHOTOGRAPHS

- Plate 1 - Unexposed face before the commencement of the test.
- Plate 2 - Close up view of the unexposed face during melting of the film coating.
- Plate 3 - Unexposed face towards the end of the test.
- Plate 4 - Unexposed face of the glazing at the termination of the test.





UNITED KINGDOM TEST REPORTS

Plate 1





Plate 2

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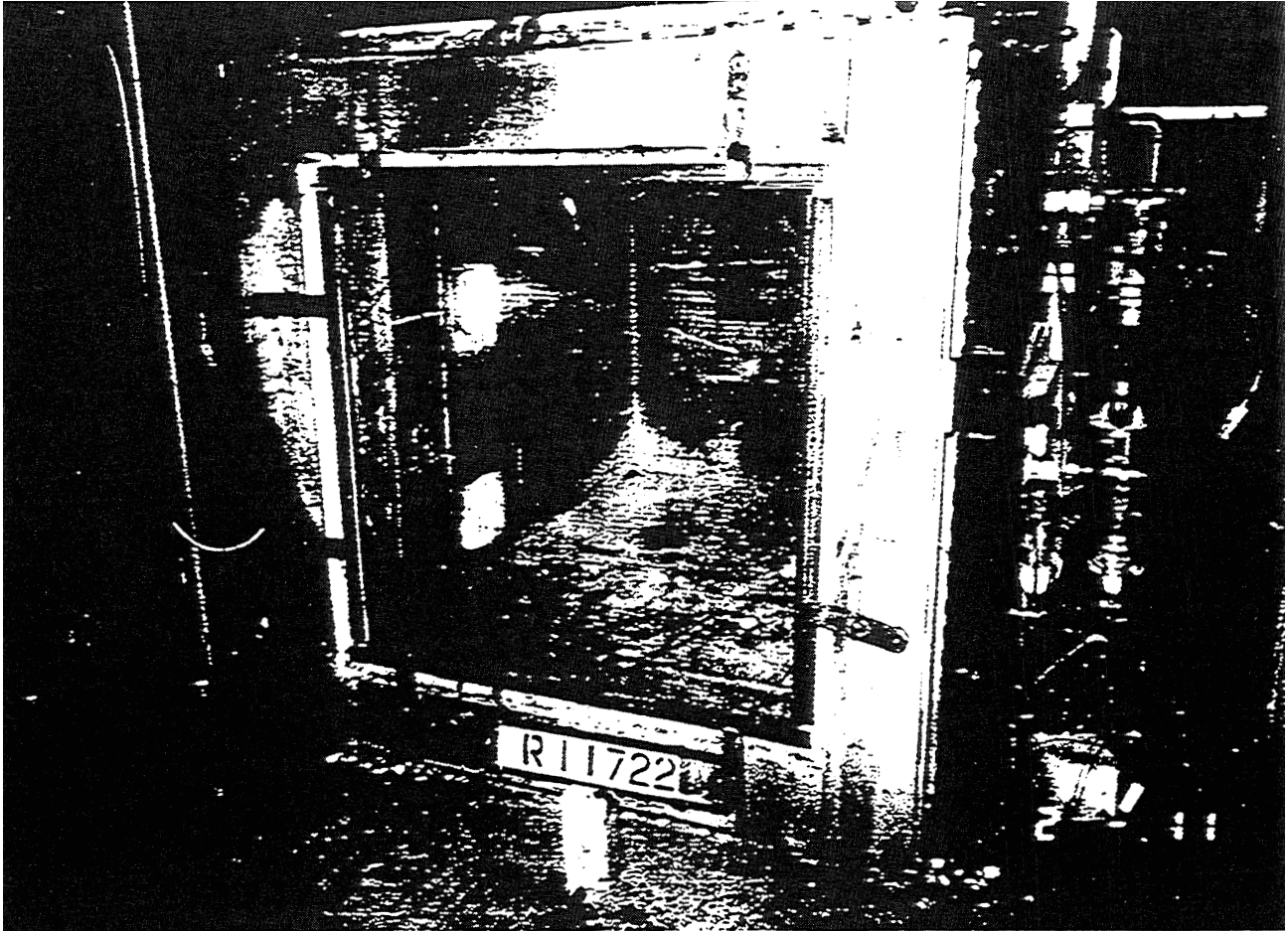


Plate 3



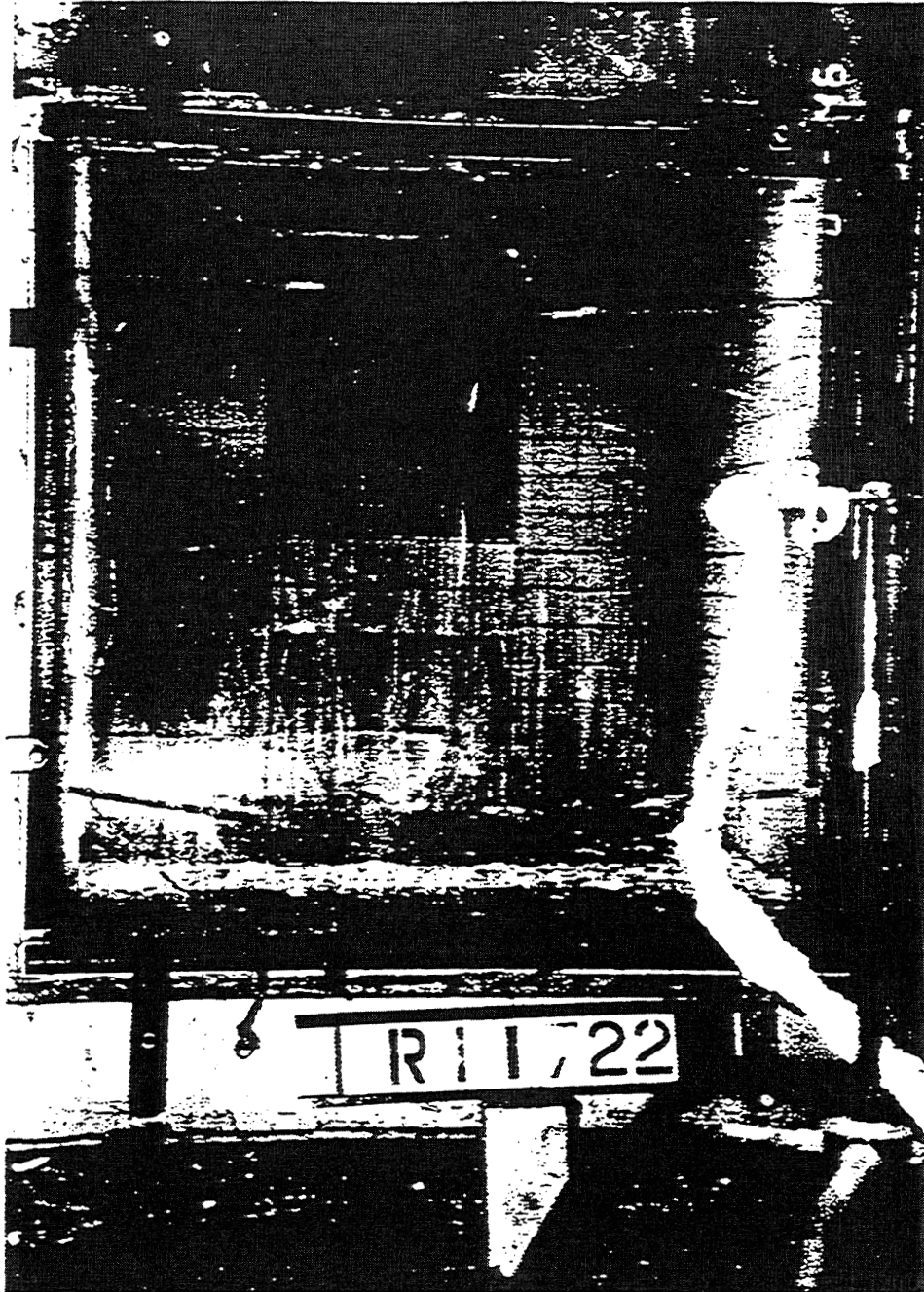


Plate 4

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