



**KOREA INSTITUTE OF
CONSTRUCTION TECHNOLOGY**

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TEST REPORT

Name of the Test : Fire resistance test for door assemblies.
Report No. : 0406-1031
Receipt No. : 601-472
Applicant : SAM HOON MACHINERY CO.
#532-5, Simgokbon1-dong, Sosa-gu, Bucheon-city,
Gyeonggi-do, Korea
Tested Date : JUNE, 4th, 2004
Name of Specimen : BLAST PROOF DOOR
Test Standard : U.L. 108 : 2001(Standard for Fire Tests of Door Assemblies)
Result of Test :

(Refer to test Result of Appendix)

Above is the test result of specimen supplied by client,
and the name of specimen belongs to client.

Tested by : Tai Jin Choi

Approved by : J. H. Yoo

Report issued JUNE, 10th, 2004

The President of Korea Institute of Construction Technology



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1. SUMMARY

1.1 The fire resistance test was conducted in accordance with the standard for fire tests of door assemblies, UL10B.(excepted hose stream test)

1.2 Furnace temperature was controlled in accordance with the standard time/temperature curve specified in UL10B.(See Appendix 2)

1.3 To measure the average temperature, four thermocouples were placed on unexposed surface of the test specimen.(See Appendix 3)

1.4 The pressure within the furnace measured at the top of the specimen was controlled to be maintained as zero.(See Appendix 4)

2. TEST RESULTS

2.1 The actual time/temperature curve is shown in Appendix 2.

The percentage difference in the areas under the standard time/temperature curve and actual time/temperature curve is shown in Appendix 2-A. The percentage difference satisfied the tolerance for the percentage difference of UL10B.

2.2 The unexposed surface temperatures of the door assembly pair were measured and recorded. the average unexposed surface temperature rise, measured after 30 min of fire of exposure, was 223°C.(See Appendix 3)

2.3 There was no crack, no flaming on the unexposed face of the specimen during the test. (See Appendix 5)

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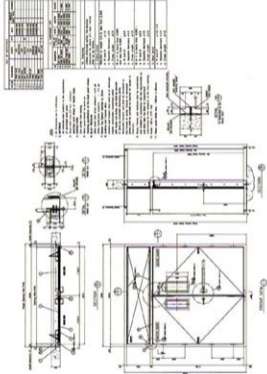
APPENDIX

| | |
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Appendix 1. Drawing of test specimen

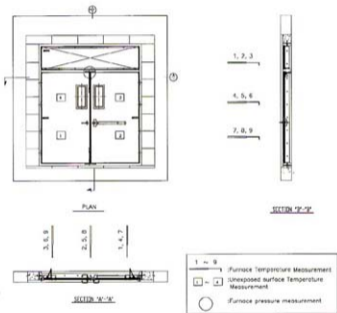
A. Construction Drawing & Material of test specimen

(Dimension : mm)



B. Drawing of measurement location

(Dimension : mm)



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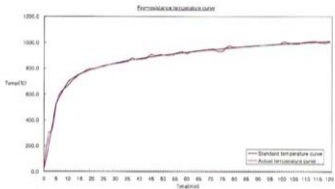
Appendix 2. Heating temperature

A. Measured heating temperature table

| Time (min) | UL10B Furnace Temp. (Deg C) | Actual Furnace Temp. (Deg C) | Area Under Standard Curve. (Deg C) | Area Under Actual Curve. (Deg C) | Difference (%) | Tolerance (+ or -) (%) |
|---------------|--------------------------------------|---------------------------------------|---|---|-------------------|------------------------------|
| 0 | 20 | 39 | 20 | 39 | | |
| 1 | 107 | 194 | 127 | 232 | | |
| 2 | 208 | 305 | 335 | 537 | | |
| 3 | 315 | 309 | 640 | 846 | | |
| 4 | 421 | 385 | 1070 | 1231 | | |
| 5 | 528 | 519 | 1599 | 1751 | | |
| 8 | 564 | 586 | 2163 | 2336 | | |
| 7 | 599 | 617 | 2762 | 2953 | | |
| 8 | 632 | 636 | 3394 | 3589 | | |
| 9 | 665 | 653 | 4059 | 4243 | | |
| 10 | 697 | 668 | 4756 | 4911 | | |
| 12 | 723 | 711 | 6190 | 6315 | | |
| 14 | 745 | 741 | 7669 | 7782 | | |
| 16 | 764 | 763 | 9180 | 9298 | | |
| 18 | 778 | 786 | 10738 | 10860 | | |
| 20 | 792 | 794 | 12314 | 12450 | | |
| 22 | 802 | 802 | 13913 | 14049 | | |
| 24 | 812 | 811 | 15533 | 15667 | | |
| 26 | 822 | 820 | 17172 | 17302 | | |
| 28 | 831 | 829 | 18830 | 18956 | | |
| 30 | 839 | 837 | 20504 | 20627 | | |
| 35 | 859 | 852 | 24759 | 24854 | | |
| 40 | 875 | 870 | 29101 | 29211 | | |
| 45 | 889 | 909 | 33516 | 33639 | | |
| 50 | 902 | 902 | 37998 | 38154 | | |
| 55 | 913 | 915 | 42540 | 42667 | | |
| 60 | 924 | 914 | 47138 | 47273 | 0.3 | 10 |
| 65 | 934 | 937 | 51785 | 51926 | | |
| 70 | 943 | 948 | 56481 | 56646 | | |
| 75 | 952 | 931 | 61222 | 61324 | | |
| 80 | 960 | 963 | 66006 | 66145 | | |
| 85 | 963 | 967 | 70830 | 70968 | | |
| 90 | 975 | 973 | 75692 | 75821 | | |
| 95 | 982 | 981 | 80589 | 80709 | | |
| 100 | 988 | 999 | 85519 | 85644 | | |
| 105 | 994 | 990 | 90477 | 90622 | | |
| 110 | 999 | 1003 | 95460 | 95601 | | |
| 115 | 1004 | 1001 | 100469 | 100626 | | |
| 120 | 1008 | 1002 | 105501 | 105618 | 0.1 | 7.5 |

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B. Fire-resistance temperature curve



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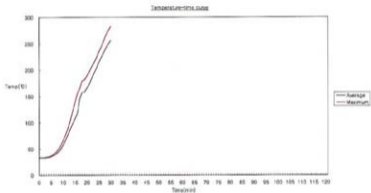
Appendix 3. Unexposed Face Temperature Rise

A. Unexposed face temperature table

| Time(min) | ch1 | ch2 | ch3 | ch4 | Average | Maximum |
|-----------|-----|-----|-----|-----|---------|---------|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3 | 1 | 1 | 0 | 0 | 0 | 1 |
| 4 | 1 | 2 | 0 | 1 | 1 | 2 |
| 5 | 2 | 4 | 1 | 3 | 2 | 4 |
| 6 | 3 | 7 | 2 | 5 | 5 | 7 |
| 7 | 6 | 10 | 4 | 8 | 7 | 10 |
| 8 | 8 | 16 | 7 | 12 | 11 | 16 |
| 9 | 12 | 23 | 10 | 19 | 16 | 23 |
| 10 | 19 | 32 | 16 | 28 | 24 | 32 |
| 11 | 27 | 43 | 22 | 39 | 33 | 43 |
| 12 | 37 | 55 | 29 | 50 | 43 | 55 |
| 13 | 49 | 71 | 37 | 60 | 54 | 71 |
| 14 | 61 | 88 | 46 | 62 | 64 | 88 |
| 15 | 72 | 105 | 57 | 63 | 74 | 105 |
| 16 | 84 | 123 | 67 | 64 | 84 | 123 |
| 17 | 93 | 131 | - | - | 112 | 131 |
| 18 | 103 | 146 | - | - | 125 | 146 |
| 19 | 103 | 149 | - | - | 126 | 149 |
| 20 | 110 | 156 | - | - | 133 | 156 |
| 21 | 117 | 163 | - | - | 140 | 163 |
| 22 | 129 | 173 | - | - | 151 | 173 |
| 23 | 141 | 181 | - | - | 161 | 181 |
| 24 | 151 | 190 | - | - | 170 | 190 |
| 25 | 161 | 201 | - | - | 181 | 201 |
| 26 | 171 | 210 | - | - | 191 | 210 |
| 27 | 178 | 222 | - | - | 200 | 222 |
| 28 | 185 | 233 | - | - | 209 | 233 |
| 29 | 191 | 242 | - | - | 217 | 242 |
| 30 | 197 | 249 | - | - | 223 | 249 |

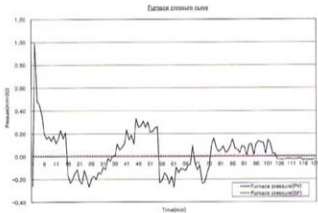
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B. Temperature-time curve



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Appendix 4. Furnace pressure curve



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Appendix 5. Observation

| Time(min) | Observation |
|-----------|--|
| 00:00 | Test started |
| 00:03 | Slight smoke began to be released from the top of the test specimen. |
| 00:17 | The test specimen began to be bent toward the furnace. |
| 00:37 | whole specimen unexposed surface getting dark |
| 01:19 | The test specimen began to be red hot |
| 02:00 | The test was terminated. |

Appendix 6. Test photography



Before the test



After the test

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