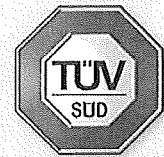


**Test Report No. 7191252325-MEC21-SW**  
dated 11 FEB 2021



PSB Singapore

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**Note:** This report is issued subject to the Testing and Certification Regulations of the TÜV SÜD Group and the General Terms and Conditions of Business of TÜV SÜD PSB Pte Ltd. In addition, this report is governed by the terms set out within this report.

**SUBJECT:**

Fire resistance test on "Hang Hong" ML3, a mullion metal doorset submitted by Hang Hong Contractor Pte Ltd.

**TESTED FOR:**

Hang Hong Contractor Pte Ltd  
10 Bukit Batok Crescent  
#04-08, The Spire  
Singapore 658079

**DATE SUBMITTED:**

19 Jan 2021

**DATE OF TEST:**

22 Jan 2021

**PURPOSE OF TEST:**

1. To determine the fire resistance performance of a door assembly when tested in accordance with SS 332: 2018 – Annex B Fire resistance test: Requirements and test methods – BS EN 1634-1.



LA-2007-0380-A LA-2007-0386-C  
LA-2007-0381-F LA-2010-0464-D  
LA-2007-0382-B LA-2018-0702-B  
LA-2007-0383-G LA-2018-0703-G  
LA-2007-0384-G LA-2020-0747-L  
LA-2007-0385-E

The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council. Inspections/Calibrations/Tests marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our inspection body/laboratory.

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**CONCLUSION:**

32. The specimen satisfied the requirements of the SS 332: 2018: Annex B Fire resistance test: Requirements and test methods – BS EN 1634-1 for the periods stated below: -

Integrity

Sustained flaming : 53 minutes  
Gap gauge : 132 minutes  
Cotton pad : Not evaluated (uninsulated doorset)

Insulation : 10 minutes (normal procedure)

\*Test terminated at 132 minutes as agreed by test sponsor

**REMARKS:**

33. Integrity

At 53 minutes 44 seconds, continuous flaming for more than 10 seconds was observed on the active leaf of the unequal double leaf doorset, at mid-width of the top edge. Therefore, the integrity of the specimen meets the standard for 53 minutes.

34. Insulation

At 11 minutes of test;

Maximum average temperature and maximum temperature rises above the initial temperature, measured on the unexposed face of the specimen was 90.0°C (<140°C).  
Maximum temperature rises above the initial temperature of door leaf, 100mm from edge was 200.5°C (<180°C).

Maximum temperature rise of the door frame above initial temperature was 171.8°C (<360°C).

Therefore, the insulation of the doorset meets the standard for 10 minutes for normal procedure.



**LIMITATIONS:**

35. This report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in BS EN 1363-1, and where appropriate BS EN 1363-2. Any significant deviation with respect to size, constructional details, loads, stresses and edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report.
36. Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.
37. The results only relate to the behaviour of the specimen of the element of construction under the particular conditions of the 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.

**WITNESSES:**

38. The test was witnessed by the following representatives: -

Hang Hong Contractor Pte Ltd	:	Mr. Daniel Kee
Allegion (SEA) Pte Ltd	:	Ms. Sally Sim

A handwritten signature in black ink.

Wu JieHao, Sherman  
Associate Engineer

A handwritten signature in black ink.

Chan Lung Toa  
Assistant Vice President  
(Fire Testing)  
Mechanical Centre



**APPENDIX 1**

Time (min.sec)	Observations on the unexposed face
0:00	Test commenced.
4:06	Door A top and bottom corner of lockset side bulged up.
6:56	Smoke emitting from all 3 doors.
8:56	Slight through gap observed at bottom left corner of door A.
10:17	Top astragal of door B discoloured.
13:14	Both mullions discoloured at all hinge locations.
14:13	Vision panel beading discoloured.
15:54	Transitory flaming observed at bottom left lockset side of door A, deflection point G location.
16:33	Concealed door closer of door A leaked.
17:18	Transitory flaming at 15:54 stopped.
19:35	Door B digital lock cover detached.
23:06	All door panels discoloured.
25:33	Top of astragal of door B active leaf bulged up.
26:25	Door B digital lock cover dropped.
42:40	Mid-height of left mullion red hot.
<b>53:44</b>	Continuous flaming for more than 10 seconds was observed on the active leaf of door B (with concealed door closer), at mid-width of the top edge. Integrity fails at this point.
56:58	Door A digital lock deformed.
57:38	Slight through gap observed at top left corner of door A.
73:51	Continuous flaming for more than 10 seconds was observed at door A third hinge location.
76:35	Flaming at 73:51 stopped. Flaming at third hinge location lasted for 2 minutes and 44 seconds.
86:50	Door B digital lock rubber gasket glowing.
97:51	Transitory flaming was observed at door A third hinge location.
122:44	Transitory flaming was observed at door A bottom left of lockset side, deflection point G area.
124:02	Continuous flaming for more than 10 seconds was observed at door A top left of lockset side, deflection point B area.
125:29	Continuous flaming for more than 10 seconds was observed at inactive leaf of door B first hinge location.
132:00	Test ended as requested by test sponsor. Flaming persist at areas 53:44, 124:02 and 125:29.



**APPENDIX 2**  
**SCHEDULE OF COMPONENT**

(With reference to drawing on pages no.26 to no.29 of this test report)

1. Door closer : Door A – “Briton” 3620 EN3-6 concealed door closer with sliding arm, 40mm x 54mm x 257mm body dimension.  
Door B (Active) – “Briton” C3024C EN2-4 concealed door closer with sliding arm, 33mm x 46mm x 241mm body dimension.  
Door B (Inactive) – “CISA” C1510.03 EN2-4 surface mounted door closer with regular arm, 60mm x 41mm x 206mm body dimension.  
Door C – “CISA” C2010.03 EN3 surface mounted door closer with sliding arm, 55mm x 40mm x 202mm body dimension.
  
2. Lockset : Door A – “Schlage” LM50 digital mortise lock with case size of 103mm x 147mm x 22mm thick, forend size of 24mm x 240mm x 2.5mm thick, latch size of 15mm x 20mm x 12mm throw.  
Door B – “Schlage” LM50 digital mortise lock with case size of 103mm x 147mm x 22mm thick, forend size of 24mm x 240mm x 2.5mm thick, latch size of 15mm x 20mm x 12mm throw.  
Door C – “Schlage” EL3000 mortise lock, with case size of 81mm x 165mm x 15mm thick, forend size of 20mm x 235mm x 3mm thick, latch size of 12mm x 30.5mm and 12mm throw.
  
3. Lever handle : Door A – “Schlage” S6500 lever handle on plate, with back body dimension of 87mm x 333mm and front body dimension of 88mm x 334mm, with handle length of 141mm.  
Door B – “Schlage” S6500 lever handle on plate, with back body dimension of 87mm x 333mm and front body dimension of 88mm x 334mm, with handle length of 141mm.  
Door C – “Schlage” ET500 lever handle on rose, with round rose of Ø52mm x 8mm thick and handle length of 140mm x Ø19mm.



**APPENDIX 2**

**SCHEDULE OF COMPONENT (cont'd)**

(With reference to drawing on pages no.26 to no.29 of this test report)

4. Lock cylinder : Door A – “Schlage” S-6500 cylinder.  
Door B – “Schlage” S-6500 cylinder.  
Door C – “Schlage” EC900 brass 6 pin euro profile cylinder with key and thumb turn, 71mm length.
5. Hinge : Door A – “IVES” 5BB1 4.5x4.5x4.5 stainless steel 4BB butt hinge with dimension of 114mm x 114mm x 4.5mm thick. The door leaf was installed with 4 number of hinges.  
Door B – “IVES” 5BB1 5x4.5x5 stainless steel 4BB butt hinge with dimension of 127mm x 114mm x 5mm thick. The door leaf was installed with 8 number of hinges.  
Door C – “Briton” EH300 4”x4”x3mm stainless steel 2BB butt hinge with dimension of 101.5mm x 101.5mm x 3mm thick. The door leaf was installed with 4 number of hinges.
6. Flush bolt : “Briton” BT DB 004-18 stainless steel extension type flush bolt without casing, size 25mm x 172mm x 2mm thick. Shoot bolt size Ø12mm and extension length of 300mm/600mm.
7. Door selector : “Hang Hong” DS 280 surface stainless steel door coordinator with swing arm of 280mm.
8. Panic bar : “ISEO” Push panic exit device with overall dimension of 842mm x 145mm x 63mm.
9. Recess flip cup handle : “Hang Hong” RFH-102 stainless steel rectangular recessed flipped handle without keyhole, with dimension of 62mm x 102mm x 22mm thick.
10. Perimeter seal : Door A – “Zero” 328  
Door B – “Zero” 770  
Door C – “Zero” 118
11. Drop seal : Door A – “Zero” 361  
Door B – “Zero” 364  
Door C – “Zero” 111
12. Rain drip : Door B – “Zero” 8197  
Door C – “Zero” 11

