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Letter of the test results – fire resistance tests on hinged folding steel doors

Two separate fire resistance tests were carried out in the vertical furnace of the VTT Expert Services Ltd fire laboratory in Espoo, Finland. Test with the hinged folding steel door, the door with its railing mounted on the exposed side of the supporting construction, was carried out on July 2, 2015. Test with the hinged folding steel door, the door with its railing mounted on the unexposed side of the supporting construction, was carried out on August 21, 2015. Test method was standard SFS-EN 1634-1:2014 *"Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware – Part 1: Fire resistance test for door and shutter assemblies and openable windows"*

Construction of the hinged folding steel door in brief

Test specimen was a hinged folding steel door with four door leaves (two plus two, folding to opposite directions). Size of the door was 4571 x 3480 mm (width x height). Dimensions of each door leaf were 1130 mm x 3480 mm x 64 mm (width x height x thickness). The size of the clear opening in the supporting construction was 4500 mm x 3400 mm (width x height).

Door leaves were manufactured from 0.5 mm thick steel sheets with Hard Goat Glossy coating. Door leaves were insulated with 50 mm thick Paroc Fps14 rock wool insulation slabs. There were 1.0 mm thick steel sheets on both sides of wool into which the rock wool was glued.

Framework inside each door leaf was made of 40 mm x 60 mm x 1.5 mm steel tubes which were insulated with Joints Fire Foam Pro+ urethane foam. Both sides of the framework was covered with 6 mm thick MgO –sheets.

Around the door leaves there was a silicon seal, 4345 inside which was installed a fire seal Fire Band. There was a cover plate of 0.5 mm thick on the hinges.

The guiding rail was manufactured from steel profile 60 mm x 68 mm x 2.5 mm. There was Ø10 mm pin, made of rst, and four pieces of rollers, 26/8 mm on the guide. Guide rail was attached into the supporting construction with ten rail hangers.

The doors were equipped with 18 pcs of hinges (Polar Metalli Oy) and espagnolette mrf.es 105.

Fire resistance test on July 2, 2015 – door with its railing mounted on the exposed side of the supporting construction

The test was terminated 55 min after the start of the test. The test specimen met criteria for integrity (E) for 43 minutes and for insulation (I_1) for 32 minutes and for insulation (I_2) 33 minutes.

The test results and detailed description of the test specimen are presented in test report No VTT-S-04664-15 by VTT Expert Services Ltd.

Fire resistance test on August 21, 2015 – door with its railing mounted on the unexposed side of the supporting construction

The test was terminated 69 min and 10 s after the start of the test. The test specimen met criteria for integrity (E) for 68 minutes and for insulation (I_1) for 39 minutes and for insulation (I_2) 51 minutes.

The test results and detailed description of the test specimen are presented in test report No VTT-S-04665-15 by VTT Expert Services Ltd.

Espoo, November 30, 2015

Ville Grönvall
Expert, Fire Safety

APPENDICES Appendix 1. Photos of the test specimen

DISTRIBUTION Findoor Oy (Original)
VTT Expert Services Ltd / file folder (Copy)

Photographs of the test specimen

Fire resistance test on July 2, 2015
– door with its railing mounted on the exposed side of the supporting construction

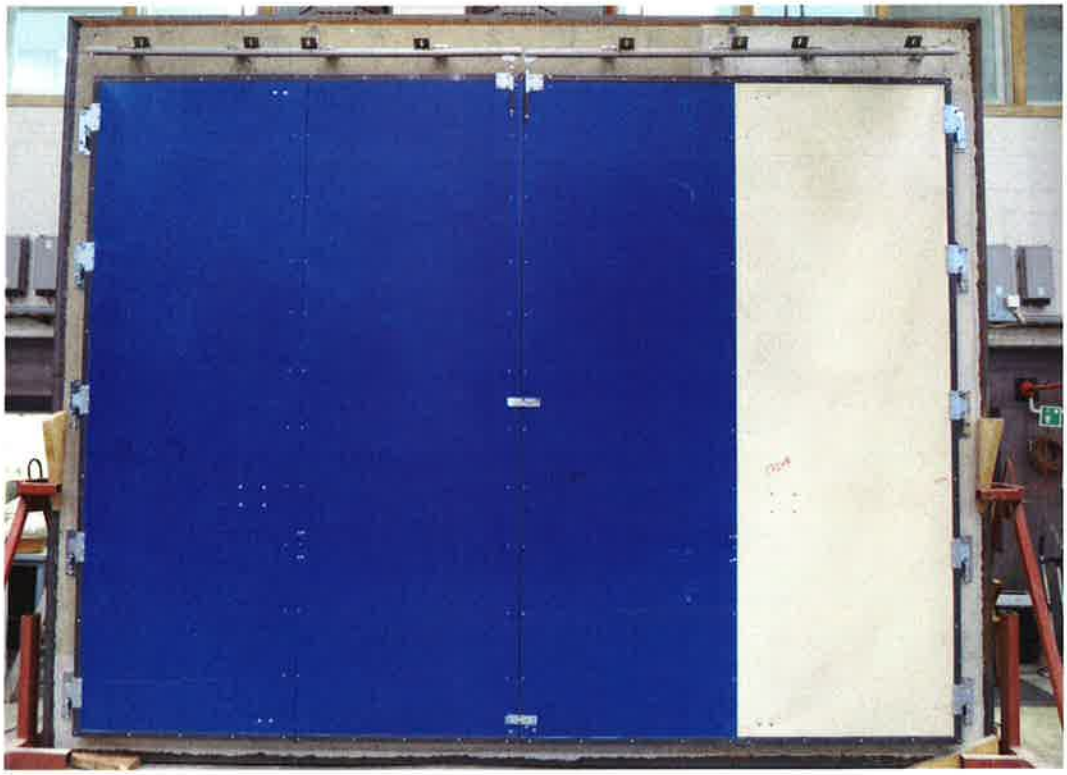

Figure 1. Exposed side of the test specimen prior to the fire test.

Figure 2. Unexposed side of the test specimen prior to the fire test.

Figure 3. Unexposed side of the test specimen after the fire test.

Figure 4. Exposed side of the test specimen after the fire test.

Fire resistance test on August 21, 2015 – door with its railing mounted on the unexposed side of the supporting construction

Figure 1. Exposed side of the test specimen prior to the fire test.

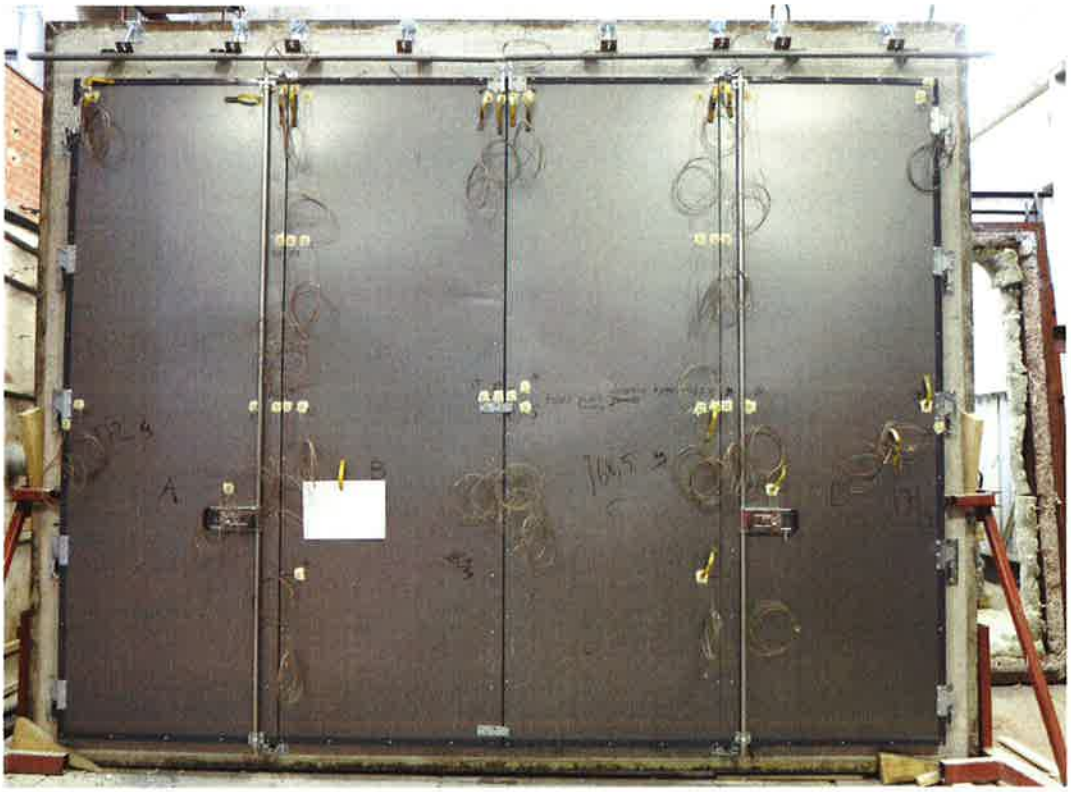

Figure 2. Unexposed side of the test specimen prior to the fire test.

Figure 3. Unexposed side of the test specimen after the fire test.

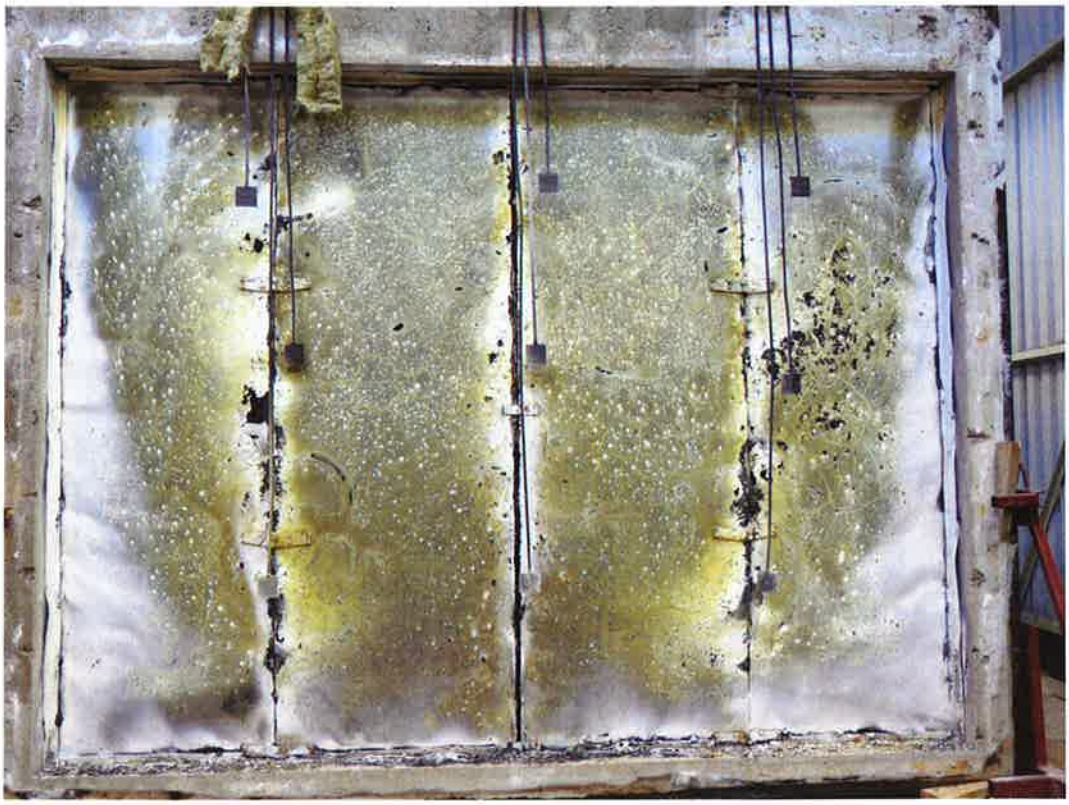

Figure 4. Exposed side of the test specimen after the fire test.