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V.Z.W.

AGC FLAT GLASS EUROPE
166, Chaussée de la Hulpe

1170 BRUSSELS

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AB/EW/PP

Ghent, 3 August 2009

Extrapolation of "Rapport d'Essai n° 4/EF/64458/GF/874", drafted by Services Ponts et Charpentes, University of Liège, on the basis of "Beproevingsverslag Nr. 11631", drafted by WarringtonFireGent nv, Ghent, with respect to the fire resistance of timber frameworks provided with glazed panels Pyrobel 25 (thickness : 25 mm).

TECHNICAL EVALUATION 2009-G-078

On your request we have examined the above-mentioned test reports.

Test report n° 4/EF/64458/GF/874 gives the description and the results of a resistance to fire test conducted according to the Belgian standard NBN 713.020 (edition 1968), on a timber window frame (meranti; width x height: 2950 x 2776 mm), provided with glazed panels **PYROBEL 25** (thickness: 25 mm; dimensions (width x height): 1400 x 2700 mm / 800 x 1800 mm / 542 x 1800 mm / 1398 x 844 mm). At the top of the glazed window a partition wall (width x height x thickness: 2985 x 220 x 95 mm) was installed. The partition wall was composed of a metal framework (lower and upper rail: steel U-profile; section: 40 x 48 x 40 x 0,6 mm - struts: steel C-profile; section: 6 x 50 x 48 x 50 x 6 x 0,6 mm; centre-to-centre distance : 600 mm), and both sides were covered with 2 layers of gypsum plasterboard Knauf (thickness: 2 x 12,5 mm). The space between the edge profiles and the frame was filled with rock wool. The window frame construction was composed of 2 frames placed next to one another (width x height : 1475 x 2776 mm), each composed of edge profiles (section circumscribed rectangle: 60 x 95 mm), provided with a notch (section circumscribed rectangle: 27 x 65 mm) for the fixation of the glass and the timber glazing beads (section circumscribed rectangle: 27 x 30 mm). One of the window frames was provided with a timber intermediate rail and a strut (section circumscribed rectangle: 100 x 95 mm), each

Rue de Paris 15
B - 4020 LIEGE
Tel. 04 340 42 70
Fax: 04 340 42 79

Ottergemsesteenweg 439 - bus 11
B - 9000 GENT
Tel. 09 240 10 80
Fax: 09 240 10 85

provided with 2 notches (section circumscribed rectangle: 27 x 65 mm). The window frames were interconnected by means of a timber tongue (section: 20 x 20 mm). Both sides of the joint between the frames were finished with a timber board (section: 40 x 10 mm). For the application of the glazed panel, a gap of approximately 5 mm was provided all round. Each glazed panel was positioned by means of nogs in fibre-silicate or calcium silicate (dimensions: 5 x 27 x 20 mm). The sealing between the glazed panels and the profiles was realised by means of a strip of ceramic paper Kerafix 2000 (section: 15 x 6 mm) and silicone. The test was conducted with a free vertical edge.

Test report n° 11631 gives the description and the results of a resistance to fire test conducted according to the European standard EN 1364-1 (edition 1999), on a timber window frame (meranti; volumic mass : approximately 593 kg/m³; width x height : 2950 x 2950 mm), provided with glazed panels **PYROBEL EI60 25 - IGU** (total thickness : 42 mm; composition : Pyrobel 25 (25 mm) – 9 mm cavity - 44.2 CL MF (2 x 4 mm Float and 0,76 mm PVB foil). One glazed panel (width x height: 1098 x 2874 mm) was tested with the Pyrobel 25 on the exposed side, the other glazed panel (width x height: 1700 x 2874 mm) was tested with the Pyrobel 25 on the unexposed side. The window frame construction was composed of 2 frames placed next to one another (width x height : 1776/1174 x 2950 mm), each composed of edge profiles (section circumscribed rectangle: 59 x 112 mm), provided with a notch (section circumscribed rectangle: 26 x 82 mm) for the positioning of the glass and the timber glazing beads. Approximately every 500 mm the edge profiles were fixed to the wall by means of concrete plugs HILTI 100 HT (∅ 10 x 112 mm). The space between the edge profiles and the frame was filled up with mineral wool. The window frames were interconnected by means of a timber tongue (section: 20 x 20 mm). Both sides of the joint between the frames were finished with a hardwood board (section: 40 x 12 mm). For the application of the glazed panel, a gap of approximately 5 mm was provided all round. Each glazed panel was positioned by means of nogs in calcium silicate Promatect-H (dimensions: 5 x 40 x 70 mm). The glazed panels were fixed by means of timber glazing beads (section circumscribed rectangle: 26 x 30 mm), that were fixed to the frame by means of screws (∅ 4 x 60 mm) approximately every 240 mm. The sealing between the glazed panels and the profiles was realised by means of a strip of ceramic paper Superwool X607 (section: 20 x 5 mm) and silicone. The test was conducted with a free vertical edge.

The results obtained during these tests are given in the table underneath:

Test report no.	**874**	**11631**
Criteria	**Time in minutes**	
Themal insulation	≥ 72	67
Integrity	≥ 72	82
Stability	≥ 72	87

Taking into account the above-mentioned results, we are of the opinion that **the fire resistance** of a timber window frame (hardwood; minimal volumic mass: 550 kg/m³), composed as described in test report n° 874 and provided with glazed panels Pyrobel 25 (thickness: 25 mm), will not be less than **60 minutes** according to the Belgian standard NBN 713.020 (edition 1968), on the condition that all requirements mentioned below are fulfilled:

- The maximum surface of the glazed panel amounts to 4,88 m².
- The maximum height of the glazed panel amounts to 2874 mm.
- The maximum width of the glazed panel amounts to 1700 mm.

All constructional details of the glazed window framework have to be executed identically to the description of the test report n° 874.

This evaluation is only valid as far as the composition of the glazed panels has not been modified with respect to the glazed panels which have been subjected to the tests.

It is self-evident that only tests according to the Belgian standard NBN 713.020 can provide the undisputable evidence of this statement.

This evaluation is based on the actual knowledge and on the know-how of the test Laboratories at Ghent and Liège.

This evaluation is only valid when accompanied by the above-referenced test reports.

The validity of this evaluation is limited to the 31th August 2012, unless the test standard or the legislation should be reviewed or amended during this period.

This evaluation cannot be combined with another technical evaluation, except when mentioned explicitly.

Dr. ir. A. BRULS
Technical Director ISIB Liège

ir. E. VAN WESEMAEL
Technical Director ISIB Ghent

This evaluation contains 3 pages.