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Datum

2021-08-09

Beteckning

P111228

Sida

1 (4)

Keep the company AB
Kabelgatan 9
943 31 Öjebyn, Sweden

Range test

(3 annexes)

This is a translation from the Swedish original document. In the event of any dispute as to the content of the document, the Swedish text shall take precedence.

1 Introduction

On assignment from Keep the company AB, RISE has tested glass doors and glass sections of Keep's patented attachment, patent SE 543207.C2, related to explosion resistance. The purpose of the testing was to assess the test specimen's explosion resistance in accordance with the specifications in SS-EN 13123-2:2004.

2 Testing method

The testing was conducted in accordance with:

- SS-EN 13124-2:2004 "Windows, doors and shutters – Explosion resistance – Test method – Part 2: Range test.
- The specifications in SS-EN 13123-2:2004 "Windows, doors and shutters – Explosion resistance – Test method – Part 2: Range test.

Test date: 29 June 2021.

Test site: Driving centre Arena Fällfors.

Test staff: Peter Blomgren, Andreas Anderson.

Temperature: 15.4-20.8 °C.

Humidity: 75–97%.

Explosive: Poladyn.

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3 Test specimen door

Test specimen:	Section size was 2300 x 1200 mm (h x w).
Test specimen:	Keep Plus.
Attachment profile:	Keep shock absorbing profile KPP503.
Shock absorber:	Keep shock absorber E505030.
Lock:	ASSA1487_1ZN – 1 pc, ASSA1487_9ZN – 2 pc
Hinge:	SP8CLSBB160 – 4 pc
Type of glass:	Vetrogard Blast Climatop, EXR 3.
Glass thickness:	57 mm
Installation:	Door installed in Keep shock absorbing attachment profile.
Manufacturer:	Keep the company.

4 Test specimen window section

Test specimen:	Section size was 2000 x 1500 mm (h x w).
Test specimen:	Keep safe, Keep Plus.
Attachment profile:	Keep shock absorbing profile.
Shock absorber:	Keep shock absorber E505030.
Type of glass:	Vetrogard, see annex.
Installation:	See annex.
Manufacturer:	Keep the company.

5 Procedure and results

5.1 Description of test specimen

All tests were conducted with glass/doors installed in a reinforced 20-foot container. The container was built so that two units could be tested simultaneously.

Test 1	Keep safe. Left section attachment 5 mm material thickness. Glass EXR3. Keep safe. Right section attachment 3 mm material thickness. Glass EXR3.
Test 2 EXR1.	Keep Plus. Left section attachment 3 mm material thickness, non-glued glass Keep Plus. Right section attachment 3 mm material thickness, glued glass EXR1.
Test 3 EXR3.	Keep Plus. Left section attachment 3 mm material thickness, non-glued glass Keep Plus. Right section attachment 3 mm material thickness, glued glass EXR3.
Test 4	Keep Plus Door. Left section attachment 3 mm material thickness, non-glued glass EXR3.

The test was conducted to determine the resistance of different variations of the same system. The Keep attachment profile including shock absorber was used in all tests. The attachment profiles were installed together with different steel profiles and glass in accordance with the drawing in annex 1.

5.2 The results

The results from the explosion tests are presented in the tables below.

Table 1 Results.

Test	Glass/door	Class	Charge (kg)	Distance (m)	Charge height (m)	Splitter/no splitter	Results
1	Left	3	14.5	5.5	0.8	No splitter	OK
1	Right	3	14.5	5.5	0.8	No splitter	OK
2	Left	3	14.5	5.5	0.8	No splitter	OK
2	Right	3	14.5	5.5	0.8	No splitter	OK
3	Left	5	23.6	4	0.8	No splitter	OK
3	Right	5	23.6	4	0.8	Splitter	OK
4	Door	3	14.6	5.5	0.8	No splitter	OK

Table 2 Results pressure impulse.

Test	Class	Pressure P _{so} bar Specification	Impulse I _{so} bar/ms Specification	Pressure P _{so} bar Results	Impulse I _{so} bar/ms Results	Results
1	3	1.70	2.25	2.415	2.785	OK
2	3	1.70	2.25	1.805	2.964	OK
3	5	6.30	4.20	6.412	6.157	OK
4	3	1.70	2.25	1.903	2.41	OK

The measuring uncertainty for pressure and impulse is $\leq 2.0\%$.

The test results are intended solely for the tested specimens.

6 Summary

On assignment from Keep the company AB, RISE has tested glass doors and glass sections of Keep's patented attachment, patent SE543207.C2, related to explosion resistance.

The tested sections met the specifications in accordance with Table 1 above in accordance with SS-EN 13123-2:2004 "Windows, doors and shutters – Explosion resistance – Test method – Part 2: Range test.

RISE Research Institutes of Sweden AB
Tillämpad mekanik, RISE AB - Transport- och produktsäkerhet

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- 1: Drawings
- 2: Test plan
- 3: Log data