

Technical Report

Report No **R13967**
Author **M Swanborough**
Date **26 March 2014**

Customer **Fenster Commercial Ltd.**
Unit 7, Highfield business park,
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Project Name **Testing in accordance with BS EN 13126-5:2011**

Product Name **Fenster Window Safety Restrictor (W.S.R.)**

Test Standards **BS EN 13126-5:2011**

Test	Description	Pass/Grade	
Clause 7.2	Initial opening test	Yes	n/a
Clause 7.3	Durability test	Yes	Grade 5
Clause 7.4	Mechanical strength	Yes	n/a
Clause 7.6	Percussion test	Yes	n/a
Clause 7.7	Impact test	Yes	2
Clause 7.8	Cutting test	Yes	n/a

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1. Introduction
 2. Summary of Test Results
 3. Description of Test Sample
 4. Instrumentation
 5. Test Procedures
 6. Conclusions
- Appendix A (Clients drawing)

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Author **M Swanborough**

Approved by **M Wass**
Technical Director

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Testing Conducted by: Wintech Engineering Ltd
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Test Conducted at: Address as above

Test Conducted for: Fenster Commercial Ltd.

Standard Specified: BS EN 13126-5:2011

Project No: 13967

Product to be tested: Fenster Window Safety Restrictor (W.S.R.)

Date sample arrived: 17th March 2014

Tests Performed: As listed in – Test Procedures

Date test commenced: 17th March 2014

Date test completed: 31st March 2014

Testing Conducted by: M Swanborough
Process Engineer

Report Compiled by: M Swanborough
Process Engineer

Technical Approval:
(Authorising Signatory) M Wass
Technical Director



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1. INTRODUCTION

Wintech Engineering Ltd is UKAS accredited to ISO/IEC 17025:2005. The testing and calibration performed using standard methods, non-standard methods, and laboratory-developed methods are all carried out in accordance with ISO/IEC 17025:2005. Although this test is not covered by our scope of accreditation, the methods and equipment used are in line with that of an accredited test.

This report describes tests conducted at the test laboratory of Wintech Engineering Ltd to a window holding restrictor model WSR/200/W on behalf of Fenster Commercial Ltd.

The test methods were in accordance with the following standards:

Building hardware - Hardware for windows and door height windows - Requirements and test methods and closing **BS EN 13126-5:2011**
Part 5: Devices that restrict the opening of windows and door height windows

The initial test sample was supplied to us fixed to a side hung window, it was mounted into the required test rig/s by Wintech Engineering Ltd.

2. SUMMARY OF TEST RESULTS

The following summarises the results of testing carried out, in accordance with the relevant testing & classification standards in BS EN 13126-5:2011.

Test Type	Description	Test Method & Classification Standard	Pass/Class	
Clause 7.2	Initial opening test	BS EN 13126-5:2011	Pass	n/a
Clause 7.3	Durability test	BS EN 13126-5:2011	Pass	Grade 5
Clause 7.4	Mechanical strength	BS EN 13126-5:2011	Pass	n/a
Clause 7.6	Percussion test	BS EN 13126-5:2011	Pass	n/a
Clause 7.7	Impact test	BS EN 13126-5:2011	Pass	Grade2
Clause 7.8	Cutting test	BS EN 13126-5:2011	Pass	n/a

The restrictor as tested conforms to "Safety in use - Grade 2" and "Application Grade - 5/5" as a Safety Holding Restrictor according to Table 2 of BS EN 13126-5:2011

More comprehensive details feature later in this report

Note: These results are valid only for the conditions under which the test was conducted.

All measurement devices, instruments and other relevant equipment were calibrated and traceable to National Standards.

3. DESCRIPTION OF TEST SAMPLE

<i>Manufactured by:</i>	<i>Fenster Commercial Ltd.</i>
<i>Project name:</i>	<i>Testing in accordance with BS EN 13126-5:2011</i>
<i>Product name:</i>	<i>Fenster Window Safety Restrictor (W.S.R.)</i>
<i>Product code:</i>	<i>WSR/200/W</i>
<i>Restrictor type:</i>	<i>Cord</i>
<i>Window:</i>	<i>Side hung, Test size A (According to table 3 of BS EN 13126-5:2011)</i>
<i>Restrictor Fixings:</i>	<i>3.9 x 16mm self drill/csk</i>
<i>Subframe:</i>	<i>4" x 2" Timber subframe</i>
See Appendix A for test sample drawings as supplied by:	<i>Fenster Commercial Ltd.</i>

TEST SAMPLE PRIOR TO TESTING

(Photograph no. 1)



4. INSTRUMENTATION

4.1 FORCES

A force gauge and load cell accurate to 2% were used to measure forces.

4.2 GAUGES AND TEST EQUIPMENT

The gap gauges and test equipment used for testing were accurate to 1mm

4.3 MEASUREMENT

A Calibrated stop watch was used to record the duration of tests when required.

4.4 TEMPERATURE & HUMIDITY

A data logger capable of measuring temperature with accuracy of $\pm 1^{\circ}\text{C}$ and humidity with accuracy of $\pm 5\% \text{Rh}$ was used. The sample was stored and tested in the laboratory in the permitted range of 15-30°C and 25-75% humidity.

5. TEST PROCEDURES AND RESULTS

5.1 INITIAL OPENING

The test sample mounted on the side hung window provided was fitted into the security test rig. The test rig operating equipment was adjusted to test in accordance with clause 7.2 as per BS EN 13126-5-2011. A load of 350N was applied without shock for 60 seconds to the window sash in the direction of opening. A check was conducted to ensure that a gap gauge of 100mm diameter could not pass through the opening gap of the window.

5.1.2 RESULTS

The Restrictor achieved a pass as per 7.2.3 of BS EN 13126-5-2011 as it was unable to pass the gauge through the windows opening. The restrictor continued to operate normally after the test and therefore met the requirements of this test.

5.2 DURABILITY TEST PROCEDURES

5.2.1 SEQUENCE OF TESTING

The test sample on the side hung window provide was fitted into the cyclic test rig. The test rig operating equipment was adjusted in accordance with the operation of the hardware, its reference velocity established within the specified limits, and the cycle counter set to zero.

5.2.2 MAIN TEST

The test equipment was configured for the correct amount of cycles as specified in Table 1 below as per BS EN 13126-5-2011 7.3.1 Grade 5. At every period equal to 10% of the specified total test cycles the test was stopped and the specimen examined. The test was continued and paused at examination periods through out its duration as defined above.

The test was completed when the specified number of cycle was completed.

5.2.3 END OF TEST

After completion of the cyclic test the following checks were carried out

- a) The restrictor continued to operate correctly
- b) The 100mm gap gauges could not pass through the window

TABLE 1 - Durability Grade cycles

Grade	Restrictor operations cycles
Grade 3	10,000 (+1%) cycles
Grade 4	15,000 (+1%) cycles
Grade 5	25,000 (+1%) cycles

5.2.4 RESULTS

The Restrictor showed very few signs of wear after completion of 25,000 cycles. It continued to operate normally after the test and therefore met the requirements for Grade 5 as specified in BS EN 13126-5-2011

5.3 MECHANICAL TEST PROCEDURES

5.3.1 SEQUENCE OF TESTING

The test sample mounted on the side hung window provided was fitted into the security test rig. The test rig operating equipment was adjusted to test in accordance with clause 7.4 as per BS EN 13126-5-2011. The Following loads were applied without shock for 60 seconds to the window sash in the direction opening.

200N for 60 seconds
350N for 60 seconds
500N for 60 seconds

5.3.2 RESULTS

The Restrictor showed no obvious signs of wear after completion of the above testing. It continued to operate normally after the test and therefore met the requirements for a Pass as specified in clause 7.4 as per BS EN 13126-5-2011

5.4. PERCUSSION TEST PROCEDURE

5.4.1 SEQUENCE OF TESTING

The restrictor was impacted on the point chosen by the test engineer to give the most severe impact on the hardware as per BS EN 13126-5-2011 7.6

1. The pendulum is set so that the selected point of the restrictor is struck with when the pendulum is horizontal.
2. The pendulum arm is set so that a fall angle of 45° is achieved
3. This restrictor is subject to 3 percussions with the hammer as photo below.



Pendulum Arm 0.3kg



Pendulum head 0.6kg

5.4.2 RESULTS

The Restrictor showed no significant signs of damage after completion of 3 percussions. The restrictor continued to operate normally after the test and therefore met the requirements for clause 7.6 as specified in BS EN 13126-5-2011

5.5 IMPACT TEST PROCEDURE

The Restrictor fitted to a window sample should withstand a mass colliding with the active sash to one or more of the grades specified below as per EN 13049. A 50kg double tyre impacter was released from the required grade drop height and impacted the centre of the window sash.

- Grade 1 - 200mm
- Grade 2 - 300mm
- Grade 3 - 450mm
- Grade 4 - 700mm
- Grade 5 - 950mm

5.5.1 RESULTS

The Restrictor achieved a pass at grade 2. This test has been video recorded for review. The restrictor remained engaged and continued to operate normally after the test and therefore met the requirements for Grade 2 as per clause 7.7 specified in BS EN 13126-5-2011

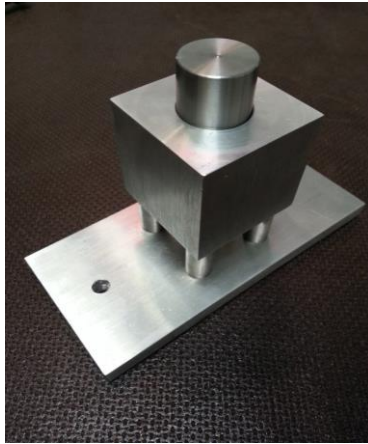


Grade 2 Drop height

5.6 CUTTING TEST PROCEDURE

5.6.1 SEQUENCE OF TESTING

The test sample mounted in the cutting test block was fitted into the security test rig. The test rig operating equipment was adjusted to test in accordance with clause 7.8 as per BS EN 13126-5-2011. The restrictor is mounted to fixed base of a stamping tool and a force of 10N is applied throughout the test to keep the cord taught. The movable punch is rested onto the cord and a force was applied at 100N/s until a force of 3600N was achieved.



Cutting test block



Cutting test block and restrictor mounted in test rig

5.6.2 RESULTS

The Restrictor showed cord showed some signs of wear after completion of the test however these were minimal (photo below). The restrictor continued to operate normally after the test and therefore met the requirements for clause 7.8 as specified in BS EN 13126-5-2011.



Restrictor cord after testing

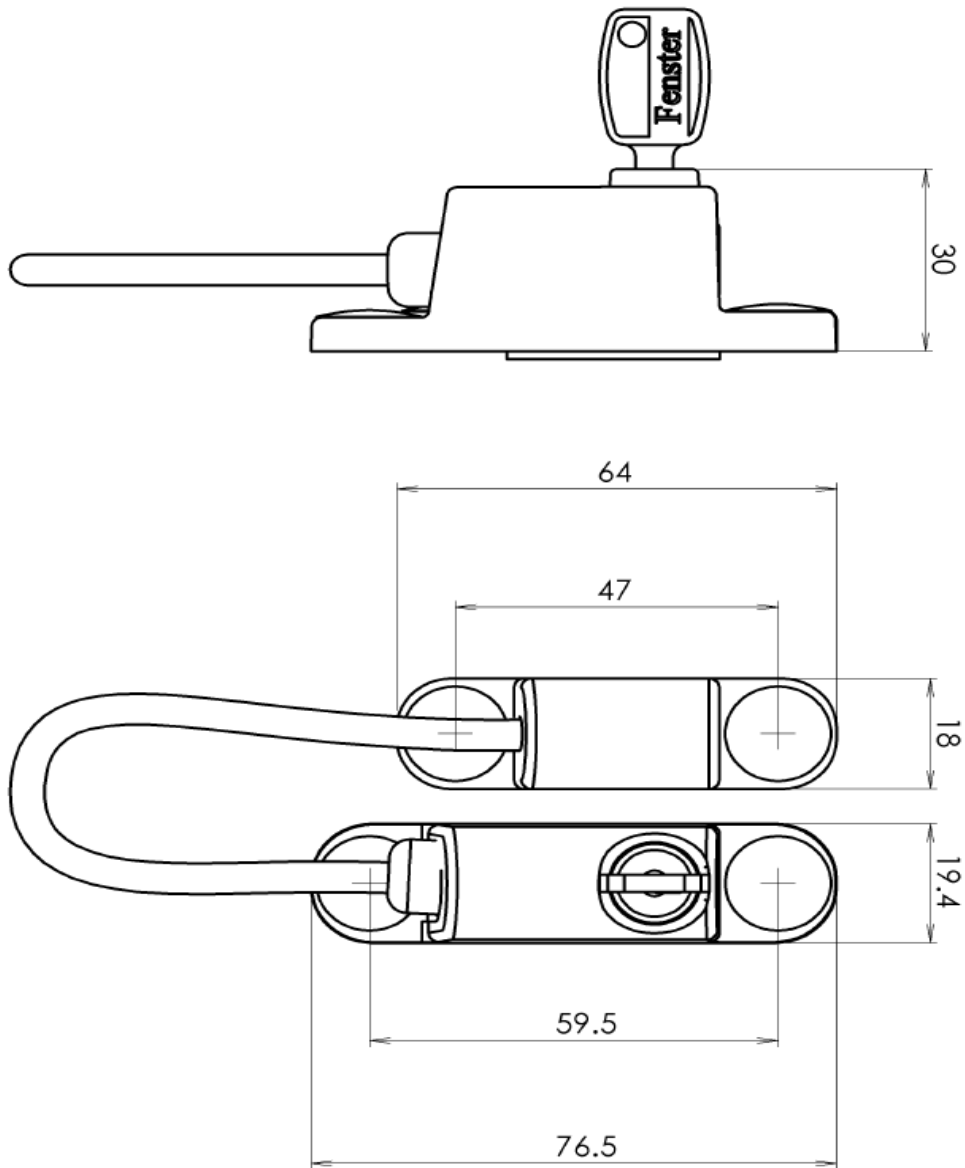
6. CONCLUSION

The restrictor as tested conforms to "Safety in use - Grade 2" and "Application Grade - 5/5" as a Safety Holding Restrictor according to Table 2 of BS EN 13126-5:2011. This report covers the WSR/200/W model restrictor only.

APPENDIX A

Drawings

Line drawing with overall dimensions supplied by Fenster Comercial Ltd.



End Of Report