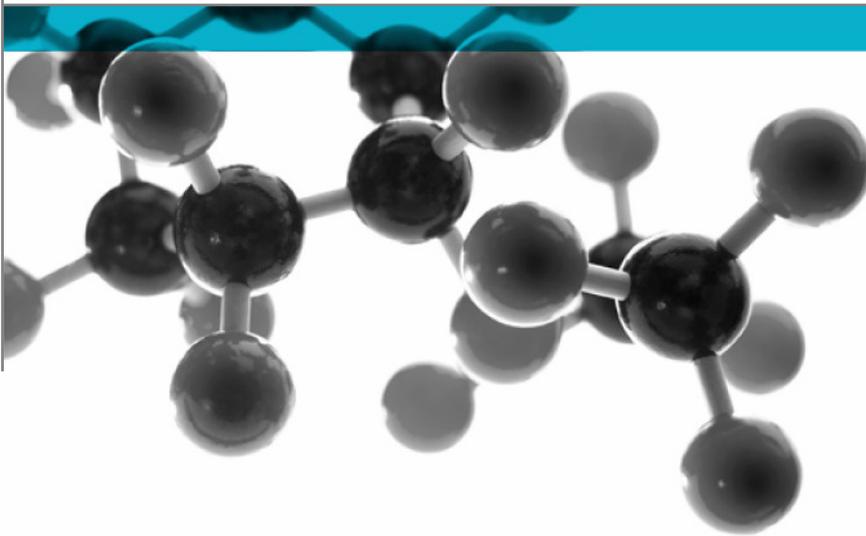


# BS EN 14351-1:2006



**Test of: Auto Latch and Laminated restrictor**

**Performance of windows & doors  
Part 1: Windows and external pedestrian doorsets  
without resistance to fire and/or smoke leakage  
characteristics**

A Report To: Maco Door and Window Hardware (UK) Ltd

Document Reference: 303147

Date: 21/12/2010

Copy: 1

Issue No.: 1

Page 1

Testing  
Advising  
Assuring

## TEST CONCLUSIONS

Samples of:

Manufacturer Maco Door and Window Hardware (UK) Ltd  
 Product Restritors  
 Model Auto Latch and Laminated Restritors

have been tested in accordance with: BS EN 14351-1

By Exova Warrington APT, a UKAS accredited Testing Laboratory (No. 0621) and EC Notified Body number (No. 1104)

At Key Industrial Park, Fernside Rd., Willenhall. West Midlands. WV13 3YA.

Results and comments as detailed below:

Clause No.	Description	Compliance
	Auto Latch restrictor	
4.8	Load bearing capacity of safety devices – 350N(Left Hand)	Yes
4.8	Load bearing capacity of safety devices – 350N(Right Hand)	Yes
	Laminated Restrictor	
4.8	Load bearing capacity of safety devices – 350N(Left Hand)	Yes
4.8	Load bearing capacity of safety devices – 350N(Right Hand)	Yes

*Tested on the Allan Brothers “NC” Storm proof window, report number 192646*

No inferences can be made regarding performance against other requirements of this standard

Tests marked “ N/A” are not applicable to the sample under test.

Tests marked “N/T” were not applied to the sample under test

Document No.: 303147

Author: C Bryan

Client: Maco Door and Window Hardware (UK) Ltd

Page No.: 2 of 16

Issue Date: 21/12/2010

Issue No.: 01



## AUTHORISATION

Tests performed by: Chris Bryan, Laboratory Technician

Report issued by: Chris Bryan, Laboratory Technician

Signed



Date 20.12.2010

For and on behalf of Exova Warrington APT

Report authorised by: Mark West, Assistant Operations Manager

Signed



Date 20.12.2010

For and on behalf of Exova Warrington APT

Report issued: 21 December 2010



**NOTE.**

Tests marked "Not UKAS Accredited" are not covered by the Laboratory UKAS accreditation schedule.

Tests marked NT were not tested

Tests marked NA are not applicable to the product on test.

The laboratory has tested the product supplied by the client as sampled in accordance with their own requirements

Exova Warringtonapt is an EC Notified Body Number 1104

This report shall not be reproduced except in full, (and then only as permitted by copyright laws), without written approval from Exova warringtonapt

Document No.: 303147

Author: C Bryan

Client: Maco Door and Window  
Hardware (UK) Ltd

Page No.: 3 of 16

Issue Date: 21/12/2010

Issue No.: 01



**CONTENTS**

**PAGE NO.**

TEST CONCLUSIONS.....2  
AUTHORISATION.....3  
TEST DETAILS.....5  
TEST PROCEDURE.....6  
INITIAL OBSERVATIONS.....7  
TEST SPECIMEN.....8  
Schedule of Components.....9  
PERFORMANCE CRITERIA & TEST RESULTS.....14  
CONCLUSIONS.....15  
LIMITATIONS.....15  
REVISION HISTORY.....16



## TEST DETAILS

### CLIENT DETAILS

Company name Maco Door and Window Hardware (UK) Ltd  
 Address Eurolink Industrial Centre,  
 Castle Road  
 Sittingbourne  
 Kent  
 Postcode ME10 3LY  
 Contact Craig Bryant

### ORDER DETAILS

Order number M00010  
 Dated 10/12/2010

### SAMPLE DETAILS

Product Restrictors  
 Model Auto Latch and Laminated Restrictor  
 Manufacturer Maco Door and Window Hardware (UK) Ltd  
 Frame Dimensions 1945 x1520 mm  
 Sash Dimensions 1100 x 1075 mm (Top hung) 690 x 1394 mm (Side hung) Internal measurements  
 Material Timber  
 Details of Hardware  
 Hinges Defender 13mm stack Friction hinges  
 Hinge protection Maco Hinge protectors  
 Lock Maco MK1 stainless steel  
 Restrictor 1 Maco Auto latch (RH – 95023U. LH –95022U)  
 Restrictor 2 Maco Laminated (RH– 95033U. LH –95032U)  
 Post 95006U  
 Markings None  
 Date of Manufacture Unknown  
 Other information None

### TEST DETAILS

Test specification BS EN 14351-1  
 Full test Yes  
 Test to clauses  
 Test Methods BS EN 948 :1999

Sample received 16/12/2010  
 Test started 16/12/2010  
 Test completed 16/12/2010

Special Test requirements None  
 Other reports to be used in conjunction with this report None

Document No.: 303147 Page No.: 5 of 16  
 Author: C Bryan Issue Date: 21/12/2010  
 Client: Maco Door and Window Hardware (UK) Ltd Issue No.: 01



## TEST PROCEDURE

---

<b>Introduction</b>	<p>This test report should be read in conjunction with the Standard BS EN 14351-1:2006 – Part 1: Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics.</p> <p>The specimens were judged on their ability to comply with the performance criteria as required in BS EN 14351-1:2006</p>
<b>Instruction To Test</b>	<p>The test was conducted on the 16<sup>th</sup> December 2010 on behalf of Maco Doors and Windows Hardware (UK)Ltd.</p> <p>Mr Craig Bryant, a representative of Maco Door and Window Hardware (UK) Ltd witnessed the test.</p>
<b>Test Specimen Construction</b>	<p>A description of the test construction is given in the Schedule of Components. The description is based on a detailed survey of the specimens and information supplied by the sponsor of the test.</p>
<b>Installation</b>	<p>The sample was supplied mounted within a timber sub-frame of nominal section 75mm x 100mm fitted flush with the exterior face, in accordance with the clients fitting instructions. The sample was then installed into the test apparatus by a representative of Exova warringtonapt on the 16/12/2010.</p>
<b>Test Climate</b>	<p>The sample was conditioned in the laboratory in the range 10-30 °C and 25-75% humidity.</p>

---

Document No.:	303147	Page No.:	6 of 16
Author:	C Bryan	Issue Date:	21/12/2010
Client:	Maco Door and Window Hardware (UK) Ltd	Issue No.:	01



## INITIAL OBSERVATIONS

---

The internal face  
of the sample



Auto Latch Restrictor



Laminated Restrictor

---



# SCHEDULE OF COMPONENTS

(Refer to Figures 1 to 3)  
(All values are nominal unless stated otherwise)  
(All other details are as stated by the sponsor)

## Variants

None

<u>Item</u>	<u>Description</u>
<b>1. Window frame head</b>	
Reference	: NFH10
Material	: European Redwood
Density	: 510kg/m <sup>3</sup> average at 15% moisture content
Overall section size	: 68 mm x 68 mm
Rebate	: 18 mm x 48 mm
Fixing jamb to head joints	: Corrugated Fastener
i. type	: W12 Plain – Corrugated fastener
ii. size	: 12 mm
iii. quantity	: 1 Per corner
Details of adhesive	
i. supplier	: H B Fuller
ii. reference	: Rakoll GXL/4
<b>2. Window frame jamb</b>	
Reference	: NFJ10
Material	: European Redwood
Density	: 510kg/m <sup>3</sup> average at 15% moisture content
Overall section size	: 56 mm X 68 mm
Rebate	: 18 mm x 48 mm
Fixing jamb to sill joints	: Corrugated Fastener
i. type	: W12 Plain Corrugated fastener
ii. size	: 12 mm
iii. quantity	: 1 Per Corner
<b>3. Window frame mullion</b>	
Reference	: NFM10
Material	: European Redwood
Density	: 510kg/m <sup>3</sup> average at 15% moisture content
Overall section size	: 68 mm x 68 mm
Rebate	: 18 mm x 42 mm x 2
Fixing mullion to head & sill joints	: Corrugated Fastener
i. type	: W12 plain – Corrugated
ii. size	: 12 mm
iii. quantity	: 1 per corner

**Item****Description****4. Window frame transom**

Reference	:	NFT10
Material	:	European Redwood
Density	:	510kg/m <sup>3</sup> average at 15% moisture content
Overall section size	:	68 mm x 68mm
Rebate	:	18mm x 48mm x 2
Fixing transom to mullion & jamb joints	:	Corrugated fastener
i. type	:	W12 Plain – Corrugated fastener
ii. size	:	12 mm
iii. quantity	:	1 per corner

**5. Window frame sill**

Reference	:	NFS10
Material	:	European Redwood
Density	:	510kg/m <sup>3</sup> average at 15% moisture content
Rebate	:	18mm x 48mm
Overall section size	:	68 mm x 68 mm
Fixing transom to mullion & jamb joints	:	18 mm x 48 mm
i. type	:	W12 Plain – Corrugated fastener
ii. material	:	12 mm
iii. quantity	:	1 per corner

**6. Window frame weather seals**

Description	:	Q-LON Urethane foam
Manufacturer	:	Schlegel
Reference	:	Aquamac 21
Fixing method	:	Push in

**7. Window casement (s)**

Overall Size		
i. top hung sash	:	1124mm wide x 1100mm high
ii. side hung sash	:	714mm wide x 1420mm high
iii. fixed sash	:	n/a
Material	:	European Redwood
Density	:	510kg/m <sup>3</sup> average at 15% moisture content
Sash framing section sizes		
i. rail	:	59mm x 70mm NST10F TOP RAIL NSC10F BTM RAIL
ii. stile	:	59mm x 70mm NSS10F
Glazing rebate	:	18mm x 46mm
Corner fixing method	:	Corrugated Fastener
i. type	:	W8 Plain – corrugated fastener
ii. size	:	6 mm
iii. quantity	:	1 per corner
Details of adhesive		
i. supplier	:	H B Fuller
ii. reference	:	Rakoll GXL/4

<u>Item</u>	<u>Description</u>
<b>8. Window casement glass</b>	
Supplier	: Solaglas
Thickness	: 28mm
Overall size	
i. top hung sash	: 1014mm wide x 990mm high
ii. side hung sash	: 604mm wide x 1310mm high
iii. fixed sash	: n/a
iv. direct glazing	: 1118mm wide x 282mm high
Nominal edge clearance	: 3-6mm
<b>9. Glazing setting blocks</b>	
Supplier	: Abacus
Material	: Plastic
Thickness	: 5mm
Overall size	: 100x20x5mm
<b>10. Glazing tape (internal face)</b>	
Supplier	: UK industrial tapes
Reference	: Foamlink 1603H+
Material	: PVC Foam
Thickness	: 2 mm
Overall size	: 1.6 mm x 12mm
Fixing method	: Self Adhesive
<b>11. Glazing tape (external face)</b>	
Supplier	: Deventer
Reference	: SV2
Material	: TPE Sash Seal
Thickness	: Deventer
Overall size	: 10 mm 5 mm
Fixing method	: Push fit
<b>12. Glazing beads</b>	
Glazing method	: Externally beaded
Material	: European Redwood
Density	: 510kg/m <sup>3</sup> average at 15% moisture content
Overall size	: 21x15 / 25x25mm
Fixing method	: Pins
i. type	: Stainless steel
ii. size	: 30mm
iii. quantity	:
iv. centres	: Max 200mm

**Item****Description****13. Hinges**

Supplier	:	Securistyle
Description	:	Defender 13mm stack Friction hinges
Reference	:	DSR16 (side hung) DTR24 (top hung)
Quantity	:	1 Pair per sash
Fixing hinge to sash		
iii. type	:	Stainless Steel
iv. size	:	4.8x28mm
v. quantity	:	3
Fixing hinge to frame		
i. type	:	Stainless Steel
ii. size	:	4.8x28mm
iii. quantity	:	3

**14. Hinge protectors**

Supplier	:	Maco
Description	:	Hinge protectors
Reference	:	94200 (frame) 356365 (sash)
Quantity	:	2 pair per sash
Position	:	100mm from end of sash/frame
Fixing device to sash		
i. type	:	Stainless steel Wood screw
ii. size	:	4.0 x 30 mm
iii. quantity	:	2 on top hung, 2 on side hung
Fixing device to frame		
i. type	:	Stainless steel Wood screw
ii. size	:	4.0 x 30 mm
iii. quantity	:	2 on top hung, 2 on side hung

**15. Lock Keeps**

Supplier	:	Maco
Description	:	
Reference	:	MA356456TR NV Mushroom Strike Tri-coat Finish MA356510TR Shootbolt Strike R/Hand Tri-coat Finish MA356511TR Shootbolt Strike L/Hand Tri-coat Finish
Quantity	:	2 of each shoot bolt keep and 4 mushroom keeps
Fixing keeps to frame		
i. type	:	Stainless steel Wood screw
ii. size	:	4.0 x 30 mm
iii. quantity	:	1 per fixing hole position.

**Item**

**Description**

**16. Lock**

Supplier : Maco  
 Description : Stainless Steel MK 1 shootbolt  
 Reference : MA57178SC lock box.  
 MA356508TR Timber Security Cover Plate Tri-coat  
 Finish  
 MA206168SS 401- 800mm S/Bolt Ext 7.7mm Cams  
 Stainless Steel  
 MA206169SS 801-1100mm S/Bolt Ext 7.7mm Cams  
 Stainless Steel  
 MA206170SS 1101-1400mm S/Bolt Ext 7.7mm  
 Cams Stainless Steel  
 MA356576TR Stabilizing Plate Tri-coat Finish

Fixings  
 i. type : Stainless steel Wood screw  
 ii. size : 4.0 x 30 mm  
 iii. quantity : 1 per fixing hole position.

**17. Lever handles**

Supplier : Fab & Fix  
 Description : Push button Espagnolette locking handle  
 Reference : CONNISIEUR.  
 Material : Mazak

Fixings  
 i. type : Machine Screw  
 ii. size : M5 x 45mm  
 iii. quantity : 2

**18. Restrictor 1**

Supplier : Maco  
 Description : Auto Latch  
 Reference : RH – 95023U LH -95022U  
 Material : Stainless Steel

Fixings  
 iv. type : Mild Steel  
 v. size : 4.3 x 30 mm  
 vi. quantity : 1 Per fixing hole position

**19. Restrictor 2**

Supplier : Maco  
 Description : Laminated  
 Reference : RH – 95033U LH – 95032U  
 Material : Stainless Steel

Fixings  
 vii. type : Mild Steel  
 viii. size : 4.3 x 30 mm  
 ix. quantity : 1 per fixing hole position



## PERFORMANCE CRITERIA & TEST RESULTS

Clause	Result	Pass/Fail
<b>4.8 Load-bearing capacity of safety devices</b>	A 350N load was applied to the restricted and unrestricted corner of the looking rail. The load was held in both positions for 1minute.	<b>PASS*</b>
	A additional load was applied to 500N for 1 minute in the same positions, these also passed.	
<b>4.8 Load-bearing capacity of safety devices</b>	A 350N load was applied to the restricted and unrestricted corner of the looking rail. The load was held in both positions for 1minute.	<b>PASS**</b>

\* Tested on the Auto latch RH on a top hung window

\*\* Tested on the Auto Latch LH on a side hung window

Clause	Result	Pass/Fail
<b>4.8 Load-bearing capacity of safety devices</b>	A 350N load was applied to the restricted and unrestricted corner of the looking rail. The load was held in both positions for 1minute.	<b>PASS***</b>
	A additional load was applied to 500N for 1 minute in the same positions, these also passed.	
<b>4.8 Load-bearing capacity of safety devices</b>	A 350N load was applied to the restricted and unrestricted corner of the looking rail. The load was held in both positions for 1minute.	<b>PASS****</b>

\*\*\* Tested on the Laminated RH on a top hung windows

\*\*\*\* Tested on the Laminated LH on a side hung window

## CONCLUSIONS

---

**Evaluation against objective**      The sample as provided by the client was subjected to operational & strength testing in accordance with BS EN 14351-1

**Observations & comments**

---

## LIMITATIONS

---

**Limitations**      The results relate only to the behaviour of the specimens of the element of construction under the particular conditions of test. They are not intended to be the sole criteria for assessing the potential performance of the element in use, nor do they reflect the actual behaviour in use.

**Range of window assemblies covered by this report**      It is our opinion that the range of window assemblies covered by this report are limited to the following

- Assemblies with identical hardware fitted no further apart than in the tested assembly
- Assemblies of the same or smaller overall dimensions to the tested assembly

**Uncertainty of Measurement**      The uncertainties of measurements calculated for a confidence level of 95% throughout these tests are within the limits of these tolerances.

The standard specifies the following tolerances

- Forces:  $\pm 2\%$
  - Distances:  $\pm 1\text{mm}$  for tape measures  $\pm 0.01\text{mm}$  for dial gauges
  - Times:  $\pm 5\text{s}$
- 

---

Document No.:	303147	Page No.:	15 of 16
Author:	C Bryan	Issue Date:	21/12/2010
Client:	Maco Door and Window Hardware (UK) Ltd	Issue No.:	01



## REVISION HISTORY

<b>Issue No :</b>	<b>Re - Issue Date :</b>
<b>Revised By:</b>	<b>Approved By:</b>
<b>Reason for Revision:</b>	

<b>Issue No :</b>	<b>Re - Issue Date :</b>
<b>Revised By:</b>	<b>Approved By:</b>
<b>Reason for Revision:</b>	

**END OF REPORT**