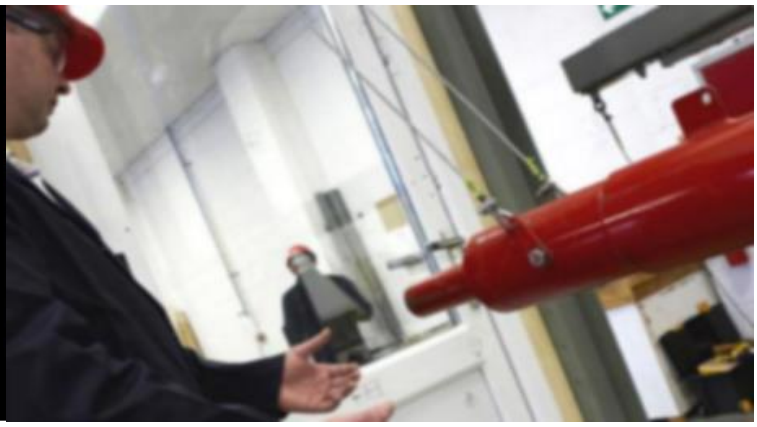
PAS 24:2016

Annex A & B

Product Testing To Exceed Industry Standards



Product Tested: Bifolding Doorset

Conducted for: Alunet

Date:	29/03/2023
Version:	Original
Issue Nº:	1
Test Nº:	T2327
Report Nº:	MTCR0175

Enhanced security performance requirements
for Doorsets and Windows in the UK

Contents page

Revision History

Issue No:	N/A	Re - issue date:	N/A
Revised by:	N/A	Approved by:	N/A
Reason for revision:	N/A		

Issue No:	N/A	Re - issue date:	N/A
Revised by:	N/A	Approved by:	N/A
Reason for revision:	N/A		

Performance summary

Samples of:	Bifolding Doorset
Manufacturer:	SGG Manufacturing
Product:	Aluminium, open inward doorset with a standard threshold
Model:	Alunet
Tested in accordance with:	PAS 24:2016 - Annex A & B
By:	Mila Test Centre, A UKAS accredited testing laboratory No. 9868
Located at:	11 Brunel Close, Drayton Fields Ind. Est., Daventry, Northamptonshire, NN11 8RB

Sample	Clause	Description	Compliance
1	ANNEX A	Security Hardware & Cylinder Test - Part 1	PASS
1	ANNEX A	Security Hardware & Cylinder Test - Part 2	PASS
1	B.4.6	Manual Check Test	Resisted Entry
1	B.4.4.3	Mechanical Test on Infill	PASS
1	B.4.3	Manipulation Test A	PASS
1	B.4.5	Mechanical Loading Test	PASS
1	B.4.3	Manipulation Test B	PASS
1	B.4.4.2	Manual Test on Infill	PASS
1	B.4.8	Soft Body Impact Test	PASS
1	B.4.9.2.2	Hard Body Impact Test	PASS

Classification in accordance with Clause 4.4 = **D**

Note: The results presented in this technical report are valid only for the conditions under which the test was conducted and 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.

The Doorset assembly range resisted ALL attempts to gain entry during the tests completed as listed above and in accordance with:

PAS 24:2016
Specification for enhanced security performance requirements for Doorsets and Windows in the UK

Authorisation

Test Conducted by:	Dave Vinyard	**Position:**	Test Centre Manager
	Alex Fenemore	**Position:**	Test Engineer
Witnessed by:	Dave Duffield	**Company:**	Alunet

Report composed by: Alex Fenemore **Position:** Test Engineer

Signed: 

Date: 03/04/2023

For & behalf of the Mila Test Centre

Report authorised by: Dave Vinyard **Position:** Test Centre Manager

Signed: 

Date: 03/04/2023

For & behalf of the Mila Test Centre

Report issued: 03/04/2023

9868

Heywood Williams Components Ltd.
Trading as
Mila Hardware
Operating as
Mila Test Centre

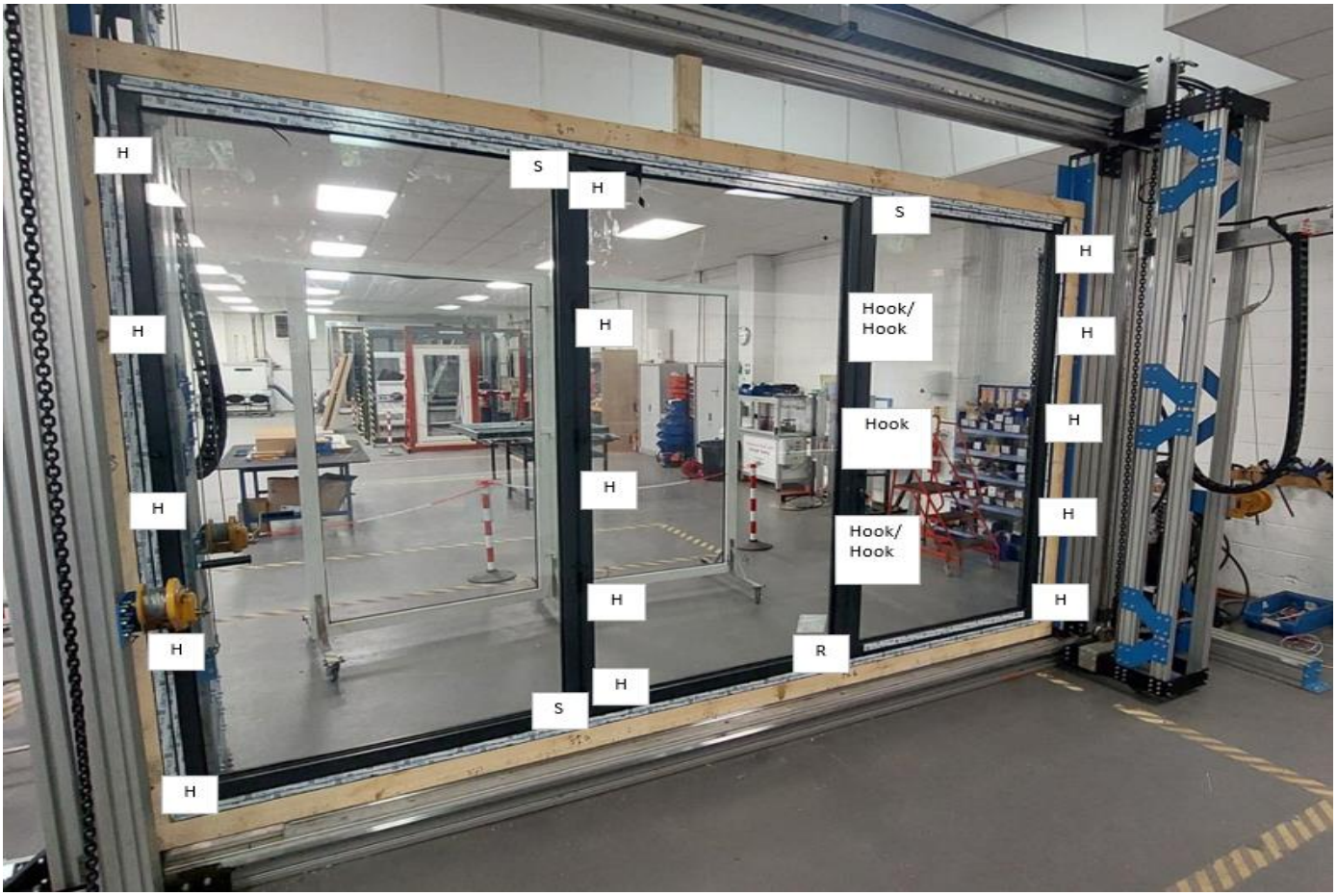
C/o Mila UK
1 Brunel Close
Drayton Fields Industrial Estate
Daventry
Northamptonshire
NN11 8RB

Test details

Test Number:	T2327
Test Subject:	Bifolding Doorset
Test Specification:	PAS 24:2016 Enhanced security performance requirements for Doorsets and Windows in the UK
Report Dated:	03/04/2023
Items Tested:	Bifolding Doorset
Customer Details:	Alunet
Manufacturer Details:	SGG Manufacturing
Date sample received:	20/03/2023
Date tested:	29/03/2023

Test sample

Figure 1. Photograph of sample viewed from outside



Key

H = Hinge

Hook = Hook Bolt

S = Shoot Bolt

R = Roller

Test procedure

Introduction

This test report should be read in conjunction with the Standard PAS 24:2016 Specification for enhanced security performance requirements for Doorsets and windows in the UK.

The specimens were judged on their ability to comply with the performance criteria as required in PAS 24:2016 Annex B.

Instruction to test

n/a

Test equipment

Mila Test Rigs are purpose designed and built for the application of tests as described within PAS 24:2016.

All equipment used for the measurement of time, force or distance is calibrated, with traceability to National Standards, using UKAS Accredited Testing Laboratories. At the time of this test all equipment was within its calibration period and all recorded results within the tolerances permitted by the Test Standard.

Mounting of test specimen

In keeping with the requirements detailed within PAS 24:2016 Annex B clause B.4.2 the test sample was delivered mounted into a sub-frame made from 100mm x 75mm (Nominal) timber sections. Mounting screws being driven from opening cavity of outer frame, through the frame section and into timber sub-frame, so as to simulate normal installation work practice.

Installation

The complete assemblies were installed plumb and square in the test rigs and checked for overlap (cover) at the frame over-rebate flanges, perimeter gap / clearances and correct operation prior to the commencement of the test.

Sample Conditioning

Upon receipt of the test specimens, all protective packaging was removed and the sample was placed into storage for a minimum of 12 hours prior to testing, in a non-destructive environment within the temperature ranges of 15°c - 30°c and the humidity ranges of 25% RH - 75% RH.

Test climate

The temperature & humidity of the laboratory was maintained in the ranges below for the duration of the test.

Temperature range	Minimum:	20.1	°C	Maximum:	22.1	°C
Humidity range	Minimum:	41.2	%Rh	Maximum:	41.6	%Rh

Please complete the below with as much information as possible.

Doorset Style

3-2-1 Open inward bifold door

Customer Reference

BF123

Overall Width: 3770 mm **Overall Height:** 2630 mm **Nº of samples:** 2

Profile material: Aluminium 6063-T6 **System:** BF73 **Colour:** RAL 7016

Profile & Reinforcement Codes

Outerframe Codes: BF73.0101
Sash Codes: BF73.0203
Transom Codes: BF73.0804 Swing door rebate profile
Transom Mullion Codes: BF73.0811 Door lock adaptor profile
Midrail Codes: BF73.0813 Sash extension profile
Mullion Codes: BF73 0808 Half roller and adaptor profile

Weatherseal Codes

Outerframe: DBA1-137, DBA1-134 **Sash:** DBA1-132, DBA1-146, DBA1-13

Fabrication Methods

Frame Corners: Mitered Mechanical & bond
Sash Corners: Mitered Mechanical & bond
Sash to Midrail: n/a

Glazing Bead Codes

Internal: BF73.0601 **Co Extruded?:** No
External: n/a **Co Extruded?:** n/a

Glazing Gasket Codes

Internal: DBA1-136 **External:** DBA1-135
Security tape?: No

Glazing/Infill Panel Specification

Glass type: Toughened **DGU Makeup:** 6mm glass 16mm spacer 6mm
Glass thickness: 6mm **Overall Thickness:** 28mm
Clear/OBS: Clear **Infill panel style:** n/a
Infill panel reinforcement: n/a

Schedule of components continued

Item		Description
1, Hinge		
Supplier	:	Debar
Description	:	Standard hinge with fixing
Part Number	:	DBA1-350N hinges. Hinges are captive in the following part
Material	:	Extruded aluminium. Stainless steel clamp plates
Quantity	:	15
Fixing to Frame		
i. supplier	:	Debar
ii. type	:	Clamping plate with final fix screw
iii. size	:	97mm
iiii. quantity	:	2 plates per hinge
V. code	:	n/a
Fixing to Sash		
i. supplier	:	Debar
ii. type	:	Clamping plate with final fix screw
iii. size	:	97mm
iiii. quantity	:	2 plates per hinge
V. code	:	n/a
3, Multipoint lock		
Supplier	:	Ingeniuos
Description	:	Duplex hook with shootbolt extension
Part Number (s)	:	432016
Material	:	Steel
Quantity	:	1
Fixing to sash		
i. supplier	:	n/a
ii. type	:	n/a
iii. size	:	n/a
iiii. quantity	:	n/a
V. code	:	n/a
8, Shootbolt keeps		
Description	:	Alulock bifold shootbolt keep
Part Number (s)	:	TBC
Material	:	Nylon
Quantity	:	1
9, One piece keep		
Supplier	:	Ingenious
Description	:	Alunet one piece keep
Part Number	:	432148
Material	:	Steel
Quantity	:	1

Schedule of components continued

10, Handles

Supplier	:	Brisant
Description	:	Sweet handle
Part Number	:	LCSH-LL-BL
Material	:	Aluminium
Quantity	:	1 set
Fixing to Sash		
i. supplier	:	Brisant
ii. type	:	Bespoke through fixing
iii. size	:	n/a
iiii. quantity	:	n/a
V. code	:	n/a

11, Cylinder

Supplier	:	Brisant
Description	:	Ultion 3 star high security cylinder
Part Number	:	n/a
Material	:	n/a
Quantity	:	1

12, Run up blocks

Supplier	:	Debar
Description	:	n/a
Part Number	:	DBA1-204
Material	:	Plastic
Quantity	:	1

Schedule of components continued

Hardware	Qty	Supplier	Part Number	Description
40/10 cylinder	1	Brisant	40/10	half cylinder
Shootbolt cone set	1	Alunet	BF73.0930	Shootbolt cone & get set
Vevo handle	1	Debar	DBHL-05	Vevo short handle with escutcheon
Intermediate lock	1	Debar	DBLK-06	Robus heavy duty intermediate lock
Lock cover	1	Debar	DBLK-26	Robus lock cover
Anti-lift block	5	Debar	DBA1-205	Plastic anti-lift block
Cleat	24	Alunet	BF73.0905K	Sash corner cleat
Chevron	16	Debar	DBA1-102	corner chevron
Aditional kit	1	Debar	DBA1-119	Half roller add on
Cleat - frame	8	Debar	BF73.0902K	Outer frame corner cleat
Track	1	Alunet	DBPR-001	Stainless steel running track
Rebate end cap	1	Debar	DBA1-201	Rebate top/bottom caps
End cap	6	Alunet	BF73.0910	Sash extension endcap

Testing results

B.4.5 Mechanical Loading Test	The sample was installed into the test rig square and true in accordance with B.3.1 and was tested in accordance with clause B.4.5 with parallel-to-plane loads of 1.5kN and perpendicular to plane loads of 4.5kN applied progressively, without shock to all loading cases established in clause B.6.	PASS
Sample 1	The Doorset resisted all attempts to gain entry during this test.	

ANNEX A - Security hardware test part 1

Date Tested: 29/03/2023

Security Hardware & Cylinder Test Part 1		The sample was tested in accordance with A.3.2 with the objective of the test to assess the hardware, lock & cylinders resistance to manual attack when using the tools as described in section A.2 of PAS 24:2016. The hardware was attacked for 3 minutes which consisted of the following methods: i) attempt to remove, dislodge or otherwise gain access to the cylinder and/or lock by attacking any protective item; ii) attempt to break and defeat any cylinder by applying a twisting and/or bend force; iii) if access to the internal workings of the hardware, cylinder or lock is gained then attempt to defeat the lock and gain entry by operating any accessible mechanism.	PASS
Sample	1	The sample remained secure during this part of the test.	

Tool ID	Description	Attack Method Utilised	Total	
			Mins	Secs
29	Curved Jaw Self Gripping Pilar's	Grips used to attempt to remove the handle	3	

ANNEX A - Security hardware test part 2

Date Tested: 29/03/2023

Security Hardware & Cylinder Test Part 2

Sample 1

The sample was tested in accordance with A.3.3 with the objective of the test to assess the hardware, lock & cylinders resistance to manual attack when using the tools as described in section A.2 of PAS 24:2016.
The a rest period of not more than 7 minutes was permitted before the hardware was attacked for further 3 minutes which consisted of the following methods:
iv) attempt to remove, dislodge or otherwise gain access to the cylinder by attacking any item protecting the cylinder;
v) attempt to screw the self-cutting traction screw into any exposed part of the cylinder so that it provides suitable fixing force for activity
vi) attempt to break and defeat the cylinder by applying a nominally axial force to the screw using the hooked head attachment and torque gauge;
vii) if access to the internal workings of the hardware, cylinder or lock is gained, then attempt to defeat the lock and gain entry by operating any accessible mechanism.

PASS

The sample remained secure during this part of the test.

Tool ID	Description	Attack Method Utilised	Total	
			Mins	Secs
25	Torque gauge with curved attachment	Trcation screw insterted and attempt was made to snap the cylinder	3	

B.4.6 - Manual Check Test

Date Tested: 29/03/2023

B.4.6
Manual Check Test

The sample was installed into the test rig square and true and allowing free, unrestricted access to the exterior face of the door in accordance with B.3.1 and was tested in accordance with clause B.4.6 using the tools specified in B.4.6.2.1 & B.4.6.2.2. The overall attack time was one continuous period of 15 minutes, with no single test technique used for more than 3 minutes, and no location attacked for more than 6 minutes. The objective of this test is to explore the possibility that there might be weaknesses & vulnerabilities in the product that are not covered in the standard loading cases specified in B.6.

Sample 1

Resisted Entry

The Doorset resisted all attempts to gain entry during this test.

Tool ID	Description	Position on Doorset	Method	Total	
				Mins	Secs
9 & 10	2 x Crowbar	bottom of door set	bars used to attempt to manipulate the doors leafs up enough to left bottom shoot bolt out of threshold	3	
9	Crowbar	bottom of door set	bar used to attempt to manipulate the doors leafs up enough to left bottom shoot bolt out of threshold	3	

B.4.4.3 - Mechanical test on infill

Date Tested: 29/03/2023

B.4.4.3
Mechanical Test on Infill

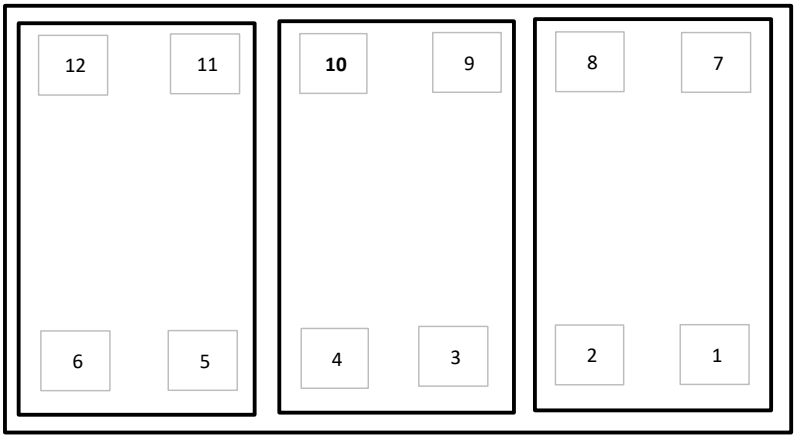
The sample was installed into the test rig square and true in accordance with B.3.1 and was tested in accordance with clause B.4.4.3 with loads of 2.0kN applied progressively, without shock to every corner of the glazing retention system. The objective of this test is to establish the strength and resistance to forces applied to the glazing with the view to pushing the glass out from the exterior face of the sample to gain entry.

PASS

Sample 1

The Doorset resisted all attempts to gain entry during this test.

Test Ref Point	Load Applied	Result
1	2kN	PASS
2	2kN	PASS
3	2kN	PASS
4	2kN	PASS
5	2kN	PASS
6	2kN	PASS
7	2kN	PASS
8	2kN	PASS
9	2kN	PASS
	2kN	PASS
11	2kN	PASS
12	2kN	PASS



B.4.3 - Manipulation test A

Date Tested:

B.4.3 Manipulation Test A	The sample was installed into the test rig square and true and allowing free, unrestricted access to the exterior face of the door in accordance with B.3.1 and was tested in accordance with clause B.4.3 using tool groups A & B where applicable. The overall attack time was 15 minutes, with no single test technique used for more than 3 minutes. The objective of this test is to establish that there is no inherent vulnerability in the design which , from the outside , would permit entry by the hardware being operated, released or disengaged.	PASS
Sample 1	The Doorset resisted all attempts to gain entry during this test.	

Tool ID	Description	Position on Doorset	Method	Total	
				Mins	Secs
			No tools effective		

B.4.5 - Mechanical loading test

Date Tested: 29/03/2023

Table 5. Clause B.4.5 Mechanical Loading results - ***Direction of loads applied are as viewed from outside face.***

Test ref point	Parallel-to-plane		Equal & opposite		Perpendicular		Deflection measurement	Component failure	Result
	Direction	Load applied	Direction	Load applied	Direction	Load applied			
1	⇦	1.5kN				4.5kN		N/A	Pass
2	⇦	1.5kN				4.5kN		N/A	Pass
3	⇦	1.5kN				4.5kN		N/A	Pass
4	⇦	1.5kN				4.5kN		N/A	Pass
5	⇦	1.5kN				4.5kN		N/A	Pass
6	⇧	1.5kN				4.5kN		N/A	Pass
7	⇧	1.5kN				4.5kN		N/A	Pass
7.1	⇩	1.5kN				4.5kN		N/A	Pass
7.2	⇦	1.5kN	⇨	1.5kN		4.5kN		N/A	Pass
8	⇧	1.5kN				4.5kN		N/A	Pass
8.1	⇦	1.5kN	⇨	1.5kN		4.5kN		N/A	Pass
9	⇧	1.5kN				4.5kN		N/A	Pass
9.1	⇩	1.5kN				4.5kN		N/A	Pass
9.2	⇦	1.5kN	⇨	1.5kN		4.5kN		N/A	Pass
10	⇩	1.5kN				4.5kN		N/A	Pass
11	⇩	1.5kN				4.5kN		N/A	Pass
12	⇦	1.5kN	⇨	1.5kN		4.5kN		N/A	Pass
13	⇦	1.5kN	⇨	1.5kN		4.5kN		N/A	Pass
14	⇦	1.5kN	⇨	1.5kN		4.5kN		N/A	Pass
15	⇦	1.5kN	⇨	1.5kN		4.5kN		N/A	Pass
16	⇦	1.5kN	⇨	1.5kN		4.5kN		N/A	Pass
17	⇧	1.5kN				4.5kN		N/A	Pass
18	⇦	1.5kN	⇨	1.5kN		4.5kN		N/A	Pass
19	⇦	1.5kN	⇨	1.5kN		4.5kN		N/A	Pass
20	⇦	1.5kN	⇨	1.5kN		4.5kN		N/A	Pass
21	⇦	1.5kN	⇨	1.5kN		4.5kN		N/A	Pass
22	⇦	1.5kN	⇨	1.5kN		4.5kN		N/A	Pass

B.4.3 - Manipulation B

Date Tested:

B.4.3 Manipulation Test B	The sample was installed into the test rig square and true and allowing free, unrestricted access to the exterior face of the door in accordance with B.3.1 and was tested in accordance with clause B.4.3 using tool groups A & B where applicable. The overall attack time was 3 minutes with the primary intention of releasing threaded fasteners exposed as a result of the mechanical loading test.	PASS
Sample	The Doorset resisted all attempts to gain entry during this test.	

Tool ID	Description	Position on Doorset	Method	Total	
				Mins	Secs
			No fixings exposed from mechanical loading		

B.4.4.2 - Manual test on infill

Date Tested: 29/03/2023

B.4.4.2
Manual Test on Infill

The sample was installed into the test rig square and true and allowing free, unrestricted access to the exterior face of the door in accordance with B.3.1 and was tested in accordance with clause B.4.4.2 using Tool groups A & B where applicable. The objective of this test is to remove gaskets, beads, any security devices within the glazing system and the infill medium from the exterior face of the sample within a period of 3 minutes.

PASS

Sample 1

The Doorset resisted all attempts to gain entry during this test.

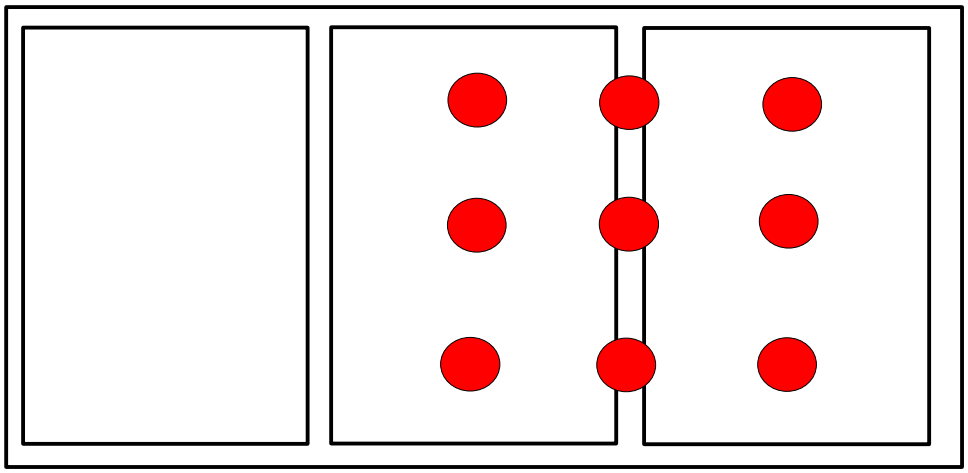
Tool ID	Description	Position on Doorset	Method	Total	
				Mins	Secs
3	Craft Knife	Right leaf	Knife used to cut the external glazing gasket	3	

B.4.8 - Soft body impact test

Date Tested: 29/03/2023

B.4.8 Soft Body Impact Test	The sample was installed into the test rig square and true in accordance with B.3.1 and was tested in accordance with clause B.4.8 with all impact positions defined by the style of sample submitted. The objective of this test is to assess the doorset's resistance to impacts using a soft body by striking each impact point 3 times from the exterior face of the door leaf at 0.8m, and 1.7m above floor level.		PASS
Sample 1	The Doorset resisted all attempts to gain entry during this test.		

Viewed from outside



	=	Impact locations
1	=	0.8
2	=	1.25
3	=	1.7
4	=	0.8
5	=	1.25
6	=	1.7
7	=	0.8
8	=	1.25
9	=	1.7

B.4.9.2.2 - Hard body impact test

Date Tested: 29.03./2023

B.4.9.2.2
Hard Body Impact
Test
Door Leaf

The sample was installed into the test rig square and true in accordance with B.3.1 and was tested in accordance with clause B.4.9.2.2 with all impact positions defined within this clause. The objective of this test is to assess the doorset's resistance to impacts using a hard body by striking each impact point 3 times from the exterior face of the door leaf.

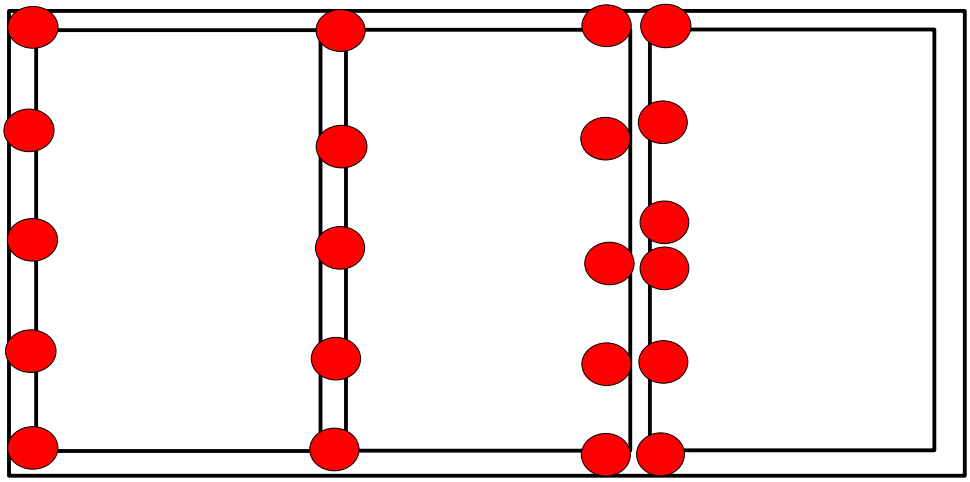
The Doorset resisted all attempts to gain entry during this test.

PASS

Sample 1

Viewed from outside - Impact sequence starts from top corner on the hinge side.

= Impact locations on door leaf



1 - Corner / Shoot
2 - Hook / Hook
3 - Hook
4 - Cylinder
5 - Hook / Hook
6 - Corner
7 - Roller
8 - Corner / Hinge
9 - Hinge
10 - Hinge
11 - Hinge
12 - Corner / Hinge
13 - Corner / Shoot
14 - Corner / Shoot
15 - Corner Hinge
16 - Hinge
17 - Hinge
18 - Hinge
19 - Corner Hinge

Pictures

*** END OF REPORT ***