Test Report

Report No	2370/7612200	This Report consists of 28 pages
Client	Smart Systems Limited Arnolds Way Yatton BS49 4QN	
Authority & date	Request by Client dated 25 November 2010	
Items tested	3 off Single leaf hinged door assemblies, Smart Systems Alitherm Plus Aluminium alloy Residential Door System	
Specification	PAS 24:2007 Enhanced security performance requirements for door assemblies Single and double leaf, hinged external door assemblies to dwellings.	
Results	Pass	
Prepared by	D Kirsop	(Technician)
Authorized by	M Manito	(Senior Engineer)
Issue Date	16 December 2010	
Conditions of issue	This Test Report is issued subject to the conditions stated in current issue of CPO322 'General conditions relating to acceptance of testing'. The results contained herein apply only to the particular sample/s tested and to the specific tests carried out, as detailed in this Test Report. The issuing of this Test Report does not indicate any measure of Approval, Certification, Supervision, Control or Surveillance by BSI of any product. No extract, abridgement or abstraction from a Test Report may be published or used to advertise a product without the written consent of the Managing Director, BSI who reserves the absolute right to agree or reject all or any of the details of any items or publicity for which consent may be sought.	

TEST AND EXAMINATION OF THREE SINGLE LEAF HINGED DOOR ASSEMBLIES SUBMITTED FOR ASSESSMENT, SMART SYSTEMS LIMITED ALITHERM PLUS ALUMINIUM ALLOY RESIDENTIAL DOOR SYSTEM

INTRODUCTION

The door assemblies submitted by Smart Systems Limited, detailed on pages 5, 6, 7, 16, 17, 18, 24, 25 and 26, were tested and assessed to the requirements of PAS 24:2007 Enhanced security performance requirements for door assemblies – Single and double leaf, hinged external door assemblies in to dwellings, as indicated on the following pages of this Report. This request was made on quote No: BSI 0000290889 dated 25 November 2010.
It is emphasized that assessments have not been made against the other Clauses of the Specification.

TEST SAMPLES

1 off single leaf open in glaze in door assembly with glass/midrail/glass and standard threshold (Sample 1)

1 off single leaf open in glaze in door assembly with glass/midrail/glass and standard threshold (Sample 2)

1 off single leaf open in glaze in door assembly with glass/midrail/glass and standard threshold (Sample 3)

(Equipment Record No 10119382)

Date samples received: 10 December 2010

SUMMARY OF RESULTS

1.	Manipulation	The test samples met the requirements of the Specification in respect of Clause 7 Annex A.4
2.	Infill removal	The test samples met the requirements of the Specification in respect of Clause 7 Annex A.5
3.	Mechanical loading	The test samples met the requirements of the Specification in respect of Clause 7 Annex A.6
4.	Manual check test	The test samples met the requirements of the Specification in respect of Clause 7 Annex A.7
5.	Soft body impact	The test samples met the requirements of the Specification in respect of Clause 7 Annex A.9
6.	Hard body impact	The test samples met the requirements of the Specification in respect of Clause 7 Annex A.10
7.	Security hardware and cylinder test	The test samples met the requirements of the Specification in respect of Clause 7 Annex A.11
8.	Letter plates	Not applicable

CLAUSE 4 SAMPLE SELECTION

The samples submitted for tests were selected using the criteria in Clause 4 of the Specification. Each sample was submitted for test mounted in a 75mm x 100mm timber subframe in accordance with the manufacturer's installation requirements.

CLAUSE 5.1 TEST METHODS

The method of testing the samples followed the sequence detailed in Annex A of the Specification.

CLAUSE 6 REQUIREMENTS FOR TEST APPARATUS

The test apparatus for the manual and mechanical tests is shown in figures A.1 to A.10 inclusive.

DESCRIPTION OF SAMPLE

Sample type - A single leaf open in glaze in door. The leaf had glass above and glass below the midrail

Material - Aluminium alloy

Finish - Natural

Profile reference -

Outerframe:	-	ETD017
Leaf:	-	ETD024N
Midrail	-	ETD030

Construction -

Outerframe:	-	Cleated
Leaf:	-	Cleated
Midrail:	-	Cleated

Fittings - A seven point locking (two hookbolts/bolt, two roller cams, two shootbolts and a key operated deadbolt/latch) Paddock Lockmaster ref: ACET183 espagnolette system with Paddock top and bottom shootbolts, a Sobinco euro profile cylinder 30/50 cylinder, a Hoppe Tokyo SBD key locking handle, three Fapim hinges, a VL72 drip bar and three Wagner dog bolts

Weathersealing - Double sealed with plastics ACET160 Flipper gasket

DESCRIPTION OF SAMPLE (CONTINUED)

Glass - Double glazed with 4-20-4 mm toughened glass sealed units

Glass retention system - Internal beads ref ETC161 and ACVG31 3mm E gasket ACVG34 5mm Wedge gasket

Sample dimensions - Length: 960mm Height: 2180mm

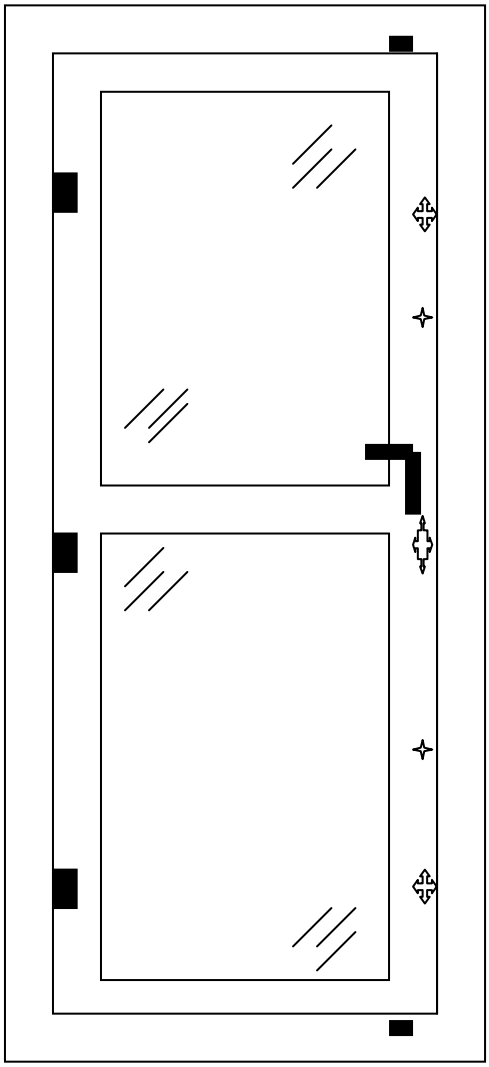
Date of test - 13 December 2010 - conducted by M Manito, D Kirsop and P Rossington

Laboratory temperature - 21.0°C

Ancillaries -

ACET045	-	Stainless steel chevron for ETD017 & ETD024N
WCA106	-	Stainless steel chevron for ETD024N
ACET057	-	Corner cleat for ETD017 Internal
ACVN162	-	Corner Cleat for ETD017 External
ACET154	-	Stainless steel chevron for ETD024N
ACET155	-	Corner Cleat for ETD024N
ACVL059	-	End caps for VL72
WCA106	-	Chevron for ETD018
ACVL061	-	Rivet for VL72
ACET131	-	Drainage covers
ACSIL04	-	Sealant
ACSIL013	-	Cleat glue
ACET200	-	Bridge Packers
PCX17 PVC	-	infill
PUA056	-	Stainless steel screws for ETD030

ELEVATION DRAWING OF DOOR ASSEMBLY
(indicating position of hardware)



- hinge/dog bolt
- dead bolt and latch
- roller cam
- handle, lockcase and cylinder
- shootbolt
- hookbolt/bolt

EXAMINATION AND TEST

CLAUSE 7 PERFORMANCE REQUIREMENTS **ASSESSMENT**

Annex A.4 Manipulation Test

The sample was mounted, vertically and square, in the test rig as described in Clause 6.1 and Annex A.2.

The test was carried out in accordance with the given objective of this Annex using the procedure detailed in Annex A.4.2 and the tools described in Annex A.3.

The sample was closed and locked and the key removed.
Within the overall time limit of 15 minutes no one technique was used for more than 3 minutes.

Screwdriver used to no effect

No entry could be effected by any technique within 3 minutes Pass

Annex A.5.4 Manual Cutting Test

The sample was mounted, vertically and square, in the test rig as described in Clause 6.1 and Annex A.2.

The test was carried out in accordance with the requirements of this Annex using the tools described in Annex A.3.

key operated hardware and no aperture large enough to cut infill Pass

EXAMINATION AND TEST (CONTINUED)

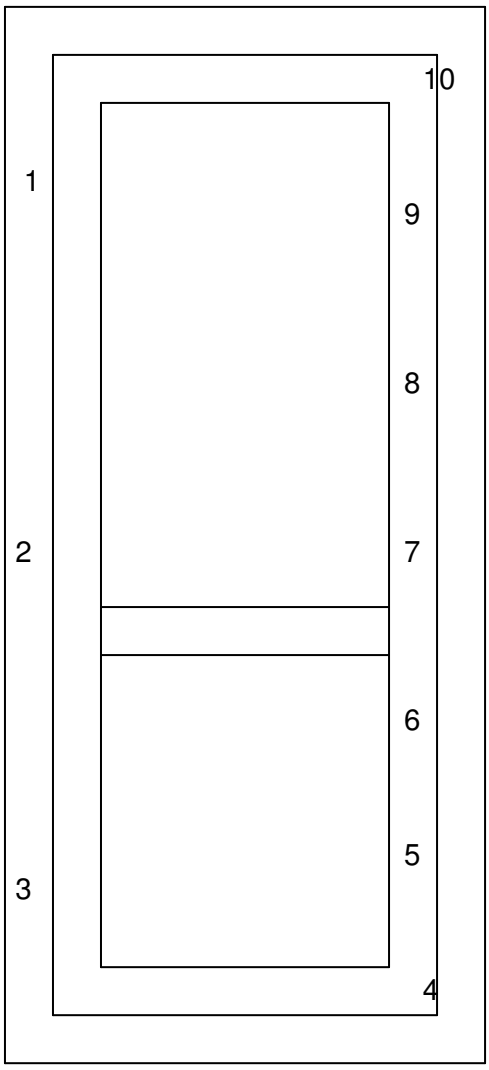
CLAUSE 7 PERFORMANCE REQUIREMENTS

Annex A.6 Mechanical Loading Test

The sample was mounted, vertically and square, in the test rig as described in Clause 6.1 and Annex A.2.

The test was carried out in accordance with the procedures detailed in Annex A.6, Table B.1 and Figures A.1, A.2, A.3, A.4 and A.11 using the test apparatus detailed in Figures A.5, A.6, A.7 and A.8.

Diagram of points of application of loads



EXAMINATION AND TEST (CONTINUED)

CLAUSE 7 PERFORMANCE REQUIREMENTS

Annex A.6 Mechanical Loading Test

Annex A.6.2 Loading Procedures

Point of application of load

First Sequence

1. Hinge/Dog bolt (upper left jamb)

   Standard loading case used: 2/5
   Load applied in plane: 1.5kN along the edge in an upwards direction
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

2. Hinge/Dog bolt (centre left jamb)

   Standard loading case used: 2/5
   Load applied in plane: 1.5kN along the edge in an upwards direction
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

3. Hinge/Dog bolt (lower left jamb)

   Standard loading case used: 2/5
   Load applied in plane: 1.5kN along the edge in an upwards direction
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

4. Shoot bolt (right sill)

   Standard loading case used: 3
   Load applied in plane: 1.5kN along edge in a direction to disengage the bolt
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

5. Roller cam (lower right jamb)

   Standard loading case used: 4
   Load applied in plane: 1.5kN along edge in a direction to disengage the cam
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

   Loads applied in plane: 1.5kN at right angles to the edge and away from the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

EXAMINATION AND TEST (CONTINUED)

CLAUSE 7 PERFORMANCE REQUIREMENTS

Annex A.6 Mechanical Loading Test

Annex A.6.2 Loading Procedures

Point of application of load

6. Hookbolt/Bolt (lower right jamb)

   Standard loading case used: 3/4
   Load applied in plane: 1.5kN along edge in a direction to disengage the bolt
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

   Loads applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

7. Deadbolt/Latch (centre right jamb)

   Standard loading case used: 3
   Load applied in plane: 1.5kN at right angles to the edge and away from the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

8. Hookbolt/Bolt (upper right jamb)

   Standard loading case used: 3/4
   Load applied in plane: 1.5kN along edge in a direction to disengage the bolt
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

   Loads applied in plane: 1.5kN at right angles to the edge and away from the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

9. Roller cam (upper right jamb)

   Standard loading case used: 4
   Load applied in plane: 1.5kN along edge in a direction to disengage the cam
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

   Loads applied in plane: 1.5kN at right angles to the edge and away from the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

EXAMINATION AND TEST (CONTINUED)

CLAUSE 7 PERFORMANCE REQUIREMENTS **ASSESSMENT**

Annex A.6 Mechanical Loading Test

Annex A.6.2 Loading Procedures

Point of application of load

10. Shootbolt (right head)

    Standard loading case used: 3
    Load applied in plane: 1.5kN along edge in a direction to disengage the bolts
    Load applied perpendicular to plane: 4.5kN applied for 4 seconds

    The load was reduced to 1.5kN, held for 10 seconds, with no further deflection recorded

Additional sequence

1. Hinge/Dog bolt (upper left jamb)

    Standard loading case used: 2/5
    Load applied in plane: 1.5kN along the edge in an upwards direction
    Load applied perpendicular to plane: 4.5kN applied for 10 seconds

    Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
    Load applied perpendicular to plane: 4.5kN applied for 10 seconds

2. Hinge/Dog bolt (centre left jamb)

    Standard loading case used: 2/5
    Load applied in plane: 1.5kN along the edge in an upwards direction
    Load applied perpendicular to plane: 4.5kN applied for 10 seconds

    Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
    Load applied perpendicular to plane: 4.5kN applied for 10 seconds

3. Hinge/Dog bolt (lower left jamb)

    Standard loading case used: 2/5
    Load applied in plane: 1.5kN along the edge in an upwards direction
    Load applied perpendicular to plane: 4.5kN applied for 10 seconds

    Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
    Load applied perpendicular to plane: 4.5kN applied for 10 seconds

EXAMINATION AND TEST (CONTINUED)

CLAUSE 7 PERFORMANCE REQUIREMENTS **ASSESSMENT**

Annex A.6 Mechanical Loading Test

Annex A.6.2 Loading Procedures

Point of application of load

4. Shoot bolt (right sill)

   Standard loading case used: 3
   Load applied in plane: 1.5kN along edge in a direction to disengage the bolt
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

5. Roller cam (lower right jamb)

   Standard loading case used: 4
   Load applied in plane: 1.5kN along edge in a direction to disengage the cam
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

   Loads applied in plane: 1.5kN at right angles to the edge and away from the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

6. Hookbolt/Bolt (lower right jamb)

   Standard loading case used: 3/4
   Load applied in plane: 1.5kN along edge in a direction to disengage the bolt
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

   Loads applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

7. Deadbolt/Latch (centre right jamb)

   Standard loading case used: 3
   Load applied in plane: 1.5kN at right angles to the edge and away from the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

8. Hookbolt/Bolt (upper right jamb)

   Standard loading case used: 3/4
   Load applied in plane: 1.5kN along edge in a direction to disengage the bolt
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

   Loads applied in plane: 1.5kN at right angles to the edge and away from the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

EXAMINATION AND TEST (CONTINUED)

CLAUSE 7 PERFORMANCE REQUIREMENTS

Annex A.6 Mechanical Loading Test

Annex A.6.2 Loading Procedures

Point of application of load

9. Roller cam (upper right jamb)

   Standard loading case used: 4
   Load applied in plane: 1.5kN along edge in a direction to disengage the cam
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

   Loads applied in plane: 1.5kN at right angles to the edge and away from the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for 10 seconds

   No entry effect Pass

EXAMINATION AND TEST (CONTINUED)

CLAUSE 7 PERFORMANCE REQUIREMENTS **ASSESSMENT**

Annex A.5 Infill medium removal test

Annex A.5.3 Mechanical Test

The sample was mounted, vertically and square, in the test rig as described in Clause 6.1 and Annex A.2.

The test was carried out with a perpendicular to plane load of 2.0kN applied to each corner of the glazing in turn as specified in this Annex.

No evidence of bead failure
No entry could be effected Pass

DESCRIPTION OF SAMPLE

Sample type - A single leaf open in glaze in door. The leaf had glass above and glass below the midrail

Material - Aluminium alloy

Finish - Natural

Profile reference -

Outerframe:	-	ETD017
Leaf:	-	ETD024N
Midrail	-	ETD030

Construction -

Outerframe:	-	Cleated
Leaf:	-	Cleated
Midrail:	-	Cleated

Fittings - A seven point locking (two hookbolts/bolt, two roller cams, two shootbolts and a key operated deadbolt/latch) Paddock Lockmaster ref: ACET183 espagnolette system with Paddock top and bottom shootbolts, a Sobinco euro profile cylinder 30/50 cylinder, a Hoppe Tokyo SBD key locking handle, three Fapim hinges, a VL72 drip bar and three Wagner dog bolts

Weathersealing - Double sealed with plastics ACET160 Flipper gasket

DESCRIPTION OF SAMPLE (CONTINUED)

Glass - Double glazed with 4-20-4 mm toughened glass sealed units

Glass retention system - Internal beads ref ETC161 and ACVG31 3mm E gasket ACVG34 5mm Wedge gasket

Sample dimensions - Length: 960mm Height: 2180mm

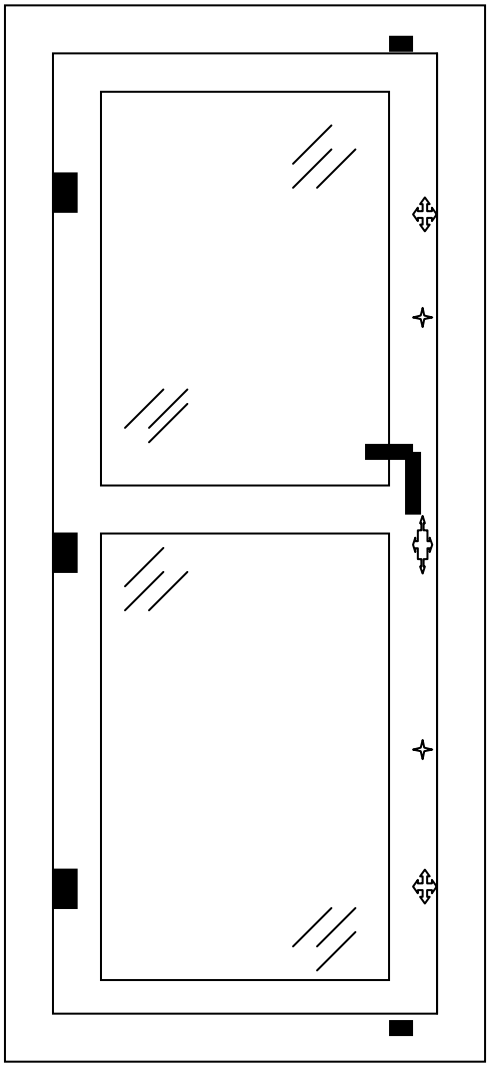
Date of test - 13 December 2010 - conducted by M Manito, D Kirsop and P Rossington

Laboratory temperature - 21.0°C

Ancillaries -

ACET045	-	Stainless steel chevron for ETD017 & ETD024N
WCA106	-	Stainless steel chevron for ETD024N
ACET057	-	Corner cleat for ETD017 Internal
ACVN162	-	Corner Cleat for ETD017 External
ACET154	-	Stainless steel chevron for ETD024N
ACET155	-	Corner Cleat for ETD024N
ACVL059	-	End caps for VL72
WCA106	-	Chevron for ETD018
ACVL061	-	Rivet for VL72
ACET131	-	Drainage covers
ACSIL04	-	Sealant
ACSIL013	-	Cleat glue
ACET200	-	Bridge Packers
PCX17 PVC	-	infill
PUA056	-	Stainless steel screws for ETD030

ELEVATION DRAWING OF DOOR ASSEMBLY
(indicating position of hardware)



- hinge/dog bolt
- dead bolt and latch
- roller cam
- handle, lockcase and cylinder
- shootbolt
- hookbolt/bolt

EXAMINATION AND TEST (CONTINUED)

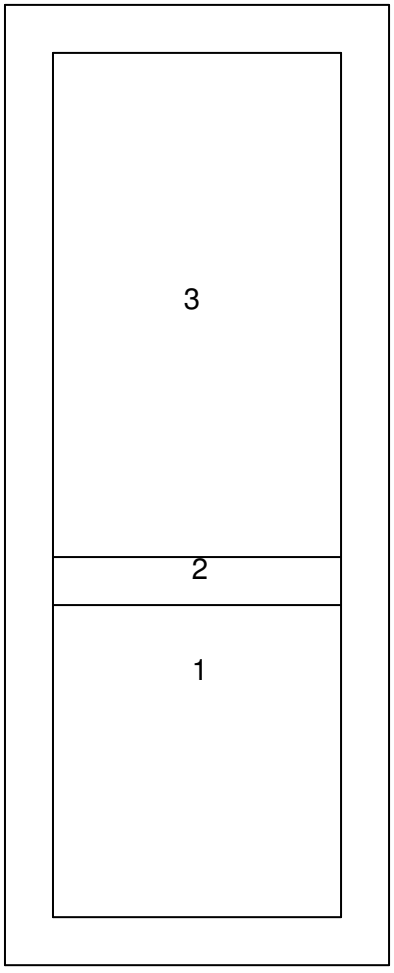
CLAUSE 7 PERFORMANCE REQUIREMENTS

Annex A. 9 Soft Body Impact Test **ASSESSMENT**

The sample was mounted, vertically and square, in the test rig as described in Clause 6.1 and Annex A.2.

The test was carried out in accordance with the requirements, objectives and procedures detailed in Clause 6.4, Annex A.9.1 and Annex A.9.3 using the test apparatus detailed in Figure A.9 and the impact points as indicated in Annex A.9.2 a) and Figure A 12

Diagram of points of application of loads



EXAMINATION AND TEST (CONTINUED)

CLAUSE 7 PERFORMANCE REQUIREMENTS

Annex A. 9 Soft Body Impact Test **ASSESSMENT**

Impact point	**Position from floor level**	**Effect**
1	0.80m	None
2	Midrail	None
3	Centre upper infill	None

No entry effected Pass

EXAMINATION AND TEST (CONTINUED)

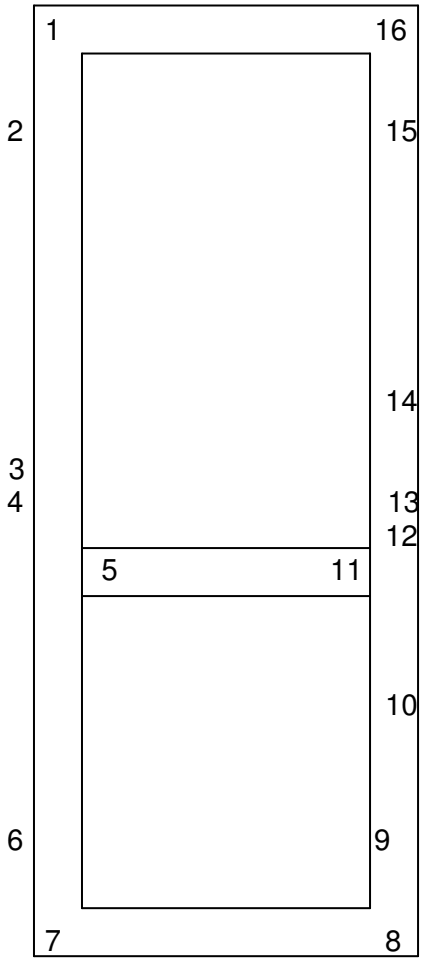
CLAUSE 7 PERFORMANCE REQUIREMENTS

Annex A. 10 Hard body impact test

The sample was mounted, vertically and square, in the test rig as described in Clause 6.1 and Annex A.2.

The test was carried out in accordance with the requirements, objectives and procedures detailed in Clause 6.5, Annex A.10.1 and Annex A.10.3 using the test apparatus detailed in Figure A.10 and the impact points as indicated in Annex A.10.2 and Figure A 13.

Diagram of points of application of loads



EXAMINATION AND TEST (CONTINUED) **ASSESSMENT**

CLAUSE 7 PERFORMANCE REQUIREMENTS

Annex A. 10 Hard body impact test

Impact point	Position	Effect
1	Corner of leaf/Hinge	None
2	Dog bolt	None
3	Hinge	None
4	Dog bolt	None
5	Midrail	None
6	Dog bolt	None
7	Corner of leaf/Hinge	None
8	Shootbolt/Corner of leaf	None
9	Roller cam	None
10	Hookbolt/Bolt	None
11	Midrail	None
12	Cylinder	None
13	Dead bolt	None
14	Hookbolt/Bolt	None
15	Roller cam	None
16	Corner of leaf/Shoot bolt	None

No entry effected Pass

EXAMINATION AND TEST (CONTINUED)

CLAUSE 7 PERFORMANCE REQUIREMENTS **ASSESSMENT**

Annex A.5 Infill medium removal test

Annex A.5.2 Manual Test

The sample was mounted, vertically and square, in the test rig as described in Clause 6.1 and Annex A.2.

The test was carried out in accordance with the requirements of this Annex using the tools described in Annex A.3.

Paint scrapers used around glazing to remove gaskets to no effect

No entry could be effected within 3 minutes Pass

DESCRIPTION OF SAMPLE

Sample type -	A single leaf open in glaze in door. The leaf had glass above and glass below the midrail
Material -	Aluminium alloy
Finish -	Natural
Profile reference -	Outerframe: - ETD017 Leaf: - ETD024N Midrail - ETD030
Construction -	Outerframe: - Cleated Leaf: - Cleated Midrail: - Cleated
Fittings -	A seven point locking (two hookbolts/bolt, two roller cams, two shootbolts and a key operated deadbolt/latch) Paddock Lockmaster ref: ACET183 espagnolette system with Paddock top and bottom shootbolts, a Sobinco euro profile cylinder 30/50 cylinder, a Hoppe Tokyo SBD key locking handle, three Fapim hinges, a VL72 drip bar and three Wagner dog bolts
Weathersealing -	Double sealed with plastics ACET160 Flipper gasket

DESCRIPTION OF SAMPLE (CONTINUED)

Glass - Double glazed with 4-20-4 mm toughened glass sealed units

Glass retention system - Internal beads ref ETC161 and ACVG31 3mm E gasket ACVG34 5mm Wedge gasket

Sample dimensions - Length: 960mm Height: 2180mm

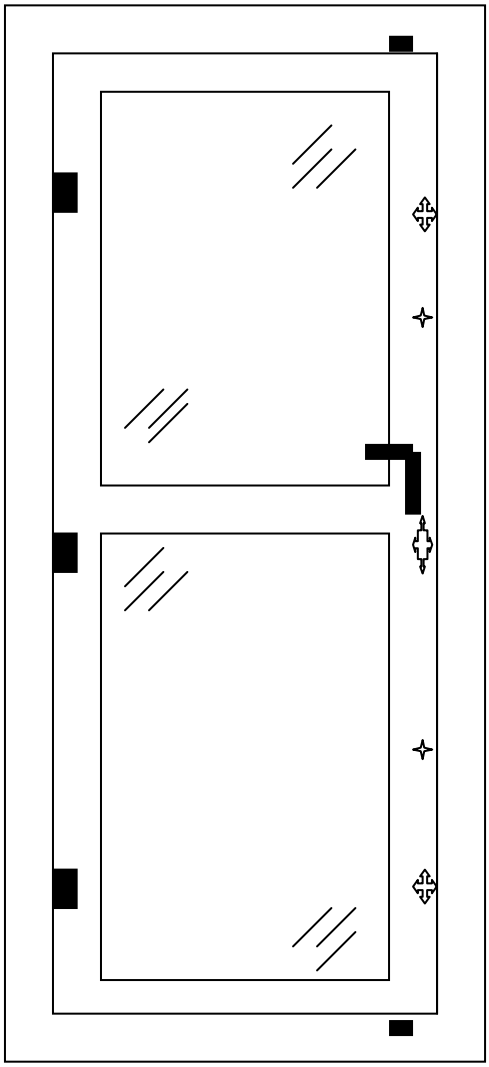
Date of test - 13 December 2010 - conducted by M Manito, D Kirsop and P Rossington

Laboratory temperature - 21.0°C

Ancillaries -

ACET045	-	Stainless steel chevron for ETD017 & ETD024N
WCA106	-	Stainless steel chevron for ETD024N
ACET057	-	Corner cleat for ETD017 Internal
ACVN162	-	Corner Cleat for ETD017 External
ACET154	-	Stainless steel chevron for ETD024N
ACET155	-	Corner Cleat for ETD024N
ACVL059	-	End caps for VL72
WCA106	-	Chevron for ETD018
ACVL061	-	Rivet for VL72
ACET131	-	Drainage covers
ACSIL04	-	Sealant
ACSIL013	-	Cleat glue
ACET200	-	Bridge Packers
PCX17 PVC	-	infill
PUA056	-	Stainless steel screws for ETD030

ELEVATION DRAWING OF DOOR ASSEMBLY
(indicating position of hardware)



- hinge/dog bolt
- dead bolt and latch
- roller cam
- handle, lockcase and cylinder
- shootbolt
- hookbolt/bolt

EXAMINATION AND TEST (CONTINUED)

CLAUSE 7 PERFORMANCE REQUIREMENTS **ASSESSMENT**

Annex A.7 Manual Check Test

The sample was mounted, vertically and square, in the test rig as described in Clause 6.1 and Annex A.2.

The test was carried out in accordance with the given objective of this Annex using the procedure detailed in Annex A.7.3 and the tools described in Annex A.7.2.

No one technique was used for more than 3 minutes.

Nail bars used to no effect on mid points

No alternative method of entry could be effected within 3 minutes Pass

Annex A.8 Additional Loading Test

Not applicable as an alternative method of entry was not identified under Annex A.7

EXAMINATION AND TEST

CLAUSE 7 PERFORMANCE REQUIREMENTS	**ASSESSMENT**

Annex A.11 Security Hardware and Cylinder Test

Annex A.11.3.2 (Part 1)

The sample was mounted, vertically and square, in the test rig as described in Clause 6.1 and Annex A.2.

The test was carried out in accordance with the given objective of this Annex using the procedure detailed in Annex A.11.3.1 and the tools described in Annex A.11.2.1 to Annex A.11.2.4.

The sample was closed and locked and the key removed.

The total attack time was 3 minutes and the total rest time was 7 minutes

Chisel used to try and get behind handle but could not

No entry could be effected within 3 minutes — Pass

Annex A.11.3.3 (Part 2)

The sample was mounted, vertically and square, in the test rig as described in Clause 6.1 and Annex A.2.

The test was carried out in accordance with the given objective of this Annex using the procedure detailed in Annex A.11.3.1 and the tools described in Annex A.11.2.1 to Annex A.11.2.4 and in Annex A.3

The sample was closed and locked and the key removed.

The total attack time was 3 minutes and the total rest time was 7 minutes

Torque wrench clicked of at max trying to remove screw from cylinder

No entry could be effected within 3 minutes — Pass

Annex A.7.2 Letter Plates

Not applicable no letter plate fitted.

END OF REPORT