

AS 5039.3:2023



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Australia



Security door and window screens

Part 3: Methods of test



AS 5039.3:2023

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- Curtin University
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- Master Locksmiths Association of Australasia
- National Association of Testing Authorities Australia
- National Security Screen Association

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Preface

This Standard was prepared by the Standards Australia Committee CS-023, Security Screen Doors and Window Screens, to supersede AS 5041:2003, *Methods of test—Security screen doors and window grilles*.

The objective of this document is to provide methods for testing the performance of security door and window screens used in buildings classified by the National Construction Code as Class 1 to Class 10.

This document is intended to be read in conjunction with AS 5039.1 and AS 5039.2. It is anticipated that AS 5039.2 will be published in 2024.

This document forms part of the AS 5039 series on security door and window screens. A list of all parts in this series can be found in the Standards Australia online catalogue

The major changes in this edition are as follows:

- (a) Inclusion of product definitions, categorisations and testing formats.
- (b) Removal of the shear test.
- (c) Change to the impact test to include two impact levels.

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Australian Standard®

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Part 3: Methods of test

Section 1 Scope and general

1.1 Scope

This document sets out methods for testing the performance of security door and window screens as specified in AS 5039.1.

The tests apply to security door and window screens used in Class 1 to Class 10 building types.

NOTE Building types are classified in the National Construction Code.

1.2 Application

It is intended that this document be read in conjunction with AS 5039.1 and AS 5039.2. It is anticipated that AS 5039.2 will be published in 2024.

1.3 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document:

AS 1231, *Aluminium and aluminium alloys—Anodic oxidation coatings*

AS 1397, *Continuous hot-dip metallic coated steel sheet and strip — Coatings of zinc and zinc alloyed with aluminium and magnesium*

AS 2331.3.1, *Methods of test for metallic and related coatings, Method 3.1: Corrosion and related property tests—Neutral salt spray test (NSS test)*

AS 1789, *Electroplated zinc (electrogalvanized) coatings on ferrous articles (batch process)*

AS 3715, *Metal finishing - Thermoset powder coatings for architectural applications of aluminium and aluminium alloys*

AS 4506, *Metal finishing—Thermoset powder coatings*

AS 5039.1, *Security door and window screens, Part 1: Design and Performance*

AS/NZS 3750.9, *Paints for steel structures, Part 9: Organic zinc-rich primer*

AS/NZS 4534, *Zinc and zinc/aluminium-alloy coatings on steel wire*

AS/NZS 4680, *Hot-dip galvanized (zinc) coatings on fabricated ferrous articles*

1.4 Terms and definitions

For the purpose of this document the definitions in AS 5039.1 apply.

Section 2 General requirements for performance testing

2.1 General

The requirements of this section shall apply to the preparation, application and sequence of testing for—

- (a) dynamic impact tests (see [Section 3](#));
- (b) jemmy tests (see [Section 4](#));
- (c) pull tests (see [Section 5](#));
- (d) probe tests (see [Section 6](#));
- (e) knife shear tests (see [Section 7](#)); and
- (f) corrosion tests (see [Section 8](#)).

A test specimen shall be prepared in accordance with [Clause 2.3](#) and then sequentially subjected to the dynamic impact test, jemmy test, pull test, and probe test, as applicable. This specimen shall be used for all tests.

NOTE See the flowcharts in AS 5039.1 for test sequences.

Independent specimens shall be tested in accordance with the knife shear and corrosion tests.

2.2 Principle

The effects of a physical attack against a security door or window screen are replicated in a series of tests. Generally, a physical attack comprises kicking, levering, manipulation and pulling. For this reason, only one test specimen is used and is subjected to a series of consecutive tests as specified in AS 5039.1.

2.3 Test specimen

2.3.1 Security door screens

2.3.1.1 General

Security door screens shall be tested as submitted, without modification to the test specimen.

Security door screens smaller than 2 700 mm high × 2 000 mm wide shall be tested using standard size doors.

Security door screens larger than 2 700 mm high × 2 000 mm wide shall have a separate test specimen provided. Test results shall be considered valid for manufactured products ± 300 mm of the test specimen.

Security door screens submitted for type testing shall be sized as specified in [Table 2.3.1.1](#).

Table 2.3.1.1 — Security door screen sizes for testing

Screen door type	Test panel		Tolerance
	Height (mm)	Width (mm)	Height and width (mm)
Hinged	2 040	870	±50
Sliding	2 100	1 250	±50
Fixed	2 100	1 250	±50
Bi-fold	2 100	900	±50

Table 2.3.1.1 (continued)

Screen door type	Test panel		Tolerance
	Height (mm)	Width (mm)	Height and width (mm)
NOTE For multiple combination tests, the sizes given are individual panel sizes.			

The test results shall be taken as indicative for all security screen doors that are built by the same method.

2.3.1.2 Hinges (for hinged screen doors only)

Hinges shall be positioned as specified by the manufacturer. If the specimen passes, this position ± 100 mm shall be acceptable for manufacturing.

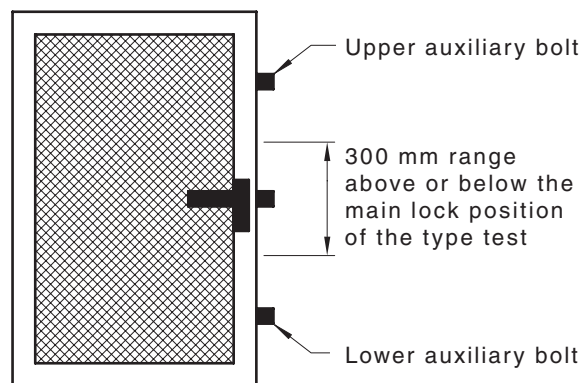
2.3.1.3 Lock fittings

The main lock bolt shall be positioned not more than 300 mm either side of the type-tested door as measured from the bottom of the door, see [Figure 2.3.1.3\(A\)](#).

Any test specimen with the main lock bolt positioned more than 300 mm either side of the type-tested door as measured from the bottom of the door will require retesting.

Where multiple point locking is used and auxiliary bolts can be fitted in a range of positions in the lock side door stile, the distance of the auxiliary bolts from the ends of the test specimen shall be the maximum nominated by the manufacturer, see [Figure 2.3.1.3\(A\)](#) or [2.3.1.3\(B\)](#).

Where multiple point locking is used and auxiliary bolts are connected via a fixed-length link, the auxiliary bolt shall be located within 300 mm of the type-tested door as measured from the bottom of the door.

**Figure 2.3.1.3(A) — Ranges for lock bolts — hinged doors**

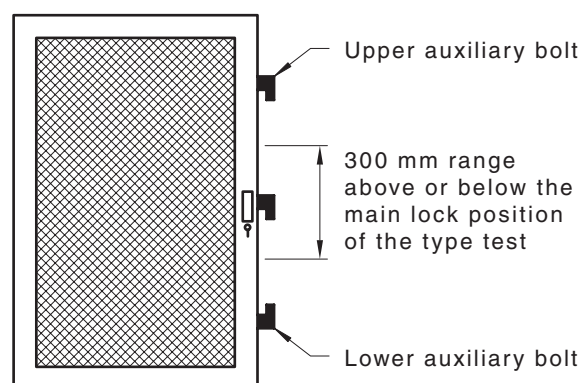


Figure 2.3.1.3(B) — Ranges for lock bolts — sliding doors

2.3.2 Security window screens

2.3.2.1 General

Security window screens shall be tested as submitted, without modification to the test specimen.

Security window screens submitted for type testing shall meet the requirements of [Table 2.3.2.1](#).

Test results shall be taken as indicative for security window screens that are built by the same method.

Table 2.3.2.1 — Security window screen sizes for testing

Screen window type	Test Panel		Tolerance
	Height (mm)	Width (mm)	Height and width (mm)
Hinged	1 500	1 200	±10
Sliding	1 500	1 200	±10
Fixed	1 500	1 200	±10
Bi-fold	1 500	600	±10

2.3.2.2 Hinges (for hinged and bi-fold window screens only)

Hinges shall be positioned as specified by the manufacturer.

NOTE 1 The position of hinges is also determined by the dimensions of the test specimen.

If the specimen passes, the position of the hinges on the manufactured product shall be within ± 100 mm of the hinge location on the test sample.

NOTE 2 The top hinge is measured to the top of panel; the bottom hinge is measured to the bottom of panel; and the centre hinge is measured to the centre of panel.

2.4 Preparation for testing

2.4.1 General

A security door or window screen supplied as a complete door screen set or a complete window screen set, respectively (such as proprietary products), shall be tested with its frame as supplied, closed and locked. The specimen shall be operable before commencing the test.

A security door or window screen supplied as a separate or fixed panel shall be mounted to the nominated timber or metal installation frame as specified by the system supplier or manufacturer. This installation frame shall be mounted into a rigid test frame so no movement occurs.

NOTE Penetrations, such as drilled holes and screw fixings into the frame, may have a weakening effect which may affect the test results.

The test frame shall be constructed of either timber or metal.

2.4.1.1 Timber frame

The installation frame shall be constructed from a species of seasoned timber commonly used in the region of installation for entry door frames.

The timber test frame size shall be specified by a recognized testing authority. If no size is specified, the frame size shall be 90 mm × 35 mm.

NOTE Security door or window screens tested in softer timbers, such as western red cedar, may require additional and stronger fastenings, whereas harder timbers, such as Jarrah, would transmit greater forces to the test specimen in the application of the Jemmy test. Therefore, clear pinus radiata is suggested due to its availability and mid-range mechanical properties.

2.4.1.2 Metal frame

A security door screen supplied as a complete set (proprietary system) shall be tested as supplied with its frame.

A security door screen supplied as a separate panel shall be mounted to an installation frame for testing.

NOTE 1 See [Clause 2.4.2](#) for fixed screens and [Clause 2.4.3](#) for hinged screens.

A specimen submitted for type testing shall be fitted to the metal material specified by the system supplier or manufacturer that is representative of an installation.

NOTE 2 The metal material may be steel or aluminium.

2.4.2 Fixed screens

A product manufactured for a specific application shall be mounted in a complete system for testing as specified by the manufacturer.

NOTE See [Clause 2.3](#) for single-screen applications.

The type of frame for a specimen submitted for type testing shall be determined by the system supplier or manufacturer as either timber or metal; each shall be separately tested and representative of the installation.

2.4.3 Hinged screens

A hinged screen manufactured for a specific application shall be mounted in a complete system for testing as specified by the manufacturer.

For single-screens, the size of the test specimen shall be as specified in [Table 2.3.1.1](#) or [2.3.2.1](#).

For multiple screen applications, such as bi-fold and French servery screens, the test specimen shall be in multiples of the single size requirement. The type of frame for a specimen submitted for type testing shall be determined by the system supplier or manufacturer as either timber or metal. Each shall be tested separately and be representative of the installation. If there are multiple possible configurations (e.g. bi-fold), each different joining method shall be tested in either one multiple combination or in as many as are required to complete all possible joining combinations.

2.4.4 Sliding screens

A sliding screen manufactured for a specific application shall be mounted in a complete system for testing as specified by the manufacturer.

For single screens, the size of the test specimen shall be as specified in [Table 2.3.1.1](#) or [2.3.2.1](#).

For multiple screens (e.g. double- or multi-stacking screens), the test specimen shall be in multiples of the single size requirement. The type of frame for a specimen submitted for type testing shall be determined by the system supplier or manufacturer as either timber or metal. Each shall be tested separately and representative of the installation. Where there are multiple configurations (e.g. multi-stacking) each different joining method shall be tested in either one multiple combination or as many as is required to complete all the different joining combinations.

2.5 Test application

Where security door or window screen design is such that the tests specified cannot be carried out, that part of the test sequence shall be deemed to have been passed.

Levers or probes used during testing shall be manually inserted using reasonable force and manipulation for a period not longer than 3 min without the aid of any other hand tools. If the depth cannot be achieved within 3 min, the test shall be continued at the insertion depth obtained.

Tests shall be separately carried out in the sequence illustrated in the flow charts in AS 5039.1.

Except for the dynamic impact test, all forces shall be applied in a static manner

Unless otherwise specified, the following tolerances shall apply:

- (a) All angles $\pm 3^\circ$ of the nominated angle.
- (b) All forces $\pm 2\%$ of the nominated value.
- (c) All dimensions $\pm 5\%$ of the nominated value.

Any omissions, deviations, additions, or exclusions from the specified test procedure shall be detailed in the test report, including the reason for the omission.

The fastening point jemmy attack and the corner pull test shall be carried out in accordance with [Sections 4](#) and [5](#), respectively.

2.6 Test sequence

The test specimen shall be subjected to the dynamic impact test, jemmy test, pull test, and probe test sequentially, as applicable.

Note Refer to flowcharts in AS 5039.1 for test sequences.

Independent specimens shall be tested in accordance with the knife shear and corrosion tests.

2.7 Test report

The following information shall be reported:

- (a) Manufacturer's name, product model and infill material batch number, where applicable.
- (b) Test date.
- (c) Report number.
- (d) Detailed drawings of the test item, specifying materials and parts.

- (e) Reference to this Australian Standard, i.e. AS 5039.3, and the test method used.
- (f) Test results.
- (g) Any deviations from the procedure.

Section 3 Dynamic impact test

3.1 General

This method of test shall be used to determine the resistance of security door and window screens incorporating infill panels to specified levels of lateral impact energy, see [Clause 3.4](#).

The general requirements for performance testing specified in [Section 2](#) shall be met.

3.2 Principle

The effects of a human kick onto a security door or window screen are simulated by allowing an impactor to swing as a pendulum against a test specimen that is held in a vertical orientation.

NOTE 1 Refer to AS 5039.1 for further information on dynamic test energy.

NOTE 2 The levels of dynamic impact energy that are required to be resisted by security door and window screens in various situations are generated by raising the centre of gravity of the impactor to pre-set heights above the impact plane before allowing it to swing freely towards the point of impact.

3.3 Apparatus

3.3.1 General

The following apparatus are required:

- (a) A support frame to hold —
 - (i) the test specimen in a vertical orientation; and
 - (ii) the impactor as a pendulum.
- (b) An impactor with attached suspension cable, bridle and hoisting cable.

NOTE 1 See [Clause 3.3.2](#) for additional information on support frames.

NOTE 2 [Figure 3.3.1](#) shows an arrangement of apparatus suitable for testing plane specimens.