Trans-Tasman Industry Code of Practice

TT-ICP-002 NZ

Window and Door Hardware in Housing and Residential Buildings
Product Performance – Durability and Corrosion Resistance

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PREFACE

This Industry Code of Practice was prepared by the Australian Window Association and the Window & Glass Association of New Zealand.

The goal of this document is to be a single generic code, applicable to a range of hardware on residential windows and doors.

- It should provide customers and consumers a means of selecting hardware.
- This document covers primarily corrosion and cyclic performance requirements of hardware in Housing and Residential Buildings.
- These performance requirements were selected as they affect the longevity of the hardware.
- This code does not currently cover testing for weather tightness and resistance to wind loads by the hardware when installed in a window or door system, which is covered by testing to AS2047 or NZS 4211. It is the intent of the committee to consider water penetration resistance and structural performance in subsequent revisions.
- Customers and consumers should always check with WGANZ or the AWA for the existence of a companion document for any other market specific requirement.

INTERPRETATION

If there are any concerns regarding interpretation of this Code of Practice they should be referred to the relevant association either AWA or WGANZ .

USING THIS DOCUMENT (TT-ICP-002 NZ)

This ICP must always be referred to in full as:

Window and Door Hardware in Housing and Residential Buildings
Product Performance – Durability and Corrosion Resistance

SUBSTITUTION

This document is designed to provide comparison of performance between one item of hardware and another. It cannot however be the basis for substitution between items of hardware in a given window or door system. The final determination of whether hardware is suitable and whether the window and door system complies with AS 2047, NZS 4211 or other requirements is the responsibility of the window or door manufacturer or system supplier.

MAINTENANCE

Routine preventative maintenance in accordance with the manufacturer’s instructions is essential to ensure that hardware products achieve their intended useful life.

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AUSTRALIAN WINDOW ASSOCIATION
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SECTION 1 SCOPE AND GENERAL

1.1 GENERAL

This document specifies the test conditions and performance requirements for hardware used on external windows and doors in housing and residential buildings as they are defined in the Building Code of Australia and New Zealand Building Code.

1.2 SCOPE OF WINDOWS AND DOORS

This document is applicable for hardware for the following types of windows and doors-

(a) sliding sashes
(b) folding sashes
(c) casement sashes (including swinging sashes)
(d) awning sashes
(e) hung windows
(f) louvre windows

Where ‘sashes’ denotes both windows and doors.

This ICP does not cover hardware that is covered by AS1926.1-2007 Safety Barriers for Swimming Pools.

1.3 SCOPE OF HARDWARE

This document is applicable to the following hardware,

(a) locks
(b) latches
(c) stays
(d) hinges
(e) tracks
(f) rollers
(g) pivots
(h) operators
(i) winders
(j) restrictors
(k) fasteners
(l) balances
(m) handles
(n) skids
(o) retractable or pivoting seals

1.4 REFERENCED DOCUMENTS

This document references the following documents-

(a)	AS 2047	Windows in buildings – Selection and installation
(b)	NZS 4211	Specification for Performance of Windows
(c)	AS 4145	Locksets
(d)	AS 2331.3.1	Neutral Salt Spray Test
(e)	BCA	Building Code of Australia
(f)	NZBC	New Zealand Building Code

1.5 CERTIFICATION PROCEDURE

Companies seeking certification of hardware to this document must follow the procedure described below-

(a) Test hardware according to the tests described in Section 2 in the order described in 2.5 Test Flow Chart.
(b) Perform those tests according to the test conditions described in Section 3.
(c) Meet the performance requirements described in Section 4.
(d) Apply labelling and supply certification as described in Section 5.

1.6 DEFINITIONS

For the purpose of this document, the definitions given in AS 2047, AS 4145.1 and those below apply-

1.6.1 **Accredited test facility** - a test facility accredited to perform a given test by a 3rd party accreditation body complying with ISO/IEC 17025.

1.6.2 **Association** - either the AWA or WGANZ, whichever is relevant.

1.6.3 **Fit for Purpose** - refer to Appendix A

1.6.4 **Fixture** - a small section of a typical window or door to which the samples are mounted.

1.6.5 **Hardware Company** – the manufacturer, supplier, distributor or individual who is seeking certification of hardware to this document.

1.6.6 **Sample** - all the components and multiples of the product that are required for testing.

1.6.7 **Significant surface** - that part of the surface which is required to be covered by the coating, and which is essential to the appearance and serviceability of the item. The significant surface does not include edges, deep recesses and secondary surfaces.

SECTION 2 TESTS

2.1 GENERAL

Samples of the hardware within the scope of Section 1 for which certification is being sought shall be subject to various tests. It is not appropriate to subject all hardware types to all of the tests described. Prior to starting the testing programme the applicable tests should be determined using the testing segregation table in section 2.1.1. Once the relevant tests have been determined, the tests are to be performed consecutively and cumulatively according to the two streams of tests shown in the 2.5 Test Flow Chart.

The test flow chart contains two streams of tests - Stream A for corrosion and Stream B cyclic performance. Separate identical production samples shall be used for each stream of testing as conducting both streams of tests on one set of hardware would be too onerous and unrealistic when compared to actual hardware installed in operational conditions.

2.1.1 Testing Segregation

The testing segregation table should be used in conjunction with the two streams of tests shown in 2.5 Test Flow Chart, to determine the relevant test schedule for the hardware item to be tested.

Hardware Type	Corrosion 3.2 (Stream A testing)	Cyclic Durability (Stream B testing)	Ease of Operation (Stream A & B testing)
Locks	✓	✓	✓
Latches	✓	✓	✓
Stays	✓	✓	×
Stays – Non Friction	✓	✓	✓
Hinges	✓	✓	✓
Tracks	✓	✓	✓
Rollers	✓	✓	✓
Pivots	✓	✓	✓
Operators	✓	✓	✓
Restrictors	✓	✓	✓
Fasteners	✓	✓	✓
Balances	✓	✓	×
Handles	✓	✓	✓
Skids	✓	✓	✓
Louvre Gallery	✓	✓	✓

2.1.2 Test samples

A ‘sample’ includes all the components and multiples of the products that are required for its typical installation. Samples shall be selected from normal production with regards to design, materials and workmanship. The samples shall not be prototypes.

Samples shall be tested in the ‘as received’ condition and undergo no lubrication, adjustment, modification nor be dismantled unless specified by the product’s instructions or the test conditions described within this document. Once testing has begun, the samples may not be further lubricated, adjusted or maintained in any way beyond that allowed for by the test conditions described within this document.

Three samples shall be supplied for each product to be tested-

- Stream A of testing One sample
- Stream B of testing One sample
- Reference One sample (Refer to 2.1.4 for exceptions)

Only once the hardware samples of both Stream A and Stream B have passed their individual sequences of tests can an application for certification be made for that product. If any sample or individual product within a sample in either streams, fails a test, then the product is deemed to have failed.

The Reference sample shall be kept in a manner to preserve its ‘as new’ condition. All three test samples shall be labelled and retained until the end of the certification process.

2.1.3 Extended and linked hardware

Elements of hardware that are typically linked together to form an extended mechanism and that cannot be accommodated in either the neutral salt spray chamber of 3.2 or the contamination container of 3.3.1 may be dealt with in a modified state in those situations only. Such mechanisms may have their elements mounted to separate fixtures or may be mounted to a single fixture in a shortened or truncated form, for example a remote mechanism of a door lock.

2.1.4 Multiple identical or matching combinations of hardware

For products typically installed in multiple identical or matching combinations (e.g. mirror image stays on a window or three identical hinges on a door), a sample includes all the products required for the configuration for which certification is being sought. For example, if a hinge is typically fixed in triples, then a total of 7 hinges will be supplied; one sample of three hinges for Stream B, yet only three hinges are required for Stream A and one as a reference sample.

2.1.5 Type-testing of similar products

Groups of similar products which are mechanically equivalent, for example left and right handing or colour variations in the same finish may be type-tested to determine performance of the whole group.

2.1.6 Test facilities

It is a requirement that the tests be performed in a test facility as defined. This requirement is specified in the relevant tests described in 2.2 to 2.5. That test facility is responsible for the handling, storage, safety and confidentiality of the hardware samples and intellectual property.

2.1.7 Testing safety

The testing described in this document involves procedures and equipment that are potentially dangerous to those performing the tests, bystanders and facilities. Careful planning should be undertaken before testing commences to ensure that all avoidable dangers to people and facilities are minimised. Testing should only then be performed by persons trained in the safe operation of the required equipment. This document does not describe the safety equipment and practices necessary; this information should be obtained independently.

2.2 CORROSION

The Stream A sample shall be subject to a corrosive environment under the test conditions in 3.2 and must pass the performance requirements in 4.2 before proceeding to the next test.

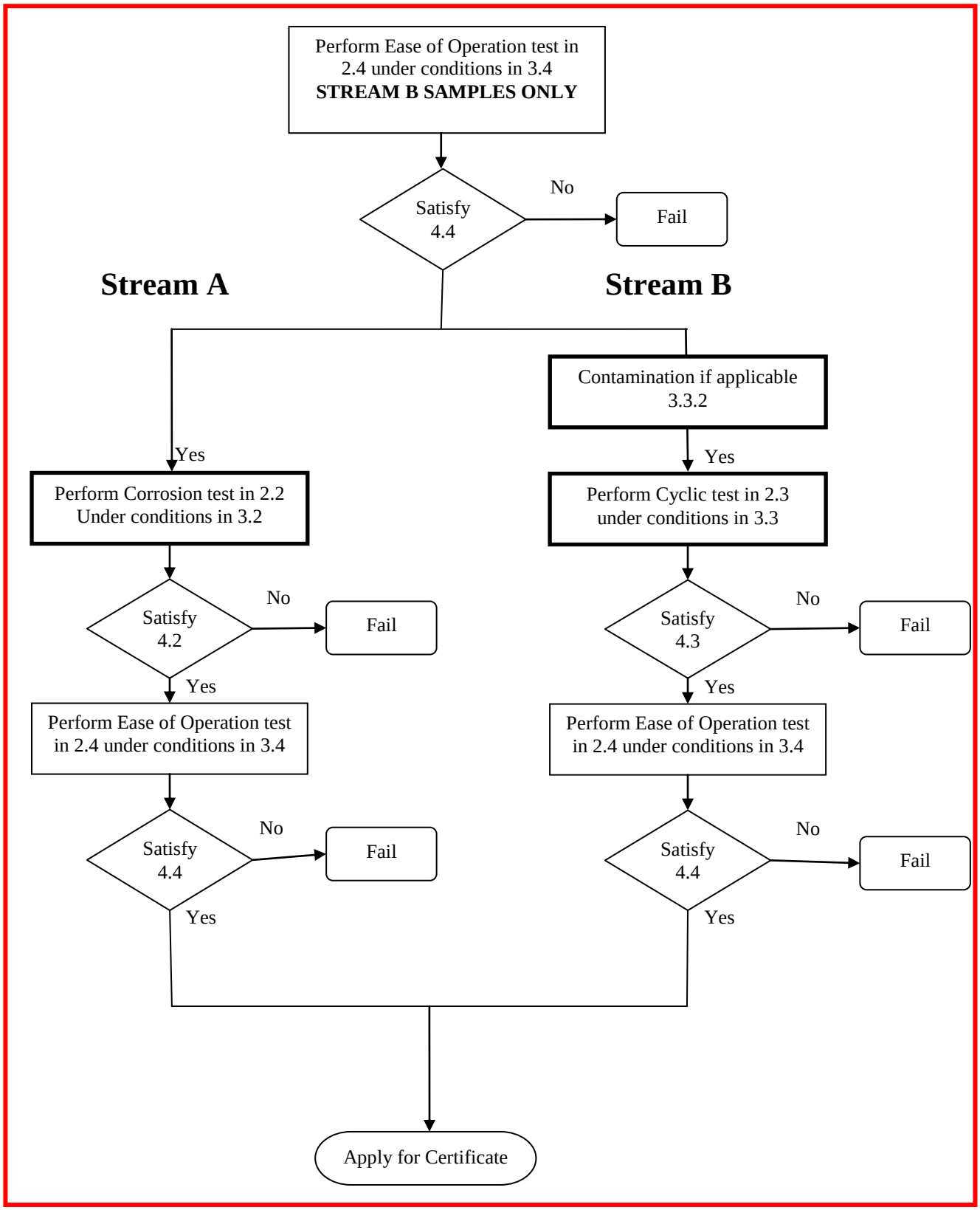
2.3 CYCLIC DURABILITY

The Stream B sample shall be subject to contamination, if applicable and to Cyclic Durability under the test conditions in 3.3 and must pass the performance requirements in 4.3 before proceeding to the next test.

2.4 EASE OF OPERATION

The samples in both Stream A and Stream B shall be subject to the relevant operating forces described in 3.4 and must pass the performance requirements in 4.4 as dictated by the Test Flow Chart in 2.5.

2.5 TEST FLOW CHART



SECTION 3 TEST CONDITIONS

3.1 GENERAL

The tests described in Section 3 shall be performed under the following conditions. During these tests and within the test conditions specified, reasonable effort shall be made to

replicate the conditions of actual field use regarding the installation and operation of the samples.

The test rig described in the Cyclic Durability test in 2.3 may be the same test rig used in the Ease of Operation test 2.4. Thought should be given to the construction and flexibility of this rig to ensure it can meet the variety of tests it must perform.

During and between the tests, there are restrictions on the disassembly and adjustment of the samples. Where there are a limited number of fixtures, test rigs and neutral salt spray (NSS) chamber space available, it is permitted to perform the entire sequence of tests on individual samples before beginning with the next sample.

If the samples are to be lubricated as part of the product's instructions, then lubrication may only be applied before any testing commences, and may not be reapplied at any time thereafter.

3.2 CORROSION

The Stream A sample shall be subjected to NSS in accordance with AS 2331.3.1 except where specified under the conditions details below.

3.2.1 Sample preparation

The samples shall be mounted to fixtures that simulate their typical installation. This includes the fixing method, fixing hardware, those surfaces totally shielded in a typical installation and those surfaces partially shielded in a typical installation. Where possible, the fixtures shall be sections of a typical window or door.

Where a hollow section is used for a fixture, the open ends of the section may be closed off to prevent the spray entering in either of the following situations-

a) where no element of the hardware would exist inside the section within 150 mm from the end of the section in a typical installation, excluding fixings/fasteners, for example a lock fitted near the open end of a door stile would not be closed off but may be shielded by typical frame elements.
b) where the end of the section is effectively covered in a typical installation, for example a hinge screwed to a door with mitred corners.

Where an individual sample is typically mounted to multiple elements of a window or door, a hinge for example, multiple fixtures that simulate the different elements shall be used. Where components of an individual sample can become separated during normal operation, a lock and strike for example, these components shall be mounted on their own fixtures and tested separately.

The samples and fixtures shall be orientated in the NSS chamber as they would be in typical use. For example, hardware typically attached to a sill should be orientated horizontally and facing up, and hardware typically attached to a head should be orientated horizontally and facing down.

Each sample shall be operated to its most exposed configuration, for example the chain of a chain winder shall be fully extended or the leaves of a hinge shall be open.

It is not required that the surfaces of the samples be scribed prior to testing.

3.2.2 Test duration

There are several different performance grades of resistance to salt induced corrosion which require different test durations-

TABLE 3.1 CORROSION GRADE TEST DURATIONS

Corrosion Resistance Category	Test Time (hours)
CR1 – N/A	**-**
CR2 – Very Low	**24**
CR3 - Low	**48**
CR4 – Mild	**72**
CR5 - Moderate	**96**
CR6 - Normal	**168**
CR7 - High	**240**
CR8 – Very High	**480**
CR9 - Severe	**720**
CR10 - Extreme	**1000**

Testing to grade CR2 must be performed continuously .During testing to grades CR3 to CR10 the testing may be paused at intervals of minimum of 24 hours from the commencement time for inspection. The samples must not be lubricated, adjusted or disassembled during the intervals, and the testing must recommence within 30 minutes of the stoppage

During these intervals, the samples may be removed from the NSS chamber and hand rinsed with clean low pressure running water not exceeding 40 degrees C whilst still mounted to the test fixtures. The samples may also be operated a maximum of 5 consecutive complete operations during each interval which may be performed concurrently with the rinsing. These operations may be performed under load as specified and at the discretion of the Hardware Company.

The testing may be paused for up to a maximum of 24 hours but the product shall not be removed from the chamber

3.2.3 Completion

At the completion of the test, the samples shall be removed from the NSS chamber and hand rinsed with running tap water not exceeding 40 degrees C whilst still mounted to the test fixtures to remove obvious salt deposits, and left for a minimum of 24 hours to dry. The samples may also be operated a maximum of 10 complete cycles at the completion of this test which may be performed concurrently with the rinsing. These operations may be performed under load as specified and at the discretion of the Hardware Company.

Evidence of corrosion emanating from internal components that have leached through onto the visual surfaces of the hardware may be wiped with a non-abrasive cloth, but must first be recorded according to the performance requirements of this test.

3.3 CYCLIC DURABILITY

The Stream B sample shall be contaminated and subjected to Cyclic Durability where specified under the conditions detailed below.

3.3.1 Sample preparation

The samples shall be mounted to fixtures that simulate their typical installation. This includes the fixing method, fixing hardware, those surfaces totally shielded in a typical installation and those surfaces partially shielded in a typical installation. Where possible, the fixtures shall be sections of a typical window or door.

Where a hollow section is used for fixtures, the open ends of the section may be closed off to prevent the contaminant entering in either of the following situations –

a) Where no element of the hardware would exist inside the section within 150 mm from the end of the section in a typical installation, excluding fixings/fasteners, for example a lock fitted near the open end of a door stile would not be closed off but may be shielded by typical frame elements.
b) Where the end of the section is effectively covered in a typical installation, for example a hinge screwed to a PVC door with mitred corners.

3.3.2 Contamination

Sample contamination is to be performed if the hardware manufacturer deems that it is suitable for the hardware to be mounted within 150mm of the adjacent finished floor level.

The exposed elements of the hardware shall be contaminated with a dry mixture constituting by weight –

- 50% plaster dust (‘Plaster of Paris’)
- 25% cement powder (commercial bagged cement)
- 25% sand (bricklayer’s fine sand)

The samples shall be placed in a sealed container with 100g of the mixture and vigorously shaken for 1 minute. The walls of the container shall be smooth, non-porous and non-static relative to the mixture to deter the mixture from being attracted to the container walls themselves. Coarsely cut timber, low density open cell foam, materials that develop static charge and other similar materials are unsuitable for the container construction.
For items of hardware that can be adjusted or moved to both ends of extremes (i.e. open and closed or retracted or extended) the hardware will be contaminated in both positions.

The cyclic testing of a sample must begin within 4 hours of its contamination.

3.3.3 Rated size, weight and seals

After contamination, each sample shall be mounted to a test rig that simulates its typical installation in accordance with the product’s instructions. This includes the fixing method and the fixing hardware. Where possible, the rig shall be an actual window or door, or as a minimum shall be constructed of materials used in a typical installation.

Where a fixture used for a sample’s contamination does not form part of the cyclic test rig, the sample may be removed from that fixture and remounted to the cyclic test rig.

The sash of this rig shall be the maximum size and weight for which the hardware is rated by the manufacturer. Where the hardware is typically exposed to the forces of a sash closing against a weather seal, the cyclic test rig must reproduce that force.

3.3.4 Clearances

The samples shall be installed to hold the sash and frame of the cyclic test rig within the clearances stated in the product's instructions.

3.3.5 Cyclic travel and rate

The sash hardware shall be operated through the minimum movement within the prescribed rates specified in table 3.2 where appropriate. For example, a sliding door roller test shall be conducted over the full 820 mm at between 5 and 30 cycles/min, while testing a sliding door lock shall only require movement such as to perform the full operation of the lock.

TABLE 3.2 TRAVEL AND CYCLIC RATE

Sash Type	Movement	Cyclic Rate
Window	620mm	5-30 cycles/min to be specified by the manufacturer to minimise heat build-up
Sliding Door	820mm	5-30 cycles/min to be specified by the manufacturer to minimise heat build-up
Swinging Sash/Louvre	90% of recommended opening	3-30 cycles/min to be specified by the manufacturer to minimise heat build-up
Folding Sash	90% of recommended opening for a 4 panel system	2-30 cycles/min to be specified by the manufacturer to minimise heat build-up

The cyclic rate shall be set to ensure that a cycle has been fully completed before the start of the next cycle and no part of the hardware shall be submitted to any strains due to the test apparatus that are not typical of normal usage.

The manufacturer shall have the option of specifying a lower speed that more closely simulates the product's typical use in order to avoid overheating. If so specified, the test report shall state the speed of testing and the reasons for using a lower speed.

3.3.6 Cycles

There are several different performance grades for hardware durability that require a different number of cycles. Hardware used on each window and door type has a minimum level that must be achieved. The test samples must be contaminated (as applicable) and tested to the required durability level as stipulated in the table below.

Performance Grade	CYCLES	Windows	Sliding Doors	Folding Doors	Hinged Doors
D1	**10,000**	Minimum			
D2	**25,000**			Minimum	
D3	**50,000**		Minimum		
D4	**75,000**				
D5	**100,000**				Minimum
D6	**150,000**				
D7	**250,000**				
D8	**500,000**				
D9	**750,000**				
D10	**1,000,000**				

Testing for all hardware and opening types must be performed continuously; testing can be paused for routine inspection that does not remove hardware from the testing rig and can be paused overnight, except for friction hardware that have an adjustment mechanism to maintain operating forces, the sash can be disconnected from the cycling mechanism and adjusted to maintain the operating force and then the testing recommenced minimum intervals of 2,000 cycles

3.4 EASE OF OPERATION

The test may be performed with the samples mounted to same test rig used in the Cyclic Durability test sub-section 3.3.2 in the same manner.

3.4.1 The Stream A sample

The Stream A sample shall be removed from the fixtures used in the Corrosion test in 2.2 and mounted to the test rig. These samples must not be lubricated before this test begins nor lubricated or adjusted during this test.

3.4.2 The Stream B sample

This test is performed twice on the Stream B sample, before and after the Cyclic Durability test in 2.3. On the first occasion, if the samples are to be lubricated as part of the product's instructions, then lubrication is to be applied before the test. On the second occasion, these samples may not be lubricated or adjusted before or during this test.

The actuating mechanism of the test rig shall be removed or disconnected to allow the hardware to be freely operated.

Within this test alone, the seals shall be removed.

SECTION 4 PERFORMANCE REQUIREMENTS

4.1 GENERAL
Upon successful completion of the tests in Section 3, hardware tested shall meet the following performance requirements

4.2 CORROSION RESISTANCE
At the completion of the test described in 2.2, the product shall be assessed by evaluating to the following acceptable criteria for

a) Decorative Finish
b) Protective finish
c) Functional Requirements.

4.2.1 Decorative Finish
Immediately upon completion of the test the exposed surfaces of the product shall be cleaned and dried as specified in AS 2331.3.1. The coated finish shall withstand exposure for the time specified for the nominated corrosion resistance designation without corrosion of the base metal substrate visible to unaided normal or corrected vision. There shall be no signs of tarnish as blackening or discolouration of the surface. The degree of blistering of the coatings shall be not worse than density 2 and size 2 as shown in figure 4.2 below: (Reference AS4145 section 3, and AS1247)

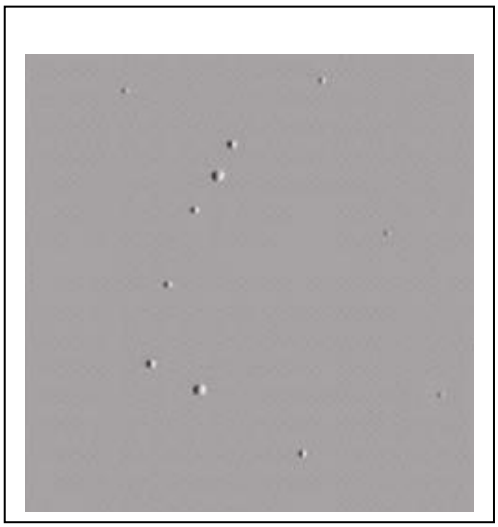


Figure 4.2

Decorative finishes shall also comply with the requirements for Protective Finish and Functional requirements.

4.2.2 Protective Finishes
Immediately upon completion of the test the exposed surfaces of the product shall be cleaned and dried as specified in AS 2331.3.1. The coated finish shall withstand exposure for the time specified for the nominated corrosion resistance designation without corrosion of the base metal substrate visible to unaided normal or corrected vision excepting of three spots per 50 x 50mm of significant surface and without any spots larger than 2mm in any direction of the substrate.
Note: Examples of this corrosion could be rust of a reddish brown for steel or white corrosion for aluminium or zinc alloy.

4.2.3 Functional Requirements

Immediately upon completion of the test the exposed surfaces of the product shall be cleaned and dried as specified in AS 2331.3.1. The product shall be fully operable and provide full functionality.

Evidence of corrosion emanating from internal components that have leached through onto the visual surfaces of the hardware shall be photographed and recorded for the test report. The hours lapsed when intervals were taken, the hours completed and the performance grading achieved shall also be recorded for the test report.

4.3 CYCLIC DURABILITY

At the completion of the test described in 3.3, the sample shall-

a) not break
b) be fully operable and pass the Ease of Operation test 3.4
c) All hardware including hardware relying upon friction or resistance to control an opening must still perform its function as intended

The simulated or actual sash weight, the 'as installed' clearances, the cyclic rate and the number of cycles completed shall be recorded for the test report.

4.4 EASE OF OPERATION

4.4.1 Locks and Locksets

(This includes latches, winders, camlocks etc. that have a key mechanism).

During the test described in 3.4 the maximum measured operating forces shall be in accordance with AS4145.2 to the requirements of Table 4.1.

TABLE 4.1 EASE OF OPERATION – AS4145.2-2008

Lockset excluding keying security	Clause reference		
	Requirement Clause	(Appendix A) Paragraph	Value for designation
Ease of operation			
Torque to retract friction -free bolt---	3.3.2	A5.1	
by turnknob	3.3.2(a)	A5.1	D_{knob} X 0.05 Nm max.
by key	3.3.2(b)	A5.1	D_{key} X 0.05 Nm max.
by knob	3.3.2(a)	A5.1	D_{knob} X 0.05 Nm max.
by lever	3.3.2(c)	A5.1	L_{lever} X 0.04 Nm max.
Torque to operate hub locking device	3.3.7	A5.6	D_{key} X 0.05 Nm max.
Torque to retract friction-loaded bolt---	3.3.4	A5.2	
by turnknob	3.3.4(a)	A5.2	D_{knob} X 0.1 Nm max.
by key	3.3.4(b)	A5.2	D_{key} X 0.22 Nm max.
by knob	3.3.4(a)	A5.2	D_{knob} X 0.1 Nm max.
by lever	3.3.4(c)	A5.2	L_{lever} X 0.07 Nm max.
Force to latch door	3.3.5	A5.3	20 N max.
Projection of deadlatch plunger to effect deadlocking action	3.3.6	A5.5	4 mm ± 1mm

4.4.2 Force to operate hardware by manually operating a sash:

- folding sashes 30 N (applied at edge of sash)
- sliding 30 N
- swinging sashes 30 N (applied at edge of sash)

4.4.3 Hardware requiring loads:

- armwinder (e.g casement) 2 Nm
- cam lock 2 Nm
- chainwinders 2 Nm
- sliding window latch 20 N (to unlatch only)
- wedgeless keepers 2 Nm
- window and door bolts 15 N

This excludes hardware specifically designed to resist by friction alone the forces generated by wind pressure such as casement or awning friction stay.

Maximum force to operate hardware by manually operating a sash where the hardware is specifically designed to resist by friction alone the forces generated by wind pressure-

- swinging sashes 90 N applied at edge of sash

Where friction restraints alone are relied on to control an open, pivoted or projected sash, they shall provide sufficient restraint to prevent the window from moving when a force in Newtons equal to 35 times the sash area in m^2 is applied to the edge furthermost from the hinges or pivots. This force shall be applied perpendicularly to the plane of the sash at all angles of opening to 70% of the maximum opening distance.

These forces are for the operation of the hardware alone, without any friction imposed by seals or other hardware not part of the sample being tested.

The force(s) required to operate the hardware in Newtons and Newton metres (whether tension, compression or torque) shall be recorded for the test report.

SECTION 5 LABELLING AND CERTIFICATION

5.1 GENERAL

Hardware packaging and or literature may be labelled. Labels shall be in accordance with Clause 5.3. Hardware claiming compliance or labelled as compliant to this ICP shall be supported by a certificate as per Clause 5.2

5.2 CERTIFICATION

–The following minimum information shall be stated on the compliance certificate as per Appendix A

Industry Code of Practice Number
Date of certificate
Identification of testing report number traceable to ISO 17025
Name of Manufacturer or supplier of hardware and contact information
Product description and detail including part number(s) identification
Product capacity or size specification as tested
Product type as specified in clause 1.3
Product performance ratings

- Corrosion Resistance Category
- Cyclic Durability Performance Grade

5.3 LABELLING

–The Label shall contain the following information

(a) the manufacturer's identification mark or name
(b) test report number and date
(c) the corrosion grade
(d) the cyclic performance grade
(e) Product capacity or size specification as tested

Below is a template for the label when used:

Window and Door Hardware in Housing and Residential Buildings Product Performance – Durability and Corrosion Resistance			
ICP Test Report No.		**Date:**	
Corrosion Performance		**Cyclic Performance**	
Product Code		**Product Capacity, Rating or Size**	
Manufacturer			

APPENDIX A FIT FOR PURPOSE (INFORMATIVE)

A1 GENERAL

Hardware should be fit for those purposes and applications for which the Hardware Company recommends its use.

a) "FITNESS FOR PURPOSE" DEFINITION
Hardware that is designed and constructed in a quality manner that will meet the intended purpose as set forth by the manufacture.

A2 FIT FOR PURPOSE CONSIDERATIONS

In addition to the legal definition, 'Fit for Purpose' within this document and for the scope of hardware it covers means the following within the product's nominal life-
The following functional aspects of fit for purpose should be considered

b) STRUCTURAL FAILURE
The hardware shall be operable without permanent deformation or breakage.

The hardware shall withstand the forces generated by wind pressure on a sash up to the force to which the hardware is rated by the Hardware Company and remain serviceable.

c) SECONDARY DAMAGE
The hardware shall allow the sash to operate without causing damage to any element of the window or door opening.

d) OPERATION
The hardware shall allow itself and the sash to operate through the functions and movements for which their design provides, across the full range of sash loads for which the hardware is recommended.

e) SECURITY
Where applicable, the hardware shall provide a level of security suitable for the applications for which the hardware is recommended by the Hardware Company (reference can be made to a product's performance under AS 4145 or other appropriate standard).

f) NOISE
The hardware shall be operable without causing excessive noise which would not normally or reasonably be associated with that type of hardware.

g) SAFETY
The hardware shall be safe to operate and must not represent a danger to a person.