



CEN/TC 33 Secretariat

"Doors, windows, shutters, building hardware and curtain walling"

"Portes, fenêtres, fermetures, quincaillerie de bâtiment et façades rideaux"

"Türen, Tore, Fenster, Abschlüsse, Baubeschläge und Vorhangfassaden"

CEN/TC 33 N 3950

2020-07-09

**prEN 13126-14, Building hardware – Hardware for windows and door height windows – Requirements and test methods – Part 14: Sash fasteners
WI 00033558**

Action: For information

Source: CEN/TC 33/WG 4

Comments: Draft sent to CCMC on 2020-07-03 for the CEN Enquiry.



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Building hardware — Hardware for windows and door height windows - Requirements and test methods — Part 14: Sash fasteners

Baubeschläge — Beschläge für Fenster und Fenstertüren - Anforderungen und Prüfverfahren — Teil 14: Einreiberverschlüsse für Schiebefenster

Quincaillerie pour le bâtiment — Ferrures de fenêtres et portes-fenêtres - Exigences et méthodes d'essai — Partie 14 : Verrouillages à came

ICS: 91.190

Descriptors:

Document type: European Standard

Document subtype:

Document stage: CEN Enquiry

Document language: E

STD Version 2.9p

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European foreword

This document (prEN 13126-14:2020) has been prepared by Technical Committee CEN/TC 33 “Doors, windows, shutters, building hardware and curtain walling”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13126:14:2012.

With regard to EN 13126-14:2012, the following significant changes were made:

- EN 13126-14 now is independent from EN 13126-1; all necessary information is included without the need of any further information from EN 13126-1;
- several editorial changes in the wording for a better understanding;
- new terms and definitions added under 3.3 (sash width) and 3.4 (sash height);
- under 4.1 classification system changed completely
 - former digit 1 (Category of use) changed into box 1 (Durability)
 - former digit 2 (Durability) changed into box 2 (Mass)
 - former digits 3, 4 and 5 deleted
 - former digit 6 (Corrosion resistance) changed into box 3 (Corrosion resistance)
 - former digits 7 and 8 deleted
 - former digit 9 (Test sizes – test limitations) changed into box 4 (Test sizes)
- under 4.2 new grades for the number of cycles defined; H1 (5 000), H2 (10 000) and H3 (20 000);
- under 4.5 new example of classification added in accordance with the new classification system; 2 alternative ways (table or alphanumerical) to show the classification defined;
- under 5.2 information regarding new grades for durability added
- under 5.6 information regarding corrosion resistance added
- under clause 6 “Test equipment and preparation for the test” additional information added
- under clause 8 new clause added regarding marking with information from the current version of EN 13126-1;

This European Standard is one of a series of European Standards for building hardware products for windows and door height windows. This European Standard is independent of EN 13126-1.

EN 13126 consists of the following parts:

- EN 13126-1, *Building hardware — Hardware for windows and door height windows — Requirements and test methods — Part 1: Requirements common to all types of hardware;*
- EN 13126-2, *Building hardware — Hardware for windows and door height windows — Requirements and test methods — Part 2: Window fastener handles;*
- EN 13126-3, *Building hardware — Hardware for windows and door-height windows — Requirements and test methods — Part 3: Handles, primarily for Tilt and Turn, Tilt-First and Turn-Only hardware;*
- EN 13126-4, *Building hardware — Requirements and test methods for windows and door height windows — Part 4: Espagnolettes;*
- EN 13126-5, *Building hardware — Hardware for windows and door height windows — Requirements and test methods — Part 5: Devices that restrict the opening of windows and door height windows;*
- EN 13126-6, *Building hardware — Hardware for windows and door height windows — Requirements and test methods — Part 6: Variable geometry stay hinges (with or without a friction stay);*
- EN 13126-7, *Building hardware — Requirements and test methods for windows and door height windows — Part 7: Finger catches;*
- EN 13126-8, *Building hardware — Hardware for windows and door height windows — Part 8: Requirements and test methods for tilt and turn, Tilt-First and Turn-Only hardware;*
- EN 13126-9, *Building hardware — Requirements and test methods for windows and door height windows — Part 9: Hardware for horizontal and vertical pivot windows;*
- EN 13126-10, *Building hardware — Requirements and test methods for windows and door height windows — Part 10: Arm-balancing systems;*
- EN 13126-11, *Building hardware — Requirements and test methods for windows and door height windows — Part 11: Top hung projecting reversible hardware;*
- EN 13126-12, *Building hardware — Requirements and test methods for windows and door height windows — Part 12: Side hung projecting reversible hardware;*
- EN 13126-13, *Building hardware — Hardware for windows and balcony door — Requirements and test methods — Part 13: Sash balances;*
- EN 13126-14, *Building hardware — Hardware for windows and door height windows — Requirements and test methods — Part 14: Sash fasteners;*
- EN 13126-15, *Building hardware — Hardware for windows and door height windows — Requirements and test methods — Part 15: Rollers for sliding and hardware for sliding folding windows;*
- EN 13126-16, *Building hardware — Hardware for windows and door height windows — Requirements and test methods — Part 16: Hardware for Lift and Slide windows;*
- EN 13126-17, *Building hardware — Hardware for windows and door height windows — Requirements and test methods — Part 17: Hardware for Tilt and Slide windows;*
- EN 13126-19, *Building hardware — Requirements and test methods for windows and door height windows — Part 19: Sliding Closing Devices*

1 Scope

This European Standard specifies requirements and test methods for durability, strength, security and function of sash fasteners for windows and door height windows.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1670, *Building hardware — Corrosion resistance — Requirements and test methods*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

sash fastener

device to secure, in the closed position, the sashes of a double or single hung vertically sliding window and the sashes of a horizontally sliding window

3.2

pull-in

distance the sashes are moved towards each other during operation of a sash fastener from a fully open to a fully closed position

3.3

sash width

the total horizontal outer dimension of the sash

3.4

sash height

the total vertical outer dimension of the sash

4 Classification

4.1 General

Sash fasteners shall be classified in accordance with the four box classification system (see Table 1).

Table 1 — Classification system of hardware

box	1	2	3	4
characteristic	Durability	Mass	Corrosion resistance	Test sizes

4.2 Durability (1 – first box)

The first box shall display the grade applied to the durability test in accordance with 5.2:

- grade H1: 5 000
- grade H2: 10 000
- grade H3: 20 000

4.3 Mass (2 – second box)

The second box shall display the maximum tested sash-mass (weight).

The mass range starts from 10 kg and varies in steps of 5 kg up to 50 kg. After that the mass varies unlimited in steps of 10 kg. An unlimited number of grades are identified, whereby 010 is the lowest.

Table 2 — Tested sash-mass

Grade	010	015	020	025	030	035	040	045	050	060	070	080	...
Mass (kg)	10	15	20	25	30	35	40	45	50	60	70	80	...

The mass of the test sash shall be determined in accordance with the claims made by the hardware manufacturer.

4.4 Corrosion resistance (3 – third box)

The third box shall display the grade regarding corrosion resistance in accordance with 5.6.

4.5 Test sizes (4 – fourth box)

The fourth box shall display the test sizes which were used for testing the sash fastener.

SW = Sash Width in mm / SH = Sash Height in mm

EXAMPLE 600 SW x 1 200 SH

NOTE The specified sizes are test sizes only. It does not relate to the maximum sizes to which a window with this hardware may be fabricated.

4.6 Example of classification for sash fasteners

a) Alternative 1: Table with boxes:

Standard	Box			
	1	2	3	4
EN 13126-14:YYYY	H2	040	3	600/1 200

In accordance with Clause 8 the information regarding the classification by using a table with boxes shall always be shown together with the number of this standard, EN 13126-14.

b) Alternative 2: Alphanumeric:

EN 13126-14:20XX H2-040-3-600 × 1 200

This denotes sash fastener, which have:

—	box 1	durability	grade H2 (10 000 cycles)
—	box 2	mass	40 kg
—	box3	corrosion resistance	grade 3
—	box 4	test sizes	SW = 600 mm, SH = 1 200 mm

5 Requirements

5.1 Dangerous substances

Materials in products should not release any dangerous substances in excess of the maximum levels specified in the European material standards and any National regulations.

5.2 Durability

The test specified in 7.2 shall be carried out to ensure the sash fastener is capable of continued operation after cycling in accordance with the grades specified in 7.2, with regard given to normal maintenance.

Upon completion of the durability test in accordance with 7.2 the sash fastener shall continue to function normally.

The manufacturer specifies one of the following 3 grades for the number of cycles, with which the durability test shall be carried out:

- grade H1: 5 000 (+1 %) cycles ;
- grade H2: 10 000 (+1 %) cycles;
- grade H3: 20 000 (+1 %) cycles;

5.3 Static force tests

5.3.1 General

The tests specified in 7.3.1, 7.3.2 and 7.3.3 shall be used to ensure the hardware is capable of withstanding both normal operations and excessive forces with minimal deformation.

5.3.2 Operating force test

Upon completion of the operating force test in accordance with 7.3.1, the operating force shall not exceed 5 Nm nor an applied force of 50 N.

5.3.3 Excessive horizontal force test

Upon completion of the excessive horizontal force test in accordance with 7.3.2, the maximum deformation shall not exceed 1 mm.

5.3.4 Excessive vertical force test

Upon completion of the excessive vertical force test in accordance with 7.3.3, the maximum deformation shall not exceed 1 mm.

5.4 Wear test

The tests specified in 7.4 shall be used to ensure the sash fastener is capable of continued operation after cycling, under load, to the same number of cycles as that selected in 5.2, with regard given to normal maintenance.

Upon completion of the wear test in accordance with 7.4:

- The pull-in shall not have increased by more than 0,2 mm.
- The sash fastener shall not be fractured.
- The sash fastener shall continue to function normally.

5.5 Critical deformation test

The test specified in 7.5 shall be used to ensure the sash fastener retains sufficient pull-in following prolonged usage, including additional excessive force.

Upon completion of the critical deformation test in accordance with 7.5, there shall be no permanent deformation of the sash fastener.

5.6 Corrosion resistance

Hardware shall conform to the grades listed in EN 1670 whereby grade 2 is the minimum.

Unless already stated with a test report by the manufacturer, the sash fastener shall be tested in accordance with EN 1670.

NOTE The evaluation of the corrosion resistance is limited to the essential areas (as a rule, the visible surfaces of the installed hardware).

6 Test equipment and preparation for the test

The sash fastener shall be installed in accordance with the manufacturer's fixing instructions.

The hardware tested shall conform to the manufacturer's recommendations for the size of the specimen. The dimensions of the specimen shall conform to 4.4

The tolerance for the specimen (test sizes) is ± 10 mm.

The hardware manufacturer shall provide complete test specimens for the testing institute. A drawing of the profile cross-section with relevant information shall be enclosed in the test application, as well as the necessary hardware installation information for the windows.

The test shall be conducted on a test rig which corresponds in function and shape to the window for which the hardware is intended. The hardware tested shall conform to the manufacturer's recommendation for the size and mass of the test specimen.

The forces and torques shall be applied with moderate velocity as can be expected in practise in a jerk- and jolt-free manner.

The test rig shall be provided with adjustable datum surfaces that can be mounted alongside the window fastener handles, so that deviations of pull-in can be measured and documented.

Test room ambient temperature from 15°C to 30°C.

7 Test procedure

7.1 Samples

Three samples shall be used for testing in accordance with this European Standard.

- Sample A - performance tests
- Sample B - corrosion test
- Sample C - retained for reference control

NOTE 1 Sample B should only be necessary if no test report can be supplied by the manufacturer regarding the testing of the hardware component in accordance with EN 1670.

NOTE 2 Sample C should be retained by the test institute for the duration of the validity of the test report. Alternatively, the test institute should substitute sample C by a comprehensive documentation (description, photos etc.) of all tested components.

See flowchart of test procedures in accordance with Figure B.1 in informative Annex B.

7.2 Durability test procedure

Measure and record the pull-in before commencing testing to an accuracy of 0,1 mm (see Figure A.1). Cycle the sash fastener according to one of the grades in accordance with 5.2 at the rate of (250 +50) cycles per hour.

The fastener shall be cycled from a fully open position to a fully closed position.

NOTE All moving parts requiring lubrication may be lubricated in accordance with the hardware manufacturer's instructions unless the manufacturer has specified the hardware as maintenance free.

In accordance with 5.2 upon completion of the durability test the sash fastener shall continue to work as intended; there shall be no cracks or breakages.

7.3 Static force test procedure

7.3.1 Operating force test procedure

The cam of the sash fastener is partially engaged to (20 ±2) % engagement within the keeper.

A force of (20 ± 1) N is applied to the sash in a horizontal direction to separate the fastener from the keeper.

A force of (20 ± 1) N is applied to the sash in a vertical direction to separate the fastener from the keeper (see Figure A.2).

Measure the torque required to turn the fastener cam until it is fully engaged.

In accordance with 5.3.2 upon completion of the operating force test the operating force shall not exceed 5 Nm nor an applied force of 50 N.

7.3.2 Excessive horizontal force test procedure

With the operating forces of (20 ± 1) N maintained, increase the force in a horizontal direction to (300 ± 15) N for a period of (20 ± 1) s.

Remove the force.

Measure and record any permanent deformation of the sash fastener.

In accordance with 5.3.3 upon completion of the excessive horizontal force test the maximum deformation shall not exceed 1 mm.

7.3.3 Excessive vertical force test procedure

Repeat the operating force test in accordance with 7.3.1.

With the operating forces of (20 ± 1) N maintained, increase the force in a vertical direction to (300 ± 15) N for a period of (20 ± 1) s.

Remove the force.

Measure and record any permanent deformation of the sash fastener.

In accordance with 5.3.4 upon completion of the excessive vertical force test the maximum deformation shall not exceed 1 mm.

7.4 Wear test procedure

The cam of the sash fastener is partially engaged to (50 ± 2) % engagement within the keeper.

A force of (20 ± 1) N is applied to the sash in a horizontal direction to separate the fastener from the keep.

A force of (20 ± 1) N is applied to the sash in a vertical direction to separate the fastener from the keep (see Figure A.2).

Cycle the sash fastener to the number of cycles previously chosen for the Durability Test in 7.2.

The fastener shall be cycled through $(60 \pm 5)^\circ$ equally about the centre line of the engaged position.

NOTE All moving parts requiring lubrication may be lubricated in accordance with the hardware manufacturer's instructions unless the manufacturer has specified the hardware as maintenance free.

Measure and record the pull-in at the conclusion of testing to an accuracy of 0,1 mm (see Figure A.1).

In accordance with 5.4 upon completion of the wear test:

- The pull-in shall not have increased by more than 0,2 mm.
- The sash fastener shall not be fractured.
- The sash fastener shall continue to function normally.

7.5 Critical deformation test procedure

Repeat the operating force test in accordance with 7.3.1.

Repeat the excessive horizontal force test in accordance with 7.3.2.

Repeat the excessive vertical force test in accordance with 7.3.3.

In accordance with 5.5 upon completion of the critical deformation test there shall be no permanent deformation of the sash fastener.

7.6 Corrosion resistance test

NOTE If no test report in accordance with EN 1670 can be supplied by the manufacturer, a test is necessary.

Use sample B. All corrosion tests shall be carried out on original new samples in accordance with 5.6.

8 Marking

The product and/or its literature, packaging etc., shall be marked with the following:

- a) manufacturer's name or trademark, or other means of positive identification;
- b) number of this European Standard (EN 13126-14) and the year of publishing;
- c) the classification in accordance with Clause 4;
- d) year and calendar-week of production.

The information for d) may be in a coded form.

The marking shall be quoted using one or more of the following methods:

- hardware manufacturer's technical documentation (catalogue);
- accompanying documents;
- on the product label or packaging;
- by marking the product itself.

Annex A
(informative)

Test procedure

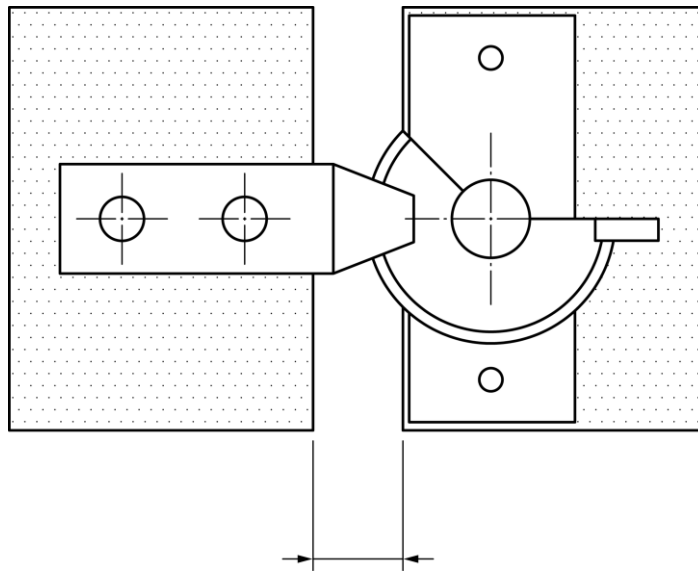


Figure A.1 — Pull-in measurement

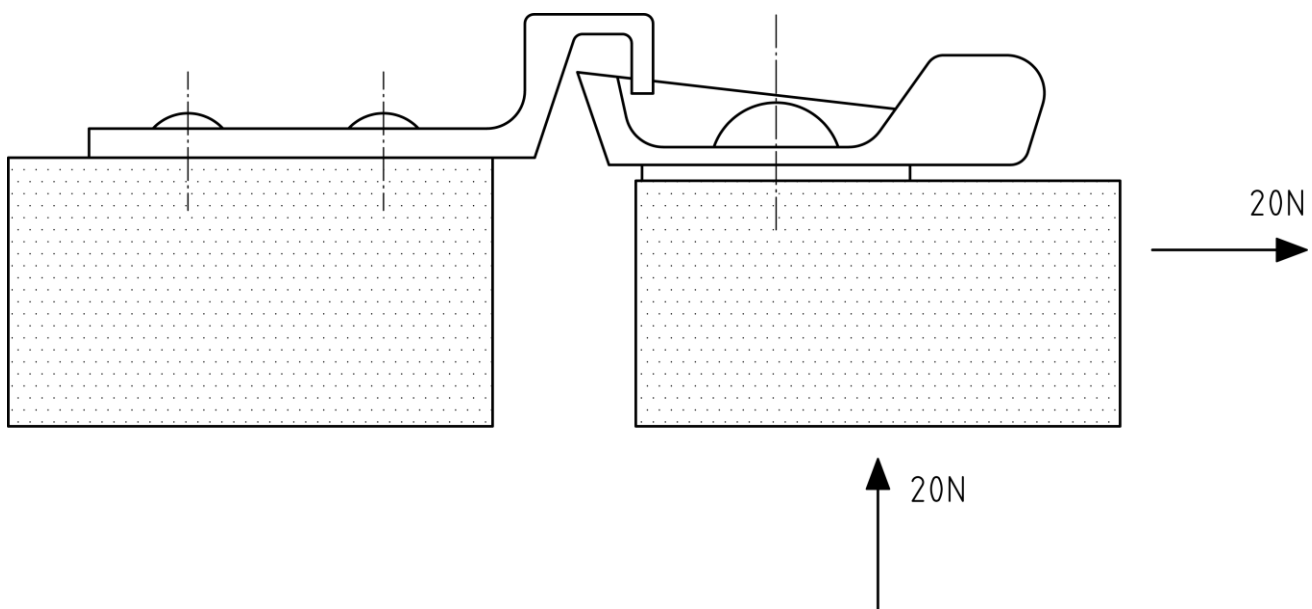


Figure A.2 — Applied force

Annex B
(informative)

Flow Chart of test procedure

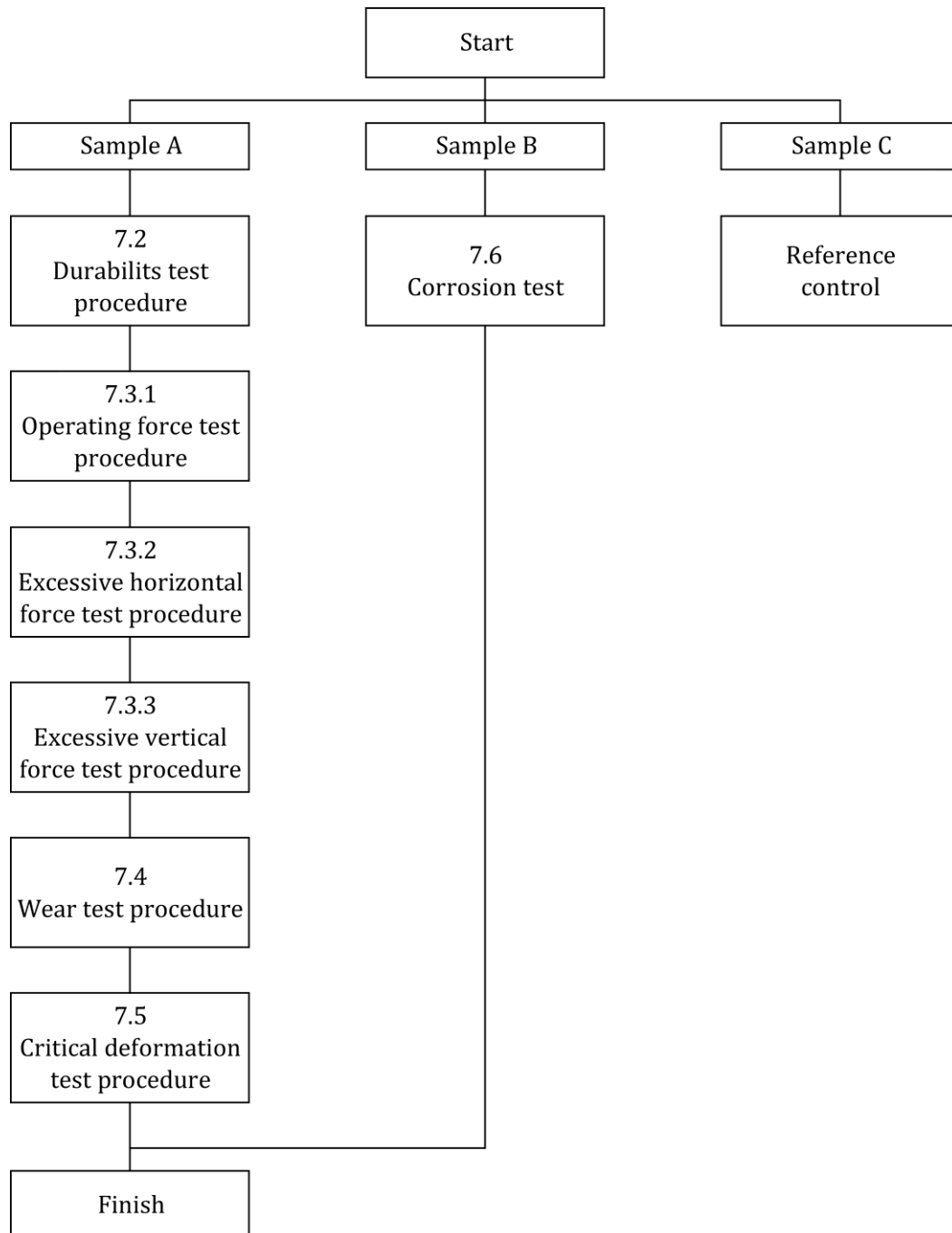


Figure B.1 — Flow chart of test procedures

Bibliography

- [1] EN 1191, *Windows and doors — Resistance to repeated opening and closing — Test method*
- [2] EN 12400, *Windows and pedestrian doors — Mechanical durability — Requirements and classification*
- [3] EN 12519, *Windows and pedestrian doors — Terminology*