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English Version

Building hardware - Hardware for windows and door height windows - Requirements and test methods - Part 2: Window fastener handles

Quincaillerie pour le bâtiment - Ferrures de fenêtres et portes-fenêtres - Exigences et méthodes d'essai - Partie 2 : Poignées à ergot de verrouillage

Baubeschläge - Beschläge für Fenster und Fenstertüren - Anforderungen und Prüfverfahren - Teil 2: Einreiberverschlüsse

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 33.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 13126-2:2020) 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 13126-2:2011.

With regard to EN 13126-2:2011, the following significant changes were made:

— EN 13126-2 now is independent from EN 13126-1; all necessary information are included without the need of any further information from EN 13126-1;

— several editorial changings in the wording for a better understanding;

— terms under 3.4 'locking mechanism”, 3.10 'sample', 3.11 'specimen' and 3.12 'test-rig' added; term under 3.6 'key operated locking mechanism' modified for better understanding;

— under 4.1 classification system changed completely; former digits 1 (Category of use), 4 (Fire resistance), 5 (Safety in use) and 8 (Application) deleted; former digit 2 changed into box 1 (Durability), former digit 3 changed into box 2 (Mass), former digit 6 changed into box 3 (Corrosion resistance), former digit 9 changed into box 4 (Test sizes); former digit 7 changed into box 5 (Security against burglar attack), new box 6 (Key related security);

— under 4.2 new grades for the number of cycles defined; H1 (5 000), H2 (10 000) and H3 (20 000); see also 5.7;

— under 4.8 new example added for the new classification;

— under 5.7 new grades for the number of cycles defined; H1 (5 000), H2 (10 000) and H3 (20 000) in accordance with 4.2 established;

— under 5.8.1 former Table 3 deleted; all values are listed unchanged in the corresponding clauses and subclauses;

— under 5.8.2 the number of cycles adapted to the newly defined grades for the durability;

— under 5.8.4 and 5.8.5 grade 3 added with 200 Nm;

— under 5.8.6 subclause for locking variations regarding key related security added;

— under 5.9 subclause for corrosion resistance added;

— under 6 headline modified with “…and preparation for the test”;

— under 7.8 sublause for security added with new structure;

— under Clause 8 new clause added regarding marking with information from the current version of EN 13126-1.

This document is one of a series of European standards for building hardware products for windows and door height windows. This document 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, Bu*ilding 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 balcony door — Requirements and test methods — Part 14: Sash fasteners*;

— EN 13126-15, *Building hardware — Hardware for windows and balcony door — Requirements and test methods — Part 15: Rollers for sliding and hardware for sliding folding windows;*

— EN 13126-16, *Building hardware — Hardware for windows and balcony door — Requirements and test methods — Part 16: Hardware for Lift and Slide windows;*

— EN 13126-17, *Building hardware — Hardware for windows and balcony door — 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 document specifies requirements and test methods for durability, strength, security and functionality of window fastener handles.

This document does not apply to the following hardware:

a) handles - primarily for Tilt and Turn, Tilt-First and Turn-Only hardware, refer to EN 13126-3;

b) sash fasteners, refer to EN 13126-14;

c) sliding closing devices, refer to EN 13126-19.

NOTE The handles covered by this document do not have a spindle and the spur is primarily used to achieve the locked closed position.

2 Normative references

The following documents are referred to in the text in such a way that some of all of their contents constitute requirements of this document. 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
window fastener handle
operating device to hold the window in a closed position, with or without a locking mechanism (key-operated or a non key operated)

Note 1 to entry: Also known as Cockspur handles.

3.2
spur
part projecting from the handle that interacts with the compression wedge / keeper to close the window to give the desired pull-in

3.3
pull-in
distance the sash is moved towards the frame during operation of a window fastener handle from the initial contact of the handle spur to the fully closed position

3.4
locking mechanism
assembly of components to ensure the locked position of the handle and to prevent the movement of the handle from the locked position

3.5
non-key operated locking mechanism
locking mechanism not operated by a key

Note 1 to entry: For example 'push-to-open', button, thumb turn.

3.6
key operated locking mechanism
locking mechanism operated by appropriate means (e.g. a key)

3.7
compression wedge / keeper
component applied to the window frame in a position, that allow interaction with the handle spur to hold the window in a closed position

3.8
weather seal
compressible gasket between the sash and the frame that prevents air and water ingress

3.9
closing conditions

3.9.1
closed position
situation in which the hardware is not engaged and the active sash is resting up against the frame or weather seal

3.9.2
locked closed position
situation in which the active sash rests up against the frame and the hardware is engaged

3.9.3
secured position
situation in which the active sash rests up against the frame and the hardware is engaged and the locking mechanism of the handle is activated, e.g. by a key

3.10
sample
hardware component which shall be tested

3.11
specimen
window to accommodate hardware components (samples) for testing

3.12
test-rig
testing device onto which the specimen is mounted

4 Classification

4.1 General

Window fastener handles shall be classified in accordance with the six box classification system (see Table 1).

Table 1 — Classification system of hardware

box	1	2	3	4	5	6
	Durability	Mass	Corrosion resistance	Test sizes	Security against burglar attack	Key related security

4.2 Durability (1 – first box)

The first box shall display the grade applied to the durability test in accordance with 5.7:

— grade H1: 5 000;

— grade H2: 10 000;

— grade H3: 20 000.

4.3 Mass (2 – second box)

No requirements, the second box shall display the digit 0.

4.4 Corrosion resistance (3 – third box)

The third box shall display the grade regarding corrosion resistance in accordance with 5.9.

4.5 Test sizes (4 – fourth box)

No requirements, the fourth box shall display the digit 0.

4.6 Security against burglar attack (5 – fifth box)

The fifth box shall display the grade of the security against burglar attack:

— grade 0: without security against burglar attack;

— grade 1: 35 Nm resistance against twisting-off and forcing-off;

— grade 2: 100 Nm resistance against twisting-off and forcing-off;

— grade 3: 200 Nm resitance against twisting-off and forcing-off.

4.7 Key related security (6 – sixth box)

— grade 0: no locking mechanism;

— grade 1: non-key operated locking mechanism (e.g. 'PTO': Push-to-open);

— grade 2: key-operated locking mechanism with ≥ 30 and ≤ 99 locking variations;

— grade 3: key-operated locking mechanism with ≥ 100 locking variations.

4.8 Example of classification for window fastener handles (EN 13126-2)

a) Alternative 1: Table with boxes (see Table 2):

Table 2 — Example of classification

	1	2	3	4	5	6
EN 13126-2:YYYY	**H2**	**0**	**2**	**0**	**1**	**2**

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 document EN 13126-2.

b) Alternative 2: Alphanumerical:

EN 13126-02:YYYY H2-0-2-0-1-2

box 1	durability	grade H2 (10 000 cycles)
box 2	mass	0 (no requirements)
box 3	corrosion resistance	grade 2
box 4	test sizes	0 (no requirements)
box 5	security against burglar attack	grade 1
		(35 Nm resistance against twisting-off and forcing-off)
box 6	key related security	grade 2
		(locking mechanism with ≥ 30 and ≤ 99 locking variations)

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 Operating torque

The test specified in 7.2 shall be used to measure the operating torque during normal operation.

The operating torque shall not exceed 10 Nm during the operating torque test in accordance with 7.2.

5.3 Torsion strength

The test specified in 7.3 shall be used to ensure the window fastener handle is capable of withstanding additional force applied once the handle is closed.

Upon completion of the additional torque test in accordance with 7.3, there shall be no cracks or breakages and the measured deformity at the point of the applied load shall not exceed 5 mm.

5.4 Tensile strength – eccentric

The tests specified in 7.4 shall be used to ensure a window fastener handle is capable of withstanding leverage force being applied away from the sash.

Upon completion of the tensile strength test in accordance with 7.4, the handle and its fixings shall withstand the load without cracks or breakages.

5.5 Simulated pressure

The tests specified in 7.5 shall be used to ensure a window fastener handle is capable of withstanding high loading to the handle in the direction of opening.

Upon completion of the simulated pressure test in accordance with 7.5, there shall be no more than 3 mm permanent deformation of the spur.

5.6 Pull-in

The test specified in 7.6 shall be used to ensure that the pull-in on the window fastener handle can maintain the contact between the edge of the sash and the window frame, or weather stripping, when the window fastener handle is closed, while under force.

On completion of the pull-in test in accordance with 7.6 the measured additional displacement of the datum surfaces shall not exceed 1 mm.

5.7 Durability

The test specified in 7.7 shall be used to ensure that the window fastener handle is capable of continued operation after the durability test (with regard given to normal maintenance). The 3 grades for the number of cycles are specified following:

— grade H1: 5 000 cycles (+ 1 %);

— grade H2: 10 000 cycles (+ 1 %);

— grade H3: 20 000 cycles (+ 1 %).

Upon completion of the durability test the window handle shall continue to work as intended; there shall be no cracks or breakages.

5.8 Security

5.8.1 General

Window fastener handles with a locking mechanism shall not be able to be unscrewed while the spur is in the fully locked closed position.

5.8.2 Durability of the locking mechanism

The locking mechanism shall in each case fulfil 25 % of the number of cycles in the designated durability grade in accordance with 7.7.

— $1\ 250\ ^{+100}_{0}$ cycles for durability grade H1;

— $2\ 500\ ^{+100}_{0}$ cycles for durability grade H2;

— $5\ 000\ ^{+100}_{0}$ cycles for durability grade H3.

In the case of handles with non-key-operated locking mechanisms that need to be operated together with the handle, the same number of cycles as stated in the durability test in accordance with 7.7 shall be fulfilled. (e.g. 'PTO': push-to-open).

5.8.3 Torque resistance of the cylinder of the locking mechanism / solid fixing

The cylinder of the closed locking mechanism shall withstand a torque of minimum 2 Nm.

Deformation of the locking cylinder as well as cylinder malfunctioning is permissible, if the handle remains locked.

5.8.4 Twist-off resistance / security against burglar attack

Handles with locking mechanism (fifth box of classification system) shall withstand a torque in the rotation direction of:

— 35 Nm in grade 1;

— 100 Nm in grade 2;

— 200 Nm in grade 3.

In the case of loads ≥ 40 Nm in grade 2 and ≥ 50 Nm in grade 3, the handle's lever may be damaged or destroyed, provided the blocking function still works after the test.

NOTE This can be achived by means of a predetermined breaking point.

5.8.5 Forcing off resistance / security against burglar attack

Handles with locking mechanism (fifth box of the classification system) shall withstand a torque perpendicular to the mounting plane of:

— 35 Nm in grade 1;

— 100 Nm in grade 2;

— 200 Nm in grade 3.

In the case of loads ≥ 40 Nm in grade 2 and ≥ 50 Nm in grade 3, the handle's lever may be damaged or destroyed, provided the blocking function still works after the test.

NOTE This can be achived by means of a predetermined breaking point.

5.8.6 Locking variations / key related security

In the case of key related security (sixth box of the classification system) the handle shall enable:

— ≥ 30 and ≤ 99 locking variations in grade 2;

— ≥ 100 locking variations in grade 3.

5.9 Corrosion resistance

Hardware shall conform to the grades listed in EN 1670.

Unless already stated with a test report by the manufacturer, the window fastener handle 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 window fastener handle shall be installed in accordance with the manufacturer's fixing instructions.

The hardware manufacturer shall provide test frames for the testing institute. A drawing of the profile cross-section with relevant information shall be enclosed in the test application, which also contains the necessary hardware installation information for the window.

The test shall be conducted on a test rig which corresponds in function and shape to the window for which the hardware was intended.

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

Up to eight samples can be used for testing according to this document.

Samples A1 until A4	main test parameters
Samples A1 until A6	main and additional test parameters
Sample B	corrosion resistance test
Sample C	retained for reference control

See flow chart of test procedures in accordance with Figures A.1 and A.2 in informative Annex A.

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

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.

Right-hand and left-hand fasteners for both inward and outward opening windows should be mounted in the same position but inverted to engage with the appropriate compression wedge / keeper.

7.2 Operating torque test procedure

Use sample A1. The spur of the window fastener handle shall be partially engaged (20 ± 2) of the maximum engagement angle) onto the compression wedge / keeper (see Figure B.1).

A force of (10 ± 1) N shall be applied as close to the spur as possible horizontally to the sash in the direction of opening.

The applied load shall be increased to (20 ± 1) N without shock.

With the applied force of (20 ± 1) N a second perpendicular force is applied at a distance of 85 mm, measured from the handle rotation point, in the closing direction of the handle (see Figure B.1). The second force shall be increased without shock, until the window fastener handle is moved into the fully locked closed position.

The torque calculated with the maximum second force and the distance of 85 mm shall not exceed 10 Nm in accordance with 5.2. Alternatively measure the torque with an appropriate measuring tool.

7.3 Torsion strength test procedure

Use sample A2. The spur of the window fastener handle is in the fully locked closed position onto the compression wedge / keeper.

The handle shall be secured against further movement by fitting a stop block (see Figure B.2) of a size appropriate to the handle dimensions.

An initial perpendicular force of (50 ± 2) N is applied to the window fastener handle at a distance of 85 mm measured from the handle rotation point, parallel to the plane of the window and in the closing direction of the handle. Then increase the perpendicular force without shock to (200 ± 5) N and hold for $(30\ ^{+1}_{-0})$ s.

After the load is released the permanent deformation of the handle shall be measured. In accordance with 5.3, there shall be no cracks or breakages and the measured permanent deformation at the point of the applied force shall not exceed 5 mm.

7.4 Tensile strength test procedure – eccentric

Use sample A3. The spur of the window fastener handle is in the fully locked closed position onto the compression wedge / keeper.

A load of (300 ± 10) N is applied to the window fastener handle at a distance of 50 mm measured from the handle rotation point. The load shall be applied perpendicular to the plane of the window and in a direction away from the handle fixings for $(30\ ^{+1}_{-0})$ s (see Figure B.3).

Upon completion of the tensile strength test, the handle and its fixings shall withstand the load without cracks or breakages in accordance with 5.4.

7.5 Simulated pressure test procedure

Use sample A4. The spur of the window fastener handle is in the fully locked closed position onto the compression wedge / keeper.

Apply a force of (700 ± 10) N in the direction of the opening movement of the sash as close to the spur as possible and maintain for $(60\ ^{+10}_{-0})$ s (see Figure B.4).

Measure and record any permanent deformation between the spur and the wedge / keeper.

Upon completion of the simulated pressure test, there shall be no more than 3 mm permanent deformation of the spur in accordance with 5.5.

7.6 Pull-in test

Use sample A1. The spur of the window fastener handle is in the fully locked closed position engaged onto the compression wedge / keeper.

The datum surfaces shall be defined as close as possible to the spur of the handle.

Apply a force of (10 ± 1) N horizontally in the direction of the opening movement of the sash as close to the spur as possible.

Measure and record the distance between the predefined datum points.

The applied load shall be increased to (20 ± 1) N without shock.

Measure and record the distance between the datum points with the increased load applied.

Calculate and record the difference of the measured distances.

On completion of the pull-in test, the measured difference of the distances (additional displacement) of the datum surfaces shall not exceed 1 mm in accordance with 5.6.

7.7 Durability test procedure

Use sample A1. The window fastener handle shall be mounted in accordance with the manufacturer's fitting instructions.

The handles shall always be tested in the same direction; commencing in the 0° position.

The window fastener handle shall be cycled from 0° to 90° (or to the maximum handle stop, if this is less than 90°) and back to 0°. This operation is equivalent to one cycle.

Cycle the window fastener handle according to one of the grades in accordance with 5.7 at the rate of (550 ± 20) cycles/h.

A rest time of approximately 3 s shall be adhered to after every complete cycle. The procedure shall be in conjunction with a continuous counteracting force of $(20\,^{+1}_{-0})$ N to the handle in the area of the spur (see Figure B.5).

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

Upon completion of the durability test the window handle shall continue to work as intended; there shall be no cracks or breakages (see 5.7).

After the durability test repeat the pull-in test in accordance with 7.6 and use sample A1.

7.8 Security

7.8.1 General

Use sample A6. For window fastener handles with a locking mechanism: check that it is not possible to unscrew the handle while the spur is in the fully locked closed position.

7.8.2 Durability test of the locking mechanism

Use sample A6. The locking mechanism testing shall be carried out on a test-rig with the quantity of locking and unlocking operations as defined in 5.8.2 with a maximum torque of 1,5 Nm.

On handles with a key operated locking mechanism, the key shall be removed from the locking mechanism and then re-inserted each time.

NOTE In the case of handles with non-key-operated locking mechanisms and the 'push to open' operating mode, the locking mechanism's durability test can be carried out in conjunction with the durability test in accordance with 5.7.

7.8.3 Torque resistance of the cylinder of the locking mechanism / solid fixing test

Use sample A6. The closed handle shall be fixed with the accompanying screws or fixings. A torque of 2 Nm shall be applied with a lock-channel adapted tool and torque measurement equipment (see Figure B.6).

In accordance with 5.8.3 deformation of the locking cylinder as well as cylinder malfunctioning is permissible, if the handle remains locked.

7.8.4 Twist-off resistance / security against burglar attack

Use sample A5. The handle in the secured position shall be fixed with the accompanying screws or fixings. The test wir the predefined torques in accordance with 5.8.4 shall be carried out by means of an adapter and torque wrench (see Figure B.7). The adapter shall be fixed to the handle's lever in such a

manner that the torque is applied axial to the handle rotation point when twisting-off and parallel to the mounting plane.

The acceptance criterion shall be in accordance with 5.8.4.

7.8.5 Forcing-off resistance / security against burglar attack

Use sample A5. After the test of the twist-off resistance in accordance with 7.8.4 the test of the forcing-off resistance shall be done on the same window handle. The handle in the secured position shall be fixed with the accompanying screws or fixings. The test with the predefined torques in accordance with 5.8.5 shall be carried out by means of an adapter and torque wrench (see Figure B.8). The adapter shall be fixed to the handle's lever in such a manner that the torque is applied vertical to the handle rotation point when forcing off and parallel to the mounting plane.

The acceptance criterion shall be in accordance with 5.8.5.

7.8.6 Locking variations

The number of the locking variation shall be checked and assessed against the predefined grade in accordance with 5.8.6.

7.9 Corrosion resistance

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 5.9.

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 document;

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)

Flow chart of test procedures

Testing of handles without requirements regarding security

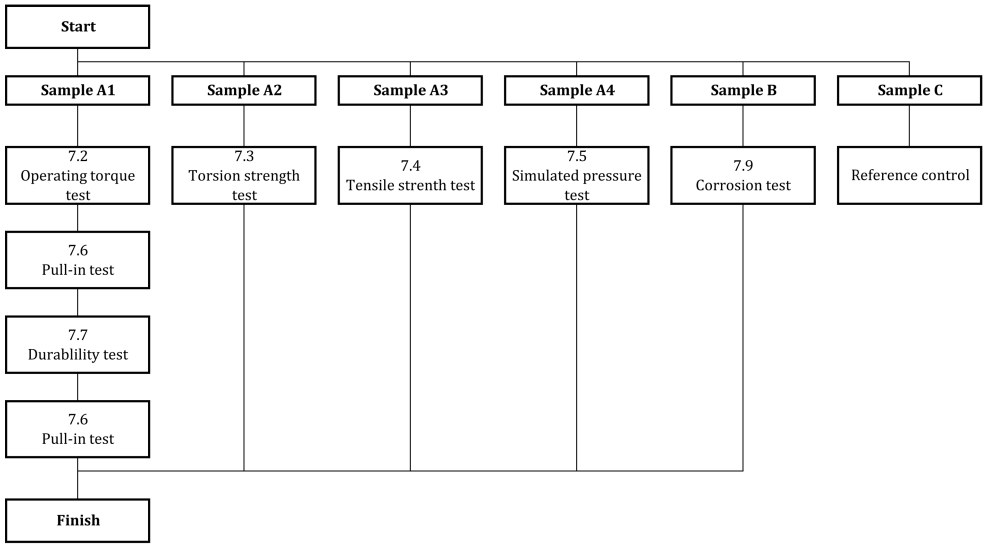

Figure A.1 — Flowchart test procedures / handles without security

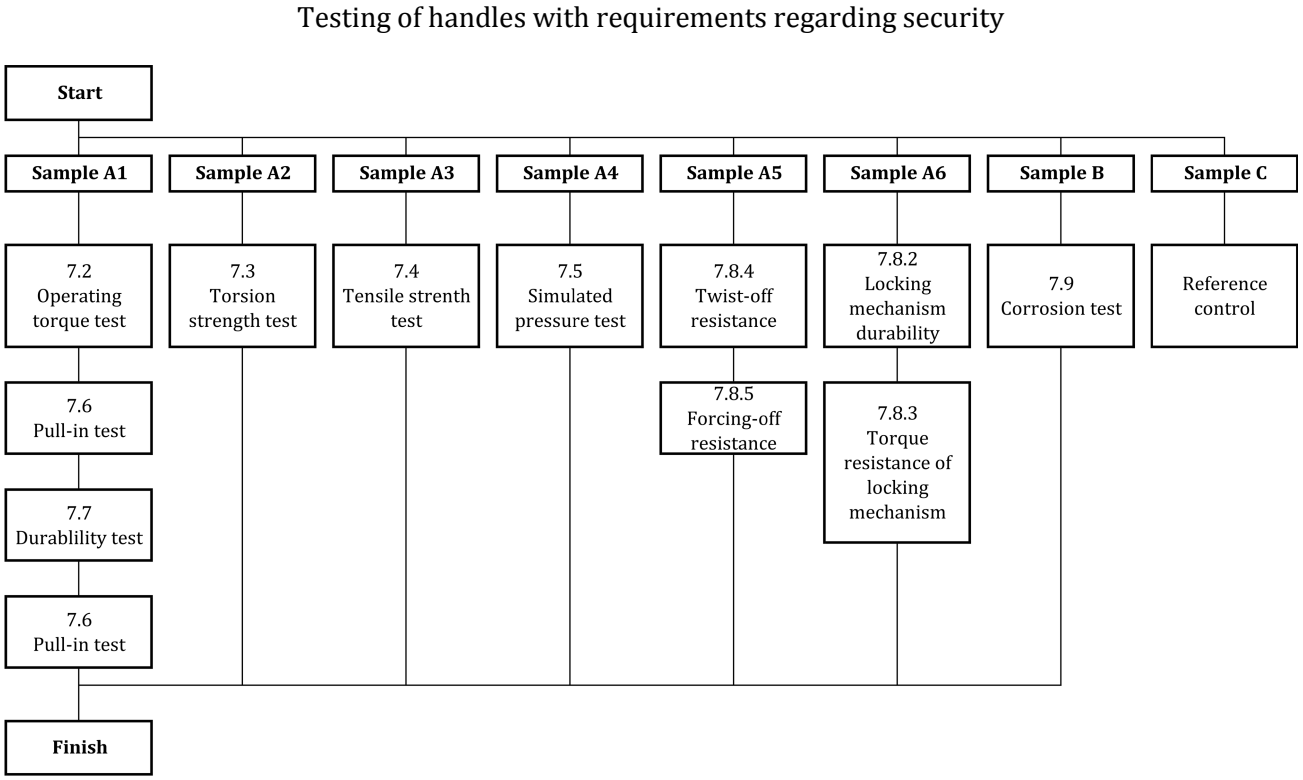

Figure A.2 — Flow chart test procedures / main and additional test parameters

Annex B
(informative)

Figures

Dimensions in millimetres

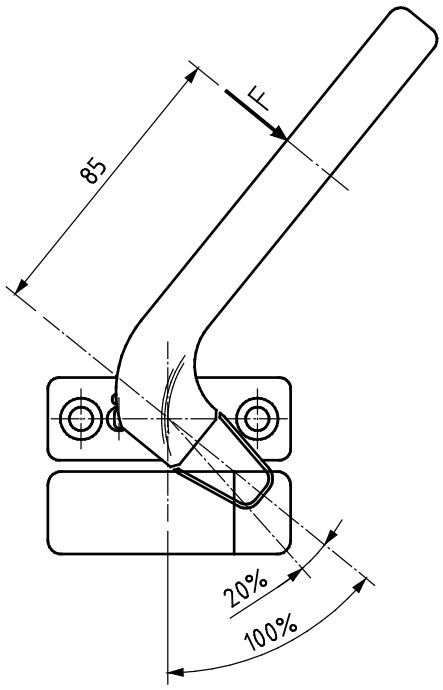

Figure B.1 — Operating torque test

Dimensions in millimetres

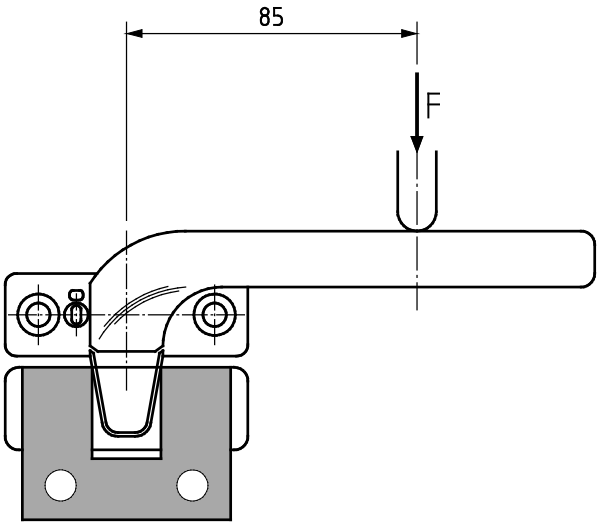

Figure B.2 — Torsion strength test

Dimensions in millimetres

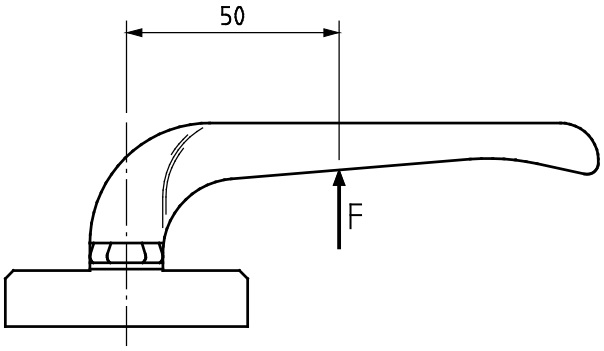

Figure B.3 — Tensile strength test

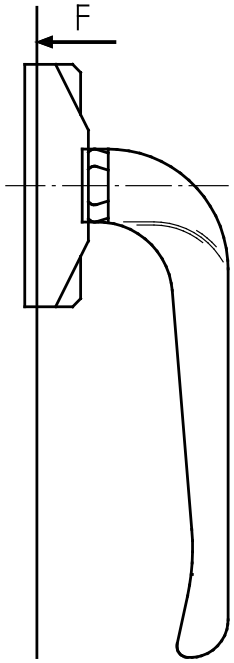

Figure B.4 — Simulated pressure test

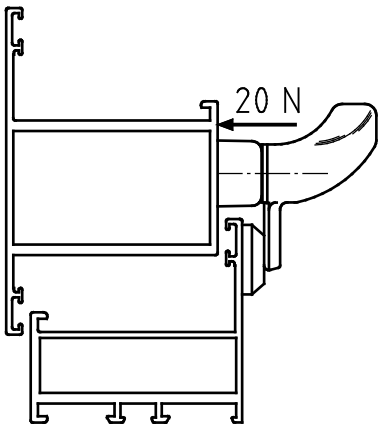

Figure B.5 — Durability test with a continuous counteracting force of 20 N

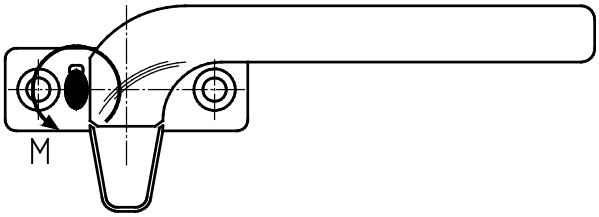

Figure B.6 — Torque resistance of the locking mechanism / solid fixing test

Dimensions in millimetres

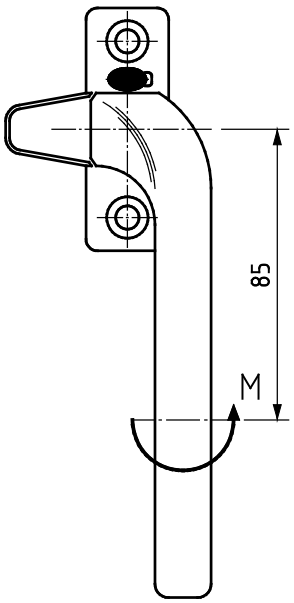

Figure B.7 — Resistance against twisting-off

Dimensions in millimetres

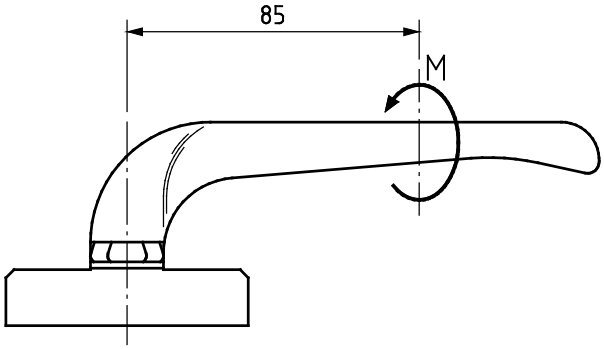

Figure B.8 — Resistance against forcing-off

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