SLOVENSKI STANDARD
oSIST prEN 13126-6:2017

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Stavbno okovje - Okovje za okna in zastekljena vrata - Zahteve in preskusne metode - 6. del: Oporni tečaji z različno geometrijo (s sistemom trenja ali brez njega)

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)

Baubeschläge - Beschläge für Fenster und Fenstertüren - Anforderungen und Prüfverfahren - Teil 6: Scheren mit veränderlicher Geometrie (mit oder ohne Friktionssystem)

Quincaillerie pour le bâtiment - Exigences et méthodes d'essai des ferrures de fenêtres et portes-fenêtres - Partie 6 : Compas à géométrie variable (avec ou sans système de friction)

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English Version

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)

Quincaillerie pour le bâtiment - Exigences et méthodes d'essai des ferrures de fenêtres et portes-fenêtres - Partie 6 : Compas à géométrie variable (avec ou sans système de friction)

Baubeschläge - Beschläge für Fenster und Fenstertüren - Anforderungen und Prüfverfahren - Teil 6: Scheren mit veränderlicher Geometrie (mit oder ohne Friktionssystem)

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.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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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

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Contents

Page

European foreword

This document (prEN 13126-6:2017) 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 13126-6:2008.

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 part 1 of EN 13126.

The performance tests incorporated in this European Standard are considered to be reproducible and as such will provide a consistent and objective assessment of the performance of these products throughout CEN Member States.

EN 13126 is currently composed with 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 — Requirements and test methods for windows and door height windows — 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 andTurn, 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 — Requirements and test methods for windows and door height windows — 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 door height windows — 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 — Requirements and test methods for windows and door height windows — Part 15: Rollers for horizontal sliding and sliding folding windows and doors;*

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

— EN 13126-17, *Building hardware — Requirements and test methods for windows and door height windows — Part 17: Hardware for Tilt&Slide windows and doors;*

— EN 13126-19, *Building hardware — Requirements and test methods for windows and door height windows — Part 19: Sliding Closing Devices.*

In comparison with EN 13126-6:2008, the following significant changes were made:

— EN 13126-6 now is independent from EN 13126-1; all necessary information are included without the need of any further information from part 1;

— several editorial changings in the wording for a better understanding and to cover variable/parallel geometry stay hinges in the whole Standard;

— under Clause 1 'scope' variable/parallel geometry stay hinges (with or without a friction system) added; former note 1 deleted;

— under Clause 3.2 definition added for parallel geometry stay hinge (with or without a friction system);

— the term 'parallelism' added under Clause 3.7;

— the term 'egress easy clean' added under Clause 3.8;

— terms 'sample', 'specimen' and 'test-rig' added under Clause 3.9, 3.10 and 3.11;

— under 4.1 classification system changed completely; former digits 1 (Category of use), 4 (Fire resistance), 5 (Safety in use), 7 (Security) and 8 (Applicable part) 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) and former digit 8 (application) transferred into box 5 (application);

— under 4.2 new grades for the number of cycles defined; H1 (5 000), H2 (10 000) and H3 (20 000) with the same number of cycles for the tilt and the turn cycles; refer also to 5.3;

— under Clause 4.7 new example added for the new classification;

— under Clause 4.5 new Table 5 added 'with test window size for parallel geometry opening stay hinges';

— under Clause 5.5 'parallelism test' added;

— under Clause 5.9 Table 1 'durability test sequence' amended;

— under Clause 6 'Test equipment and preparation for the test' additional information added for the test rig (6.1), the specimen (6.2), the mounting of the specimen (6.3), additional equipment (6.4);

— under Clause 7.2 'General' additional information added for the testing procedure;

— under Clause 7.3 'Adjusting the sash-mass' information added, mainly from the current version of part 1;

— under Clause 7.4 'Lubrication and adjustment of hardware', mainly from the current version of part 1;

— under Clause 7.7.2 'procedure – parallel opening windows' added for the obstructed track test (7.7) ;

— under Clause 7.9.2 'procedure – parallel opening windows' added for the ease of sash movement test (7.9) ;

— Annex A and Annex B amended with figures regarding parallel geometry opening stay hinges;

— new flowcharts in Annex C;

— new informative Annex D with window types.

A full contribution to the preparation of this European Standard has been made by the European manufacturer's organization 'ARGE' and National Standards institutions.

1 Scope

This European Standard specifies requirements and test methods for durability, strength, security and function of mechanically operated variable/parallel geometry stay hinges (with or without a friction system) whether fitted, with integral restrictors or not, in accordance with common application as shown in informative Annex D.

By means of this standard, the user of recognized tested hardware can assume that with correct usage, the variable/parallel geometry stay hinges (with or without a friction system) for windows conform to prescribed requirements.

NOTE 1 Balancing stay arms/hinges do not represent a friction system.

NOTE 2 For the purposes of this standard, the friction system is achieved by friction pads or similar.

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*

EN 13126-1:2011, *Building hardware - Hardware for windows and door height windows - Requirements and test methods - Part 1: Requirements common to all types of hardware*

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*

3 Terms and definitions

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

NOTE The following terms and definitions apply to windows and door height windows made of wood, PVC-U, aluminium or steel and their appropriate material combinations.

3.1
variable geometry stay hinge (with or without a friction system)
hinge mechanism which has one or more link arms connecting the frame to the opening casement; the point about which the casement pivots being near the outer end of a link arm

Note 1 to entry: The freedom of movement of the variable/parallel geometry stay hinge system is either controlled by the friction between some or all of its moveable components or through an adjustable friction system.

Note 2 to entry: Friction is usually applied either at the pivot points or between a sliding shoe and its track.

3.2
parallel geometry stay hinge (with or without a friction system)
hinge mechanism which has one or more link arms connecting the frame to the opening casement; projecting parallel to the plane of the frame

Note 1 to entry: The freedom of movement of the parallel geometry stay hinge system is either controlled by the friction between some or all of its moveable components or through an adjustable friction system.

Note 2 to entry: Friction is usually applied either at the pivot points or between a sliding shoe and its track.

3.3
working stack height
perpendicular distance between the outer faces of the frame plate and casement plate of a variable/parallel geometry stay hinge (with or without a friction system)

3.4
pull-in
characteristic of the design of the pivoting variable/parallel geometry stay hinge (with or without a friction system), which maintains the non-locking edge of a casement in contact with the window frame or weather stripping when the casement fastener is closed

3.5
integrated restrictor
mechanism that is an integral part of the variable/parallel geometry stay hinge (with or without a friction system) that limits the initial opening of the window

3.6
declared minimum opening
distance measured between the nearest adjacent edges of the sash and frame as the outward movement, from fully closed to where the friction in a variable/parallel geometry stay hinge with a friction system is sufficient to conform to the requirements of friction test

3.7
parallelism
ability of the plane of the sash to remain parallel to the plane of the frame in the open position

3.8
egress easy clean
designed secondary function within a variable geometry stay hinge that allows an opening on the hinges side of the window to allow for cleaning of the outside surface of the glass

3.9
sample
actual hardware components to be tested

3.10
specimen
window to accommodate hardware components (samples) for testing

3.11
test rig
testing device onto which the specimen is mounted

4 Classification

4.1 General

Variable/parallel geometry stay hinges (with or without a friction system) for windows and door height windows shall be classified in accordance with the five box coding system (see Table 1).

Table 1 — Classification system of hardware

box	1	2	3	4	5
	Durability	Mass	Corrosion resistance	Test sizes	Application

4.2 Durability (1 – first box)

The first box shall display the grade applied to the durability test in accordance with 5.3:

— 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 (see Table 2).

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 5.13.

4.5 Test sizes (4 – fourth box)

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

All sizes are stated in mm, *SW x SH* (*SW* = Sash Width, *SH* = Sash Height) with a tolerance of ± 2 mm.

Where a variable geometry stay hinge (with or without friction) operates on a horizontal axis of rotation, the test size is determined in accordance with Table 3.

Where a variable geometry stay hinge (with or without friction) operates on a vertical axis of rotation, the test size is determined in accordance with Table 4.

Where a parallel opening geometry stay hinge (with or without friction) operates on a parallel plane, the test size is determined in accordance with Table 5.

Table 3 — Test window size for top hung variable geometry stay hinges

Overall length of variable geometry stay hinge (mm)	Sash width (mm)	Sash height (mm)
< 250	1 200	300
≥ 251 ≤ 350	1 200	450
≥ 351 ≤ 450	1 200	600
≥ 451 ≤ 550	1 200	750
≥ 551 ≤ 750	1 200	900
≥ 751	1 200	1 200

When a hardware manufacturer specifies a different sash width and / or sash height in relation to the overall length of the variable/parallel geometry stay hinge (with or without friction system) the hardware shall be tested on the largest window size specified.

Table 4 — Test window size for side hung variable geometry stay hinges

Overall length of variable geometry stay hinge (mm)	Sash width (mm)	Sash height (mm)
< 250	600	1 200
≥ 251 ≤ 500	750	1 200
≥ 501	900	1 200

When a hardware manufacturer specifies a different sash width and / or sash height in relation to the overall length of the variable/parallel geometry stay hinge (with or without friction system) the hardware shall be tested on the largest window size specified.

Table 5 — Test window size for parallel geometry opening stay hinges

Overall length of parallel geometry stay hinge (mm)	Sash width (mm)	Sash height (mm)
< 300	1 200	750
≥ 301 ≤ 500	1 200	1 000
≥ 501	1 200	2 000

When a hardware manufacturer specifies a different sash width and / or sash height in relation to the overall length of the variable/parallel geometry stay hinge (with or without friction system) the hardware shall be tested on the largest window size specified.

If additional control arms are needed to meet the specification then the manufacturer shall specify and provide these parts for the test.

4.6 Application (5 – fifth box)

The fifth box shall display a number (grade) indicating the kind of hardware in accordance with the foreseen application in the appropriate type of window.

— grade 1: indicating hardware for windows operated on a horizontal axis of rotation;

— grade 2: indicating hardware for windows operated on a vertical axis of rotation;

— grade 3: indicating hardware for windows operates on both horizontal and vertical axis of rotation;

— grade 4: indicating hardware for windows operates on a parallel plane.

4.7 Example of classification for variable/parallel geometry stay hinges

a) Alternative 1: Table with boxes

Table 6 — Example of classification for variable/parallel geometry stay hinges

	1	2	3	4	5
EN 13126–6**XX**	**H3**	**020**	**3**	**1200/900**	**1**

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 13126-6.

b) Alternative 2: Alphanumerical

EN 13126-8**XX H3-020-3-1200/900-1**

This denotes variable/parallel geometry stay hinges (with or without a friction system), which has the following:

box 1	durability	grade H3 (20 000 cycles)
box 2	mass	20 kg
box 3	corrosion resistance	grade 3
box 4	test sizes	*SW* (Sash Width) = 1 200 mm, *SH* (Sash Height) = 900 mm
box 5	application	grade 1; hardware for windows operating on a horizontal axis of rotation

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 Integrated restrictors

Where variable/parallel geometry stay hinges (with or without a friction system) are fitted with an integrated restrictor, the hardware shall be tested in accordance with EN 13126-5.

Any integrated or additional restrictor shall be disabled before any testing commences.

5.3 Durability

Three different grades:

— grade H1: 5 000 cycles (+ 1 %);

— grade H2: 10 000 cycles (+ 1 %);

— grade H3: 20 000 cycles (+ 1 %).