

# **SLOVENSKI STANDARD**

## **SIST EN 13126-6:2018**

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**Nadomešča:**

**SIST EN 13126-6:2009**

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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)

**Ta slovenski standard je istoveten z: EN 13126-6:2018**

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Stavbna oprema

Building accessories

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**EN 13126-6**

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**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 European Standard was approved by CEN on 30 April 2018.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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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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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## EN 13126-6:2018 (E)

## European foreword

This document (EN 13126-6:2018) 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 European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2019, and conflicting national standards shall be withdrawn at the latest by February 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes 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.

A list of all parts in the EN 13126 series can be found on the CEN-CENELEC website.

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 is included without the need of any further information from part 1;
- several editorial changes 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 term number 3.2, definition added for parallel geometry stay hinge (with or without a friction system);
- the term 'parallelism' added under term number 3.7;
- the term 'egress easy clean' added under term number 3.8;
- terms 'sample', 'specimen' and 'test-rig' added under term numbers 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 4.7, new example added for the new classification;
- under 4.5, new Table 5 added with "Test window size for parallel geometry opening stay hinges";
- under 5.5, 'Parallelism test' added;
- under 5.9, Table 8 '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 7.2, 'General' additional information added for the testing procedure;
- under 7.3, 'Adjusting the sash-mass' information added, mainly from the current version of part 1;
- under 7.4, 'Lubrication and adjustment of hardware', mainly from the current version of part 1;
- under 7.7.2, 'Procedure – parallel opening windows' added for the obstructed track test (7.7);
- under 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 added 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.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## EN 13126-6:2018 (E)

## 1 Scope

This part of EN 13126 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 are referred to in the text in such a way that some or all of their content constitutes 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*

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*

## 3 Terms and definitions (standards.iteh.ai)

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>

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.; the freedom of movement of the variable 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 1 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; 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 1 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 7.6

**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).

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**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,  $SW \times SH$  ( $SW$  = Sash Width,  $SH$  = Sash Height) with a tolerance of  $\pm 2$  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
$\geq 251 \leq 350$	1 200	450
$\geq 351 \leq 450$	1 200	600
$\geq 451 \leq 550$	1 200	750
$\geq 551 \leq 750$	1 200	900
$\geq 751$	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
$\geq 251 \leq 500$	750	1 200
$\geq 501$	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
$\geq 301 \leq 500$	1 200	1 000
$\geq 501$	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 must specify and provide these parts for the test.

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### 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
<b>EN 13126-6:YYYY</b>	<b>H3</b>	<b>020</b>	<b>3</b>	<b>1200/900</b>	<b>1</b>

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 13126-6:YYYY 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	<i>SW</i> (Sash Width) = 1 200 mm, <i>SH</i> (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 %).

## 5.4 Pull-in and pull-in abuse test

The test specified in 7.5 and 7.8 shall be used to ensure that the pull-in on the variable geometry stay hinge (with or without a friction system) can maintain the contact between the non-locking edge of a casement and the window frame or weather stripping when the casement fastener is closed while under force.

On completion of the pull-in test in accordance with 7.5 and the pull-in abuse test in accordance with 7.8, the recorded additional displacement of the datum surfaces shall be a maximum of 0,5 mm.

## 5.5 Parallelism test

The test specified in 7.14 shall be used to ensure that the plane of parallelism on the parallel geometry hinges (with or without friction) can consistently maintain the sash position parallel to the plane of the frame.

The difference between the measured clearance gap at all corners shall not be greater than 1,5 mm per metre length of the sash height.

## 5.6 Friction test (where applicable)

The test specified in 7.6 shall be used to ensure that the friction of variable/parallel geometry stay hinge with a friction system shall be sufficient to maintain the open position against the applied force in either direction.

The declared value for the minimum opening of the variable/parallel geometry stay hinge with a friction system, where the friction level conforms to the requirements of 7.6, shall be stated in the descriptive literature. Where no minimum test opening is declared, the value shall be assumed to be 100 mm.

The value for the maximum opening is either the furthest open position that the hardware allows or the declared maximum opening distance or opening angle as stated in the manufacturers' literature.

The maximum opening position is measured as a chord across the opening and between the nearest adjacent edges of the sash and frame.

NOTE 1 The declared values can vary for different sizes of variable/parallel geometry stay hinges with a friction system and/or for different mass classifications. This can be noted on the test report, including the hinge size and maximum mass classification.

NOTE 2 In service an additional friction or other restraining device might be required to prevent unintentional closure of the casement from an angle of opening less than the declared minimum for any selected variable/parallel geometry stay hinges (with or without a friction system).