



# SLOVENSKI STANDARD

## SIST EN 1628:2012+A1:2016

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Nadomešča:  
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**Vrata, okna, obešene fasade, mreže in polkna - Protivlomna odpornost - Preskusna metoda za ugotavljanje odpornosti proti statičnim obremenitvam**

Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance under static loading

Türen, Fenster, Vorhangfassaden, Gitterelemente und Abschlüsse - Einbruchhemmung - Prüfverfahren für die Ermittlung der Widerstandsfähigkeit unter statischer Belastung

Blocs-portes pour piétons, fenêtres, façades rideaux, grilles et fermetures - Résistance à l'effraction - Méthode d'essai pour la détermination de la résistance à la charge statique

**Ta slovenski standard je istoveten z: EN 1628:2011+A1:2015**

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**ICS:**

|           |                         |                          |
|-----------|-------------------------|--------------------------|
| 13.310    | Varstvo pred kriminalom | Protection against crime |
| 91.060.50 | Vrata in okna           | Doors and windows        |

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EUROPEAN STANDARD

**EN 1628:2011+A1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2015

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## Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance under static loading

Blocs-portes pour piétons, fenêtres, façades rideaux, grilles et fermetures - Résistance à l'effraction - Méthode d'essai pour la détermination de la résistance à la charge statique

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This European Standard was approved by CEN on 2 December 2010 and includes Amendment approved by CEN on 17 November 2015.

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## European foreword

This document (EN 1628:2011+A1:2015) 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of an identical text or by endorsement, at the latest by June 2016, and conflicting national standards shall be withdrawn at the latest by June 2016.

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

This document includes Amendment 1 approved by CEN on 2015-11-17.

This document supersedes  $\boxed{A1}$  EN 1628:2011  $\boxed{A1}$ .

The start and finish of text introduced or altered by amendment is indicated in the text by tags  $\boxed{A1}$   $\boxed{A1}$ .

This European Standard is one of a series of standards for burglar resistant pedestrian doorsets, windows, curtain walling, grilles and shutters. The other standards in the series are:

- EN 1627:2011, *Pedestrian doorsets, windows, curtain walling, grilles and shutters — Burglar resistance — Requirements and classification*;
- $\boxed{A1}$  EN 1629:2011+A1:2015  $\boxed{A1}$ , *Pedestrian doorsets, windows, curtain walling, grilles and shutters — Burglar resistance — Test method for the determination of resistance under dynamic loading*;
- $\boxed{A1}$  EN 1630:2011+A1:2015  $\boxed{A1}$ , *Pedestrian doorsets, windows, curtain walling, grilles and shutters — Burglar resistance — Test method for the determination of resistance to manual burglary attempts*.

This standard is a revision of, and supersedes  $\boxed{A1}$  EN 1628:2011  $\boxed{A1}$ . The last two other standards in this series are revisions of, and supersede  $\boxed{A1}$  EN 1629:2011  $\boxed{A1}$  and  $\boxed{A1}$  EN 1630:2011  $\boxed{A1}$  respectively.

This revision incorporates grilles and facades in the range of application.

There are two aspects to the burglar resistance performance of a construction product: their resistance to forced operation and their ability to remain fixed to the building. Due to the limitation of reproducing the fixing methods and the buildings construction in a laboratory environment this aspect is not fully covered by the standard. This is particularly true with products built into a building. The performance of the fixed part of the product is evaluated using a standard sub frame. It is the manufacturer’s responsibility to ensure that guidance on the fixing of the product is contained in the mounting instructions and that this guidance is suitable for the burglar resistance class claimed for the product. As with the other referenced standards this specification uses a standard sub frame and the product is mounted according to the manufacturers’ instructions. The fixing method to be considered is detailed in Annex A of EN 1627:2011. This test method does not evaluate the performance of the fixing to the building.

**EN 1628:2011+A1:2015 (E)**

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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## 1 Scope

This European Standard specifies a test method for the determination of resistance to static loading in order to assess the burglar resistant properties of pedestrian door sets, windows, curtain walling, grilles and shutters. It is applicable to the following means of opening: Turning, tilting, folding, turn-tilting, top or bottom hung, sliding (horizontally and vertically) and rolling as well as fixed constructions.

This European Standard does not apply to doors, gates and barriers, intended for installation in areas in the reach of persons, and for which the main intended uses are giving safe access for goods and vehicles accompanied or driven by persons in industrial, commercial or residential premises, as covered by EN 13241-1.

## 2 Normative references

The following referenced documents are indispensable for the application 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 356:1999, *Glass in building — Security glazing — Testing and classification of resistance against manual attack*

EN 1303:2005, *Building hardware — Cylinders for locks — Requirements and test methods*

EN 1627:2011, *Pedestrian doorsets, windows, curtain walling, grilles and shutters — Burglar resistance — Requirements and classification*

EN 1630:2011+A1:2015, *Pedestrian doorsets, windows, curtain walling, grilles and shutters — Burglar resistance — Test method for the determination of resistance to manual burglary attempts*

EN 1906:2010, *Building hardware — Lever handles and knob furniture — Requirements and test methods*

EN 12195-2, *Load restraint assemblies on road vehicles — Safety — Part 2: Web lashing made from man-made fibres*

EN 12209:2003, *Building hardware — Locks and latches — Mechanically operated locks, latches and locking plates - Requirements and test methods*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1627:2011 and the following apply.

deleted text

### 3.1

#### test specimen

complete, fully functioning construction product as detailed in the scope of this standard

**EN 1628:2011+A1:2015 (E)****3.2****sub-frame**

surrounding frame into which the test specimen is mounted in accordance with the manufacturer's instructions

**3.3****test rig**

surrounding substantial steel frame with movable steel supports into which the sub- frames containing test specimens of various dimensions can be mounted

**3.4****load applicator**

hydraulic ram or similar loading device that can apply the test forces required

**3.5****pressure pad**

pad fitted to the active end of the load applicator to spread the load

**3.6****locking points**

all connecting points between the opening element and the fixed element including the following:

- main lock;
- bolts of additional locks or multi-point locks;
- hinges;
- hinge bolts;
- fixings of fixed elements;
- roller and slide bearings in guides of sliding elements;
- junction of grille bars

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**A1** Note 1 to entry: Locating wedges are not considered to be building hardware or attachment points unless they also act as a security claw/dogbolt. **A1**

**A1 3.7****inactive leaf**

leaf of a multi-leafed window or door, intended to be moved after the active leaf

[SOURCE: EN 12519:2004, definition 2.1.8]

**3.8****active leaf**

leaf of a multi-leafed window or door intended to be moved first to provide opening **A1**

## 4 Apparatus

### 4.1 Test rig

The test rig is consisting of a rigid steel frame with movable steel supports into which test specimens of various dimensions can be mounted, as shown in Figure A.5. The stiffness of the rig shall be such that a 15 kN force applied to any of the defined points and normal to the plane of the frame shall not cause a deflection of more than 5 mm. The test rig shall not impede the execution of the test.

### 4.2 Load applicators

The load applicators consisting of a hydraulic ram or similar loading device shall be capable of applying the required test forces progressively and without shock.

### 4.3 Hooks

Hooks are shown in Figure A.12.

### 4.4 Straps

Straps shall conform to EN 12195-2 or equivalent and have a minimum tensile strength of 5kN. These straps may be used to apply some of the loads.

### 4.5 Pressure pads

Pressure pads are shown in Figures A.6 to A.11.

### 4.6 Measuring equipment

The measurement equipment is consisting of the following:

- a) equipment to display and/or record the forces being applied;
- b) a chronometer with seconds display for measuring the loading times;
- c) equipment for determining temperature and relative humidity;
- d) calliper and/or depth gauge;
- e) angle measuring instrument;
- f) four gap gauges as shown in Figures A.13 and A.14: gap gauge A shall be 10 mm in diameter, gap gauge B shall be 25 mm in diameter, gap gauge C shall be 50 mm in diameter, gap gauge D shall have an elliptical form with a major diameter of 250 mm and a minor diameter of 150 mm.

NOTE The various gap gauges detailed in A.10 are used to evaluate the resistance to an applied load. They represent an acceptable level of deformation of the various products above which vulnerabilities may be exposed. They are not intended to represent any particular attack method but are used as a simple method to establishing failure.

### 4.7 Sub-frame

The sub-frame shall simulate the support given to the product when installed into a building and shall be taken into consideration in the manufacturer's installation instructions. It shall typically consist of the following:

**EN 1628:2011+A1:2015 (E)**

- a) for group 1 to group 4 products, a rectangular metal tube 120 mm x 120 mm x 5 mm or a rectangular timber frame 100 mm x 50 mm;
- b) additionally for group 3 and group 4 products, a steel tube 40 mm x 40 mm x 3 mm; and a base plate of 8 mm steel, consisting of several segments which shall be removable for the purposes of loading if necessary.

See Figures A.15 to A.32.

**4.8 Tolerances**

Unless stated otherwise in this European Standard the following tolerances shall apply to the test equipment:

|                   |                   |          |
|-------------------|-------------------|----------|
| Load              |                   | ± 5 %    |
| Dimensions        | < 20 mm           | ± 0,5 mm |
|                   | ≥ 20 to 500 mm    | ± 1,0 mm |
|                   | ≥ 500 to 2 000 mm | ± 2.0 mm |
|                   | ≥ 2 000 mm        | ± 3,0 mm |
| Angle             |                   | ± 2°     |
| Time              |                   | ± 1 %    |
| Temperature       |                   | ± 2 °C   |
| Relative humidity |                   | ± 5 %    |

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**5 Test specimen**

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**5.1 General**

Each test specimen shall be a functioning product complete with its frames, hardware, guide rails, curtain, tube, roller box and accessories, as appropriate. When testing roller shutters at least two test specimens consisting of separate sections of the guide rails shall be supplied for test. These sections shall be 1 m in length (see Figure A.56).

The test specimen shall be fixed square and plumb and without twist or bend into a sub-frame. The installation shall be in accordance with the manufacturer's instructions as detailed in Clause 10 of EN 1627:2011, including the method of fixing, packing supports, sealing requirements, etc. (see Figures A.15 to A.63).  $\text{A}_1$  The sub-frame shall be supported by the test rig so that there will be no movement of the sub-frame during the test.  $\text{A}_1$  The sub-frame shall simulate the support given to the product when installed into a building.

$\text{A}_1$  Products that are intended to be installed in orientations other than vertical (e.g. roof lights) may be installed in the vertical orientation for the purpose of this test.  $\text{A}_1$

NOTE 1 The product may be installed directly into a building  $\text{A}_1$  structure  $\text{A}_1$  as intended in practice.

For the purposes of this standard, the test specimen shall be glazed according to the relevant glazing resistance class of EN 356:1999, corresponding to the resistance class of the construction product according to EN 1627:2011, as shown in Table 1. Security glazing, when used in an insulating glass unit, is normally positioned on the non-attack side. For the purpose of this test, the glass pane offering the highest security level shall be positioned on the attack side of the sample.  $\text{A}_1$  Products shall be glazed in accordance with the manufacturer's specification.  $\text{A}_1$



Table 1 — Test sample glazing requirements

|       | Accessible opening through the glazing itself  | Fixing of the glazing on the complete element | Glazing fitted on the test sample | Test criteria (EN 1630)                                    |
|-------|--|---|-----------------------------------|--|
| RC1 N | No test, <b>no requirements</b>  | Test according to EN 1628, EN 1629, EN 1630   | P4A                               | No test  |
| RC2 N | No test, <b>no requirements</b>  | Test according to EN 1628, EN 1629, EN 1630   | P4A                               | Accessible opening according to EN 1630:2011+A1:2015, 3.11 |
| RC2   | No test, <b>classification according to EN 356 class P4A</b>                             | Test according to EN 1628, EN 1629, EN 1630   | P4A                               | Accessible opening according to EN 1630:2011+A1:2015, 3.11 |
| RC3   | No test, <b>classification according to EN 356 class P5A</b>                             | Test according to EN 1628, EN 1629, EN 1630   | P5A                               | Accessible opening according to EN 1630:2011+A1:2015, 3.11 |
| RC4   | No test, <b>classification according to EN 356 class P6B</b>                             | Test according to EN 1628, EN 1629, EN 1630   | P6B                               | Accessible opening according to EN 1630:2011+A1:2015, 3.11 |
| RC5   | <b>Classification according to EN 356 class P7B and manual test according to EN 1630</b> | Test according to EN 1628, EN 1629, EN 1630   | P7B                               | Accessible opening according to EN 1630:2011+A1:2015, 3.11 |
| RC6   | <b>Classification according to EN 356 class P8B and manual test according to EN 1630</b> | Test according to EN 1628, EN 1629, EN 1630   | P8B                               | Accessible opening according to EN 1630:2011+A1:2015, 3.11 |



**A1** NOTE 2 If a higher grade of glass is used on the test specimens, it may not be possible to assess the use of lower grade glass within those products without conducting further tests. This is because higher grades of glass may increase the rigidity of the product. **A1**

NOTE **A1** 3 **A1** The test specimen used in this test may also be used for the dynamic test in accordance with **A1** EN 1629 **A1** and the pre-test in accordance with **A1** EN 1630 **A1**, provided that any damage caused by these tests will not affect the result of the pre-test.

**EN 1628:2011+A1:2015 (E)****5.2 Preparation and examination of the test specimen**

The temperature of the test specimen shall be maintained between 15 °C and 30 °C for a period of not less than 8 hours prior to test.

The test specimen and sub-frame mounted in the test rig shall be visually examined for damage, defects or other particular conditions of finish, etc. These shall be recorded.

**A1** The top of the sub-frame should be propped local to the locking points, if necessary. **A1**

Each test specimen shall be examined and the direction to disengage each locking point shall be noted.

During testing the test specimen shall be closed and locked at the declared closing condition in accordance with the manufacturer's instructions.

All locking hardware that can be disengaged from the attack side without the use of a key or tool shall be disengaged during all tests.

Products in resistance class 1 shall additionally be prepared prior to the static loading test by removing all parts on the attack side that can be unscrewed, dismantled or disassembled using the tools described in **A1** EN 1630:2011+A1:2015 **A1**, Annex A, tool set A1. Parts must not be damaged during this procedure. The total time for this preparation procedure shall not exceed 3 minutes.

The parts removed during this preparation shall be recorded.

**6 Procedure****6.1 Test room climate**

The test room temperature shall be maintained between 15 °C and 30 °C.

The relative humidity in the test room shall be between 30 % and 70 %.

**6.2 General**

The specified test loads detailed in EN 1627:2011 shall be applied in the order specified in 7.1 of EN 1627:2011 at the various loading points using the load applicator. The ability of the products to resist static loading shall be assessed by means of a gap gauge, as shown in Figures A.13 and A.14.

The complete test procedure shall be carried out as shown in Annex B.

Details of the hardware shall be recorded and their performance in terms of EN 1303:2005, EN 12209:2003 and EN 1906:2010 shall be identified, where relevant.

**A1** Should the glass break during any tests, the test programme shall proceed with the broken glass in situ. Adhesive film may be applied to the glass to protect the tester.

F2 loads will be applied progressively and without shock over a period of 10 s to 20 s and will be maintained for a period of 8 s to 12 s. **A1**

**6.3 Testing of group 1 and group 2 construction products****6.3.1 Loading points for group 1 and group 2 products****6.3.1.1 Loading point F1: infilling corner**

The specified load shall be applied, in turn, to each corner of the infilling medium at a point as shown in Figure A.1, unless the infilling medium is circular, in which case four points shall be selected at approximately equidistant intervals around the edge. The load shall be applied in a direction to

disassemble the infilling medium retention system and perpendicular to the plane of the test specimen.  $\text{A}_1$  The F1 loads to infills will be applied with the pressure pad located nominally 5 mm from the edge of the infill, as described in Figure A.1. F1 loads on infills will be applied in the direction to disassemble the glazing/infill, i.e. loading from the outside on internally glazed windows and vice versa. Where it is unclear as to which side is the direction to disassemble the glazing/infill, e.g. cassette systems of symmetrical systems, the load will be applied from the attack side.  $\text{A}_1$

### 6.3.1.2 Loading point F2: leaf corner

The specified load shall be applied, in turn, to each corner of the leaf if the adjacent locking point has a greater distance A than 350 mm from the corner as shown in Figures A.33 to A.45. If no corner exists (e.g. circular product) apply the loads half way between locking points. It shall be applied in a direction to open the leaf and perpendicular to the plane of the test specimen.  $\text{A}_1$  The distance of a hardware loading point from a corner shall be measured from the corner of the frame rebate to the centre of that hardware loading point.  $\text{A}_1$

### 6.3.1.3 Loading point F3: locking points

The specified load shall be applied, in turn, to each locking point as defined in 3.7 and shown in Figures A.2 to A.4. If the distance between two adjacent locking points is less than 200 mm then a single loading point shall be used located at the midpoint between the two locking points. The load shall be applied in a direction to open the leaf. For locking points on adjacent edges the sum on their distance from the corner shall be used, see Figure A.48. The load shall be applied in a direction to open the leaf. Where the locking point has a contact length of greater than 200 mm (e.g. piano hinge or locking bar) then a load shall be applied at each end.  $\text{A}_1$  Once two loading points have been combined, they cannot be further combined with other loading points.  $\text{A}_1$

### 6.3.1.4 Loading point: F3.a: locking points

The specified load shall be applied to the leaf and, where necessary to the frame, in a direction to disengage the associated locking point as shown in Figure A.41 to A.50.  $\text{A}_1$  The load F3.a shall be applied in the plane of the specimen and only in association with the load applied to loading point F3 and to products in burglar resistance class 1N, as defined in EN 1627:2011.  $\text{A}_1$

Where a separating force is required, a load shall also be applied to other  $\text{A}_1$  parts  $\text{A}_1$  of the product. The load F3.a shall be applied and maintained until the load applied to loading point F3 has been applied and removed.

NOTE There is no fixed correlation between the attack side and the loading direction, because in a realistic attack with tools, forces are applied in the direction of opening or contrary to the direction of assembly. The loading direction is therefore dependent on the construction and function of the test specimen. For products where both sides are considered to be the attack side then no additional static tests are required.

## 6.3.2 Test procedure for the infill medium retention system (product groups 1 and 2)

For the purpose of this test, the leaf of the test specimen shall be restrained to resist any deflection between leaf and frame due to the loads applied to the infilling medium. The restraint shall have a nominal contact area of 100 X 50 mm and offer restraint in the opposite directions to the applied load.

The load F1 shall be applied progressively and without shock over a period of 10 s to 20 s and within 5° of perpendicular to plane to each corner of the infill medium. The load shall be maintained for a period of 8 s to 12 s. If the retention system exhibits any sign of disengagement at a corner, the loading test shall be continued along each section of the retention system in an attempt to defeat the system. Subsequent loads shall be applied at intervals of a minimum of 50 mm.