



CEN/TC 33/WG 7  
Burglary resistance

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**Pedestrian doorsets, windows, curtain walling, grilles and shutters — Burglar resistance — Test method for the determination of resistance to manual burglary attempts**

*Türen, Fenster, Vorhangfassaden, Gitterelemente und Abschlüsse — Einbruchhemmung — Prüfverfahren für die Ermittlung der Widerstandsfähigkeit gegen manuelle Einbruchversuche*

*Blocs-portes pour piétons, fenêtres, façades rideaux, grilles et fermetures — Résistance à l'effraction — Méthode d'essai pour la détermination de la résistance aux tentatives manuelles d'effraction*

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# Contents

Page

European foreword.....	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions .....	7
4 Apparatus and test team.....	8
4.1 Test rig .....	8
4.2 Test team.....	8
4.2.1 Personnel .....	8
4.2.2 Composition of the test team .....	8
4.2.3 Essential capabilities of the test team members .....	8
4.2.4 Training .....	9
4.3 Measurement and recording devices.....	9
4.3.1 Measuring equipment .....	9
4.3.2 Video recording .....	9
4.4 Tolerances .....	9
4.5 Sub-frame.....	9
4.6 Cylinder plug extraction .....	10
5 Test specimen.....	10
5.1 General.....	10
5.1.1 General.....	10
5.1.2 Product with glazing .....	11
5.2 Preparation and examination of the specimen .....	12
6 Procedure.....	12
6.1 General.....	12
6.2 Test room climate .....	12
6.3 Areas of attack.....	13
6.3.1 General.....	13
6.3.2 Construction products with moving elements .....	13
6.3.3 Fixed construction products .....	14
6.4 Attack side and attack height.....	14
6.5 Pre-test.....	14
6.6 Main test .....	14
6.7 Failure criteria .....	15
7 Tool sets.....	15
7.1 General.....	15
7.2 Tool set A1 resistance class 1 (see Figure A.1) – Application of the tool set A1 in resistance class 1.....	16
7.3 Tool set A2 resistance class 2 (see Figure A.2) – Application of the tool set A2 in resistance class 2.....	17
7.4 Tool set A3 resistance class 3 (see Figure A.3) – Application of the tool set A3 in resistance class 3.....	17
7.5 Tool set A4 resistance class 4 (see Figure A.4) – Application of the tool set A4 in resistance class 4.....	18

7.6	Tool set A5 resistance class 5 (see Figure A.5) – Application of the tool set A5 in resistance class 5 .....	18
7.7	Tool set A6 resistance class 6 (see Figure A.6) – Application of the tool set A6 in resistance class 6 .....	19
8	Test report .....	20
Annex A (normative) Tool sets.....		22
Annex B (normative) Test sequence for manual test.....		28
Annex C (normative) Example of test equipment .....		29
Annex D (informative) Examples of mounting arrangements.....		30
Annex E (normative) Cylinder plug extraction .....		47
Annex F (normative) Tests for building elements with non-key-operated unlockable hardware .....		49

## **European foreword**

This document (FprEN 1630:2020) 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 Formal Vote.

This document supersedes EN 1630:2011+A1:2015.

Significant changes in this revision are:

- a) updated editions of Normative references;
- b) Annex E and annex F added.
- c) for certain test the template E4 was added in clause 6.7
- d) the Figures in Annex A have been updated.

This document 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:—<sup>1</sup>, *Pedestrian doorsets, windows, curtain walling, grilles and shutters — Burglar resistance — Requirements and classification*;
- EN 1628:—<sup>2</sup>, *Pedestrian doorsets, windows, curtain walling, grilles and shutters — Burglar resistance — Test method for the determination of resistance under static loading*;
- EN 1629:—<sup>3</sup>, *Pedestrian doorsets, windows, curtain walling, grilles and shutters — Burglar resistance — Test method for the determination of resistance under dynamic loading*.

The manual test described in this standard covers the areas of vulnerability not suitably assessed by the static loading and dynamic loading tests described in EN 1628:— and EN 1629:—. Certain basic security requirements for the locks, furniture and cylinders are covered by the requirements detailed in Table 3 of EN 1627:—. These security characteristics are not re-assessed in this test standard and the attack methods and test times have been limited to reflect this.

The use of the tools detailed in the various tools sets is described in this standard. This has the advantage of improving the reproducibility of the test.

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<sup>1</sup> To be published.

<sup>2</sup> To be published.

<sup>3</sup> To be published.

## 1 Scope

This document specifies a test method for the determination of resistance to manual burglary attempts in order to assess the burglar resistant characteristics of pedestrian doorsets, windows, curtain walling, grilles and shutters. It is applicable to the following modes of opening: turning, tilting, folding, turn-tilting, top or bottom hung, sliding (horizontally and vertically), pivoted (horizontally and vertically), projecting, and rolling as well as non-openable constructions.

This document does not directly cover the resistance of locks and cylinders to attack with picking tools. It also does not cover the attack of electric, electronic and electromagnetic operated burglar resistant construction products using surreptitious attack methods that might defeat these characteristics.

It is acknowledged that there are two aspects to the burglar resistance performance of construction products, their normal resistance to forced operation and their ability to remain fixed to the building. This test method does not evaluate the performance of the fixing to the building.

The manufacturer's installation instructions will give guidance on the fixing of the product.

An example for the contents of the manufacturer's installation instructions is given in Annex A of EN 1627:—<sup>4</sup>.

This document does not apply to walls and roofs, as well as for 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+A2:2016.

NOTE It is important that construction products that can be reached or driven through by vehicles are protected by appropriate measures such as barriers, extensible ramps, etc.

## 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 356:1999, *Glass in building - Security glazing - Testing and classification of resistance against manual attack*

EN 1303:2015, *Building hardware - Cylinders for locks - Requirements and test methods*

EN 1627:—<sup>5</sup>, *Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Requirements and classification*

EN 1628:—<sup>6</sup>, *Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance under static loading*

EN 1629:—<sup>7</sup>, *Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance under dynamic loading*

EN 12216: 2018, *Shutters, external blinds, internal blinds – Terminology, glossary*

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<sup>4</sup> To be published.

<sup>5</sup> To be published.

<sup>6</sup> To be published.

<sup>7</sup> To be published.

*and definitions*

EN 12519:2018, *Windows and pedestrian doors – Terminology*

EN 13119:2016, *Curtain walling - Terminology*

EN ISO 10666:1999, *Drilling screws with tapping screw thread - Mechanical and functional properties*

EN ISO 15480:2019 *Hexagon washer head drilling screws with tapping screw thread*

EN ISO 15481:1999 *Cross recessed pan head drilling screws with tapping screw thread*

EN ISO 15482:1999, *Cross recessed countersunk head drilling screws with tapping screw thread*

EN ISO 15483:1999, *Cross recessed raised countersunk head drilling screws with tapping screw thread*

EN ISO/IEC 17025:2017, *General requirements for the competence of testing and calibration laboratories*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1627:—<sup>8</sup>, EN 12519:2018, EN 12216: 2018, EN 13119:2016 and the following 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

##### **test specimen**

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

#### 3.2

##### **sub-frame**

standard surrounding frame into which the test specimen is mounted for testing purpose.

#### 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

##### **tool set**

set of tools allocated for use for a particular resistance class

Note 1 to entry: For details of the tool set, see Clause 7 and Annex A.

#### 3.5

##### **rest time**

time taken when the test person carrying out the manual burglary test interrupts his work for a rest

#### 3.6

##### **tool change time**

time for the exchange or replacement of a tool or a part thereof, e.g. a defective drill, a blunt saw blade, etc

#### 3.7

##### **observation time**

time required for the test team to observe the test and to decide on its further execution

#### 3.8

##### **total test time**

combination of the resistance times, the rest times, the times for tool changes and the observation times during the main test

Note 1 to entry: The maximum total test time is the sum of the resistance time, rest time, tool change time and observation time. Resistance time is the working time of the test person carrying out the manual burglary test. The resistance time includes times of less than 5 s each for tool changes, e.g. exchanging a screwdriver for a crowbar.

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<sup>8</sup> To be published.



### **3.9**

#### **accessible opening**

opening permitting a test block of cross section of any of the dimensions defined in 6.7 to be passed through it

## **4 Apparatus and test team**

### **4.1 Test rig**

The test rig shall consist of a rigid frame into which test specimens can be mounted with their subframes. Annex C, Figure C.1 shows an example of a test rig. The stiffness of the rig shall be such that a 15 kN force applied to any of the defined points shall not cause a deflection of more than 5 mm. The test rig shall support the subframe. The test rig shall not impede the execution of the test.

### **4.2 Test team**

#### **4.2.1 Personnel**

The requirements for the test team personnel should be in accordance with EN ISO/IEC 17025:2017, 6.2.

#### **4.2.2 Composition of the test team**

The test team shall comprise a minimum of two people.

At least two members of the test team shall be capable of performing the manual test.

At least one member of the test team shall be competent to record the data and observations in such a way that a test report can be established.

For each test in an area of attack only one test team member shall be permitted.

#### **4.2.3 Essential capabilities of the test team members**

In order to perform the manual test, test team members shall be able to demonstrate that they are:

- mentally alert and well-motivated to maintain a sustained burglary attack;
- physically able to perform the test, and are able to withstand the physical strain likely to be imposed for the duration of the test;
- free from mobility impairments and have normal vision, corrected where necessary;
- capable of reflecting current *modus operandi* during burglary attacks using reasonable but not excessive force reflecting the anticipated attack relevant to the resistance class.

In addition, the test team shall be able to demonstrate detailed knowledge and understanding of:

- the design and manufacture of burglar resistant construction products including the locks, Building hardware and materials used;
- current *modus operandi* during burglary attacks;
- operation and control of test equipment;
- operation, control and maintenance of the attack tool sets;
- operation, control and maintenance of the measuring equipment;
- the handling of the tools used when performing the test for burglar resistance.

#### 4.2.4 Training

The test team shall have the opportunity for continuous development of skills and expertise appropriate to the performance of the tests, including:

- checking and assessing of video recording of the tests by the test team;

NOTE Video records can also form the basis for demonstrating the competence of test team members.

- the exchange of knowledge and experience between testing bodies and police agencies;
- further training, e.g. measuring techniques, material information, new construction products, new opening and closing techniques.

### 4.3 Measurement and recording devices

#### 4.3.1 Measuring equipment

The following equipment shall be available:

- a) chronometer for measuring the resistance time;
- b) chronometer for measuring the total test time;
- c) equipment for determining temperature and relative humidity.

#### 4.3.2 Video recording

The pre-test and the main test conducted on each test specimen shall be fully video recorded. The video and any copies of it shall not be published nor shown publicly without the permission of both the applicant and the test lab.

The video may be used as a reference when subsequent changes are made to the product.

A time reference or code should be shown in the video.

When a test laboratory is asked to conduct the test and a video is recorded, the test laboratory should include restrictions on the use of the video in their terms and conditions of contract with the applicant.

Note The test laboratory should take precautions to be in line with the EU General Data Protection Regulation

### 4.4 Tolerances

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

- Time  $\pm 1 \%$
- Temperature  $\pm 1^\circ$
- Relative humidity  $\pm 5 \%$

### 4.5 Sub-frame

The sub-frame shall simulate the support given to the product when installed into a building. It shall typically consist of the following:

- a) for group 1 to group 4 products, a rectangular minimum metal tube 120 mm x 120 mm x 5 mm or a rectangular timber frame minimum 100 x 70 mm;

NOTE High quality wood, e.g. glue laminated timber

- b) additionally for group 3 products 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.

## **4.6 Cylinder plug extraction**

When cylinders do not fulfil EN 1627:—<sup>9</sup>, Table 3, the cylinder plug extraction shall be conducted in accordance with Annex E.

## **5 Test specimen**

### **5.1 General**

#### **5.1.1 General**

The test specimen shall be a functioning product complete with its frames, building hardware, guide rails, curtain, tube, roller box and accessories, as appropriate.

The test specimen shall be fixed square and plumb and without twist or bend into a sub-frame.

The manufacturer shall ensure that the method of fixing, packing supports, sealing requirements, etc. of the test specimen into the sub-frame are in accordance with their installation instructions (see Figures A.15 to A.63). The sub-frame shall be supported by the test rig so that there will be no movement of the sub-frame during the test.

Installation shall be carried out in accordance with the manufacturer's instructions as detailed in Clause 10 of EN 1627:—<sup>10</sup>, including the method of fixing, packing supports, sealing requirements etc., as shown in Annex D, Figures D.1 to D.18. The test specimen shall be located in the test rig at a height relative to ground, nominally the same as intended in use. i.e. doors and French windows shall be mounted at ground level and windows shall be mounted at a height of 800 mm from ground level. The test specimen shall be installed in the sub-frame and test rig as close to the tester as possible to give maximum access to the test specimen.

For products intended to be installed in orientations other than vertical (e.g. rooflights) the test specimen shall be tested in the orientation of its intended use. When a range of intended orientations is considered, the test shall be performed in the most vulnerable orientation for the test specimen.

The number of test specimens needed is described in EN 1627:—<sup>11</sup>, Clause 11.

NOTE Under particular circumstances, additional specimens might be required.

The specimen used in the static test carried out in accordance with EN 1628:—<sup>12</sup>, and in the dynamic test carried out in accordance with EN 1629:—<sup>13</sup>, can also be used in the pre-test, provided that any damage caused by those tests will not affect the result of the pre-test.

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<sup>9</sup> To be published.

<sup>10</sup> To be published.

<sup>11</sup> To be published.

<sup>12</sup> To be published.

<sup>13</sup> To be published.

### **5.1.2 Product with glazing**

For the purposes of testing according to this standard, the test specimen shall be glazed according to the relevant glazing resistance class of EN 356:1999, as shown in Table 1.

**Table 1 — Glazing requirements for the test specimen**

<b>Resistance class</b>	<b>Minimum resistance class of glazing according to EN 356:1999 fitted on the test specimen for testing purpose</b>
RC 1 N	P4 A
RC 1	P4 A <sup>a</sup>
RC 2 N	P4 A
RC 2	P4 A <sup>a</sup>
RC 3	P5 A <sup>a</sup>
RC 4	P6 B <sup>a</sup>
RC 5	P7 B <sup>a</sup>
RC 6	P8 B <sup>a</sup>
<sup>a</sup> The glazing type fitted on the test specimen shall be the type (or one of the types) used for classification purpose.	

**NOTE** If a glass unit with a higher security level is used within the specimen used for the tests, it may not be possible to assess the use of glass units with a lower grade within those products without conducting further tests. This is because higher grades of glass can increase the rigidity of the product.

## **5.2 Preparation and examination of the specimen**

The specimen shall be stored for at least 8 hours in a temperature range between 15 °C and 30 °C until the start of the test to ensure that it is fully tempered for the 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.

The test specimen shall be in the closed condition specified by the manufacturer.

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

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.

**NOTE** This includes, for example, non-arresting latch bolts which are not engaged in the locking position.

The applicant shall supply the specimen pre-fitted in sub-frames (timber, aluminium or steel box section), with the maximum permitted gap between the specimen frame and the sub-frame, according to their installation instructions. The installation details and gap size shall be recorded in the test report. During test the test rig shall not support the joint line between specimen frame and sub-frame.

## **6 Procedure**

### **6.1 General**

The test sequence shall be as given in Annex B, Figure B.1.

The applicant shall provide information about possible risks caused by the electromechanical system.

### **6.2 Test room climate**

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

The relative humidity shall be between 30 % and 70 %.

### 6.3 Areas of attack

#### 6.3.1 General

For construction products in resistance classes 2 to 4 of EN 1627:—<sup>14</sup>, the glass itself shall not be directly attacked in order to create an accessible opening through which to pass template E1 to E4. The glazing and infilling retention system shall be attacked. For construction products in resistance classes 5 and 6 of EN 1627:—, the glass itself as well as the glazing and infilling retention system shall be attacked.

If the glass should break during any tests, the test shall proceed and the test laboratory may apply adhesive film to the exposed area of the glass to improve the protection of the tester for RC 2 to RC 4.

For construction products with non-key-operated unlockable hardware (e.g. panic exit device, knob cylinder, non-key-operated unlockable handle, non-lockable window handles, switches, push-buttons) or lockable window handle not complying with the requirements according EN 1627:—<sup>15</sup>, Table 3 on the non-attack side entry might be gained by penetrating the product (including glazing) and operating the operating device.

The acceptance criterion is that it shall not be possible to penetrate the product and operate the operating device so to achieve an accessible opening by this way of attack.

Regarding electrical operating device (e.g. switches or push-buttons) the test must be carried out with the product in the state to be expected in the event of an attempted attack, i.e. with the power on or in the powerless state in accordance with the operating instructions.

For RC 1 N: A test shall be carried out on the building element with tool set A1. The resistance time shall be 3 minutes.

For RC 2/RC 2 N up to RC 6: A test shall be carried out with the appropriate tool set and within the appropriate resistance time.

Annex F (Normative) shows further details to be observed when carrying out these tests.

#### 6.3.2 Construction products with moving elements

The areas of attack for movable construction products such as operable windows, doors, shutters and movable grilles, shall be as follows:

- locking parts;
- moving parts;
- body of the element;
- building hardware;
- glazing and infilling retention system;
- any other relevant areas.

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<sup>14</sup> To be published.

<sup>15</sup> To be published.

### **6.3.3 Fixed construction products**

The areas of attack for fixed construction products, such as fixed windows, curtain walling and grilles, shall be as follows:

- fixing parts (excluding the fixing of the construction product into the sub-frame);
- body of the element;
- glazing and infilling retention system;
- any other relevant areas.

### **6.4 Attack side and attack height**

The applicant shall define the attack side. The attack side shall be described and recorded in the test report. During the test the operator shall be permitted to stand on a platform in order to work in a convenient position. The platform shall be a rigid structure with a maximum height of 1,5 m above ground level.

### **6.5 Pre-test**

Before the main test, a pre-test shall be carried out to establish the test specimen's vulnerable areas (weak spots).

During the pre-test, each attack area indicated in 6.3.1 and 6.3.2 or 6.3.3 (as applicable) shall be tested. The effectiveness of each of the tools specified in the relevant tool set shall be evaluated at each attack area.

During the pre-test the test lab shall consider all aspects of the design to find one or more vulnerable areas (weak spots).

The test lab shall also consider if a combination of attacks on different parts of the product could be the most effective way to gain access. The pre-test shall be conducted on one or two specimens and will be continued as long as the test lab considers it necessary to determine vulnerable areas (weak spots). In the test report the test lab shall clearly describe why they have chosen one or more points to perform the main test on.

The attacks in the pre-test shall be recorded on the video.

The resistance time for each vulnerable area (weak spots) shall be measured and recorded.

### **6.6 Main test**

In the main test, attempts shall be made to force open the test specimen or to create an accessible opening, by targeting the weak and vulnerable areas of the test specimen identified during the pre-test using the most effective tool or set of tools appropriate to the resistance class of the test specimen, as specified in Clause 7. This shall be done within the resistance time and total test time for the resistance class in accordance with EN 1627:—<sup>16</sup> Table 14.

If the pre-tests indicate that more than one weak and vulnerable area exists, those areas should be evaluated as additional main tests. These additional tests may be done on the same specimen. If necessary, further test specimens may be required. The stipulations under Clause 11 in EN 1627:—<sup>17</sup> shall be taken in account.

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<sup>16</sup> To be published.

<sup>17</sup> To be published.

The pre-test may be declared as a main test, if all pre-tests show no vulnerable areas and the relevant pre-tests were conducted for the full resistance time resistance class in accordance with EN 1627:—<sup>18</sup>.

The main test(s) shall be recorded on the video.

The resistance time and the total test time for the main test(s) shall be measured and recorded.

## 6.7 Failure criteria

The product shall be deemed to have failed if an accessible opening is created in the test specimen, to allow the following templates to pass through.

- Template E1: - a rectangle of (400 ± 2) mm x (250 ± 2) mm; or
- Template E2: - an ellipse of (400 ± 2) mm x (300 ± 2) mm; or
- Template E3: - a circle of diameter (350 ± 2) mm

or

- Template E4: - a rectangle of (150 ± 2) mm x (660 ± 2) mm

All templates shall be at least 420 mm long.

Template E4 shall only be used for tests on sidepanels and/or overpanels to assess accessible openings by removing infillings or glazing by overcoming the infilling-/glass retention system or for tests on top/vent lights and top hung windows by opening the leaf.

## 7 Tool sets

### 7.1 General

During each individual forced entry test, the operator shall choose any tool or tools from the tool set appropriate to the resistance class of the specimen to be tested, as given in 7.2 to 7.7 and as illustrated in Annex A.

The power rating for electrically powered tools described in the tools sets is the required input power. The tool manufacturer, in the technical literature, normally states the input power.

Prior to commencing each individual forced entry test, the tools should be inspected to ensure they are in a suitably good condition to effectively conduct the test and that cutting tools are sharp. If a tool is broken during a pre-test or a main test the tool may be replaced with a new tool. Each type of tool shall only be replaced once during the test.

The purpose of the pre-test is to gain as much information as possible on the resistance the product offers to various methods of attack using various tool combinations. If a tool is blunted during a pre-test it may be sharpened. For example, damage sustained to a tool by inefficient use during the pre-test could be negated, and the tester can aim to avoid such damage during the main test. Sharpening of a tool during a main test is not permitted.

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<sup>18</sup> To be published.



## 7.2 Tool set A1 resistance class 1 (see Figure A.1) – Application of the tool set A1 in resistance class 1

Tool set A1 shall be used for the preparation of the test specimen in class 1 before conducting the static loading test (EN 1628:—<sup>19</sup>) and the dynamic loading test (EN 1629:—<sup>20</sup>).

Tools set A1 see Table 2, shall also be used during the pre-test and the main manual test in resistance class 2 and higher.

**Table 2 — Tool set A1**

Quantity	Tool set A1	Tool No.
<b>1</b>	<b>Multiple slip joint gripping pliers;</b> maximum length 260 mm	<b>1.1</b>
<b>1</b>	<b>Screwdriver;</b> Flat blade, total length (260 ± 20) mm, shaft diameter of (8 ± 2,2) mm and blade width (10 ± 1,2) mm	<b>1.2</b>
<b>1</b>	<b>Set of small screwdrivers;</b> maximum length 250 mm, maximum shaft diameter 8 mm. Typical blade forms as shown in Figure A.1.	<b>1.3</b>
	<b>set of cranked wrench</b> keys with any tip form. Examples shown in Figure A.1	<b>1.4</b>
	<b>Spanners;</b> maximum length 180 mm	<b>1.5</b>
<b>1</b>	<b>Pliers;</b> maximum length 200 mm. Typical plier forms are shown in Figure A.1.	<b>1.6</b>
<b>1</b>	<b>Tweezer</b>	<b>1.7</b>
<b>1</b>	<b>Knife;</b> maximum length of blade 120 mm, thickness of blade max. 3 mm. The blade shall not be serrated.	<b>1.8</b>
<b>1</b>	<b>Torch</b>	<b>1.9</b>
	<b>Hooks;</b> Various shapes and sizes, maximum diameter 4 mm. Hooks may be shaped with relevant tool-set.	<b>1.10</b>
	<b>Steel wire;</b> Various diameters up to a maximum diameter of 4 mm, including steel and electrical wire. No restriction on length.	<b>1.11</b>
	<b>Adhesive tape</b>	<b>1.12</b>
	<b>String;</b> Various diameters and types, including rope, cord and laundry line. The material shall not be elasticated. No restriction on length.	<b>1.13</b>
<b>1</b>	<b>Rubber hammer;</b> Hardness (90 ± 10) shore; head weight (100 ± 20) g, total weight (145 ± 20) g, length (260 ± 20) mm	<b>1.14</b>
<b>1</b>	<b>Universal lock key;</b> including cabinet lock and profile cylinder functions. Typical keys are shown in Figure A.1.	<b>1.15</b>

<sup>19</sup> To be published.

<sup>20</sup> To be published.

### 7.3 Tool set A2 resistance class 2 (see Figure A.2) – Application of the tool set A2 in resistance class 2

For testing glass and retention systems, see 6.3.

Tests for building elements with non-key-operated unlockable hardware, see Annex F.

The rubber hammer serves for the protection of the tester. They may use the hammer (instead of their hand) for hammering the wedges or screwdrivers. The rubber hammer shall be used only for hammering the wedges or screwdrivers into apertures in the test specimen. It is intended to simulate blows using the hand. The rubber hammer shall not make direct contact with the test specimen.

No other tool shall be used with a hammering action.

The compass saw, hacksaw and pad saw may only be used on grilles and accessible hinges. It is only allowed to use the saws on hinges that are directly accessible at the start of the test. It is not allowed to use the saws on dog bolts or other similar components (e.g. claws) used to strengthen the hinge edge.

The extension tube may only be used on grilles.

**Table 3 — Tool set A2**

Quantity	Tools	Tool No.
1	<b>Screwdriver;</b> Flat blade, length (365 ± 25) mm, blade width (16 ± 2,2) mm	<b>2.1</b>
1	<b>Pipe wrench;</b> length (240 ± 20) mm	<b>2.2</b>
2	<b>Plastic wedges;</b> length (200 ± 25) mm, width (80 ± 10) mm, height (40 ± 5) mm	<b>2.3</b>
2	<b>Wood wedges;</b> length (200 ± 25) mm, width (80 ± 10) mm, height (40 ± 5) mm	<b>2.4</b>
1	<b>Compass saw;</b> with two bimetals or HSS blades, total length (310 ± 25) mm	<b>2.5</b>
1	<b>Pad saw;</b> with two bimetals or HSS blades, total length (310 ± 25) mm	<b>2.6</b>
1	<b>Hacksaw,</b> with two bimetals or HSS blades, blade length (330 ± 30) mm	<b>2.7</b>
1	<b>Steel extension tube,</b> length (500 ± 5) mm, outer diameter (30 ± 0,5) mm, maximum wall thickness (3 ± 0,3) mm	<b>2.8</b>

### 7.4 Tool set A3 resistance class 3 (see Figure A.3) – Application of the tool set A3 in resistance class 3

For testing glass and retention systems, see 6.3.

Tests for building elements with non-key operated unlockable hardware, see Annex F.

The locksmiths hammer may only be used together with the pin punches. The locksmiths hammer shall not impact the test sample directly.

The crowbar may be used for levering only. It shall not be used like a hammer or an axe to impact the test specimen or other tools. The straight end may be inserted into apertures in the test specimen to generate assessable opening or access to locking components.

The compass saw, hacksaw and pad saw may only be used on grilles and accessible hinges. It is only allowed to use the saws on hinges that are directly accessible at the start of the test. It is not allowed to use the saws on dogbolts or other similar components (e.g. claws) used to strengthen the hinge edge. The extension tube may only be used on grilles.

**Table 4 — Tool set A3**

Quantity	Tools	Tool No.
1	<b>Screwdriver</b> ; Flat blade, length (365 ± 25) mm, blade width (16 ± 2,2) mm	3.1
1	<b>Crowbar</b> ; length (700 ± 20) mm	3.2
1	<b>Locksmiths hammer</b> ; head weight (200 ± 20) g, length (300 ± 20) mm	3.3
1	<b>Set of pin punches</b> ; diameters between 3 mm and 10 mm	3.4
1	<b>Hand drill</b> ; maximum length 355 mm	3.5
1	<b>Set of drill-bits</b> ; HSS or HS/CO parallel shank twist drills (jobber), Ø 1,0 mm to Ø 6,0 mm in steps of 0,5 mm. Only one drill bit of each diameter may be used.	3.6

#### 7.5 Tool set A4 resistance class 4 (see Figure A.4) – Application of the tool set A4 in resistance class 4

For testing glass and retention systems, see 6.3.

Tests for building elements with non-key-operated unlockable hardware, see Annex F.

Any limitation in the use of tools in tool set A1 to A3 is not applicable for resistance class 4.

**Table 5 — Tool set A4**

Quantity	Tools	Tool No.
1	<b>Club hammer</b> ; length (300 ± 25) mm, head weight (1,25 ± 0,1) kg	4.1
1	<b>Cold chisel</b> ; length (250 ± 25) mm, blade width (30 ± 5) mm	4.2
1	<b>Wood chisel</b> ; length (350 ± 25) mm, blade width (30 ± 5) mm	4.3
2	<b>Plate shears</b> ; left cutting and right cutting, length (260 ± 25) mm	4.4
1	<b>Axe</b> ; length (350 ± 25) mm, head weight (800 ± 30) g	4.5
1	<b>Bolt-cutter</b> ; length (460 ± 50) mm	4.6
1	<b>Cordless drilling machine</b> ; Without percussion action, with two nominal 14,4 V battery packs (up to 3,2 Ah each)	4.7
1	<b>Set of drill-bits</b> ; HSS or HS/CO parallel shank twist drills (jobber), Ø 1,0 mm to Ø 13,0 mm in steps of 0,5 mm. Only one drill bit of each diameter may be used.	4.7.1

#### 7.6 Tool set A5 resistance class 5 (see Figure A.5) – Application of the tool set A5 in resistance class 5

Any limitation in the use of tools in tool set A1 to A3 is not applicable for resistance class 5.

**Table 6 — Tool set A5**

Quantity	Tools	Tool No.
<b>1</b>	<b>Electric drill;</b> nominal 650 W $\pm$ 10 %, with percussion action	<b>5.1</b>
<b>1</b>	<b>Set of drill-bits;</b> HSS or HS/CO parallel shank twist drills (jobber), Ø 1,0 mm to Ø 13,0 mm in steps of 0,5 mm. The maximum number of drill bits is not restricted.	<b>5.1.1</b>
<b>1</b>	<b>Set of drill-bits;</b> carbide tips (masonry or metal cutting) parallel shank twist drills (jobber), Ø 3,0 mm to Ø 13,0 mm in steps of 1,0 mm. Maximum of two drill bits of each diameter may be used.	<b>5.1.2</b>
<b>1</b>	<b>Set of core drills;</b> HSS, HS/CO, carbide (masonry or metal cutting), Ø 50 mm max	<b>5.1.3</b>
<b>1</b>	<b>Electric sabre saw;</b> nominal 1 100 W $\pm$ 10 %	<b>5.2</b>
<b>5</b>	<b>Saw blades;</b> bimetal	<b>5.2.1</b>
<b>1</b>	<b>Electric jig saw;</b> nominal 650 W $\pm$ 10 %	<b>5.3</b>
<b>5</b>	<b>Saw blades;</b> bi-metal	<b>5.3.1</b>
<b>1</b>	<b>Angle grinder;</b> nominal 1 100 W $\pm$ 10 %	<b>5.4</b>
<b>3</b>	<b>Discs;</b> nominal Ø 125 mm, thickness 2,5 mm (for steel or stone excluding diamond)	<b>5.4.1</b>

### 7.7 Tool set A6 resistance class 6 (see Figure A.6) – Application of the tool set A6 in resistance class 6

Any limitation in the use of tools in tool set A1 to A3 is not applicable for resistance class 6.

**Table 7 — Tool set A6**

Quantity	Tools	Tool No.
<b>1</b>	<b>Electric drill;</b> Nominal 1050 W $\pm$ 10 %, with percussion action	<b>6.1</b>
<b>1</b>	<b>Angle grinder;</b> Nominal 2300 W $\pm$ 10 %, disc diameter max 230 mm	<b>6.2</b>
<b>4</b>	<b>Discs;</b> Ø 230 mm maxi, thickness 3,0 mm (for steel or stone excluding diamond)	<b>6.2.1</b>
<b>1</b>	<b>Spalling hammer;</b> length (800 $\pm$ 50) mm, head weight (3,5 $\pm$ 0,25) kg	<b>6.3</b>
<b>2</b>	<b>Steel wedges;</b> length (200 $\pm$ 10) mm, width (80 $\pm$ 10) mm, height (40 $\pm$ 5) mm	<b>6.4</b>

## **8 Test report**

The test report shall include the following details:

- a) name and address of the person or body carrying out the testing;
- b) name of the applicant, plus the name of the manufacturer of the test specimen, if different;
- c) details of the test specimen, to include:
  - 1) types of construction;
  - 2) profile references (codes, names, dimensions, etc.);
  - 3) types of materials used;
  - 4) thickness of infilling and glazing;
  - 5) used building hardware and it's fixing
- d) designation of materials;
- e) date of manufacture;
- f) declared classification of glazing used in the test specimen according to EN 356:1999;
- g) declared classification of applicable building hardware standards or the result of additional tests if relevant (see EN 1627:—<sup>21</sup>, Clause 6);
- h) attack side(s) of the test specimen;
- i) closed conditions effected during the test and the method of power supply during the testing of electromechanical building hardware;
- j) tool set used;
- k) dimensioned drawings of the specimen, to include the following, which shall be inspected and stamped by the testing laboratory and retained by the applicant:
  - 1) dimensions and tolerances;
  - 2) list of the various parts of the construction products, including precise manufacturer's designation;
- l) installation instructions of the product (see Annex A of EN 1627:—<sup>22</sup>);
- m) all relevant test results;
- n) Range of sizes covered by the test;

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<sup>21</sup> To be published.

<sup>22</sup> To be published.

- o) report of the condition of the specimen before the test including detailed description of any damage caused during the test (see 5.1.1, NOTE);
- p) date of report;
- q) signature of responsible person.

## Annex A (normative)

### Tool sets

#### A.1 Tool set A1



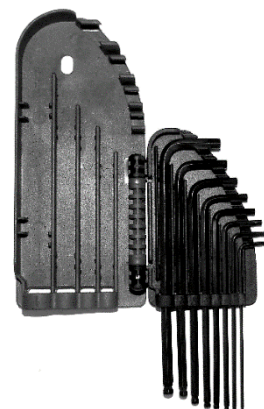
1.1



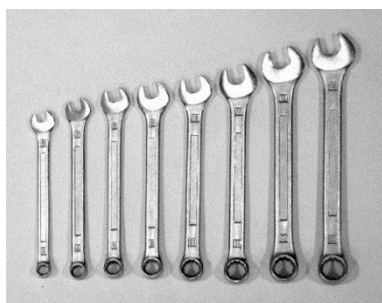
1.2



1.3



1.4



1.5



1.6



1.7



1.8



1.9



1.10



1.11



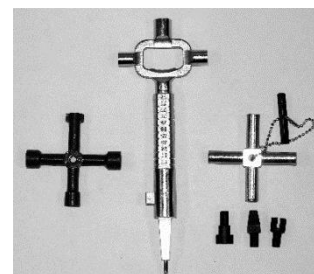
1.12



1.13



1.14



1.15

Figure A.1 — Tool set A1

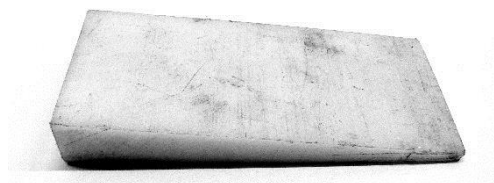
## A.2 Tool set A2



2.1



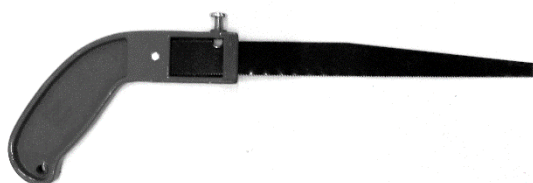
2.2



2.3



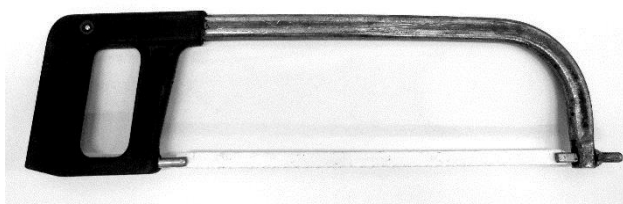
2.4



2.5



2.6



2.7



2.8

Figure A.2 — Tool set A2

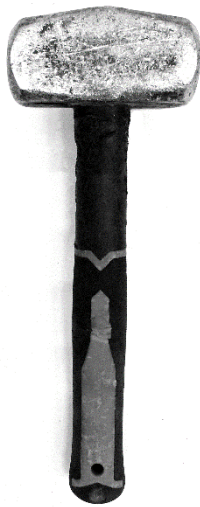


### A.3 Tool set A3

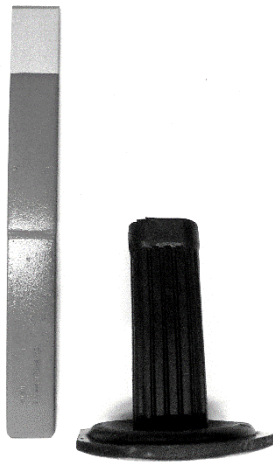


Figure A.3 — Tool set A3

#### A.4 Tool set A4



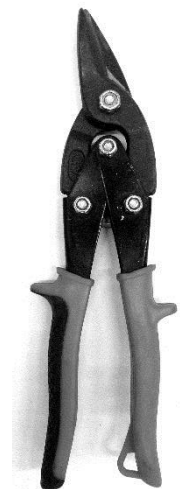
4.1



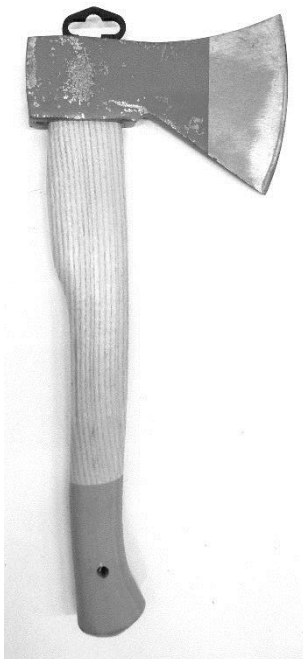
4.2



4.3



4.4



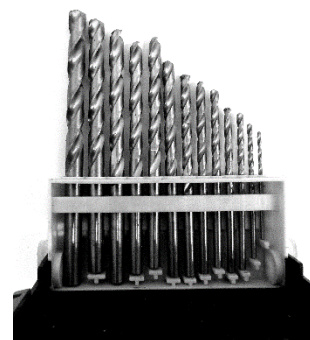
4.5



4.6



4.7



4.7.1

Figure A.4 — Tool set A4

## A.5 Tool set A5



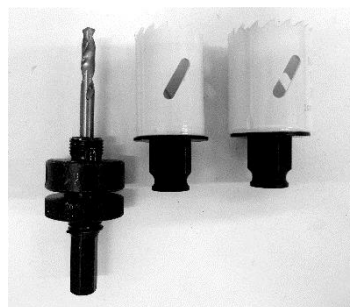
5.1



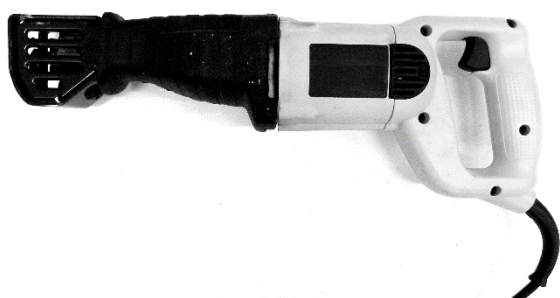
5.1.1



5.1.2



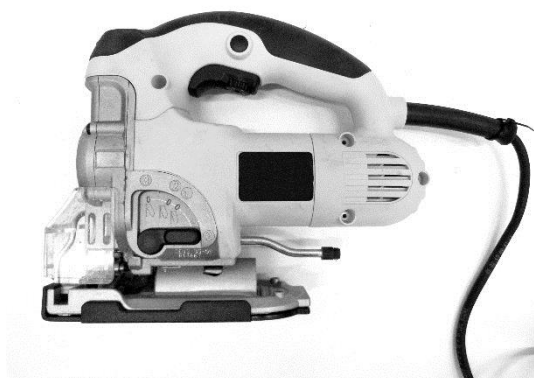
5.1.3



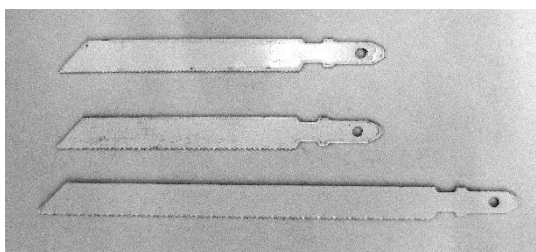
5.2



5.2.1



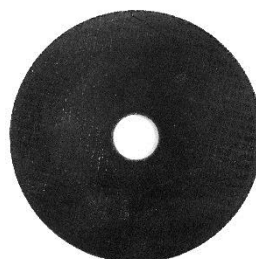
5.3



5.3.1



5.4



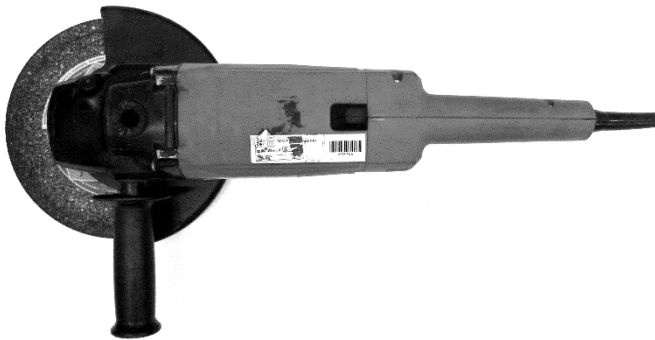
5.4.1

Figure A.5 — Tool set A5

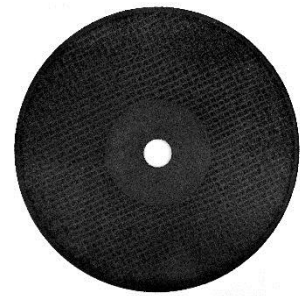
## A.6 Tool set A6



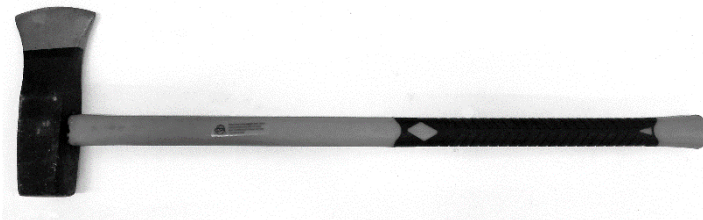
6.1



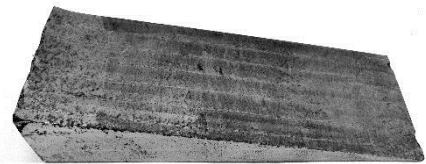
6.2



6.2.1



6.3



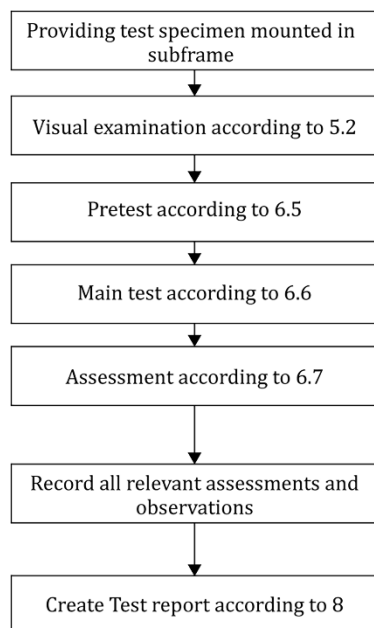
6.4

**Figure A.6 — Tool set A6**

## **Annex B** **(normative)**

### **Test sequence for manual test**

#### **B.1 Test sequence for manual test of resistance classes RC 1 N (if applicable) to RC 6**



**Figure B.1 — Test sequence for manual test**

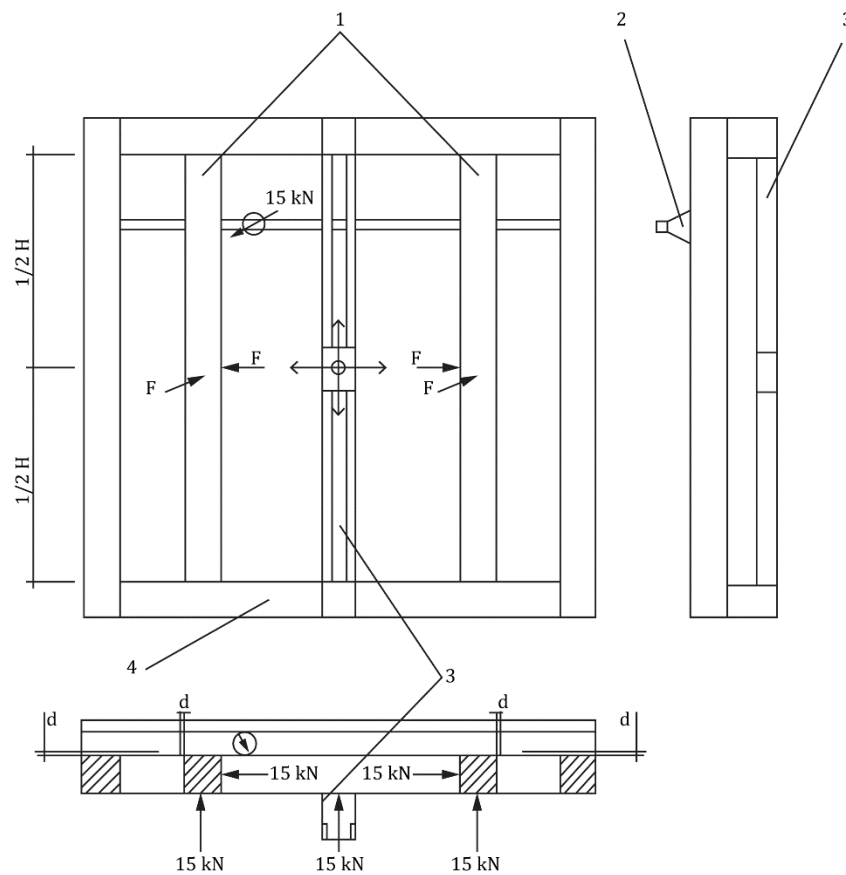


## Annex C

(normative)

## Example of test equipment

Dimension in mm



### Key

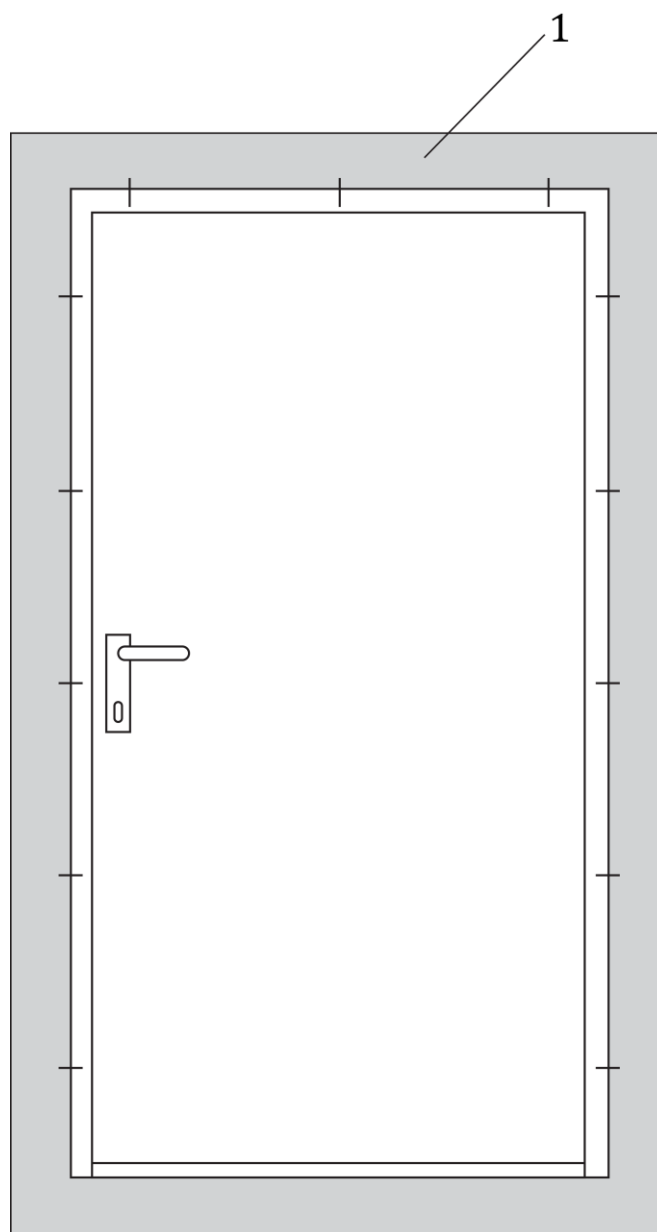
- |   |   |   |   |
|---|---|---|---|
| 1 | adjustable support to fix the test specimen       | 3 | adjustable support to fix the load applicator |
| 2 | adjustable support to fix the measuring equipment | 4 | main frame                                    |
|   |   |   | $d \leq 5 \text{ mm}$                         |

**Figure C.1 — Example of a test rig**

## **Annex D** (informative)

### **Examples of mounting arrangements**

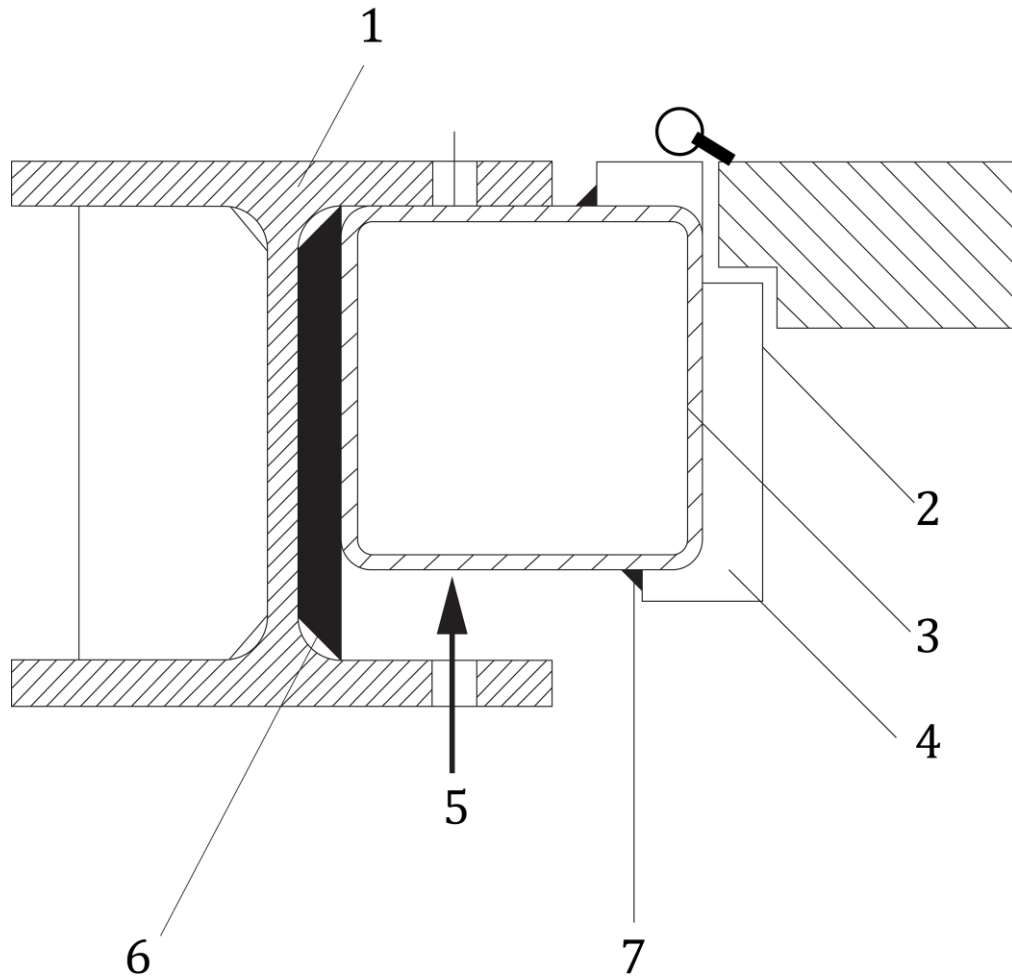
#### **D.1 Examples of mounting arrangements for doorsets**



**Key**

1 sub-frame

**Figure D.1 — Test specimen in sub-frame**

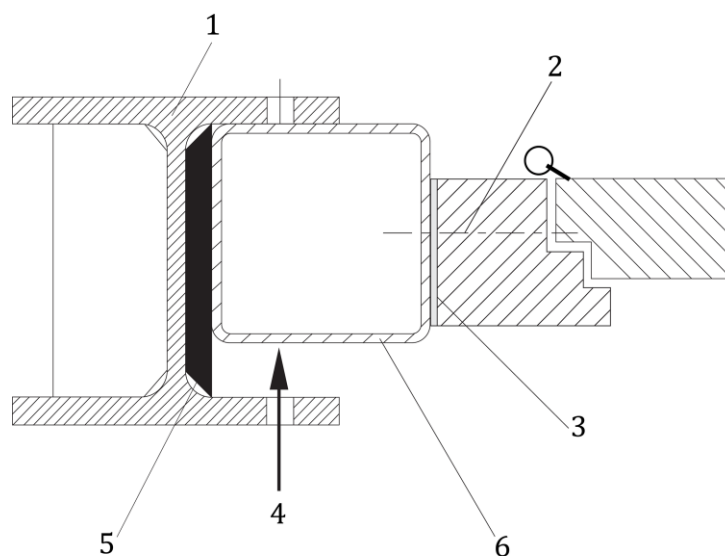


### Key

- |   |                             |   |   |
|---|-----------------------------|---|---|
| 1 | movable support of test rig | 4 | filling if required in accordance with the manufacturer's installation instructions |
| 2 | steel door frame            | 5 | clamp   |
| 3 | sub-frame                   | 6 | packing piece   |
|   |                             | 7 | welding seam  |

**Figure D.2 — Hinged door**

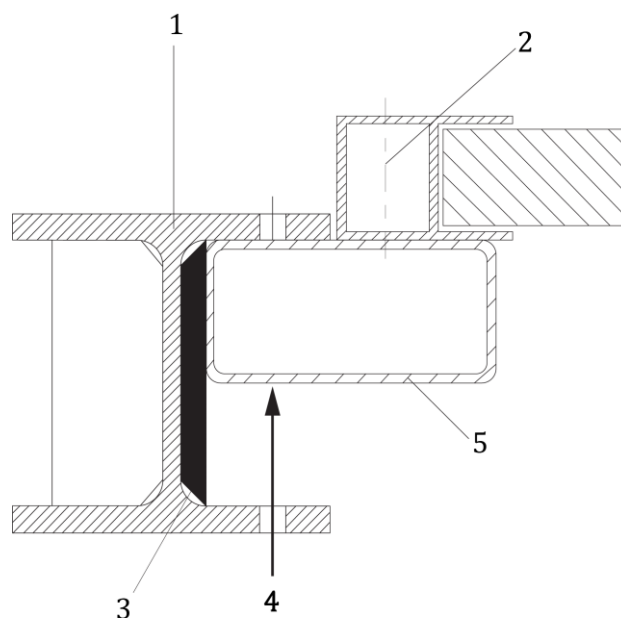




**Key**

- |   |   |   |               |
|---|---|---|---------------|
| 1 | movable support of test rig   | 4 | clamp         |
| 2 | test specimen fixing  | 5 | packing piece |
| 3 | packing in accordance with the manufacturer's installation instructions | 6 | sub-frame     |

**Figure D.3 — Hinged door**

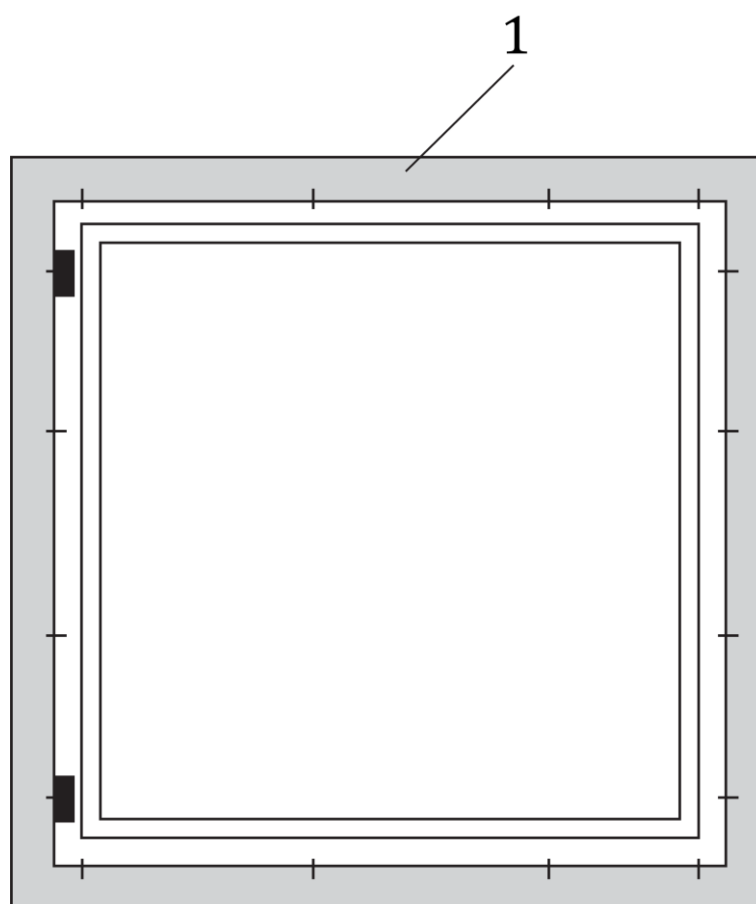


**Key**

- |   |                             |   |           |
|---|-----------------------------|---|-----------|
| 1 | movable support of test rig | 4 | clamp     |
| 2 | test specimen fixing        | 5 | sub-frame |
| 3 | packing piece               |   |           |

**Figure D.4 — Sliding door**

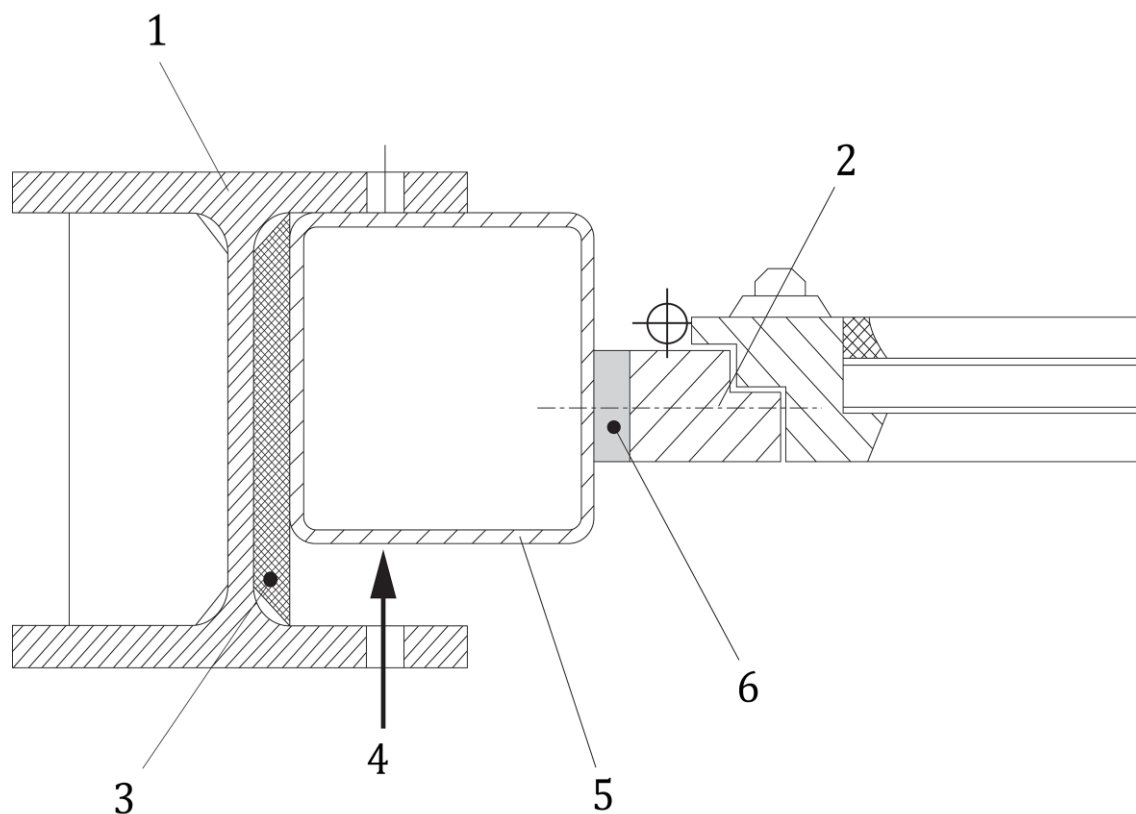
## D.2 Examples of mounting arrangements for windows



### Key

1 sub-frame

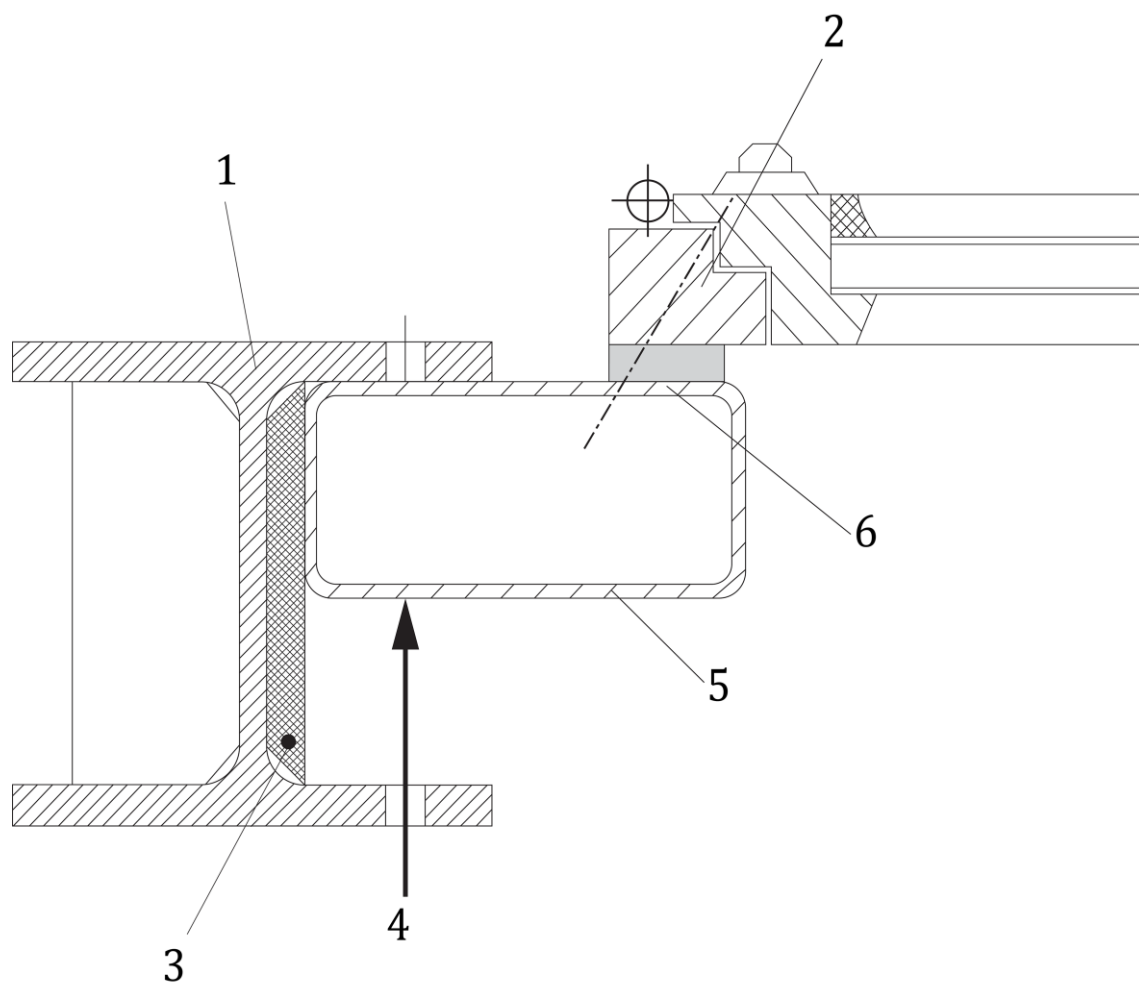
**Figure D.5 — Test specimen in sub-frame**



**Key**

- |                               |   |
|-------------------------------|---|
| 1 movable support of test rig | 4 clamp   |
| 2 test specimen fixing        | 5 sub-frame   |
| 3 packing piece               | 6 packing in accordance with the manufacturer's installation instructions |

**Figure D.6 — Side-hinged window**

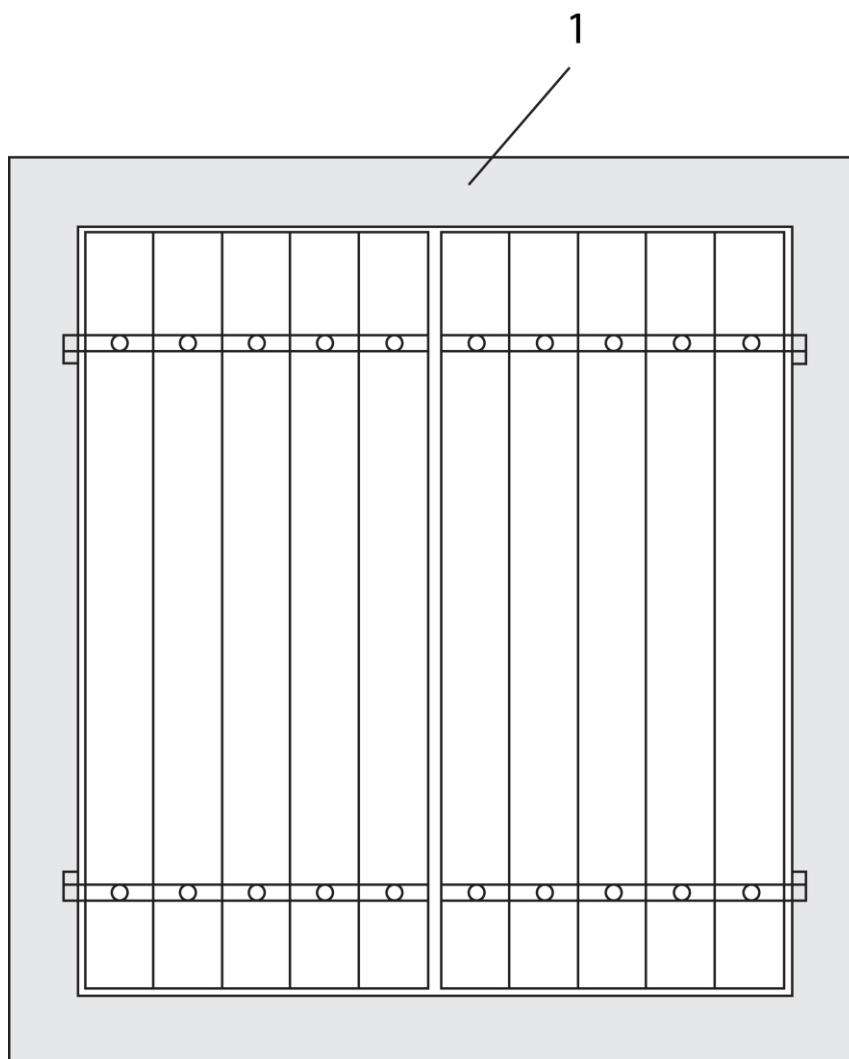


### Key

- |   |                             |   |   |
|---|-----------------------------|---|---|
| 1 | movable support of test rig | 4 | clamp   |
| 2 | test specimen fixing        | 5 | sub-frame   |
| 3 | packing piece               | 6 | packing in accordance with the manufacturer's installation instructions |

**Figure D.7 — Hinged window**

### D.3 Examples of mounting arrangements for wing and folding shutters

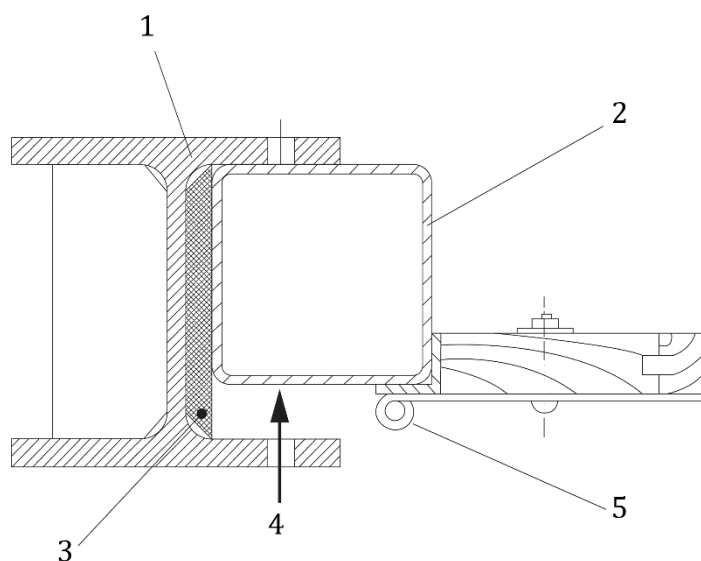


**Key**

1 sub-frame

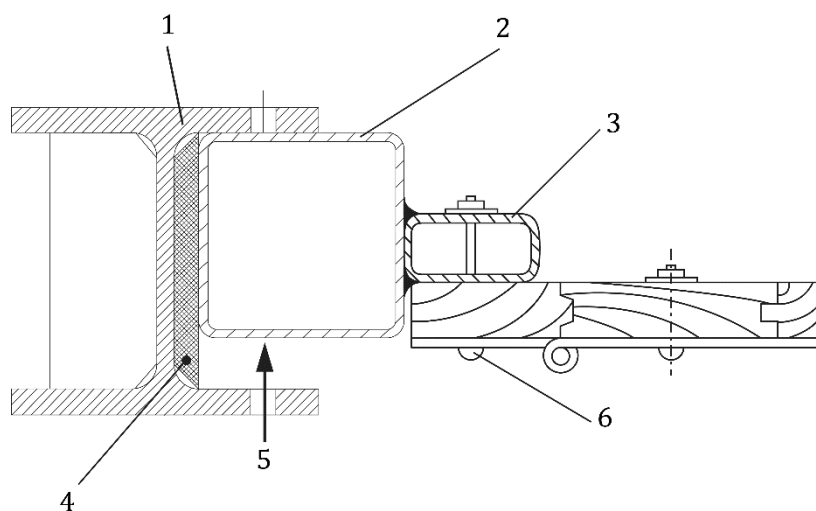
**Figure D.8 — Test specimen in sub-frame**

Dimensions in mm

**Key**

- |   |                             |   |  |
|---|-----------------------------|---|--|
| 1 | movable support of test rig | 4 | clamp  |
| 2 | sub-frame                   | 5 | mounting in accordance with the manufacturer's installation instructions |
| 3 | packing piece               |   |  |

**Figure D.9 — Wing/folding shutter**



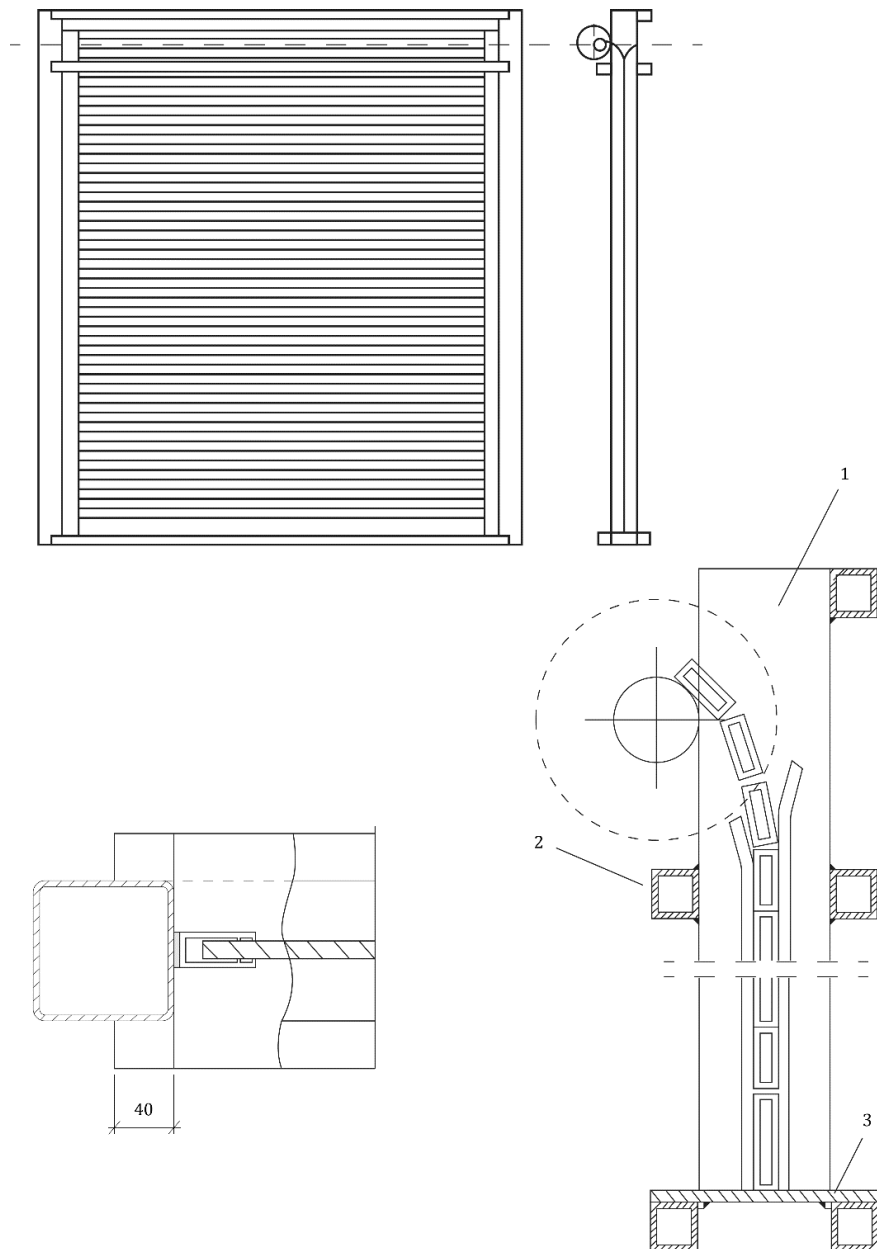
**Key**

- |                               |  |
|-------------------------------|--|
| 1 movable support of test rig | 4 packing piece  |
| 2 sub-frame                   | 5 clamp  |
| 3 80 × 40 × 5, welded on      | 6 mounting in accordance with the manufacturer's installation instructions |

**Figure D.10 — Wing/folding shutter**

#### D.4 Examples of mounting arrangements for guide rails and roller shutters into the test rig

Dimensions in mm



##### Key

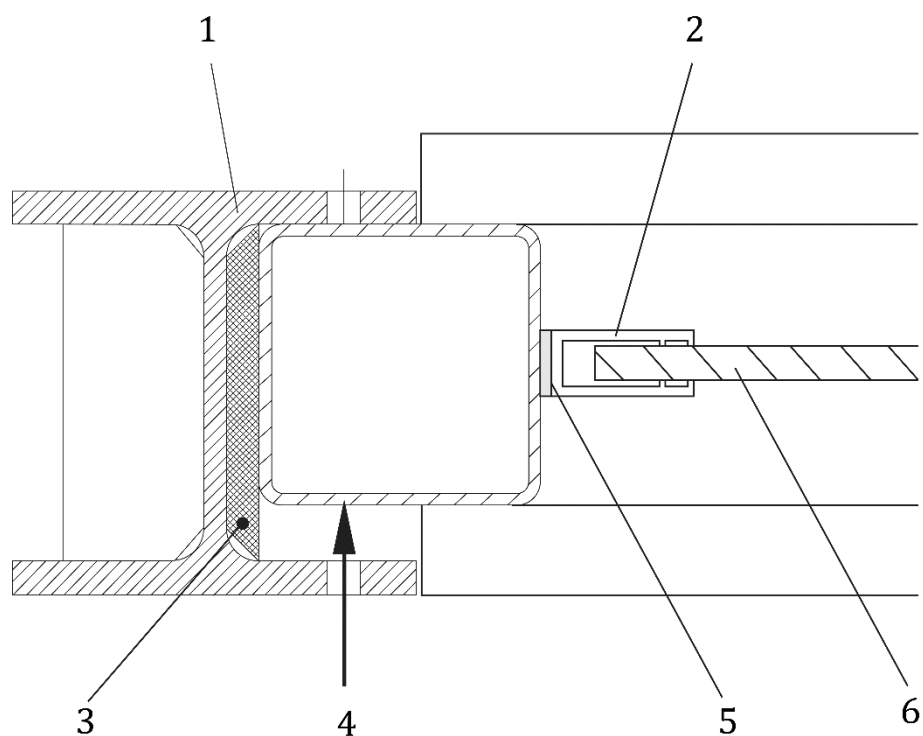
- |   |   |
|---|---|
| 1 rectangular steel tube 120 × 120 × 5 mm | 3 base plate of 8 mm steel, consisting of several parts |
| 2 rectangular steel tube 40 × 40 × 3 mm   |   |

For loading, individual segments have to be removed.

NOTE The surround frame consists of rectangular welded steel tubes.

**Figure D.11 — Example of mounting arrangements for roller shutters**



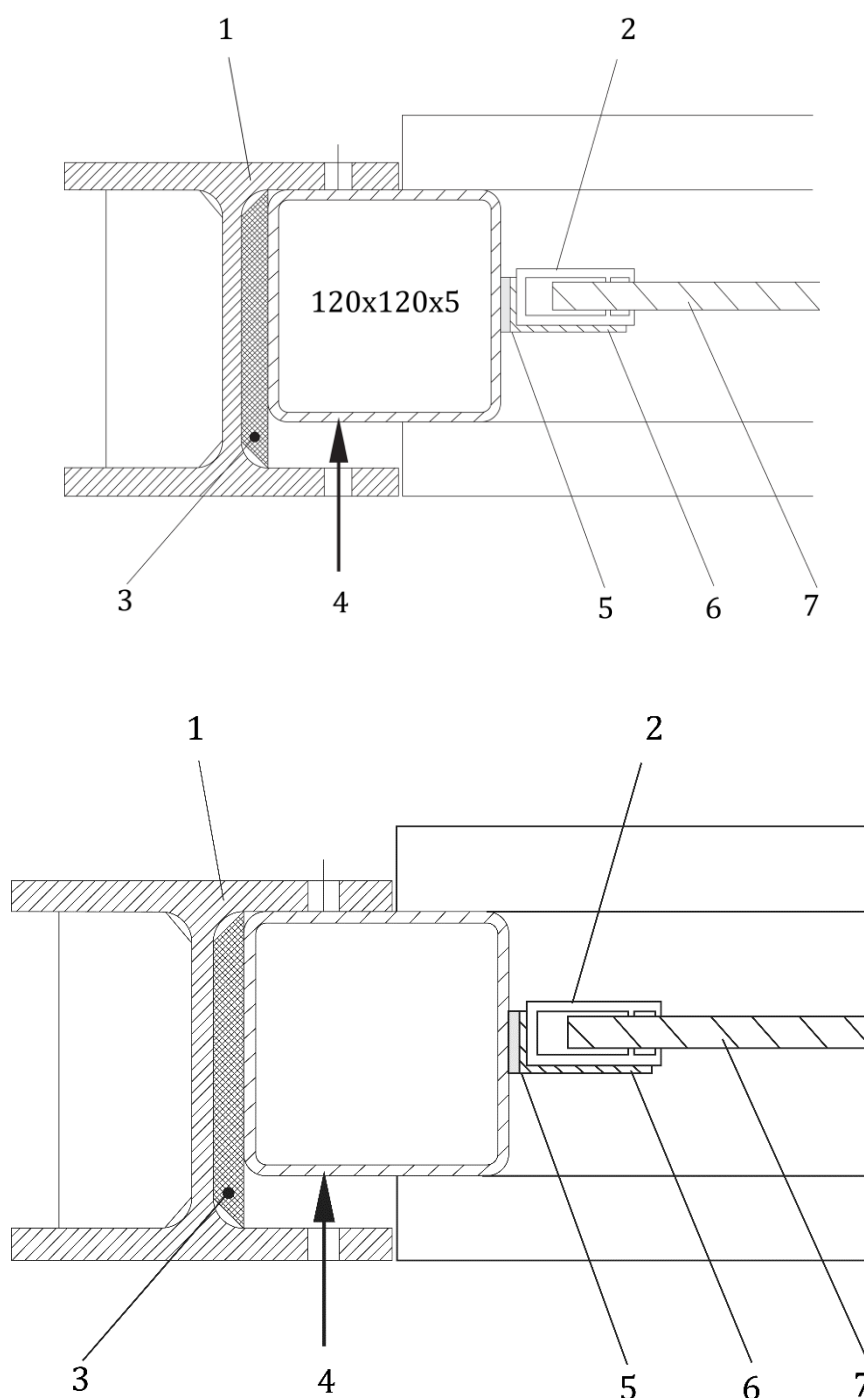


**Key**

- |   |                             |   |   |
|---|-----------------------------|---|---|
| 1 | movable support of test rig | 4 | clamp   |
| 2 | guide rail                  | 5 | packing in accordance with the manufacturer's installation instructions |
| 3 | packing piece               | 6 | shutter curtain   |

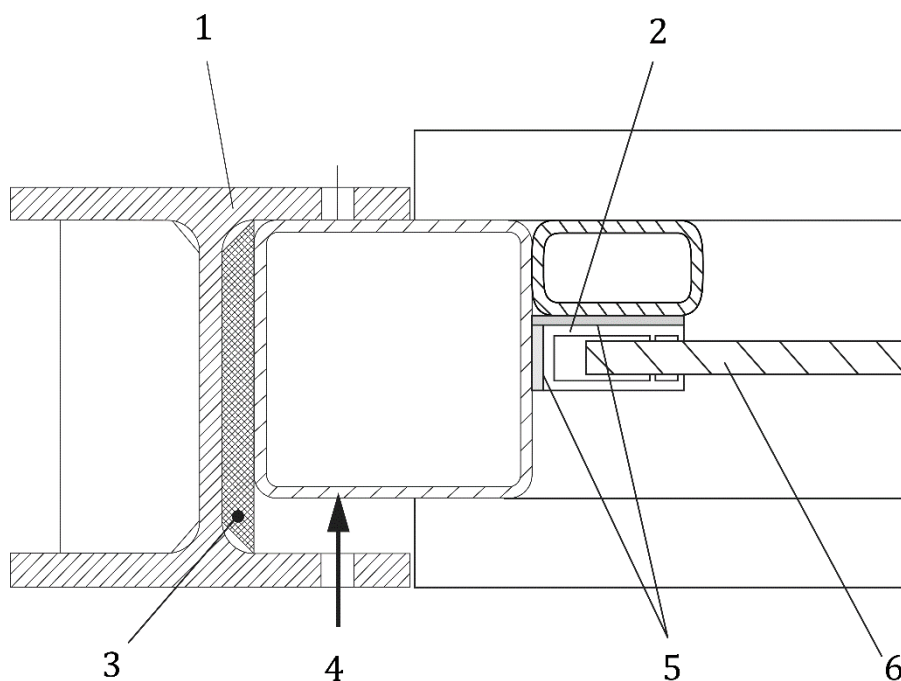
**Figure D.12 — Roller shutter**

Dimensions in mm

**Key**

- |                               |   |
|-------------------------------|---|
| 1 movable support of test rig | 5 packing in accordance with the manufacturer's installation instructions |
| 2 guide rail                  | 6 protection by means of a steel angle                                    |
| 3 packing piece               | 7 shutter curtain   |
| 4 clamp                       |   |

**Figure D.13 — Roller shutter**

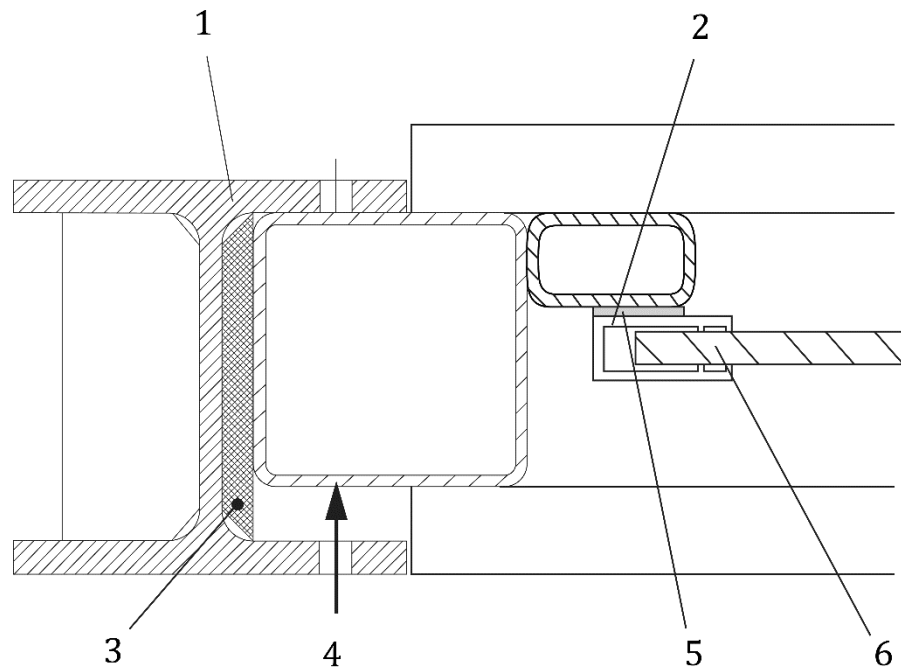


**Key**

- |   |                             |   |   |
|---|-----------------------------|---|---|
| 1 | movable support of test rig | 4 | clamp   |
| 2 | guide rail                  | 5 | packing in accordance with the manufacturer's installation instructions |
| 3 | packing piece               | 6 | shutter curtain   |

**Figure D.14 — Roller shutter**

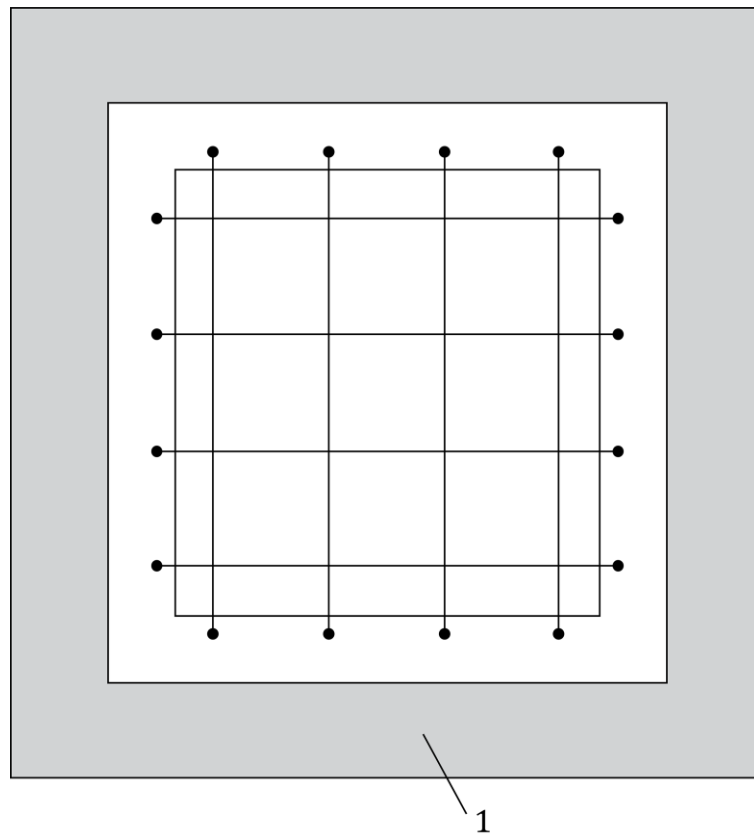
Dimensions in mm

**Key**

- |   |                             |   |   |
|---|-----------------------------|---|---|
| 1 | movable support of test rig | 4 | clamp   |
| 2 | guide rail                  | 5 | packing in accordance with the manufacturer's installation instructions |
| 3 | packing piece               | 6 | shutter curtain   |

**Figure D.15 — Roller shutter**

## D.5 Examples of mounting arrangements for grilles into the test rig

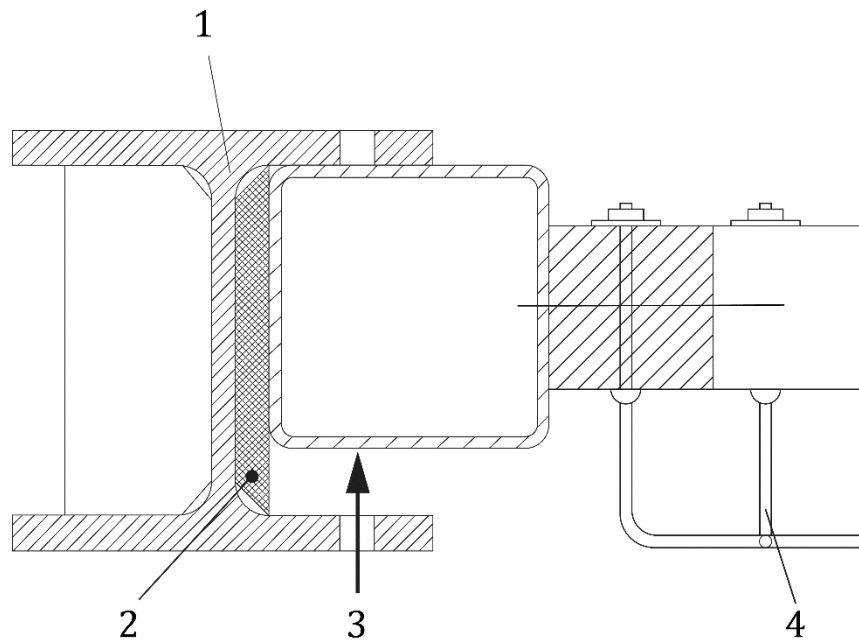


### Key

1 sub-frame

Figure D.16 — Test specimen in sub-frame

Dimensions in mm

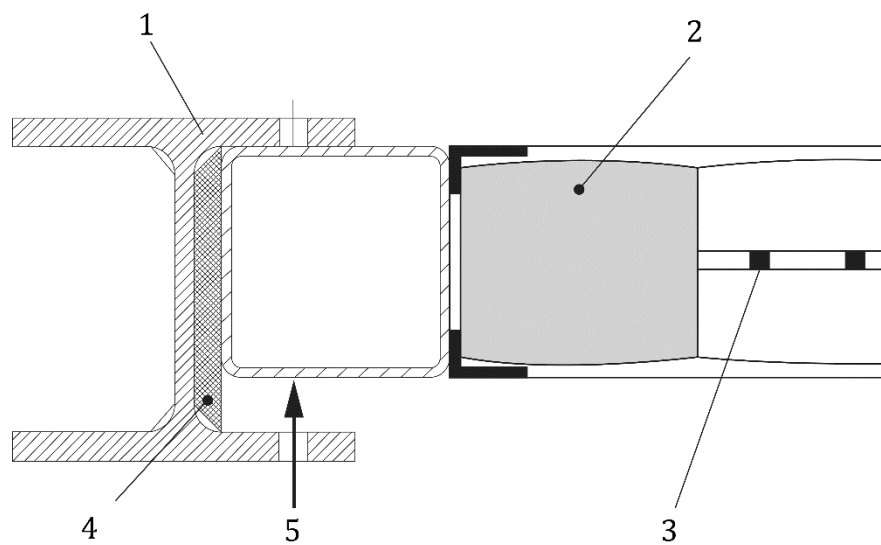
**Key**

1 movable support of test rig  
2 packing piece

3 clamp  
4 grille

**Figure D.17 — Fixed grille**

Dimensions in mm



**Key**

- |                               |                 |
|-------------------------------|-----------------|
| 1 movable support of test rig | 4 packing piece |
| 2 brick                       | 5 clamp         |
| 3 grille                      |                 |

**Figure D.18 — Fixed grille**

## Annex E (normative)

### Cylinder plug extraction

#### E.1 General

This Annex is applicable for products in EN 1627:—<sup>23</sup>, Tables 4, 5 and 6.

NOTE Requirements and test method for building hardware can be found in EN 1303:2015, Table 3.

#### E.2 Cylinder plug extraction

The cylinder, including a specified reinforcement or protection devices supplied as a unit, shall be mounted in the door in accordance with the manufacturer's instructions.

The testing device can be adapted in accordance with the design of the cylinder.

A self-cutting traction screw according to EN ISO 10666:1999, EN ISO 15480:2019 EN ISO 15481:1999, EN ISO 15482:1999 or EN ISO 15483:1999 of a maximum diameter of Ø 5,5 mm shall be screwed into the plug/cylinder and an attempt made to withdraw the plug/cylinder by means of the appropriate maximum force of 10 kN for resistance class RC1/RC 1 N to RC 3 or 15 kN for resistance class RC 4 (grade C and D according to EN 1303:2015, Table 3) applied progressively without shock within the time allowed. The time allowance begins from commencing to insert the traction screw.

The washer or traction tool shall be designed in such a way that it can be used without unscrewing the screw.

The diameter of the hole shall not be pre-drilled or enlarged to insert a screw of larger diameter than that inserted in the first attempt. The load shall be applied without removing and re-inserting the screw.

The pulling test is conducted with one screw only at the same time.

The screw or the plug shall not be lubricated before or during the attempt to insert the screw.

Perform a pull test on a screw which is screwed into the plug. The pulling shall continue until either:

- a) the pulling force (10 kN for RC 1/RC 1 N to RC 3 or 15 kN for RC 4) for the grade has been reached and held for the resistance time (EN 1627:—<sup>24</sup>, Table 14) or;
- b) the whole cylinder is removed or;
- c) the plug is removed from the cylinder or;
- d) the screw is completely withdrawn from the plug or;
- e) the screw is broken.
- f) if the screw cannot be inserted or does not grip in the plug.

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<sup>23</sup> To be published.

<sup>24</sup> To be published.



More than one pulling test is allowed on the same cylinder with different or the same screw diameters within the time for the test according to the resistance time (EN 1627:—<sup>25</sup>, Table 14) the grade in Table 3.

The screw shall not reach the coupling area of the cylinder (to prevent damage to the housing).

The screw shall be applied parallel to the rotation of the cylinder plug.

The time starts when the screw touches the cylinder and ends when:

- a) the maximum time is achieved; or
- b) the door can be opened by turning the cam/cylinder plug or operate the lock by tool 1.15 in Annex A; or
- c) termination by the test operator.

The time continues when the pulling force starts to pull. If a second attempt with an additional new screw will be made, the time shall continue when screwing in the additional screw.

The pulling force shall linearly increase from 0 kN to the value for the resistance class (10 kN for RC 1/RC 1 N to RC 3 or 15 kN for RC 4) within a period of  $(30 \pm 5)$  s. The maximum force shall be held for the resistance time (EN 1627:—<sup>26</sup>, Table 14).

The test is deemed to have been passed if the screw cannot be inserted.

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<sup>25</sup> To be published.

<sup>26</sup> To be published.

## **Annex F**

### **(normative)**

## **Tests for building elements with non-key-operated unlockable hardware**

### **F.1 Introduction**

For construction products with non-key-operated unlockable hardware (e.g. emergency exit devices, panic exit devices, knob cylinder, non-key-operated lockable window handle, non-lockable window handle) on the non-attack side entry might be gained by penetrating the product (including glazing) and operating the hardware.

For any test the acceptance criterion is that it shall not be possible to penetrate the product and operate the operating device so to achieve an accessible opening by this way of attack.

This Annex shows further details to be observed when carrying out these tests.

### **F.2 Areas of attack**

#### **F.2.1 Attack to the operating device on the non-attack side with tools**

The non-key-operated unlockable hardware shall be attacked in an area of 300 mm from the operating device to penetrate the product with the tools 1.2 or 1.10 to 1.13 of toolset A1 (see Figure F.1 and F.2).

This kind of attack may be carried out over the entire sample, also through the infillings (including glazing).

The acceptance criterion in accordance with F.1 shall be fulfilled.

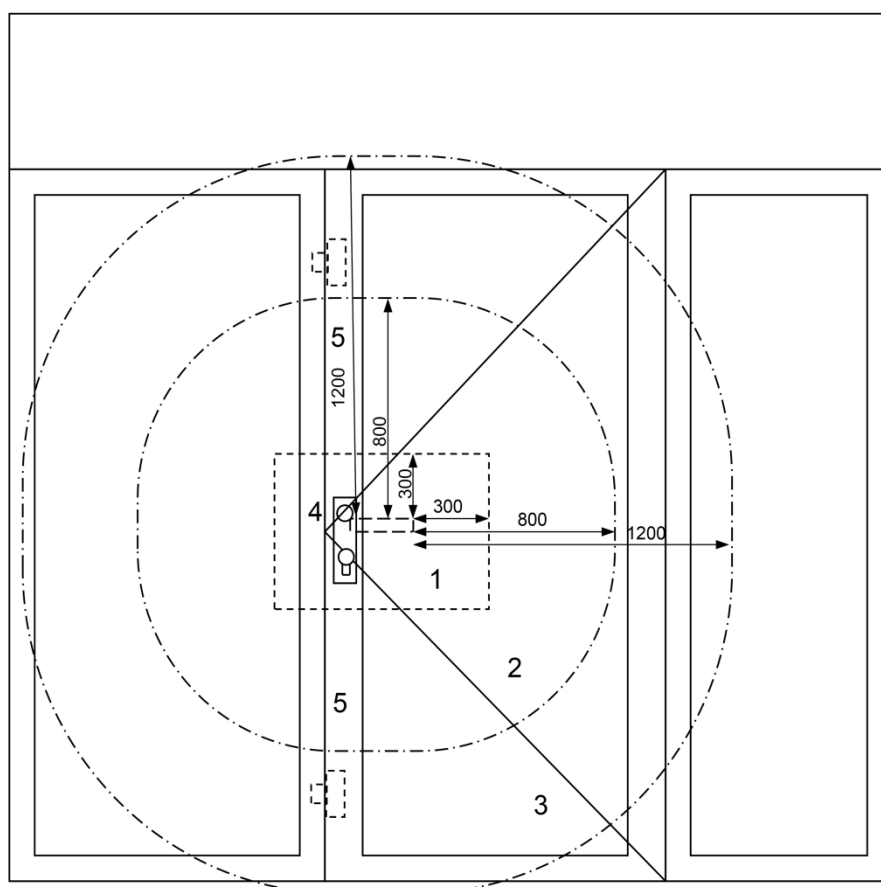
#### **F.2.2 Attack to the operating device on the non-attack side by grabbing through**

The non-key-operated unlockable hardware shall be attacked in an area of 800 mm (covering the length of an arm with the screwdriver in hand in resistance class RC 1 N, RC 2 and RC 2 N) or 1 200 mm (covering the length of an arm with the crowbar in hand in resistance class RC 3 and higher) from the operating device with the aim to achieve a hole to grab through and operate the handle (see Figure F.1 and F.2).

This kind of attack may be carried out over the entire sample, also through the infillings (including glazing).

The acceptance criterion in accordance with F.1 shall be fulfilled.

Dimensions in mm

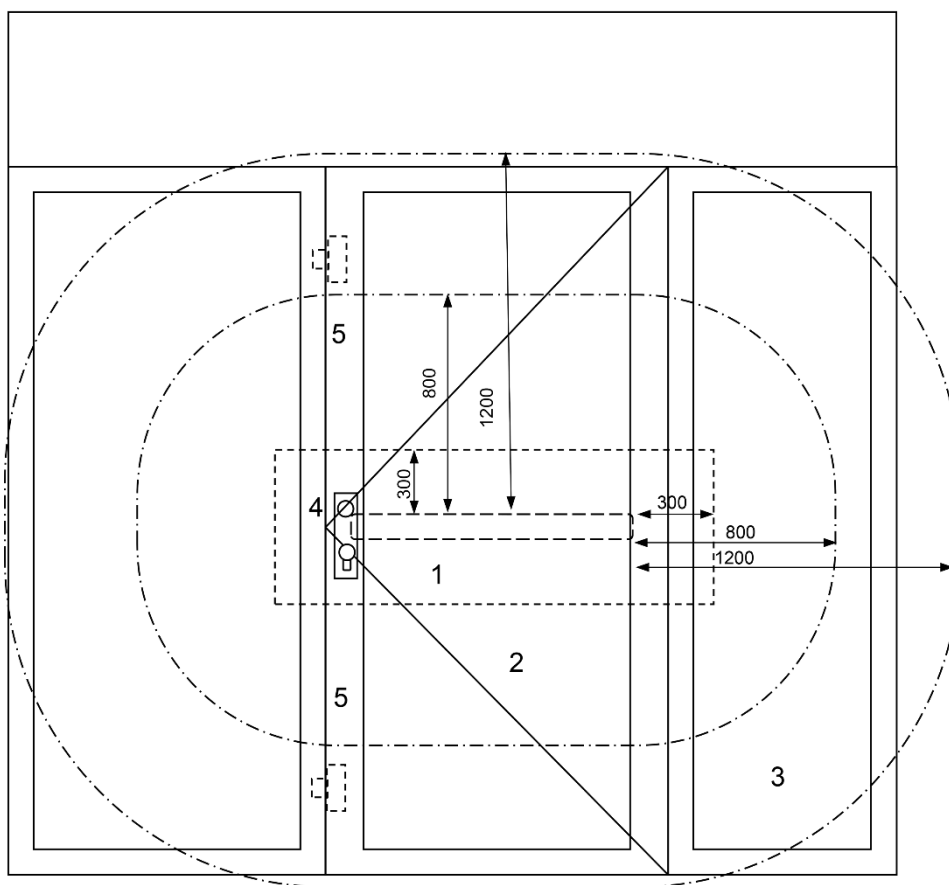


# Key

- 1 300 mm area
- 2 800 mm area for RC1/RC 1N, RC 2 and RC 2N
- 3 1200 mm area for RC 3 up to RC 6
- 4 knob or handle outside to operate square spindle or follower
- 5 lock rod

**Figure F.1 — Attack areas for example on doors with emergency exit device**

Dimension in mm

**Key**

- 1 300 mm area
- 2 800 mm area for RC 1/RC 1N, RC 2 and RC 2N
- 3 1200 mm area for RC 3 up to RC 6
- 4 knob or handle outside to operate square spindle or follower
- 5 lock rod

**Figure F.2 — Attack areas for example on doors with panic exit device**