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Building hardware — Mechanically operated locks and locking plates — Requirements and test methods

bsi.

National foreword

This British Standard is the UK implementation of EN 12209:2016. It supersedes BS EN 12209:2003 which is withdrawn.

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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 12209:2016) 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 supersedes EN 12209:2003.

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of an identical text or by endorsement, at the latest by September 2016, and conflicting national standards shall be withdrawn at the latest by December 2017.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This European Standard is one of a series of European Standards dedicated to building hardware products.

European standards for electromechanically operated locks and locking plates (EN 14846) and for mechanically operated multi-point locks (prEN 15685) are also available.

The performance tests incorporated in this standard are considered to be reproducible and as such provide a consistent and objective assessment of the performance of these products throughout CEN Members.

The major changes in this revision are as follows:

a) the type of lock that has been named latch is now integrated in the definition of locks;

b) the number of classification has been reduced

    1) field of door application have been integrated in product information;

    2) type of key operation and locking is moved to Security and drill resistance;

    3) type of spindle operation have been integrated in product information;

c) suitability for use on fire resistance and/or smoke control doorset introduces new classification. Grade 0, A, B and N is shown in Annex A;

d) temperature range changed to –10 °C to +60 °C;

e) requirements, test methods, forces, torques, figures and tables have been renumbered;

f) new requirement for product information have been added;

g) grades for durability with 10 N side force is deleted;

h) the document EN 12209:2003/AC:2005 has been integrated in this issue;

i) assessment and verification of constancy of performance – AVCP have replaced Evaluation of conformity

1) Annex ZA has been rewritten to include CPR format.

NOTE A lock conforming to this European Standard can at the same time be part of an exit device in accordance with EN 179 or EN 1125.

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.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Mechanically operated locks and their locking plates used in fire resistant and/or smoke control door assemblies require additional attributes in order to conform to the Essential Requirement “Safety in case of fire” as a part of a complete assembly. Additional requirements for locks and their locking plates used on fire resistant and/or smoke control door assemblies are specified in Annex A.

This European Standard for mechanically operated locks and their locking plates specifies requirements and test methods for durability, strength, security, and functionality and they are

— for use on doors, in buildings;

— for use on fire and smoke compartmentation doors fitted with door closing devices, to enable such doors to close reliably and thus achieve self-closing in the event of fire; and

— for use on locked fire doors to maintain the fire integrity of the door assembly.

This standard specifies locks and locking systems intended for use in different environmental and security conditions, thus necessitating different grades.

This European Standard specifies the dimensions and properties required for security and for the assessment of fire resistance and/or smoke control door suitability.

This European Standard does not specify any particular design or installation.

1 Scope

This European Standard specifies requirements and test methods for durability, strength, security and functionality of mechanically operated locks and their locking plates:

a) for use in doors in buildings;

b) for use on fire and smoke compartmentation doors fitted with door closing devices, to enable such doors to close reliably and thus achieve self-closing in the event of fire; and

c) for use on locked fire doors to maintain the fire integrity of the door assembly.

This European Standard covers locks and their locking plates which are either manufactured and placed on the market in their entirety by one producer or produced by more than one producer, or assembled from sub-assemblies produced by more than one producer and designed to be used in combination.

This European Standard specifies mechanically operated locks and locking systems intended for use in different environmental and security conditions, thus necessitating different grades.

This European Standard does not specify Multipoint locks or their locking plates which are specified by prEN 15685.

This European Standard specifies the dimensions and properties required for security.

Assessment of the contribution of the product to the fire resistance of specific fire resistance and/or smoke control doorset assemblies is beyond the scope of this European Standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

EN 1634-1, *Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware - Part 1: Fire resistance test for door and shutter assemblies and openable windows*

EN 1634-2, *Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware - Part 2: Fire resistance characterisation test for elements of building hardware*

EN 1634-3, *Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware - Part 3: Smoke control test for door and shutter assemblies*

EN 1670:2007, *Building hardware - Corrosion resistance - Requirements and test methods*

EN 16035, *Hardware performance sheet (HPS) - Identification and summary of test evidence to facilitate the inter-changeability of building hardware for application to fire resisting and/or smoke control doorsets and/or openable windows*

3 Terms and definitions

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

3.1
bored latch set
fastener that comprises an integral assembly of door furniture with a tubular latch

3.2
bored lock set
fastener that comprises an integral assembly of door furniture with a tubular lock

3.3
cylinder
device, usually separate from but engaging with its associated lock or latch, that contains the parts operated by the key

3.4
cylinder lock
lock in which the lock mechanism is operated by one or more cylinders

3.5
deadbolt
movable part of a lock that usually engages a locking plate and withdraws into a lock case that is operated at least in one direction by a key, handle or thumb turn

3.6
deadlocking
action of moving a bolt to a thrown position where pushing back of the bolt is positively prevented

3.7
detaining element
component which is moved by a key into a pre-determined position to allow the bolt to be operated

3.8
differ
variation between lock mechanisms of similar design, achieved by the detaining elements, which enables each lock to be operated only by its own key

3.9
effective differ
difference between lock or key recognition systems of similar design achieved only by the detaining elements which allows each lock or key recognition system to be operated only by its own key

Note 1 to entry: The number of effective differs is equal to the number of theoretical differs after deduction of the differs suppressed by the manufacturer due to technical constraints.

3.10
follower
part of a lock that operates latchbolt and/or deadbolt(s) when turned by a spindle

3.11
forend
part of a case through which the lock is fixed to the door leaf and through which the latch bolt and/or deadbolt pass

3.12
key
device that is removable and portable and is used to operate the lock

3.13
latch
self-engaging fastener which restrains a movable component (e.g. door leaf) in a closed position and which can be released

3.14
latch action
arrangement and performance of the constituent parts that operate a latch bolt

3.15
latch bolt
spring-loaded movable part of a lock that usually engages a component fixed to a frame, and withdraws into a lockcase that automatically engages a locking plate to keep the door leaf in its closed position

3.16
leverlock
lock with integral differs operated by a key

3.17
lock
fastener which secures a movable component in a closed position within a door frame and which is operated by a key or other device

3.18
locking plate
component, fixed to a frame to engage a bolt, or bolts

3.19
locking snib
manual device, usually in the form of a small lever or knob, operable after installation and which can be operated to prevent the deadbolt or latch bolt from being thrown or withdrawn, or to change the function of a lock

3.20
lock mechanism
constituent parts of a lock that operate the deadbolt and/or latchbolt, where required, provide the differs

3.21
manual deadlocking
dead locking where movement of the deadbolt is by key or handle/thumb turn

3.22
multi-point lock
lock comprising at least two points of interaction (security, anti-separation or clenching) interlinked and centrally controlled, where at least two points are more than 200 mm apart in locked or thrown position

3.23
shared latch action
latch action in which withdrawal of the latch bolt is by means of a handle or key

4 Requirements

4.1 General

4.1.1 Essential characteristics

The following requirements have special significance because they are a part of the Annex ZA Essential characteristics.

a) Self-closing ability

   1) ability to close and keep the door in a closed position

      i) 4.1.2, return force of latch bolt;

      ii) 4.2.1, side force on latch bolt;

      iii) 4.4.2, door closing force;

   2) suitability for use on fire resistance and/or smoke control doorset

      i) 4.5, suitability for use on fire resistance and/or smoke control doorset.

b) Self-closing ability - durability

   1) 4.3.1, durability of latch action

   2) 4.7.1, corrosion resistance

All locks regardless of classification shall conform to 4.1.2, 4.1.4, 4.1.6, 4.1.8 and where applicable 4.1.3, 4.1.5, 4.1.7.

4.1.2 Dangerous substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this standard are placed on those markets.

In the absence of European harmonized test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

NOTE An informative database covering European and national provisions on dangerous substances is available at the Construction website on EUROPA accessed through http://ec.europa.eu/growth/tools-databases/cp-ds/index_en.htm

4.1.3 Return force of latch bolt

The return forces F1 see Figure 1 of the latch bolt shall not be less than 2,5 N.

The return force shall be tested in accordance with 5.4.2.

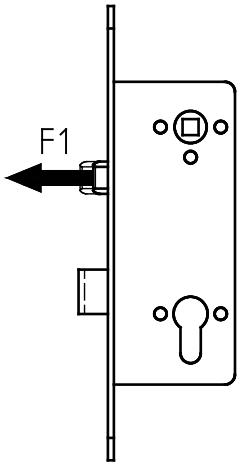


Figure 1 — Return force of latch bolt

4.1.4 Product information requirements

Products classified in accordance with this European standard shall have clear and detailed instructions for their installation and maintenance. These instructions shall contain:

a) The limitation of the products intended use, the limitation of the door mass and door dimensions, temperature range and the field of door application and distance range between locking plate and forend. If the product is tested for security classification supported or unsupported.

b) Information to ensure that the product can conform to the performance requirements of this document, including known restriction in use, for example conditions under which the product could be rendered inoperable. In particular it shall be clearly stated which locking plates are suitable in combination with the lock and vice versa.

c) Declaration of the maximum side force (25 N, 50 N or 120 N) against which key or handle operation can be performed, at the various grades indicated in Table 2.

d) An extended temperature range if applicable.

e) Declaration about suitability for use on fire resistance and/or smoke control doorset if applicable.

f) Declaration of intention to be used with spring supported furniture (or not).

The product information shall be verified in accordance with 5.4.3.

See also Annex C for further information on product information.

4.1.5 Strength of lever lock key

The key for lever lock shall have the strength so it can resist a torque of 2,5 Nm and still be able to operate its lock with the torque M1 appropriate with its grade in 4.2.2.

This requirement is not applicable to cylinder keys which shall conform to EN 1303.

The key strength shall be tested in accordance with 5.4.4.

4.1.6 Strength of bolt actions

The dead bolt components shall resist a torque of 30 Nm and the latch bolt components shall resist a torque of 20 Nm operated through the follower and after both tests the lock shall still be able to operate with the torque M1 and M2 appropriate with its grade in 4.2.2.

The strength of bolt actions shall be tested in accordance with 5.4.5.

4.1.7 Minimum follower restoring torque

a) The lock shall have a minimum restoring torque on the follower of 0,8 Nm, unless the manufacturer has declared on the Product Information Sheet (see 4.1.4) that the product is intended for use with spring supported furniture.

b) The restoring torque shall be tested in accordance with 5.4.6.

4.1.8 Protection against removal from door

The product shall be designed in such way that those parts which contribute to its burglar resistance cannot be removed:

a) from the outside of the door when door is closed and locked by any tool;

b) from the inside of the door when door is closed and locked, using any of the tools that fits to the screw heads illustrated in Figure 2, if security is necessary from the inside.

The design shall be verified in accordance with 5.4.7.

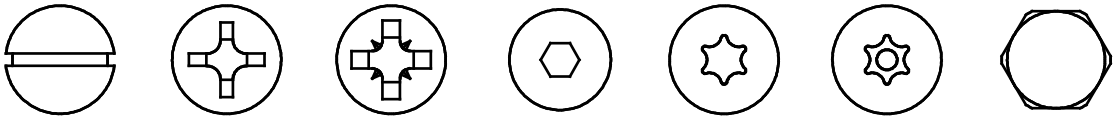


Figure 2 — Screw heads not allowed in security from inside

4.2 Category of use (first digit)

4.2.1 Resistance to side force on latch bolt

The latch bolt shall resist a side force F2 (see Figure 3) as specified in Table 1 after which operating torque shall not exceed that specified in 4.2.2, return force on latch shall still be less than 2,5 N, and closing force shall not exceed that specified in 4.4.2.

The resistance to side force shall be tested in accordance with 5.5.1.

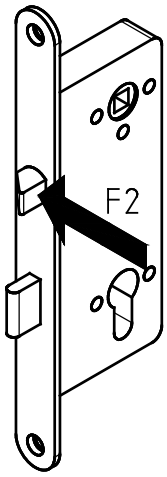


Figure 3 — Resistance to side force on latch bolt

4.2.2 Torque to operate the lock

4.2.2.1 The lock shall conform to torque on key 4.2.2.2 and torque on follower 4.2.2.3.

4.2.2.2 The torque on the key to operate the lock without side force shall not exceed M1 in accordance with Table 1 (see Figure 4).

The torque on the key shall be tested in accordance to 5.5.2.2.

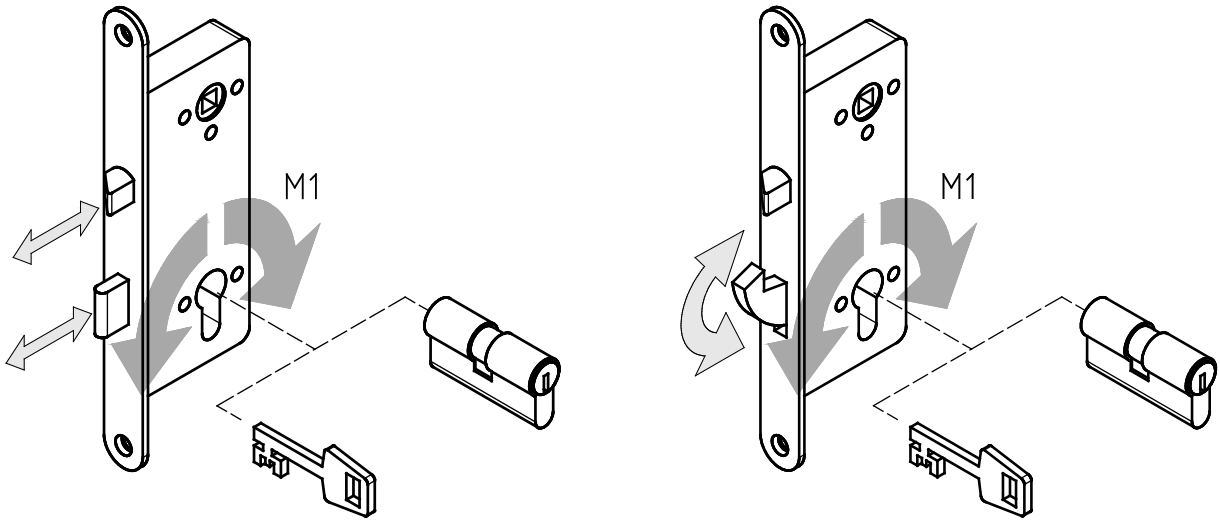


Figure 4 — Torque to operate deadbolt or latch bolt with key

4.2.2.3 The torque on the follower to operate the lock without side force shall not exceed M2 in accordance with Table 1 (see Figure 5).

The torque on the follower shall be tested in accordance to 5.5.2.3.

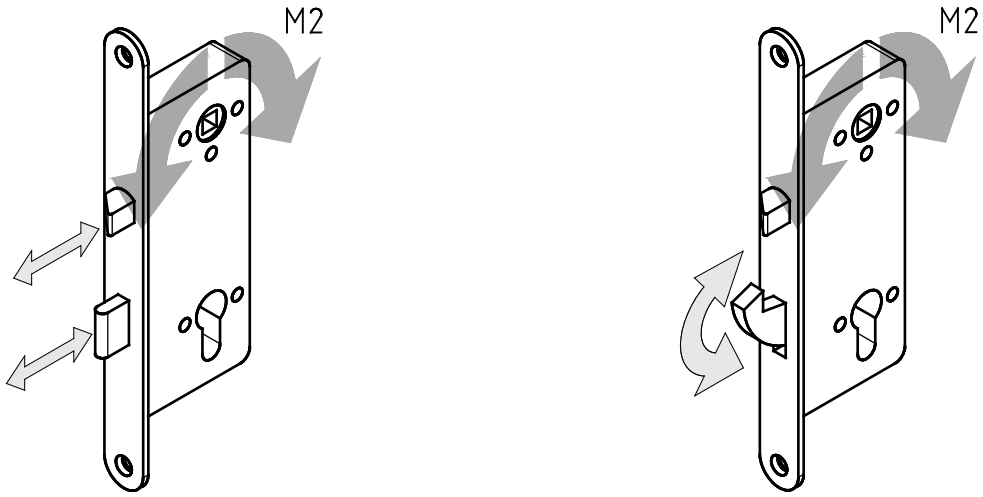


Figure 5 — Torque to operate deadbolt or latch bolt via the follower

4.2.3 Strength of follower stops

The latch components and travel limit stops shall resist a torque M3 (see Figure 6) as specified in Table 1, and the lock shall still be able to operate with the torque appropriate with its grade in 4.2.2.

The strength of follower stops shall be tested in accordance with 5.5.3.

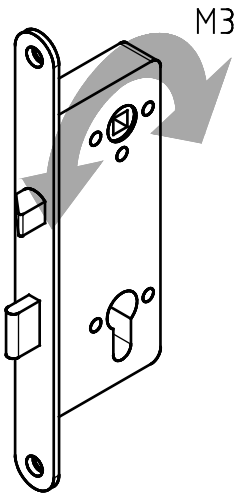


Figure 6 — Strength of follower stops

4.2.4 Torque resistance for lockable deadbolt operation by handle/knob

4.2.4.1 Torque resistance of lockable followers

A lock with a lockable follower shall resist a torque of M4 (see Figure 7) as specified in Table 1, and the lock and its lockable follower shall still be able to operate with the torque M1 and M2 appropriate with its grade in 4.2.2.

The resistance of lockable followers shall be tested in accordance with 5.5.4.

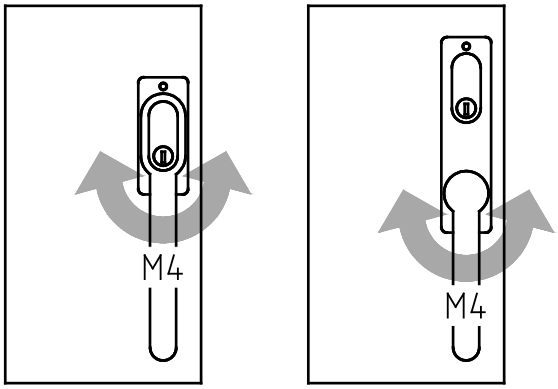


Figure 7 — Torque resistance of lockable followers

4.2.4.2 Torque resistance of rim lock with integral lockable handle/knob

A rim lock with an integral lockable handle or knob shall resist a torque of M4 (see Figure 7), where M4 (Nm) = 0,4 (kN) x maximum radius in mm of the handle/knob after which the lock and its lockable handle/knob shall still be able to operate with the torque appropriate with its grade in 4.2.2.

The torque resistance shall be tested in accordance with 5.5.4.

Table 1 — Category of use

Clause	Requirement	Test method	Test para-meter	Grade 1	Grade 2	Grade 3	Unit
4.2.1	Resistance to side force on latch	5.5.1	F 2	2	3	3	kN
4.2.2.2	Maximum torque to operate the lock without side force by key	5.5.2.2	M 1	1,2	1,0	0,8	Nm
4.2.2.3	Maximum torque to operate the lock, without side force through follower	5.5.2.3	M 2	10	7	5	Nm
4.2.3	Strength of follower stops	5.5.3	M 3	20	40	60	Nm
4.2.4.1	Torque resistance of lockable follower	5.5.4	M 4	30	50	70	Nm
4.2.4.2	Torque resistance of Rim lock with integral lockable handle / knob	5.5.4	M 4	0,4 (kN) x maximum radius (mm)	0,4 (kN) x maximum radius (mm)	0,4 (kN) x maximum radius (mm)	Nm

4.3 Durability requirements (second digit)

4.3.1 Durability of latch action

The latch action, the shared latch action (where applicable) or automatic deadbolt shall complete the minimum number of latch test cycles at the appropriate force in accordance with the grade selected in Table 2.

After the test, the operation of the latch action with key or follower shall not exceed the torque M1 and M2 for the selected grade in 4.2.2 nor shall the door closing force F9 exceed that specified in 4.4.2.

The test method for durability of latch action is described in 5.6.1 or 5.6.2.

4.3.2 Durability of deadbolt mechanism

The deadbolt mechanism shall complete the minimum number of deadbolt test cycles in accordance with the grade selected from Table 2.

After the test, the operation of the deadbolt mechanism with key or follower shall not exceed the torque M1 and M2 for the selected grade in 4.2.2. The door closing force F9 as graded in 4.4.2 shall remain after the selected number of test cycles.

The test method for durability of deadbolt mechanism is described in 5.6.3.

When the deadbolt is automatically operated it shall be tested in accordance with 5.6.1.

4.3.3 Durability of locking snib mechanism

The locking snib mechanism shall complete the minimum number of cycles specified in Table 2 without affecting the change of the different functions influenced by the snib position.

The test method for durability of locking snib mechanism is described in 5.6.4.

Table 2 – Durability requirements

Grade	Latch action	Shared latch action		Deadbolt manually locking	Deadbolt Automatically locking	Snib mechanism
		Key	Handle			
A	50 000	12 500	37 500	12 500	50 000	10 000
B, L, R, W	100 000	25 000	75 000	25 000	100 000	25 000
C, M, S, X	200 000	50 000	150 000	50 000	200 000	25 000

4.4 Door mass and door closing force (third digit)

4.4.1 Door mass

The dimensions and mass of the test door are specified in 5.7.1 and 7.2.3.

4.4.2 Door closing force

The door closing force F9 applied to the test door in accordance with the grade specified in 7.2.3 shall be sufficient to enable the latch bolt to correctly engage the locking plate every time.

The door closing force shall be tested in accordance with 5.7.2.

4.5 Suitability for use on fire resistance and/or smoke control doorset (fourth digit)

Products for the different classifications shall conform to the grades given in 7.2.4 and the requirements for grade A, B or N of Annex A.

NOTE Products for grade 0 might be suitable for fire/smoke doors but no evidence is available.

4.6 Safety (fifth digit)

Not applicable.

NOTE See EN 179 and EN 1125 for locks, latches and locking plates that are part of exit devices for use on emergency or panic doors.

4.7 Corrosion resistance and temperature (sixth digit)

4.7.1 Corrosion resistance

The lock shall resist the time specified in 7.2.6 in a corrosion chamber. The torques on the key or follower to operate the deadbolt and/or latch bolt shall not exceed M1 or M2 as specified in Table 1. The door closing force as graded in 4.4.2 shall remain after the time in the corrosion chamber. The return force of latch bolt in 4.1.3 shall not be less than 2,5 N.

The corrosion test shall be in accordance with 5.10.1.

NOTE For the purpose of this standard, the ability to operate after the test is the only criterion; appearance is irrelevant.

4.7.2 Operation at extreme temperatures

The torque to operate the deadbolt and/or latch bolt at extreme temperatures as specified in 7.2.6 shall not exceed M1 or M2 specified in Table 1. The return force of latch bolt in 4.1.3 shall not be less than 2,5 N.

Operation torque at extreme temperatures shall be tested in accordance with 5.10.2.

4.8 Security (seventh digit)

4.8.1 General

Requirements for classification of security are given in Table 3.

The requirements given in 4.8.2, 4.8.4, 4.8.5, 4.8.6, and 4.8.7 apply to all dead locking bolts.

4.8.2 Locking

Locks in security grade 1 to 7 shall be capable of deadlocking in one of the following ways.

The type of deadlocking shall be declared in the product information in accordance with 4.1.4.

4.8.3 Manual deadlocking

4.8.3.1 General

It shall not be possible to remove the key from the lock unless the deadbolt is in its unlocked or fully thrown and deadlocked position.

The manual deadlocking shall be verified in accordance with 5.11.1.1.

4.8.3.2 Manual locking with intermediate locking positions

The deadbolt shall be deadlocked in all positions in which the key can be removed.

The manual locking with intermediate locking position shall be verified in accordance with 5.11.1.2.

4.8.3.3 Automatic deadlocking bolt

The deadbolt shall be able to reach its fully thrown and deadlocked position with a gap of 5 mm between the locks forend and the locking plate.

The automatic deadlocking bolt shall be verified in accordance with 5.11.1.3.

4.8.3.4 Automatically locking latch bolt

The deadlocking latch shall be able to reach its fully thrown and deadlocked position with a gap of 5 mm between the locks forend and the locking plate.

The automatic deadlocking latch bolt shall be verified in accordance with 5.11.1.4.

4.8.4 Torque resistance of knob of tubular lock

4.8.4.1 Torque resistance of knob or lever handle on bored lock and latch sets

The locked knob or lever handle shall not force open with a maximum torque of M7, see Figure 22 and Table 3.

It is not necessary for the knob or lever handle to be operable with a torque of M1 or M2 after the resistance test with a torque M7.

The torque resistance of M7 shall be tested in accordance with 5.11.2.1.

NOTE This requirement is only applicable to grade 1 and 2 as this type of product is not considered suitable for higher security applications.

4.8.4.2 Resistance of knob on bored lock and latch set to the pull off test

The locked knob shall resist a direct pull force of F8, see Figure 27 and Table 4.

The knob and bored lock shall be able to lock and unlock and be operated with the torque M1 and M2 after the pull off test.

The pulling off shall be tested in accordance with 5.11.2.2.

4.8.5 Requirements for side force

4.8.5.1 General

Side force shall be applied to lock mechanisms in accordance with Figures 28, 29 or 30 as appropriate, depending upon the intended use of the lock and depending upon any limitations identified in 4.1.4.

4.8.5.2 Resistance to side force on deadbolt

This requirement applies to locks without drill protection that are security classified at grades 1 to 4 and 6.

The deadbolt shall resist a side force of F4 when the force is held for 60 s (see Figure 8 and Table 3).

It is not necessary for the lock to be operable with an operation torque M1 or M2 after the side force test.

The side force on deadbolt shall be tested in accordance with 5.11.3.1.

Figure 8 — Resistance to side force on deadbolt

4.8.5.3 Resistance to drilling and side force on deadbolt

This requirement applies to locks with drill protected deadlocking bolts that are classified at grades 5 and 7.

The deadbolt shall have drill resistance and resist a side force of F4 when the force is held for 60 s (see Figure 8 and Table 3).

It is not necessary for the lock to be operable with an operation torque M1 or M2 after the drill and side force test.

The side force and drill resistance on deadbolt shall be tested in accordance with 5.11.3.2.

4.8.6 Deadbolt projection

4.8.6.1 Deadbolt projection without hooks

The unloaded deadbolt that is in its fully thrown and detained position shall have a minimum length of L1 as specified in Table 3 (see Figure 9).

The projection shall be measured in accordance with 5.11.4.

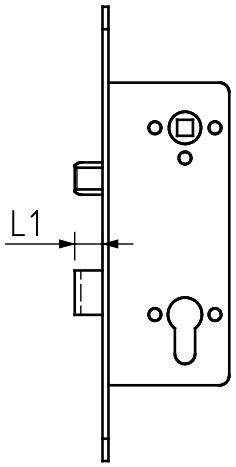


Figure 9 — Linear moving or rotating deadbolt without hooks

4.8.6.2 Deadbolt with hooks

The unloaded deadbolt with hooks for anti-separation performance that is in its fully thrown and detained position shall have a minimum length of L1 and H1 as specified in Table 3 (see Figure 10).

If the manufacturer's product specification declares that the lock is only intended for sliding doors the distance L1 can be reduced but it needs to be at least 12 mm.

The projection shall be measured in accordance with 5.11.4.

The deadbolt intended for anti-separation shall also be classified for 4.8.8 pulling of anti-separation bolt.

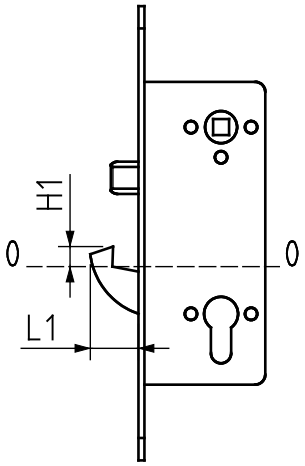


Figure 10 — Linear moving or rotating deadbolt with hooks

4.8.7 Resistance to force in the unlocking direction (disengaging force)

4.8.7.1 Resistance to disengaging force

This requirement applies to locks without drill protection that are security classified at grades 1 to 4 and 6.

The product shall resist a disengaging force of F5 when the force is held for 60 s on the deadbolt (see Figure 11).

At no time during or after the application of the disengaging force is shall the bolt projection be less than L2 for linear operating bolts. For rotating bolts the deformation d under the force shall not be more than 3 mm when the force is applied to the bolt, see Figure 33 and Table 3.

It is not necessary for the lock to be operable with an operation torque M1 or M2 after the disengaging force test.

Where the linear operated deadbolt is protected by a box locking plate with the same or higher security grade as the lock, the disengaging force requirement for grades 3, 4 and 6 shall be a minimum of 2 kN.

Resistance to disengaging force shall be tested in accordance with 5.11.5.1.

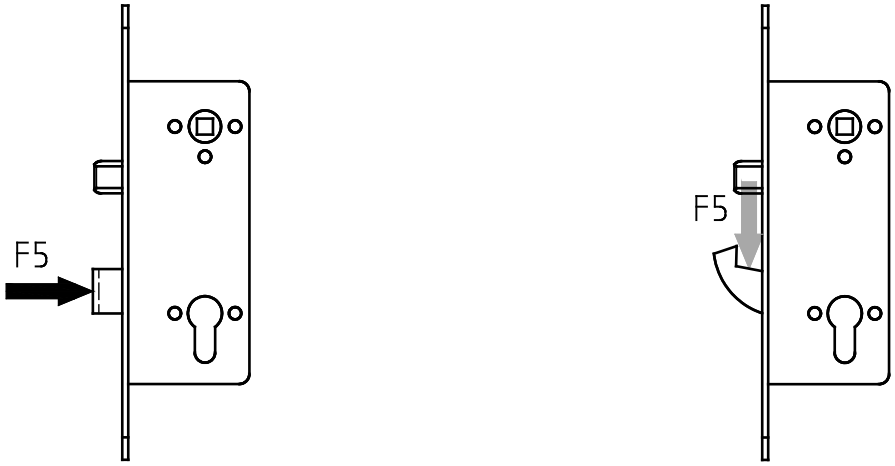


Figure 11 — Resistance to disengaging force

4.8.7.2 Resistance to drilling and disengaging force

This requirement applies to locks with a drill protected deadlocking bolts function that are classified at grades 5 and 7.

The product shall have drill protection and resist a disengaging force F5 when the force is held for 60 s, see Figure 11 and Table 3.

At no time during or after the application of the disengaging force shall the bolt projection be less than L2 for linear operating bolts, see Figure 31 or 32 and Table 3.

For rotating bolts the deformation d under the force shall not be more than 3 mm when the force is applied to the bolt, see Figure 33 and Table 3.

When the force is applied it shall not be possible to operate the locked bolt to an unlocked position using any tool other than the correct key with a maximum torque of 5 Nm.

It is not necessary for the lock to be operable with an operation torque M1 or M2 after the disengaging force test.

Where the linear operated deadbolt is protected by a box locking plate with the same or higher security grade as the lock, the disengaging force requirement for grades 5 and 7 shall be a minimum of 2 kN.

Resistance to the disengaging force and drill protection shall be tested in accordance with 5.11.5.2.

4.8.8 Requirements for pulling of anti-separation bolt

4.8.8.1 Resistance to pulling of anti-separation bolt

This requirement applies to locks without drill protected deadlocking bolts and an anti-separation function that is classified at grades 1 to 4 and 6.

The anti-separation bolt shall resist a direct pull force of F6 when the force is held for 60 s, see Figure 12 and Table 3.

It is not necessary for the lock to be operable with an operation torque M1 or M2 after the pulling force test.

The resistance of pulling force shall be tested in accordance with 5.11.6.1.

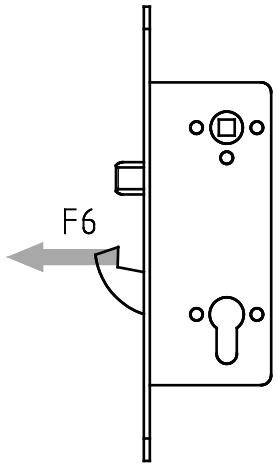


Figure 12 — Resistance to pulling of anti-separation bolt

4.8.8.2 Resistance to drilling and pulling of anti-separation bolt

This requirement applies to locks with drill protected deadlocking bolts and an anti-separation function that is classified at grades 5 and 7.

The product shall have drill protection so it can resist a pulling force F6 when the force is held for 60 s, see Figure 12 and Table 3.

It is not necessary for the lock to be operable with an operation torque M1 or M2 after the pulling force test.

The pulling force and drill resistance shall be tested in accordance with 5.11.6.2.

4.8.9 Requirements for anti-lifting devices in sliding door locks

4.8.9.1 Resistance to force of anti-lifting devices in sliding door locks

This requirement applies to locks without drill protected integrated locating devices with the function to protect the door from being moved in a vertical direction that are security classified at grades 1 to 4 and 6.

The locating device shall resist a force of F7 when the force is held for 60 s, see Figure 13 and Table 3.

The resistance of the location device for sliding doors shall be tested in accordance with 5.11.7.1.

4.8.9.2 Resistance to force of anti-lifting devices in sliding door locks with drill protection

This requirement applies to locks with drill protected integrated locating devices with the function to protect the door from being moved in a vertical direction that are security classified at grades 5 and 7.

The locating device shall be drill protected so it can resist a force of F7 when the force is held for 60 s, see Figure 13 and Table 3.

The resistance of the location device for sliding doors shall be tested in accordance with 5.11.7.2.

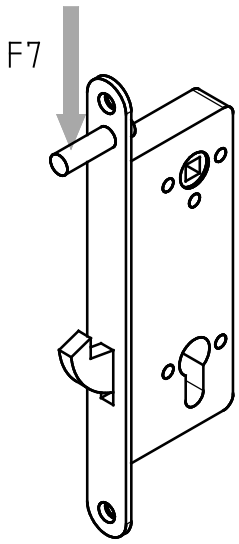


Figure 13 — Resistance to force of anti-lifting devices in sliding door locks

4.8.10 Requirement for torque resistance of lockable followers

4.8.10.1 Torque resistance of lockable followers

A lock with a lockable follower shall resist a torque of M5, as specified in Figure 14 and Table 3, without forcing the lock open.

The lock does not need to be operable with a torque M1 or M2 after application of the torque M5.

The torque resistance of lockable followers shall be tested in accordance with 5.11.8.

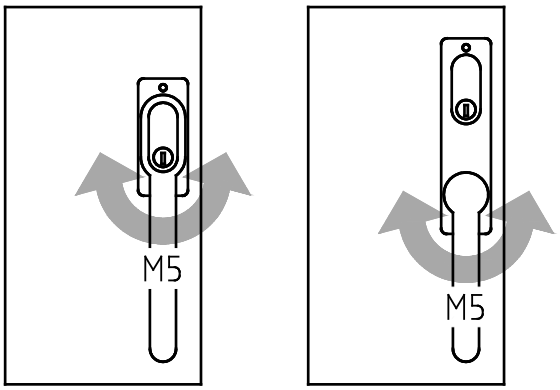


Figure 14 — Torque resistance of lockable followers

4.8.10.2 Torque resistance of rim locks with an integral lockable handle/knob

Rim locks with an integral lockable handle or knob shall resist a torque of M5, see Figure 14, where M5 (Nm) = 1,0 (kN) x maximum radius in mm of the handle/knob.

The lock does not need to be operable with a torque M1 or M2 after application of the torque M5.

The torque resistance shall be tested in accordance with 5.11.8.

4.8.11 Strong key attack on lever locks

The lever lock shall resist a torque M6 (see Figure 15) as specified in Table 3, through the key hole without being forced open.

It is not necessary for the lock to be operable with an operation torque M1 or M2 after the strong key attack.

If sufficient torque to force the lock cannot be applied via the original key hole, then the lock shall be considered to have passed.

Strong key attack shall be tested in accordance with 5.11.9.

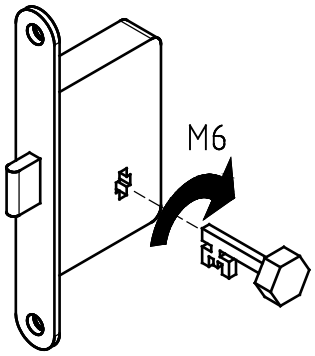


Figure 15 — Strong key attack on lever locks

4.8.12 Resistance to force on box protected locking plates

A locking plate equipped with a box to protect the associated deadbolt shall resist a force F5 for 60 s on the box in X-, Y-, and Z- direction. The box shall not be deflected more than 3 mm in X- and Y- directions, see Figure 16 and Table 3.

The box shall remain located to the locking plate after the test.

Resistance to force on box protected locking plates shall be tested in accordance with 5.11.10.

NOTE This requirement can be waived if the associated lock deadbolt resists the appropriate end force for the class or the box does not have a security purpose (e.g. adjustment or decorative boxes).

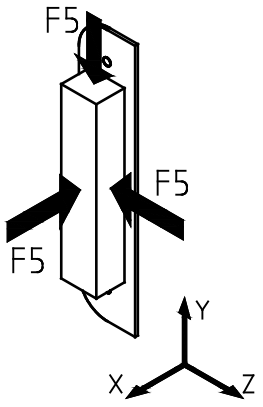


Figure 16 — Resistance to force on box protected locking plates

4.8.13 Resistance to side force on locking plates

The locking plate shall withstand a side force of F4 when held for 60 s at those apertures that are intended to operate with the dead bolt, see Figure 36 and Table 3.

The resistance to side force on locking plates shall be tested in accordance with 5.11.11.

4.8.14 Resistance to pulling on locking plates

This requirement applies to locking plates intended to operate with locks with an anti-separation function.

The locking plate shall resist a pull force of F6 when held for 60 s, see Figure 37 and Table 3.

The resistance to pulling on locking plates shall be tested in accordance with 5.11.12.

4.8.15 Resistance to lifting force on locking plates

The locking plate shall resist a lifting force of F7 when held for 60 s, see Figure 38 and Table 3.

The resistance to lifting force on locking plates shall be tested in accordance with 5.11.13.

Table 3 — Security requirements

Sub clause number	Requirement	Test method	Test Parameters	Grade of security – attack resistance								Unit
				0	1	2	3	4	5	6	7	
4.8.2	Locking	5.11.2		Principe of deadbolt operation								
4.8.3.2	Torque resistance of knob on bored lock and latch sets	5.11.2.1	M7	-	10	15	-	-	-	-	-	Nm
	Torque resistance of lever handle on bored lock and latch sets			-	20	30	-	-	-	-	-	Nm
4.8.3.3	Resistance to pulling off of knob on bored lock and latch set	5.11.2.2	F8	-	1	1,5	-	-	-	-	-	kN
4.8.5	- side force on deadbolt	5.11.3.1	F4	-	1	3	5	7	7	10	10	kN
	- net drilling time for side force test	5.11.3.2	t	-	-	-	-	-	180	-	300	s
	- total drilling time for side force test			-	-	-	-	-	300	-	600	
4.8.6	Deadbolt projection without hook	5.11.4	L1	-	10	12	14	20	20	20	20	mm
	Deadbolt projection with hooks		H1	-	5	5	5	5	5	5	5	mm
4.8.7	- disengaging force without box protected locking plate	5.11.5.1	F5	-	1	2	4	5	5	6	6	kN
	- disengaging force with box protected			-	1	2	2	2	2	2	2	
	- resulting projection		L2	-	8	10	11	17	17	17	17	mm
			d	-	3	3	3	3	3	3	3	mm
	- net drilling time for disengaging force test	5.11.5.2	t	-	-	-	-	-	180	-	300	s
	- total drilling time for			-	-	-	-	-	300	-	600	

Sub clause number	Requirement	Test method	Test Parameters	Grade of security – attack resistance								Unit
				0	1	2	3	4	5	6	7	
	disengaging force test											
4.8.8	Resistance for pulling of anti-separation bolt	5.11.6.1	F6	-	1	3	5	7	7	10	10	kN
	- net drilling time for resistance to pulling of anti- separation bolt	5.11.6.2	t	-	-	-	-	-	180	-	300	s
	- total drilling time for resistance to pulling of anti- separation bolt			-	-	-	-	-	300	-	300	
4.8.9	Resistance to forcing of anti-lifting device in sliding door lock	5.11.7.1	F7	-	1	3	4	5	5	6	6	kN
	net drilling time resistance to forcing of anti-lifting device in sliding door	5.11.7.2	t	-	-	-	-	-	180	-	300	s
	total drilling time resistance to forcing of anti-lifting device in sliding door			-	-	-	-	-	300	-	600	
4.8.10.1	Torque resistance of lockable follower.	5.11.8	M5	-	60	80	100	150	150	200	200	Nm
4.8.10.2	Torque resistance of rim locks with an integral lockable handle/knob	5.11.8	M5	M5 (Nm) = 1,0 (kN) x maximum radius in mm								Nm
4.8.11	Strong key attack on lever locks	5.11.9	M6	-	15	30	100	100	100	100	100	Nm
4.8.12	Resistance to force on box protected locking plates	5.11.10	F5	-	-	-	4	5	5	6	6	kN
4.8.13	Resistance to side force on locking plate	5.11.11	F4	-	1	3	5	7	7	10	10	kN
4.8.14	Resistance to pulling on locking plate	5.11.12	F6	-	1	3	5	7	7	10	10	kN
4.8.15	Resistance to lifting force on locking plate	5.11.13	F7	-	1	3	4	5	5	6	6	kN

4.9 Key identification requirements of lever locks (eight digit)

4.9.1 Minimum number of detaining elements

The minimum number of detaining elements that form part of the deadbolt mechanism (or latch action where there is direct operation by the key) shall conform to the requirements of Table 4.

The number of detaining elements shall be assessed in accordance with 5.12.1.

4.9.2 Minimum number of effective differs

The locks shall have the minimum number of effective differs that are specified in Table 4.

The number of effective differs shall be assessed in accordance with 5.12.2.

4.9.3 Differing steps height on key

Each key shall have the minimum number of different step heights that are specified in Table 4.

The number of different step heights shall be assessed in accordance with 5.12.3.

4.9.4 Non-interpassing of keys with just one interval differ

The locks shall only open with their matching key and not with the next closest key in any position (as defined by the manufacturer's coding system).

Non-interpassing of keys with just one interval differ shall be tested in accordance 5.12.4.

4.9.5 Coding protection

Direct coding shall not be used on keys; except for grade A keys, see Table 4.

Check in accordance with 5.12.5.

Table 4 — Key identification requirement

	Requirements				
	4.9.1	**4.9.2**	**4.9.3**	**4.9.4**	**4.9.5**
Grade	**Minimum number of detaining elements**	**Minimum number of effective differs**	**Minimum number of differing steps height on key**	**Non inter-passing of keys**	**Coding protection**
0	No requirement				
A	3	100	2	Yes	No
B	5	1 000	3	Yes	Yes
C	5	10 000	3	Yes	Yes
D	6	4 000	3	Yes	Yes
E	6	20 000	3	Yes	Yes
F	7	6 000	4	Yes	Yes
G	7	50 000	4	Yes	Yes
H	8	100 000	4	Yes	Yes

5 Test, assessment and sampling methods

5.1 General

Any model of a lock within any one product range having significantly different working components, or working components of significantly different materials or different manufacturing and assembly methods shall be considered one type and its performance separately tested.

The most critical types, i.e. worst case, within a product range are to be determined by the manufacturer and test laboratory.

According to the force of single components or component groups the sample need to be chosen in the variation with weakest/least profile/cross section and/or the ones that have to sustain the highest forces/moments.

Should any variation be exposed to an even weaker profile/cross section, e.g. an asymmetric designed forend, this variation shall be chosen.

The worst case condition shall be tested (i.e. that which produces the highest operating forces) and relevant details of the sample used shall be noted in the test report.

Failure of any one test within a sequence constitutes failure of that particular test sample. In the case of any one test sample failure, the relevant test sequence (see Annex B) shall be repeated on two further samples. A second failure (of the original or repeat samples) means that the product has failed to meet the standard. After a second failure the manufacturer shall show evidence of corrective actions undertaken and a new complete type test is to be performed.

The lock or latch shall be fitted to the test door/apparatus in accordance with the manufacturer's instructions.

NOTE The scope of any particular product range can be determined by the testing authority in discussion with the manufacturer. This can involve examination of the construction of the various products involved and pre-testing of certain attributes in order to determine the most appropriate test samples to represent the product range.

Throughout this European Standard, the following tolerances shall apply, unless otherwise specified.

— mass in kilograms or grams (kg or g): ± 5 %,

— length in millimetres (mm): ± 2 %,

— force in kilo Newton or Newton (kN or N): ± 2 %,

— torque in Newton metres (Nm): ± 5 %,

— time in seconds (s): ± 10 %,

— temperature in degrees Celsius (°C): ± 2 °C.

Unless otherwise specified, forces or torques shall be applied and raised to the required level within (60 ± 10) s and shall be held there for (60 ± 5) s.

All relevant tests of the object decided by the manufacturer and test laboratory shall be performed with the deadbolt in its fully thrown position.

The test apparatus shall be rigid enough to avoid influencing test measurements.

Figures show typical examples of lock test-rig construction or design.

Where specifically stated in manufacturer's instructions for the product, alternative materials, additional support as appropriate, may be used.

5.2 Test apparatus

5.2.1 Test door

The test door leaf shall be 2 100 mm high and 1 100 mm wide. It shall have means of attaching weights to the door to enable the door mass to be in the centre of the door. The test door and its frame shall have sufficient rigidity such that any distortion perpendicular to the plane of the test door, taking place during the test sequence shall be no more than 5 mm at any position.

The distance between the forend and locking plate shall be (3 ± 1) mm, unless manufacturer specifies otherwise If the minimum distance between forend and locking plate is larger than 4 mm it should be in the worst case of the range as specified in the manufacturer's instructions.

5.2.2 Drill machine

The drilling machine shall have a power of 500 W to 700 W and a speed of 500 rpm to 800 rpm (see Figure 17) It shall be able to apply a force of (300 ± 25) N without shock, axially to the drill.

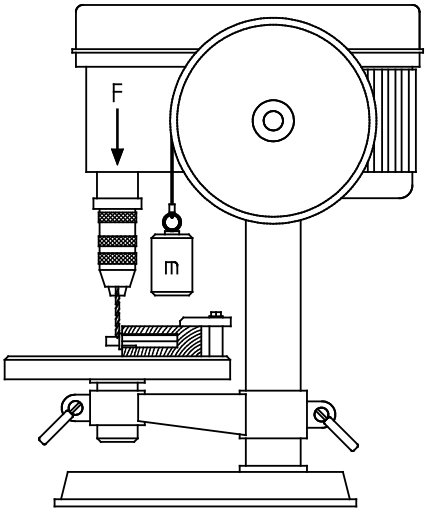


Figure 17 — Drilling machine – Example

5.2.3 Test fixtures

Unless otherwise stated, the lock or locking plate shall be fixed to a 40 mm thick wooden or metal block of sufficient height and depth to accommodate the product under test without influencing the test results.

The fixture shall be equipped so the locks or locking plate's ordinary wooden or metal screws supplied by the manufacturer can be used.

The fixture shall also be equipped with arrangement to eliminate test of the strength of the screw or screw fixing to the block.

5.3 Test procedure - Drilling procedure

The lock shall be mounted in accordance with the manufacturer's instructions in a suitable test apparatus or in a 40 mm thick wooden block, for use with a drilling machine as described in 5.2.2 and Figure 17.

A high-speed steel drill conforming to ISO 10899 or equivalent shall be used, having a maximum diameter of 5 mm. A force of (300 ± 25) N shall be applied without shock, axially to the drill. A maximum of three drills may be used for each test. No coolant or lubrication shall be applied to the drill

during the test. Drilling shall continue for the appropriate maximum net drilling time (t1) within the total time (t2) allowed for each test, including time taken to operate the deadbolt for verification.

5.4 Test methods - general

5.4.1 Dangerous substances verification

The manufacturer's statement concerning dangerous substances shall confirm compliance with 4.1.2.

5.4.2 Return force of latch bolt

The lock shall be held in a vice or similar fixture with the forend vertical. Using a suitable force gauge operating in the same direction of movement as the latch bolt, the latch bolt shall be depressed fully with the force gauge, then allowed to extend until the leading edge of the bolt head is (2 ± 0,5) mm from the face of the forend, at which point the return force on the latch bolt shall not be less than F1 = 2,5 N. See Figure 1.

5.4.3 Product information requirements verification

The information requested in 4.1.4 shall be checked by the test laboratory.

5.4.4 Strength of lever lock key

The lock shall be mounted in a suitable test apparatus with means for preventing the deadbolt from moving more than (3 ± 1) mm from its withdrawn position. Apply the torque 2,5 Nm without shock to the correctly inserted key in the bolt throwing direction. Apply the torque gradually, in a time of (5 ± 2) s. The lock shall operate correctly after this test conforming to the requirements of 4.2.2.

5.4.5 Strength of bolt action

The locking action: The lock shall be mounted in a suitable test apparatus with means for preventing the bolt from moving more than (3 ± 1) mm from its withdrawn position. A torque of 30 Nm shall then be applied, without shock to the follower in the bolt throwing direction (see Figure 18). The torque to be applied gradually, in a time of (5 ± 2) s. The lock shall operate correctly after this test conforming to the requirements of 4.2.2.

The latch bolt action: The lock shall be mounted in a suitable test apparatus with means for preventing the latch bolt from moving more than (3 ± 1) mm from its fully thrown position. A torque of 20 Nm shall then be applied, without shock to the follower in the bolt withdrawing direction (see Figure 18). The torque to be applied gradually, in a time of (5 ± 2) s. The lock shall operate correctly after this test conforming to the requirements of 4.2.2.

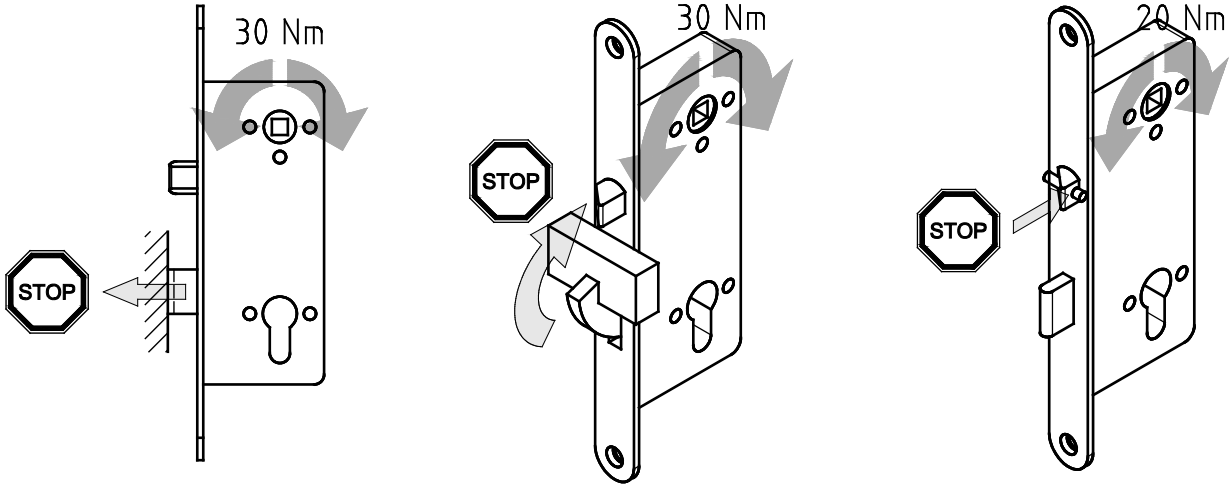


Figure 18 — Strength of bolt action

5.4.6 Minimum follower restoring torque

Using a suitable torque gauge and adapter(s), the latch bolt shall be withdrawn via the follower and allowed to return under its own spring force (where applicable) until the follower is within 5° of its back stop position, at which point the torque shall be at least 0,8 Nm, unless the manufacturer has declared on the Product Information Sheet, (see 4.1.4) that the product is intended for use with spring supported furniture.

5.4.7 Protection against removal from door

Inspect all fixings to assess whether they are concealed and inaccessible when the door is closed. With the use of any of the tools for the screw heads listed in Figure 2, attempt to remove any fixings that are exposed.

5.5 Test methods - Category of use

5.5.1 Resistance to side force on latch bolt

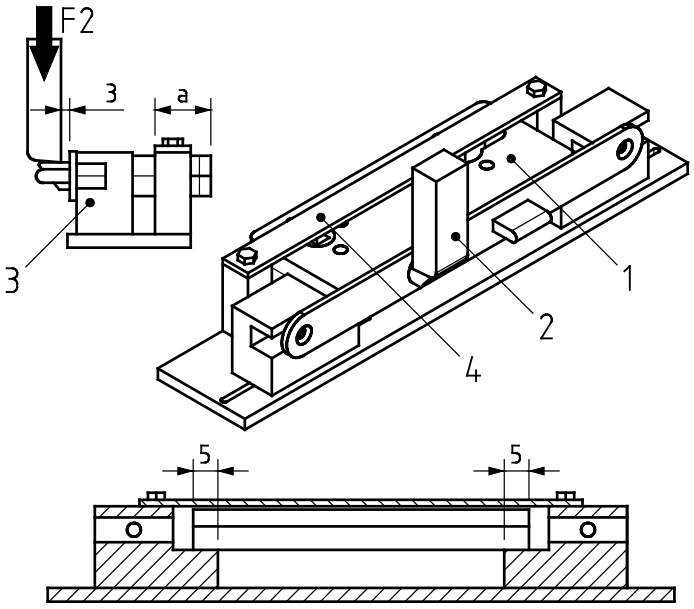
The lock shall be mounted as shown in Figure 19 or Figure 20 with support of 5 mm on the brace and the distance a to the centreline between follower and key rotation centre, using metal thread screws of equivalent strength to the fixing means supplied/recommended by the manufacturer.

The choice to use either the method from Figure 19 without support for the forend of the brace or Figure 20 with forend support by the brace, for mounting should be stated by the manufacturer in the product information, see 4.1.4.

The force F2 shall be applied to the securing face of the latch bolt using a tool in accordance with Figure 21 located (3 ± 0,2) mm from the forend and be held for 60 s.

The latch action shall not be affected as a result of this test.

Dimensions in millimetres

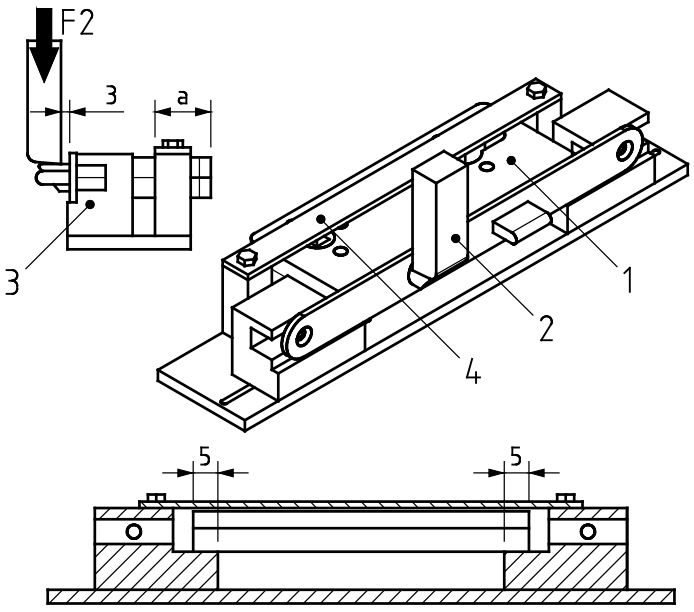


Key

1	lock	3	brace without support of the forend
2	tool	4	cover plate

Figure 19 — Resistance to side force on latch bolt without support

Dimensions in millimetres



Key

1	lock	3	brace with support of the forend
2	tool	4	cover plate

Figure 20 — Resistance to side force on latch bolt with support

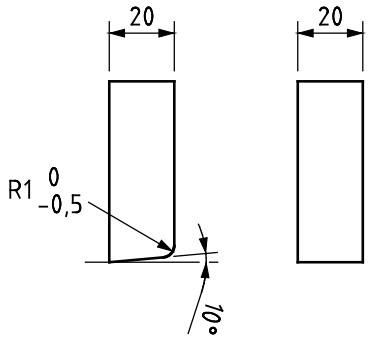


Figure 21 — Force application tool to side force on latch bolt

5.5.2 Torque to operate the lock

5.5.2.1 The lock shall be fixed to a wooden block with the forend vertical. Using a torque gauge and adaptor(s), the latch bolts and/or the deadbolt, shall be withdrawn until each bolt head is retracted.

5.5.2.2 Operate the latch bolt and/or the deadbolt using the key. Operation includes the full sequence from insertion to withdrawal of key, during which operating torque M1 shall be measured

5.5.2.3 Operate the latch bolt and/or the deadbolt using the follower, during which torque M2 shall be measured.

5.5.3 Strength of follower stops

The lock shall be attached fixed to a fixture as in 5.2.3.

The torque M3 shall be applied without shock to the follower or integral knob/handle, using a suitable torque gauge and adapter(s), in both clockwise and anticlockwise directions. The torque shall be applied gradually in a time period of (5 ± 2) s.

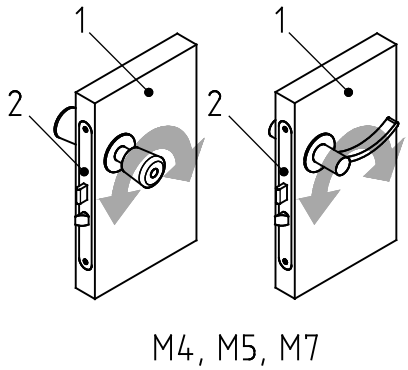
The lock shall be tested in accordance with 5.5.2 so that the torque M1 and M2 to operate the lock conform to the grades given in 4.2.2.

5.5.4 Torque resistance for lockable deadbolt operation by handle/knob

The lock shall be fixed according to 5.2.3.

The torque M4 shall be applied gradually to the locked handle/follower, in both clockwise and anticlockwise directions, in a time period of (5 ± 2) s (see Figure 22). The lock shall not be operable to open status.

The lock shall be tested in accordance with 5.5.2 so that the torque M1 and M2 to operate the lock conform to the grades given in 4.2.2.



Key

1 fixture

2 lock or tubular lock

Figure 22 — Torque resistance of lockable follower

5.6 Test methods - durability

5.6.1 Durability of latch action without force applied

This test method is applicable for classification of durability grade A, B and C.

This test can be omitted if the latch action is subjected to the same number of cycles (or more) in 5.6.2.

The durability test of the deadbolt mechanism and latch bolt mechanism may be combined in the same test.

The minimum number of required cycles shall be performed in accordance with Table 2.

The lock and its correct locking plate shall be mounted on a test door and frame in accordance with 5.1 with a gap of (3 ± 1) mm, as shown in Figure 23, together with a representative set of lever handle or knob furniture.

Each complete test cycle shall be as follows:

— rotate the lever handle, knob or key to fully withdraw the latch bolt with a maximum torque of 10 Nm on the lever handle or knob or 5 Nm on the lever lock key or the key for the dummy cylinder;

— open the door a distance of (200 ± 5) mm;

— allow the handle to return or bring the key to the ‘at rest’ position;

— let the door close under the influence of force F10 = 7 N, causing the latch bolt to strike and fully engage in the locking plate. If 7 N is an insufficient force to close the door and engage the latch bolt in the locking plate, a new F10 shall then be determined by measuring the force required and increasing the new force F10 by 20 %, up to a maximum of 50 N for the durability test, causing the latch bolt to strike and fully engage in the locking plate.

The operation speed shall be 10 cycles per minute maximum.

a) For shared latch action where the latch can be operated both by the key and the follower independent of each other, operation with the key shall be tested first followed by operation with the follower.

b) For latch action where the follower or the key can operate first the deadbolt and then the latch in the same sequence, the complete sequence shall be carried out first with the number equal to the number for deadbolts. Thereafter, the sequence shall only include the withdrawal of the latch bolt.

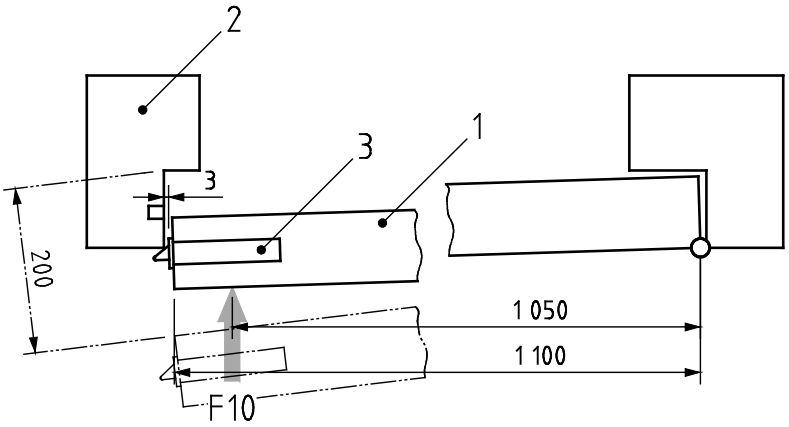
c) For locks with classification grade L, M, R, S, W and X, the cycles of only the latch operation shall be done as in 5.6.2.

The components can be cleaned and lubricated without dismantling the lock from the door at the start of the test and after each 5 000 cycles, in accordance with the manufacturer's instructions. Any cleaning and lubrication shall be recorded in the test report.

All alike keys supplied by the manufacturer can be used for durability testing. One new key shall be used to check the operating torque M1.

After the complete numbers of cycles the same lock shall be tested in accordance with 5.5.2 to verify that the operation torque M1 and M2 fulfil the requirement of 4.2.2 followed by a test 5.7.2 to verify that the closing force F9 is still within the classified grade of 4.4.2.

Dimensions in millimetres



Key

1 test door

2 frame

3 lock

Figure 23 — Durability of latch action without force applied

5.6.2 Durability of latch action with force applied

This test method is applicable for classification of durability L, M, R, S, W and X.

The durability test of the deadbolt mechanism and latch bolt mechanism may be combined in the same test.

The minimum number of required cycles shall be performed in accordance with Table 2.

The lock or latch and its correct locking plate shall be mounted as described in 5.2.1 In addition there shall be provision for applying a side force F3, as shown in Figure 24.

Each complete test cycle shall consist of the following:

— apply force F3, to the test door, in the opening direction;

— rotate the lever handle, knob or key to fully withdraw the latch bolt with a maximum torque of 10 Nm on the lever handle or knob or 5 Nm on the lever lock key or the key for the dummy cylinder;

— open the door a distance of 200 mm ± 5 mm;

— allow the handle to return or bring the key to the 'at rest' position;

— remove force F3;

— let the door to close under influence of Force F10 = 7 N, causing the latch bolt to strike and fully engage in the locking plate. If 7N is an insufficient force to close the door and engage the latch bolt in the locking plate, a new F10 shall then be determined by measuring the force required and increasing the new force F10 by 20 % up to a maximum of 50 N for the durability test, causing the latch bolt to strike and fully engage in the locking plate.

The operation speed shall be 10 cycles per minute maximum.

a) For shared latch action where the latch can be operated both by the key and the follower independent of each other, operation with the key shall be tested first followed by operation with the follower.

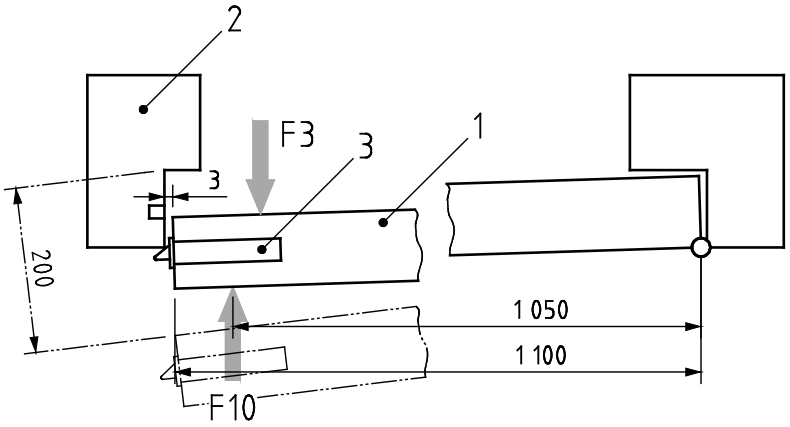
b) For latch action where the follower or the key can operate first the deadbolt and then the latch in the same sequence, the complete sequence shall be carried out first with the number equal to the number for deadbolts. Thereafter, the sequence shall only include the withdrawal of the latch bolt.

The components can be cleaned and lubricated without dismantling the lock from the door at the start of the test and after each 5 000 cycles, in accordance with the manufacturer's instructions. Any cleaning and lubrication shall be recorded in the test report.

All alike keys supplied by the manufacturer can be used for durability testing. One new key shall be used to check the operating torque M1.

After the complete number of cycles the same lock shall be tested in accordance with 5.5.2 to verify that the operation torque M1 and M2 meet the requirements of 4.2.2, followed by the test in 5.7.2 to verify that the closing force F9 is still within the classified grade of 4.4.2.

Dimensions in millimetres



Key

1 test door

2 frame

3 lock

Figure 24 — Durability of latch action with force applied

5.6.3 Durability of deadbolt mechanism

The lock shall be mounted with its forend vertical, see Figure 25. The test apparatus shall be capable of key rotation, and of inserting and withdrawing the key from the lock. Where it is possible to determine which the outward facing side of the lock is, the key shall be inserted from this side.

Each complete test cycle shall be as follows:

— insert the key into the lock;

— rotate the key sufficiently to fully throw and detain the deadbolt;

— withdraw the key from the lock;

— re-insert the key into the lock, and rotate it fully to withdraw the deadbolt (and latch bolt if shared action);

— withdraw the key from the lock.

Where the latch bolt has a shared latch action that can only be withdrawn by the key, the above test cycle shall be modified as follows:

— insert the key into the lock;

— rotate the key sufficiently to fully withdraw the spring bolt;

— rotate the key in the reverse direction, allowing the bolt to return to the ‘at rest’ position;

— withdraw the key from the lock.

This test shall be conducted with the maximum the number of keys that are delivered with the lock as described in the manufacturer's instructions.

For operating the bolt(s) a maximum torque of 1,5 Nm is allowed.

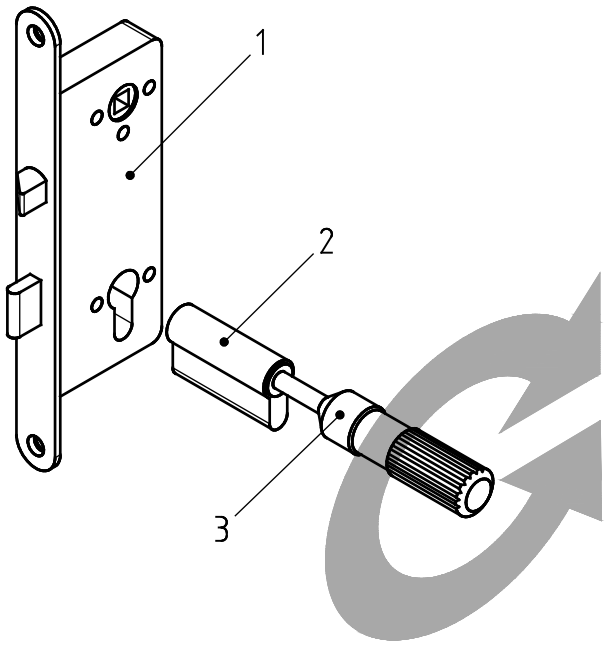
If the key operates both deadbolt(s) and latchbolt(s) the test cycle shall include the complete sequence for bolt action(s).

In the withdrawn position, the key may remain in the key guide, provided that it is not in contact with the detaining elements (levers, pins, etc.).

Where the lock is designed to be used in conjunction with a cylinder, the test apparatus shall be required only to fully throw and withdraw the deadbolt (or fully withdraw/release the latch bolt, where this provides the security), operating the bolt of the lock via a simulated cylinder without taking the ”cylinder key” in and out.

The operation speed shall be up to 15 cycles per minute.

NOTE For locks with keys with only one detaining element it is not necessary to insert and withdraw the key.



Key

1 lock

2 cylinder or lever lock key

3 coupling

Figure 25 — Durability of deadbolt mechanism

5.6.4 Durability of locking snib mechanism

The lock or latch shall be mounted on a suitable fixture providing either a sliding or partial rotary action depending upon the design of the snib mechanism. One test cycle shall consist of moving the snib in accordance with its function from the unlocked to the locked position and back to unlocked.

The operation speed shall be up to 60 cycles per minute.

5.7 Door mass and closing force

5.7.1 Door mass verification

Verification shall be carried out to ensure that the test door conforms to 7.2.3.

5.7.2 Door closing force

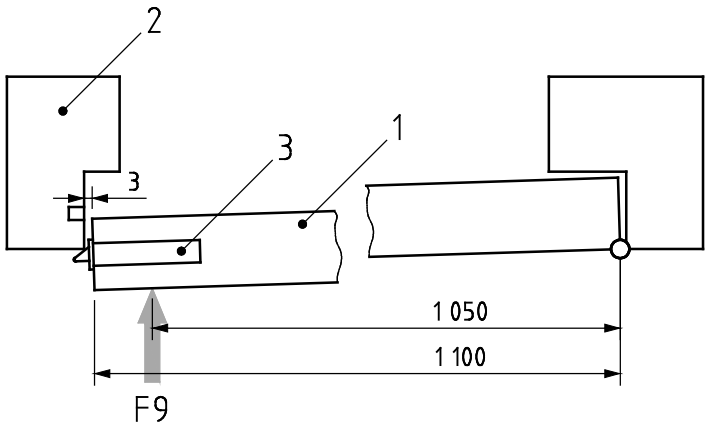
The lock or latch and its correct locking plate as defined by the manufacturer shall be fitted to a test door and frame as shown in Figure 26.

The latch and the locking plate shall be cleaned before each test.

The distance between the lock and the locking plate shall be (3 ± 1) mm. The door shall be opened so that the latch bolt is in contact with the locking plate and allowed to close under the influence of F9. The test shall be conducted three times, during which the latch bolt shall correctly engage the locking plate every time.

The test shall be done after the durability test with the same specimen.

Dimensions in millimetres



Key

1 test door

2 frame

3 lock

Figure 26 — Door closing force

5.8 Suitability for use on fire resistance and/or smoke control doorset

See Annex A.

5.9 Safety

Not applicable

5.10 Corrosion resistance and temperature

5.10.1 Corrosion resistance

The lock shall be mounted in a fixture similar to a door application and subjected to a neutral salt spray test, as detailed in 5.2.3 and EN 1670:2007, 6.1 after which, it need only comply with 5.3, to determine its ability to operate after environmental exposure. The duration of the test is determined by the grading as follows:

The lock shall be operated once every 24 h during the test for grade A, C and F.

The lock shall be operated once every 60 h during the test for grade D and G.

Immediately following the neutral salt spray test and cleaning of the lock, the lock shall be subjected to the tests specified in 5.4.2 (Return force of latch bolt), 5.5.2 (Torque to operate the lock) and5.7.2 (Door closing force). The lock shall be operated 20 times. The opening force shall be measured and recorded during the final three cycles.

5.10.2 Operation at extremes of temperature

The lock shall be stabilized before the test by subjecting it to a constant temperature of 20°C ± 5°C and a relative humidity of 60 % ± 5 % for a period of at least 1 h. The key shall be kept separately at normal room temperature during the tests.

The lock shall be cooled gradually by decreasing the temperature at a rate of 10° C ± 1 °C per hour until a temperature of - 10 °C ± 1 °C is attained. The test temperature shall be maintained for a minimum of 10 min and a maximum of 20 min. After this period the lock shall be operated with its correct key at least once (within 5 attempts) in the laboratory at ambient temperature within 5 min.

The lock shall be heated at the minimum rate of 10°C ± 1°C per hour until the required temperature of + 60°C is reached. The test temperature shall be maintained for a minimum of 2 h and at the end of this time each lock shall be operated:

— by its correct key to fully throw and withdraw the deadbolt;

— through its follower to operate the latch bolt, ensuring that it extends to its fully thrown position;

— where applicable, to manually check that any anti-thrust slide has freedom of operation.

Operating torques is to be recorded within 20 min following the stabilizing time.

5.11 Security

5.11.1 Key operation and locking

5.11.1.1 Manual locking

It shall not be possible to remove the key from the lock unless the deadbolt is in its unlocked or fully thrown and deadlocked position. The deadbolt shall be operated from the fully unlocked to fully thrown and deadlocked position with a live end force of 15 N applied ensuring that the deadbolt is deadlocked with an end load of F5 (see Table 4).

Indicators for dead locking the bolt shall be tested, indicating that the deadbolt has not reached its deadlocked position and that the key has been removed.

5.11.1.2 Manual locking with intermediate locking positions

It shall not be possible to remove the key from the lock before the deadbolt is properly deadlocked. The deadbolt shall be operated from the fully unlocked position to each key removable position with a live end force of 15 N applied ensuring that the deadbolt is deadlocked with an end force of F5 in each position with the key inserted.

Indicators for dead locking the bolt shall be tested, indicating that the deadbolt has not reached its deadlocked position and that the key has been removed.

5.11.1.3 Automatically locking deadbolt

The lock and its locking plate shall be installed on the test door in accordance with the manufacturer's instruction but with a gap of 5 mm between forend and locking plate.

With the test door open at 5°, apply a closing force of 50 N at right angles to the face of the test door at a position of 1 000 mm from the centre line of the hinges of the test door, and between 800 mm and 1 200 mm from the bottom of the test door to re-engage the lock in the secured position.

Verify that the deadbolt has reached its fully thrown and deadlocked position. Indicators for dead locking the bolt shall be tested, indicating that the deadbolt has not reached its deadlocked position.

Retract the latch bolt and the deadbolt by key operation and verify that the deadbolt has reached its fully withdrawn position before the latch bolt disengages from the locking plate.

If the lock allows retracting simultaneously the latch bolt and the deadbolt by handle or knob operation, then repeat this test using the handle or knob.

These tests shall be conducted three times.

NOTE The fully withdrawn position of the deadbolt is the one from which it will need to be released.

5.11.1.4 Automatically locking latch bolt

The lock or latch and its locking plate shall be installed on the test door in accordance with the manufacturer's instruction but with a gap of 5 mm between forend and locking plate.

With the test door open at 5°, apply a closing force of 50 N at right angles to the face of the test door, at a position of 1 000 mm from the centre line of the hinges of the test door and at between 800 mm and 1 200 mm from the bottom of the test door to re-engage the lock or latch in the secured position, check the deadlocking function of the latch bolt.

Indicators for dead locking the bolt shall be tested, indicating that the deadlocking of the latch bolt has not reached its deadlocked position.

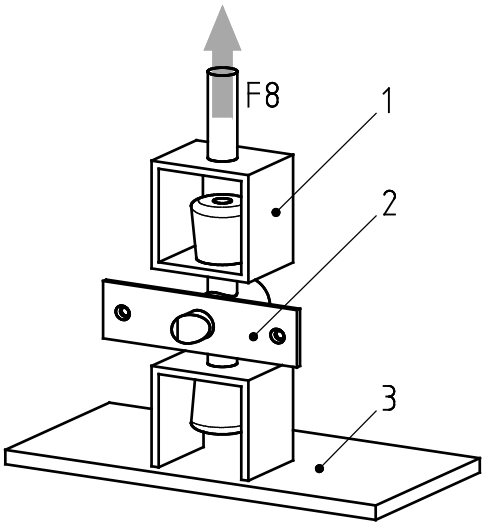
5.11.2 Torque resistance of knob of tubular lock test

5.11.2.1 Torque resistance of knob or lever handle on bored lock and latch sets

The lock shall be mounted on a suitable fixture and, by means of a suitable adapter, a torque M7 applied to the locked knob, in both directions without forcing the lock open.

5.11.2.2 Resistance to pulling off of knob on bored lock and latch set

The bored lock or latch set shall be mounted in a suitable fixture as shown in Figure 27 and an axial force F8 applied to the knob for a period of 60 s $^{+10}_{0}$ s.



Key

1 pulling tool

2 tubular/bored lock set

3 fixture

Figure 27 — Pulling off knob on bored lock

5.11.3 Resistance to side force

5.11.3.1 Resistance to side force on deadbolt

The choice of test rig (see Figure 28, 29 or 30) shall be determined by the manufacturer’s declaration in 4.1.4.

The lock shall be mounted with support of 5 mm on the brace and by a steel plate where the plate is not allowed to have a distance “a” to cover more of the lock than to the centreline between the key rotation centre and the centre of the follower.

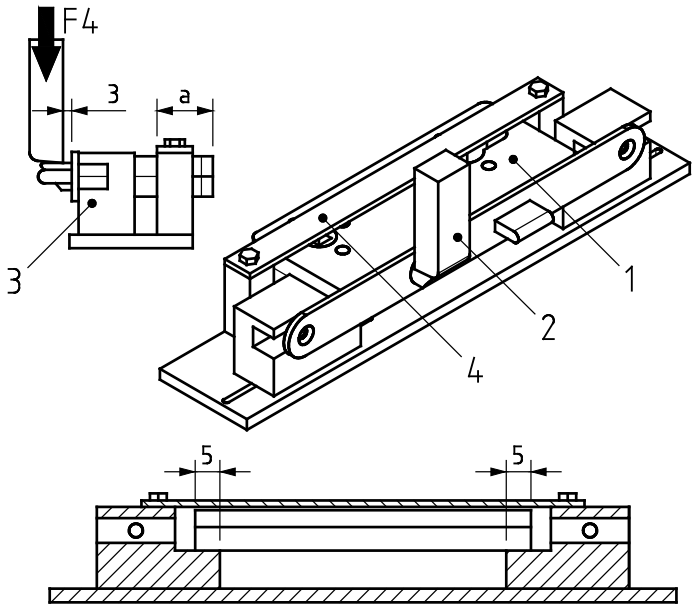
For rim locks the fixture (3) in Figure 30 shall be placed on the braces for testing in fixture as in Figure 28.

A side force F4 shall be applied by using a tool in accordance with Figure 21 to the deadbolt. The distance between the tool and the forend shall be (3 ± 0,2) mm and the force shall be held for a period of 60 s $^{+10}_{0}$ s.

At no time during the test shall the tool be permitted to slip away from the deadbolt due to deformation or collapse of the bolt or lock.

If the design of the lock allows, force shall be applied to the deadbolt from both sides, tested on separate locks.

Dimensions in millimetres

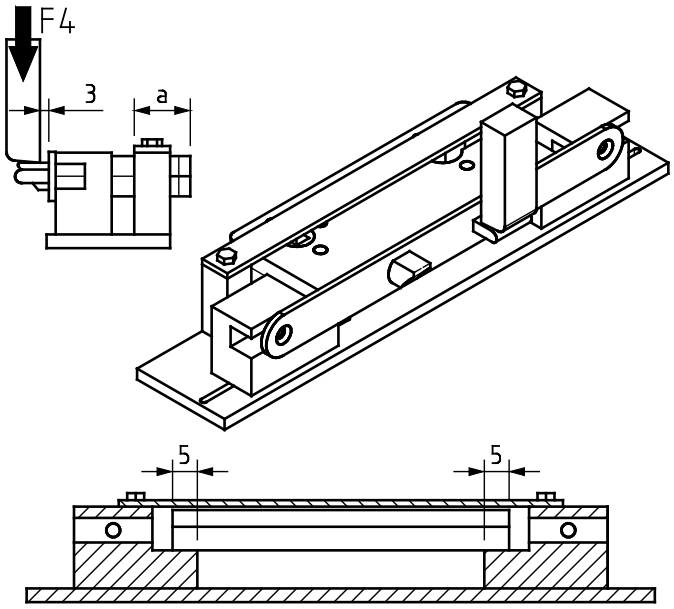


Key

1	lock	3	brace without support of the forend
2	tool	4	cover plate

Figure 28 — Resistance to side force on dead bolt without support

Dimensions in millimetres

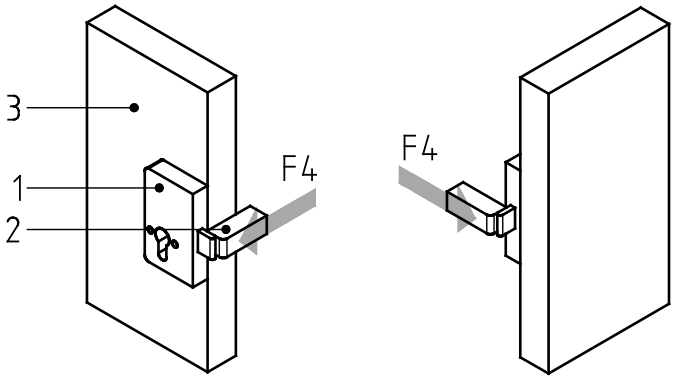


Key

1 lock 3 brace with support of the forend

2 tool 4 cover plate

Figure 29 — Resistance to side force on dead bolt with support



Key

1 lock 3 fixture to be placed in Figure 28

2 tool

Figure 30 — Side force on rim lock

5.11.3.2 Resistance to drilling and side force on deadbolt test

Use the drilling procedure described in 5.3.

Drilling shall continue for the appropriate maximum net drilling time (t1) within the total time (t2) specified in Table 3.

As much as possible of the security bolt shall be drilled away immediately outside the forend in the net time allowed. The lock shall then be mounted in the test apparatus as shown in Figure 28 or Figure 29 and with a side force F4, with a tool according to Figure 21 applied to the drilled side of the bolt. The distance between the tool and the forend shall be 3 mm ± 0,2 mm.

At no time during the test shall the tool be permitted to slip off the deadbolt due to deformation or collapse of the bolt or lock.

Locks shall be tested from both sides (on separate locks) unless indicated otherwise in the product information as in 4.1.4.

5.11.4 Deadbolt projection measure

The projection L1 shall be measured perpendicular to the forend on the unloaded deadbolt for the linear or rotating bolt. The design of the bolt end may have different shapes but the projection is always the maximum distance perpendicular to the forend to the bolt end.

The projection H1 shall be measured perpendicular to the horizontal line 0 – 0 that is placed on the bolts highest horizontal level. The anti-separation function may have different design but the projection shall be measured at the point on the bolt that is parallel with 0-line and perpendicular to the forend

The projection of the linear or rotating bolt with hook (anti-separation function) shall be measured perpendicular from the horizontal part of the bolt.

5.11.5 Resistance to forcing in the unlocking direction (disengaging force) test

5.11.5.1 Resistance to disengaging force test

The lock with a linear operating deadbolt shall be mounted in a test apparatus, as shown in Figure 31, or Figure 32 or as defined by the manufacturer (see the product information 4.1.4 in which the projection of the deadbolt can be measured). Add the pre-force of 50 N on the bolt to find the zero for the measure. Increase during 60 s the disengaging force to the value F5 depending on the grade in the direction of unlocking to the locked deadbolt and hold it for a period of 60 s $^{+10}_{0}$ s the resulting projection L2 shall be noted.

If the deadbolt has more than one end (finger bolt) the force shall be applied to all the ends at the test.

At no time during the test shall the tool be permitted to slip off the deadbolt due to deformation or collapse of the bolt or lock.

The lock with rotating deadbolt shall be mounted in a test apparatus, as shown in Figure 33 in which the movement of the hooked deadbolt can be measured. Add the pre-force of 50 N on the bolt 3 mm from the forend to find the zero for the measure. Increase during 60 s the force to the value F5 depending on grade in the direction of unlocking and hold it for a period of 60 s $^{+10}_{0}$. The deformation d shall be measured during the application of the force and shall be less than 3 mm .

When the locking bolt has a movement for opening that is not linear the disengaging force shall follow the movement of the bolt to its opening position.

If the lock is intended for use with a cylinder, a suitable cylinder or dummy cylinder shall be fitted for the test.

Locks with manual locking with intermediate locking positions shall be tested with the bolt fully thrown and deadlocked.

5.11.5.2 Resistance to disengaging force with drilling

Use the drilling procedure described in 5.3.

Drilling shall continue for the appropriate maximum net drilling time (t1) within the total time (t2) specified in Table 4.

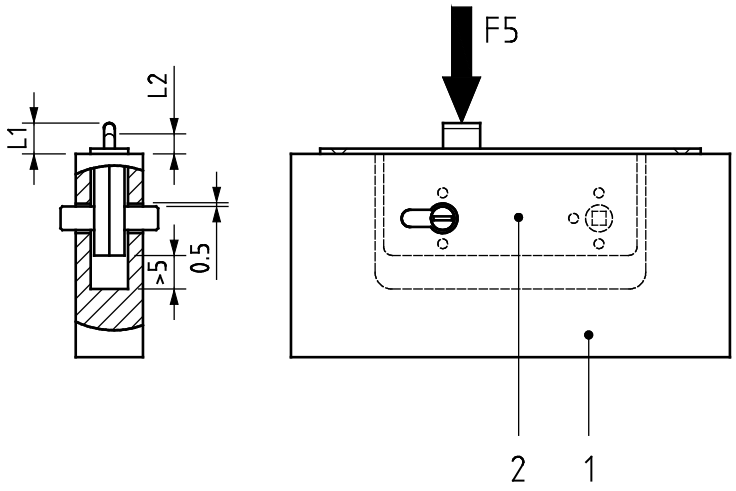
Drilling shall be directed towards any elements in the lock in an attempt to drill them away and allow the deadbolt to be withdrawn and/or towards the vulnerable fixing elements in an attempt to remove them and allow the lock to be separated from the block. It shall not be possible to operate the deadbolt

driving element of the lock to the opening position by means of a suitable tool using a maximum torque of 5 Nm.

Where vulnerable elements are protected by furniture conforming to EN 1906, the drilling test may be omitted for that particular area. Such omissions shall be recorded in the test report.

The method for testing and measure the projection L2 of deformation d shall follow the test method of 5.11.4.

Dimensions in millimetres



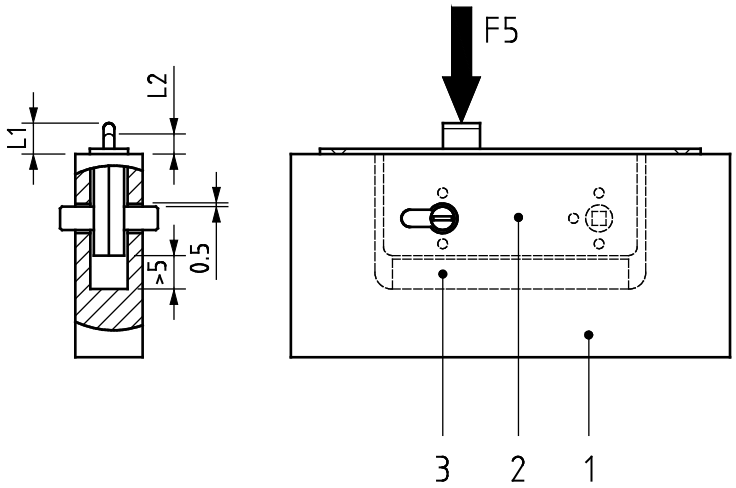
Key

1 fixture

2 lock

Figure 31 — Disengaging force without support

Dimensions in millimetres



Key

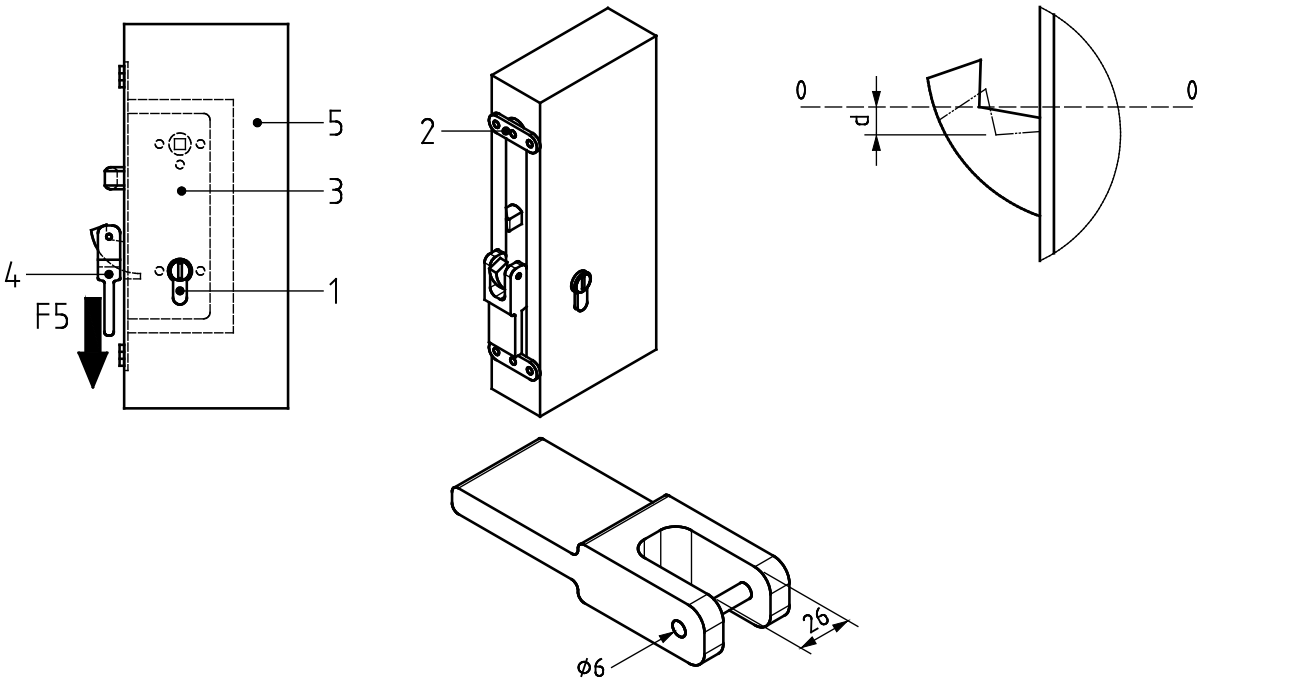
1 fixture

2 lock

3 support

Figure 32 — Disengaging force with support

Dimensions in millimetres



Key

1 lock cylinder
2 plate
3 lock case
4 tool
5 fixture

Figure 33 — Disengaging force of anti-separation bolt

5.11.6 Resistance to pulling of anti-separation bolt test

5.11.6.1 Resistance to pulling of anti-separation bolt test

The lock shall be mounted in a suitable fixture as shown in Figure 34, using metal thread screws supplied/recommended by the manufacturer and a fixing plate to support the fixing screws during the test. Add a tensile force F6 to the engaging part of the bolt with a tool (see Figure 34) and hold for a period of 60 s $^{+10}_{0}$. The tool shall be guided to avoid vertical movement.

At no time during the test shall tool be permitted to slip off the deadbolt due to deformation or collapse of the bolt or lock.

5.11.6.2 Resistance to drilling and pulling of anti-separation bolt test

Use the drilling procedure described in 5.3.

Drilling shall continue for the appropriate maximum net drilling time (t1) within the total time (t2) specified in Table 3.

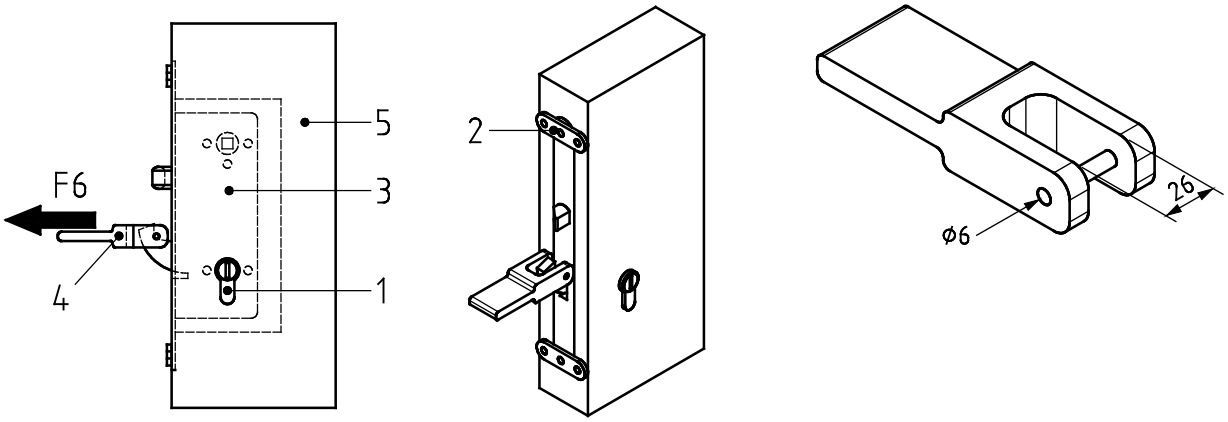
As much as possible of the security bolt shall be drilled away immediately outside the forend in the net time allowed.

The lock shall be mounted in a suitable fixture as shown in Figure 34, using metal thread screws supplied/recommended by the manufacturer supported with a plate.

Add a tensile force F6 to the engaging part of the bolt with a tool (see Figure 34) and hold for a period of 60 s $^{+10}_{0}$. The tool shall be guided to avoid vertical movement.

At no time during the test shall the tool be permitted to slip off the deadbolt due to deformation or collapse of the bolt or lock.

Dimensions in millimetres



Key

1	lock cylinder	4	tool
2	plate	5	fixture
3	lock case		

Figure 34 — Pulling of anti-separation bolt

5.11.7 Resistance to forcing of locating device in sliding door locks

5.11.7.1 Resistance to forcing of locating device in sliding door locks

The lock shall be mounted as for test 5.11.5 and a force F7 applied 3 mm from the forend on the device in the direction as shown in Figure 13.

The force shall be held for a period of 60 s $^{+10}_{0}$ s.

At no time during the test shall the tool be permitted to slip off the device due to deformation or collapse of the device or lock.

5.11.7.2 Resistance to forcing of locating device with drill protection in sliding door locks

Use the drilling procedure described in 5.3.

As much as possible of the locating device shall be drilled away immediately outside the forend in the net time allowed.

The lock shall be mounted as for test 5.11.5 and a force F7 applied 3 mm from the forend in the locking direction of the bolt as shown in Figure 13 for a period of 60 s $^{+10}_{0}$ s.

5.11.8 Torque resistance for lockable deadbolt operation by handle/knob test

The torque M5 shall be applied gradually to the locked handle/follower, in both clockwise and anticlockwise directions, in a time period of 5 s ± 2 s. The lock shall not be operable to open status.

5.11.9 Strong key attack on locks with internal blocking elements

The lock with its accessories shall be mounted to a test block as described in 5.2.3.

A key shaped tool made of tool steel, that can fit in the lock keyway without enlarging it, is pushed in the lock and rotated in the bolt withdrawing direction trying to force the lock open as illustrated in Figure 15.

The torque M6 is to be applied gradually in a time period of 5 s ± 2 s.

It is not necessary to reach the torque M6 if the lock has a protective mechanism, which breaks or isolates during a strong key attack in order to prevent the lock being forced open.

The lock does not need to be operable after the test.

The tool representing the strong key shall be manufactured to be able to insert the torque of 100 Nm into the lock. If the dimension of the key hole is designed that it is not possible to reach 100 Nm because the tool is destroyed, the lock has passed the test and the torque shall be registered.

5.11.10 Resistance to end force on box protected locking plate test

The locking plate shall be mounted in a test apparatus (as shown in Figure 35) in which:

— the deformation under the tool to apply the force can be measured; and

— a force F5 can be applied centrally to the surface of the box or where the deadbolt/anti-separation bolt works (if known), in three directions X, Y and Z and be held for a period of 60 s $^{+10}_{0}$ s.

Add a perforce of 50 N to create the Zero level. Increase the force in 60 s and hold it for 60 s.

The deflection under test is to be measured in the area where the deadbolt/anti-separation bolt is located.

The force in Z direction is to test the fixing of the box, deflection information is not required.

Force F5 is applied with a tool having a surface of 5 mm x 20 mm.

NOTE Separate locking plates for each tested direction.

Figure 35 — Force on locking plate box

5.11.11 Resistance to side force on locking plate test

The locking plate shall be mounted with 5 mm clearance in a metal fixture to a suitable test apparatus using machine screws of equivalent strength to the fixings supplied/recommended by the manufacturer

as shown in Figure 36 or as defined by the manufacturer. A side force F4 shall be applied to the bolt aperture for a period of 60 s $^{+10}_{0}$ s, using a tool which represents the deadbolt of an appropriate lock. If the locking plate has several apertures or apertures intended for several locking bolts, each aperture is tested separately on different samples. If the locking plate breaks or bends, so that the force F4 cannot be reached or the tool slips off from the aperture, the requirement is not met.

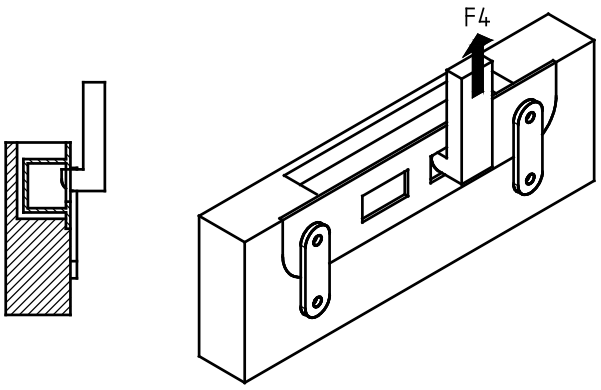


Figure 36 — Side force on locking plate

5.11.12 Resistance to pulling on locking plate

The locking plate shall be mounted with 5 mm clearance in a metal fixture to a suitable test apparatus using machine screws of equivalent strength to the fixings supplied/recommended by the manufacturer as shown in Figure 37. A pull force F6 shall be applied to the bolt aperture for a period of 60 s $^{+10}_{0}$ s, using a tool representing the hook/claw bolt of an appropriate lock.

If the locking plate has several apertures or apertures intended for several locking bolts, each locking point is tested separately on different samples. If the locking plate breaks or bends, so that the force F6 cannot be reached or the tool slips off from the aperture, the force reached is recorded.

The tool shall be guided to ensure the linear direction of pull force.

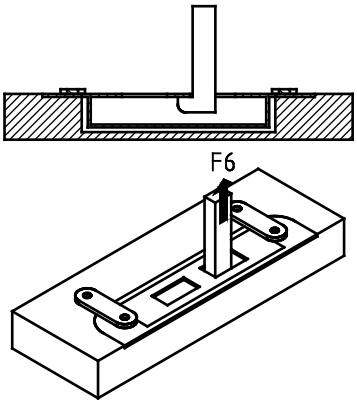


Figure 37 — Pulling force on locking plate

5.11.13 Resistance to lifting force on locking plate

The locking plate shall be mounted with 5 mm clearance in a metal fixture to a test apparatus using machine screws of equivalent strength to the fixings supplied/recommended by the manufacturer as shown in Figure 38. The locking plate shall have support of the fixture in the lifting direction and a

lifting force F7 is applied to the locating device aperture in the locking plate for a period of 60 s $^{+10}_{0}$ s, using a tool representing the locating or hook bolt device of an appropriate lock.

If the locking plate has several apertures for locating devices or deadbolt, each of them is tested separately on different samples.

If the locking plate breaks or bends, so that the force F7 cannot be reached or the tool slips off from the aperture then the requirements is not met.

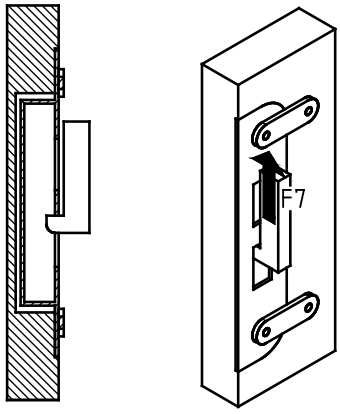


Figure 38 — Lifting force on locking plate

5.12 Key related security for lever locks

5.12.1 Detaining elements verification

Visual check based on the manufacturer's technical documentation.

5.12.2 Effective differs verification

The number of effective differs shall be assessed with reference to the manufacturer’s differs charts and/or to supporting documentation demonstrating the principle of calculation.

5.12.3 Differing step heights on key

The differing step heights on keys shall be assessed with reference to the manufacturer's differs charts and/or to supporting documentation demonstrating the principle of calculation.

5.12.4 Non-interpassing of keys with just one interval differ

Attempt to operate locks with keys differing by one interval (up and down) in just one lever/pin position using an applied torque on the key bow of 1,5 Nm, to confirm that inter passing will not occur.

For locks in grades E, F G and H, see Table 4, this test shall be conducted after the durability test 5.6.3.

5.12.5 Coding protection

Visual check based on the technical documentation.

6 Assessment and verification of constancy of performance – AVCP

6.1 General

The compliance of mechanically operated locks with the requirements of this standard and with the performances declared by the manufacturer in the DoP shall be demonstrated by:

— determination of the product type;

— factory production control by the manufacturer, including product assessment.

The manufacturer shall always retain the overall control and shall have the necessary means to take responsibility for the conformity of the product with its declared performance(s).

6.2 Type testing

6.2.1 General

All performances related to characteristics included in this standard shall be determined when the manufacturer intends to declare the respective performances unless the standard gives provisions for declaring them without performing tests. (e.g. use of previously existing data, CWFT and conventionally accepted performance).

Assessment previously performed in accordance with the provisions of this standard, may be taken into account provided that they were made to the same or a more rigorous test method, under the same AVCP system on the same product or products of similar design, construction and functionality, such that the results are applicable to the product in question.

NOTE 1 Same AVCP system means testing by an independent third party under the responsibility of a notified product certification body.

For the purposes of assessment, the manufacturer's products may be grouped into families, where it is considered that the results for one or more characteristics from any one product within the family are representative for that same characteristics for all products within that same family.

NOTE 2 Products may be grouped in different families for different characteristics.

Reference to the assessment method standards should be made to allow the selection of a suitable representative sample.

In addition, the determination of the product type shall be performed for all characteristics included in the standard for which the manufacturer declares the performance:

— at the beginning of the production of a new or modified mechanically operated lock or locking plate unless a member of the same product range, or

— at the beginning of a new or modified method of production (where this may affect the stated properties);

or

— they shall be repeated for the appropriate characteristic(s), whenever a change occurs in the mechanically operated lock or locking plate design, in the raw material or in the supplier of the components, or in the method of production (subject to the definition of a family), which would affect significantly one or more of the characteristics.

Where components are used whose characteristics have already been determined, by the component manufacturer, on the basis of assessment methods of other product standards, these characteristics need not be re-assessed. The specifications of these components shall be documented.

Products bearing regulatory marking in accordance with appropriate harmonized European specifications may be presumed to have the performances declared in the DoP, although this does not replace the responsibility on the uncontrolled door closing devices manufacturer to ensure that the mechanically operated lock or locking plate as a whole is correctly manufactured and its component products have the declared performance values.

6.2.2 Test samples, testing and compliance criteria

The number of samples of mechanically operated locks and locking plates for use fire resisting and/or smoke control doorset to be tested/assessed shall be in accordance with Table 5.

Table 5 — Number of samples to be tested and compliance criteria

Characteristic	Product characteristic	Assessment method	No. of samples	Compliance criteria
Self-closing Ability to close and keep the door in a closed position				
- Return force of latch bolt	4.1.3	5.4.2	1	4.1.3
- Door closing force	4.4.2	5.7.2	1	4.4.2
Durability of self-closing against aging and degradation				
- Durability of latch action	4.3.1	5.6.1	1	4.3.1
- Corrosion resistance	4.7.1	5.10.1	1	4.7.1
Suitability for use on fire resistance and/or smoke control doorset	4.5	5.8 Annex A	1	4.5
Dangerous substances	4.1.2	As required by regulations		

6.2.3 Test reports

The results of the determination of the product type shall be documented in test reports. All test reports shall be retained by the manufacturer for at least 10 years after the last date of production of the mechanically operated lock to which they relate.

6.2.4 Shared other party results

A manufacturer may use the results of the product type determination obtained by someone else (e.g. by another manufacturer, as a common service to manufacturers, or by a product developer), to justify his own declaration of performance regarding a product that is manufactured according to the same design (e.g. dimensions) and with raw materials, constituents and manufacturing methods of the same kind, provided that:

— the results are known to be valid for products with the same essential characteristics relevant for the product performance;

— in addition to any information essential for confirming that the product has such same performances related to specific essential characteristics, the other party who has carried out the determination of the product type concerned or has had it carried out, has expressly accepted (see 6.2.5 1)) to transmit to the manufacturer the results and the test report to be used for the latter's product type determination, as well as information regarding production facilities and the production control process that can be taken into account for FPC;

— the manufacturer using other party results accepts to remain responsible for the product having the declared performances and he also:

— ensures that the product has the same characteristics relevant for performance as the one that has been subjected to the determination of the product type, and that there are no significant

differences with regard to production facilities and the production control process compared to that used for the product that was subjected to the determination of the product type; and

— keeps available a copy of the determination of the product type report that also contains the information needed for verifying that the product is manufactured according to the same design and with raw materials, constituents and manufacturing methods of the same kind.

6.2.5 Cascading determination of the product type results

For some construction products, there are companies (often called "system houses") which supply or ensure the supply of, on the basis of an agreement (see 2)), some or all of the components (e.g. in case of windows: profiles, gaskets, weather strips) (see 3)) to an assembler who then manufactures the finished product (referred to below as the "assembler") in his factory.

1) The formulation of such an agreement can be done by licence, contract, or any other type of written consent.

2) This can be, for instance, a contract, license or whatever kind of written agreement, which should also contain clear provisions with regard to responsibility and liability of the component producer (system house, on the one hand, and the assembler of the finished product, on the other hand.

3) These companies may produce components but they are not required to do so.

Provided that the activities for which such a system house is legally established include manufacturing/assembling of products as the assembled one, the system house may take the responsibility for the determination of the product type regarding one or several essential characteristics of an end product which is subsequently manufactured and/or assembled by other firms in their own factory.

When doing so, the system house shall submit an "assembled product" using components manufactured by it or by others, to the determination of the product type and then make the determination of the product type report available to the assemblers, i.e. the actual manufacturer of the product placed on the market.

To take into account such a situation, the concept of cascading determination of the product type might be taken into consideration in the technical specification, provided that this concerns characteristics for which either a notified product certification body or a notified test laboratory intervene, as presented below.

The determination of the product type report that the system house has obtained with regard to tests carried out by a notified body, and which is supplied to the assemblers, may be used for the regulatory marking purposes without the assembler having to involve again a notified body to undertake the determination of the product type of the essential characteristic(s) that were already tested, provided that:

— the assembler manufactures a product which uses the same combination of components (components with the same characteristics), and in the same way, as that for which the system house has obtained the determination of the product type report. If this report is based on a combination of components not representing the final product as to be placed on the market, and/or is not assembled in accordance with the system house's instruction for assembling the components, the assembler needs to submit his finished product to the determination of the product type;

— the system house has notified to the manufacturer the instructions for manufacturing/assembling the product and installation guidance;

— the assembler (manufacturer) assumes the responsibility for the correct assembly of the product in accordance with the instructions for manufacturing/assembling the product and installation guidance notified to him by the system house;

— the instructions for manufacturing/assembling the product and installation guidance notified to the assembler (manufacturer) by the system house are an integral part of the assembler's Factory Production Control system and are referred to in the determination of the product type report;

— the assembler is able to provide documented evidence that the combination of components he is using, and his way of manufacturing, correspond to the one for which the system house has obtained the determination of the product type report (he needs to keep a copy of the system house's determination of the product type report);

— regardless the possibility of referring, on the basis of the agreement signed with the system house, to the latter's responsibility and liability under private law, the assembler remains responsible for the product being in compliance with the declared performances, including both the design and the manufacture of the product, which is given when he affixes the regulatory marking on his product.

6.3 Factory production control (FPC)

6.3.1 General

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market comply with the declared performance of the essential characteristics.

The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials or components, equipment, the production process and the product.

All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures.

This factory production control system documentation shall ensure a common understanding of the evaluation of the constancy of performance and enable the achievement of the required product performances and the effective operation of the production control system to be checked. Factory production control therefore brings together operational techniques and all measures allowing maintenance and control of the compliance of the product with the declared performances of the essential characteristics.

In case the manufacturer has used shared or cascading product type results, the FPC shall also include the appropriate documentation as foreseen in 6.2.4 and 6.2.5.

6.3.2 Requirements

6.3.2.1 General

The manufacturer is responsible for organizing the effective implementation of the FPC system in line with the content of this product standard. Tasks and responsibilities in the production control organization shall be documented and this documentation shall be kept up-to-date.

The responsibility, authority and the relationship between personnel that manages, performs or verifies work affecting product constancy, shall be defined. This applies in particular to personnel that need to initiate actions preventing product non-constancies from occurring, actions in case of non-constancies and to identify and register product constancy problems.

Personnel performing work affecting the constancy of performance of the product shall be competent on the basis of appropriate education, training, skills and experience for which records shall be

maintained. In each factory the manufacturer may delegate the action to a person having the necessary authority to:

— identify procedures to demonstrate constancy of performance of the product at appropriate stages;

— identify and record any instance of non-constancy;

— identify procedures to correct instances of non-constancy.

The manufacturer shall draw up and keep up-to-date documents defining the factory production control. The manufacturer's documentation and procedures should be appropriate to the product and manufacturing process. The FPC system should achieve an appropriate level of confidence in the constancy of performance of the product. This involves

a) the preparation of documented procedures and instructions relating to factory production control operations, in accordance with the requirements of the technical specification to which reference is made;

b) the effective implementation of these procedures and instructions;

c) the recording of these operations and their results;

d) the use of these results to correct any deviations, repair the effects of such deviations, treat any resulting instances of non-conformity and, if necessary, revise the FPC to rectify the cause of non-constancy of performance.

Where subcontracting takes place, the manufacturer shall retain the overall control of the product and ensure that he receives all the information that is necessary to fulfil his responsibilities according to this European Standard.

If the manufacturer has part of the product designed, manufactured, assembled, packed, processed and/or labelled by subcontracting, the FPC of the subcontractor may be taken into account, where appropriate for the product in question.

The manufacturer who subcontracts all of his activities may in no circumstances pass the above responsibilities on to a subcontractor.

NOTE Manufacturers having an FPC system, which complies with EN ISO 9001 standard and which addresses the provisions of the present European standard are considered as satisfying the FPC requirements of the Regulation (EU) No 305/2011.

6.3.2.2 Equipment

6.3.2.2.1 Testing

All weighing, measuring and testing equipment shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

6.3.2.2.2 Manufacturing

All equipment used in the manufacturing process shall be regularly inspected and maintained to ensure use, wear or failure does not cause inconsistency in the manufacturing process. Inspections and maintenance shall be carried out and recorded in accordance with the manufacturer’s written procedures and the records retained for the period defined in the manufacturer's FPC procedures.

6.3.2.3 Raw materials and components

The specifications of all incoming raw materials and components shall be documented, as shall the inspection scheme for ensuring their compliance. In case supplied kit components are used, the constancy of performance system of the component shall be that given in the appropriate harmonized technical specification for that component.

6.3.2.4 Traceability and marking

Individual products shall be identifiable and traceable with regard to their production origin. The manufacturer shall have written procedures ensuring that processes related to affixing traceability codes and/or markings are inspected regularly.

6.3.2.5 Control during manufacturing process

The manufacturer shall plan and carry out production under controlled conditions.

6.3.2.6 Product testing and evaluation

The manufacturer shall establish procedures to ensure that the stated values of the characteristics he declares are maintained. The characteristics, and the means of control, are those included in Clauses 4 and 5.

— Self-closing: shall be subject to the tests indicated in 5.4, at least one time per year;

— Self-closing and durability of self-closing: shall be subject to the tests indicated in 5.5, at least one times per year;

— Durability of self-closing: shall be subject to the tests indicated in 5.6, at least one time per year.

6.3.2.7 Non-complying products

The manufacturer shall have written procedures which specify how non-complying products shall be dealt with. Any such events shall be recorded as they occur and these records shall be kept for the period defined in the manufacturer's written procedures.

Where the product fails to satisfy the acceptance criteria, the provisions for non-complying products shall apply, the necessary corrective action(s) shall immediately be taken and the products or batches not complying shall be isolated and properly identified. Once the fault has been corrected, the test or verification in question shall be repeated. The results of controls and tests shall be properly recorded. The product description, date of manufacture, test method adopted, test results and acceptance criteria shall be entered in the records under the signature of the person responsible for the control/test.

With regard to any control result not meeting the requirements of this European standard, the corrective measures taken to rectify the situation (e.g. a further test carried out, modification of manufacturing process, throwing away or putting right of product) shall be indicated in the records.

6.3.2.8 Corrective action

The manufacturer shall have documented procedures that instigate action to eliminate the cause of non-conformities in order to prevent recurrence.

6.3.2.9 Handling, storage and packing

The manufacturer shall have procedures providing methods of product handling and shall provide suitable storage areas preventing damage or deterioration.

6.3.3 Product specific requirements

The FPC system shall address this European Standard and ensure that the products placed on the market comply with the declaration of performance. The FPC system shall include a product specific FPC, which identifies procedures to demonstrate compliance of the product at appropriate stages, i.e.:

a) the controls and tests to be carried out prior to and/or during manufacture according to a frequency laid down in the FPC test plan, and/or

b) the verifications and tests to be carried out on finished products according to a frequency laid down in the FPC test plan.

If the manufacturer uses only finished products, the operations under b) shall lead to an equivalent level of compliance of the product as if FPC had been carried out during the production.

If the manufacturer carries out parts of the production himself, the operations under b) may be reduced and partly replaced by operations under a). Generally, the more parts of the production that are carried out by the manufacturer, the more operations under b) may be replaced by operations under a). In any case the operation shall lead to an equivalent level of compliance of the product as if FPC had been carried out during the production.

NOTE Depending on the specific case, it can be necessary to carry out the operations referred to under a) and b), only the operations under a) or only those under b).

The operations under a) refer to the intermediate states of the product as on manufacturing machines and their adjustment, and measuring equipment etc. These controls and tests and their frequency shall be chosen based on product type and composition, the manufacturing process and its complexity, the sensitivity of product features to variations in manufacturing parameters etc.

The manufacturer shall establish and maintain records that provide evidence that the production has been sampled and tested. These records shall show clearly whether the production has satisfied the defined acceptance criteria and shall be available for at least three years.

6.3.4 Initial inspection of factory and of FPC

Initial inspection of factory and of FPC shall be carried out when the production process has been finalized and in operation. The factory and FPC documentation shall be assessed to verify that the requirements of 6.3.2 and 6.3.3 are fulfilled. During the inspection it shall be verified that:

a) all resources necessary for the achievement of the product characteristics included in this European standard are in place and correctly implemented;

b) the FPC-procedures in accordance with the FPC documentation are followed in practice;

c) the product complies with the product type samples, for which compliance of the product performance to the DoP has been verified.

All locations where final assembly or at least final testing of the relevant product is performed, shall be assessed to verify that the above conditions a) to c) are in place and implemented. If the FPC system covers more than one product, production line or production process, and it is verified that the general requirements are fulfilled when assessing one product, production line or production process, then the assessment of the general requirements does not need to be repeated when assessing the FPC for another product, production line or production process.

All assessments and their results shall be documented in the initial inspection report.

6.3.5 Continuous surveillance of FPC

Surveillance of the FPC shall be undertaken once per year. The surveillance of the FPC shall include a review of the FPC test plan(s) and production processes(s) for each product to determine if any changes have been made since the last assessment or surveillance. The significance of any changes shall be assessed.

Checks shall be made to ensure that the test plans are still correctly implemented and that the production equipment is still correctly maintained and calibrated at appropriate time intervals.

The records of tests and measurement made during the production process and to finished products shall be reviewed to ensure that the values obtained still correspond with those values for the samples submitted to the determination of the product type and that the correct actions have been taken for non-compliant products.

6.3.6 Procedure for modifications

If modifications are made to the product, production process or FPC system that could affect any of the product characteristics declared according to this standard, then all the characteristics for which the manufacturer declares performance, which may be affected by the modification, shall be subject to the determination of the product type, as described in 6.2.1.

Where relevant, a re-assessment of the factory and of the FPC system shall be performed for those aspects, which may be affected by the modification.

All assessments and their results shall be documented in a report.

7 Classification

7.1 Coding system

For the purpose of this European Standard, mechanically operated locks and latches shall be classified in accordance with the eight character classification system described in 7.2.1 to 7.2.8.

Locking plates intended to be sold separately from the lock may be coded accordingly using the same classification system but with grades only in those categories that are relevant to locking plates.

Table 6 — Classification

1	2	3	4	5	6	7	8
Category of use	Durability and force on latch bolt	Door mass and closing force	Suitability for use on fire resisting and/or smoke control doors	Safety	Corrosion resistance and temperature	Security and drill resistance	Key identification of lever locks

7.2 Classification for mechanically operated locks and locking plates

7.2.1 Category of use (first digit)

Three grades are identified in accordance with requirements stated in 4.2 and Table 1.

— grade 1: for use by people with a high incentive to exercise care and with a small chance of misuse, e.g. residential doors.

— grade 2: for use by people with some incentive to exercise care but where there is some chance of misuse, e.g. office doors.

— grade 3: for use by the public where there is little incentive to exercise care and where there is a high chance of misuse, e.g. doors in public buildings.

7.2.2 Durability (second digit)

Nine grades of durability and force F3 on latch bolt are identified in accordance with 4.3 and Table 2.

— grade A: 50 000 test cycles; no force on latch bolt, or for locks without latchbolt;

— grade B: 100 000 test cycles; no force on latch bolt; or for locks without latchbolt

— grade C: 200 000 test cycles; no force on latch bolt; or for locks without latchbolt

— grade L: 100 000 test cycles; 25 N force on latch bolt;

— grade M: 200 000 test cycles; 25 N force on latch bolt;

— grade R: 100 000 test cycles; 50 N force on latch bolt;

— grade S: 200 000 test cycles; 50 N force on latch bolt;

— grade W: 100 000 test cycles; 120 N force on latch bolt;

— grade X: 200 000 test cycles; 120 N force on latch bolt;

The above information relates to latch action only. Corresponding durability requirements based on number of cycles apply to the dead bolt and snib mechanisms.

NOTE For grade C, M, S and X higher number of test cycles of the latch can be tested and can be shown in the certificate.

7.2.3 Door mass and closing force (third digit)

Ten grades of door mass and closing force (F9) are identified in accordance with 4.4.

— grade 0: Locks without a latch bolt

The following grades apply for locks with latch function, automatically operated bolts or similar

— grade 1: up to 100 kg door mass; 50 N maximum closing force;

— grade 2: up to 200 kg door mass; 50 N maximum closing force;

— grade 3: above 200 kg door mass as specified by the manufacturer; 50 N maximum closing force;

— grade 4: up to 100 kg door mass; 25 N maximum closing force;

— grade 5: up to 200 kg door mass; 25 N maximum closing force;

— grade 6: above 200 kg door mass as specified by the manufacturer; 25 N maximum closing force;

— grade 7: up to 100 kg door mass; 15 N maximum closing force;

— grade 8: up to 200 kg door mass; 15 N maximum closing force;

— grade 9: above 200 kg door mass as specified by the manufacturer; 15 N maximum closing force.

7.2.4 Suitability for use on fire resisting and/or smoke control doorset (fourth digit)

Four grades are identified:

— Grade 0: not verified for use on fire resisting /smoke control doorset assemblies;

— Grade A: for use on smoke control doorset assemblies based on a test in accordance with EN 1634–3 where the lock contributes to the integrity as described in Annex A;

— Grade B: for use on smoke control and fire resisting doorset assemblies based on a test in accordance with EN 1634–1 or EN 1634–2 where the lock contributes to the integrity as described in Annex A;

— Grade N: for use on smoke control and fire resisting doorset assemblies based on tests where the lock does not contribute to keeping the door in a closed position during the fire resisting and/or smoke control test as described in Annex A;

7.2.5 Safety (fifth digit)

Only one grade of safety is identified

— Grade 0: no safety requirement

NOTE See EN 179 and EN 1125 for locks, latches and locking plates that are part of exit devices for use on emergency or panic exit doors.

7.2.6 Corrosion resistance and temperature (sixth digit)

Six grades of corrosion resistance and temperature requirement are identified.

— grade 0: no defined corrosion resistance;
no temperature requirement;

— grade A: low corrosion resistance (24 h);
no temperature requirement;

— grade C: high corrosion resistance (96 h);
no temperature requirement;

— grade D: very high corrosion resistance (240 h);
no temperature requirement;

— grade F: high corrosion resistance (96 h);
temperature requirement: from –10 °C to +60 °C;

— grade G: very high corrosion resistance (240 h);
temperature requirement: from –10 °C to +60 °C.

7.2.7 Security and drill resistance (seventh digit)

Eight grades of security and drill resistance related to the side of the lockcase that is assumed to resist an attack are identified in Table 3.

— grade 0: No security requirement

— grade 1: Minimum security and no drill resistance;

— grade 2: Low security and no drill resistance;

— grade 3: Medium security and no drill resistance;

— grade 4: High security and no drill resistance;
— grade 5: High security with drill resistance;
— grade 6: Very high security and no drill resistance;
— grade 7: Very high security with drill resistance.

7.2.8 Key identification of lever locks (eight digit)

Nine grades are identified from 0 to H in accordance with 4.9 and Table 4.

— grade 0: No requirements;
— grade A: Minimum three detaining elements;
— grade B: Minimum five detaining elements;
— grade C Minimum five detaining elements, extended number of effective differs;
— grade D: Minimum six detaining elements;
— grade E: Minimum six detaining elements, extended number of effective differs;
— grade F: Minimum seven detaining elements;
— grade G: Minimum seven detaining elements, extended number of effective differs;
— grade H: Minimum eight detaining elements, extended number of effective differs.

NOTE For non-lever locks classification "-" applies.

7.3 Example for classification of locks, latches and their locking plates

2	**M**	**5**	**B**	**0**	**E**	**5**	**0**

This indicates a mechanically operated lock and locking plate for use in an application where people have some incentive to exercise care, able to withstand a durability of 200 000 cycles with a 25 N force on the latch bolt, on a door with a mass of up to 200 kg and a maximum closing force of 25 N, it also indicates a lock for use on a fire resisting/smoke control doorset assembly, without any safety requirement, with moderate corrosion resistance in temperatures ranging from – 10 °C to + 60 °C, with high security and drill resistance and no requirements for key identification.

8 Marking, labelling and packaging

8.1 On the product

The following information shall be marked on the lock:

a) See ZA.3 for further requirements if applicable;

b) identification number of the certification body if applicable;

c) manufacturer's name or trademark or other means of positive identification;

d) the number and year of this European Standard, i.e. EN 12209;

e) the full classification of the system;

f) month and year of manufacture, may be in coded form.

NOTE See Table 7 in 8.3.

8.2 On the packaging

The following information shall be marked on the packaging:

a) manufacturer's name or trademark or other means of positive identification;

b) the number and year of this European Standard, i.e. EN 12209;

c) manufacturer’s product reference number.

NOTE See Table 7 in 8.3

8.3 On the installation instruction

The information given in Table 7 shall be marked on the installation instructions.

Table 7 – Marking requirements

Marking requirements	**On the product**		**On the packaging**	**On the installation instructions**
	Visible before installation	Accessible after installation		
Identification number of the certification body	X	-	-	X
Manufacturer's name or trademark or other means of positive identification	-	X	X	X
Registered address of the manufacturer	-	-	-	X
The last two digits of the year in which the marking was applied for the first time	-	-	-	X
The number of the EC certificate of conformity	-	-	-	X
Reference to this European standard. (number and year)	X[a]	-	X[a]	X
Classification in accordance with Clause 7 of this standard	X	-	-	X
Product information according with 4.1.4	-	-	-	X
Year of assembly by manufacturer	X	-	-	-
Manufacturer’s product reference number	-	-	X	X

[a] If a product conforms to different standards with different classifications, then this additional marking may be omitted and included in the installation instructions. See Annex A.

Annex A
(normative)

Locks and locking plates for use on fire resisting and/or smoke control doorset

A.1 Grade A

Products representative of their type, being classified grade A in 7.2.4, shall have been subjected to a successful evaluation proving their suitability for use on smoke control doors.

Products are for use on smoke control doors if a door incorporating the product has passed a smoke control test to EN 1634-3.

The evidence and test application/method shall be shown in the product information

All part of the product that are responsible for keeping the door in its closed position shall be made out of material with a melting point of not less than 300 °C. If the lock is equipped with a latch bolt and the latch bolt could be the only part of the lock that keeps a smoke door in its closed position, then the projection of the latch bolt shall be at least 10 mm. Alternatively, the suitability for use on smoke control doors shall be determined by a successful test conducted in accordance with EN 1634-3.

Installation instruction shall confirm that the engagement of the latch bolt inside the locking plate shall not be less than 6 mm.

It is not necessary for the product to be operable after such a test.

NOTE The use of a deadbolt may prevent self-closing of the smoke control door. It is the responsibility of the national regulation body to decide which type of deadbolt operation is acceptable.

A.2 Grade B

Products representative of their type, being classified to grade B in 7.2.4, shall have been subjected to a successful fire resisting and/or smoke control doorset test from both sides, in accordance with EN 1634-1 or EN 1634-2 to prove the effect of the product on the fire resistance of the complete door assembly. However if the test laboratory expert determines the test to be conducted from the one side of the door only (worst case situation for the product), then it should be allowed and stated in the test report.

The evidence and test application/method shall be shown in the product information corresponding to EN 16035 Hardware Performance Sheet (HPS).

It is not necessary for the product to be operable after such a fire resisting test.

NOTE 1 It is the responsibility of the specifiers to ensure that the fire resisting evidence for any lock covers the type of fire resistant door for which the lock is intended.

NOTE 2 The use of a deadbolt may prevent self-closing of the fire resisting door. It is the responsibility of the national regulation body to decide which type of deadbolt operation is acceptable.

A.3 Grade N

Products representative of their type, where other means are responsible for keeping the smoke control and fire resistance doorset in its closed position during the smoke control and fire resistance test, shall be classified grade N in 4.5.

Such product shall have been subjected to a successful smoke control and fire resistance test, in accordance with EN 1634-1, EN 1634-2 or EN 1634-3 to prove the effect of the product on the smoke control and/or fire resistance of the complete door assembly. Testing shall be from both sides unless the test laboratory expert decides that it is appropriate to test from the one side of the door only (worst case situation for the lock), in which case in it should be allowed and stated in the test report.

The evidence and test application/method shall be shown in the product information corresponding to EN 16035 Hardware Performance Sheet (HPS).

It is not necessary for the product to be operable after such a fire resistance test.

NOTE 1 It is the responsibility of the specifiers to ensure that the fire resistance evidence for any lock covers the type of fire resistance door for which the lock is intended.

NOTE 2 The use of a deadbolt may prevent self-closing of the fire resistance door. It is the responsibility of the national regulation body to decide which type of deadbolt operation is acceptable.

Table A.1 — Differences between grades A, B and N

Requirement/ characteristic	**Requirement clauses in this European Standard**	**Grade A**	**Grade B**	**Grade N**	**Notes (expression of performance)**
Resistance to fire E (integrity)	5.2.1	—	Minimum Grade 2	Minimum Grade 1 where applicable	Pass/fail criteria for: Side force on latch bolt (if any) to keep the door closed during fire
	5.5	—	—	—	Minimum performance requirement based on fire resistance test
Resistance to fire I (insulation)	5.5	None	None	None	Pass/fail criteria for: Minimum performance requirement based on fire resistance test
Resistance to smoke leakage	5.2.1 5.5	Minimum Grade 1	—	—	Pass/fail criteria for: Side force on latch bolt (if any) to keep the door closed during fire Minimum performance requirement based on smoke test

Annex B
(normative)

Test sampling and sequencing for locks and latches

Each test sequence shall be conducted on one sample. One extra sample shall be provided for reference and substitution. If the reference lock, latch or locking plate is used, the complete test sequence shall be repeated.

Manufacturer and test laboratory shall determine the minimum number of locks from different types in order to cover a family.

The samples A, B, C,..... shall follow the sequence 1, 2, 3 .... that starts with 1.

For evaluation of essential characteristic 2 samples shall be subject to the sequence of test as shown in Table B.1.

For classification of lock with its keys up to 10 samples shall be subjected to a sequence of test as shown in Table B.2:

1 sample for extra test if any sequence will fail

For classification of Locking Plate up to 5 samples shall be subject to test as shown in Table B.5:

4 samples (A –D) for Static forces and Durability

1 sample for extra test if any test fails

If there is more than one test performed on each sample, the test sequence shall ensure that previous tests do not have any influence on following tests in agreed sequence.

Following tests for side force and disengaging force 6.2.1, 5.11.3.1, 5.11.3.2, 5.11.5.1, 5.11.5.2 (column U/S Table B.1) shall declare which test rig used, unsupported (Figure 11 and 23) or supported (Figure 12 and 24).

Table B.1 — Test sampling and sequencing of essential characteristic for locks and locking plates

Sub clause	Test clause	Test	U/S[a]	Sequence
		Test sample A		
4.2.1	6.2.1	Resistance to side force on latch bolt	X	**1**
4.1.3	6.1.3	Return force of latch bolt		**2**
4.4.2	5.7.2	Door closing force		**3**
4.5	Annex A	Suitability for use in fire resistance and/or smoke control doors		**4**
		Test sample B		
4.3.1	6.3.1	Durability of latch action		**1**
4.7.1	6.7.1	Corrosion resistance		**2**
4.1.2	6.1.3	Return force of latch bolt		**3**
4.4.2	6.4.2	Door closing force		**4**

Sub clause	Test clause	Test	U/S[a]	Sequence

[a] U/S = unsupported or supported test rig

Table B.2 — Test sampling and sequencing for classification of locks

			test sample identification								
Sub clause	**Test clause**	**Test**	**U/S[a]**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
4.1.3	5.4.2	Return force of latch bolt		**2**							
4.1.6	5.4.5	Strength of bolt action				**1**					
4.1.7	5.4.6	Minimum follower restoring torque		**3**							
4.2.1	5.5.1	Resistance to side force on latch bolt	X			**2**					
4.2.2	6.2.2	Torque to operate dead bolt or latch bolt		**4**							
4.2.3	6.2.3	Strengths of follower stops					**1**				
4.2.4	6.2.4	Torque resistance lockable deadbolt operation by handle/knob					**2**				
4.3.1	6.3.1	Durability of latch action		**6**							
4.3.2	6.3.2	Durability of deadbolt mechanism		**(7)**[b]	**1**						
4.3.3	6.3.3	Durability of locking snib mechanism		**8**							
4.4.2	5.7.2	Door closing force		**5**							
4.7.1	5.10.1	Corrosion resistance			**4**						
4.7.2	5.10.2	Operation at extremes of temperature			**2**						
4.8.3	5.11.2	Torque resistance of knob of tubular lock			**3**						
4.8.4.1	5.11.3.1	Resistance to side force on deadbolt	X					**1a**			
4.8.4.2	5.11.3.2	Resistance to drilling and side force on deadbolt	X					**1b**			
4.8.5	5.11.4	Deadbolt projection		**1**							
4.8.6.1	5.11.5.1	Resistance to disengaging force	X						**1a**		
4.8.6.2	5.11.5.2	Resistance to drilling and disengaging force	X						**1b**		
4.8.7.1	5.11.6.1	Resistance of pulling of anti separation bolt								**1a**	
4.8.7.2	5.11.6.2	Resistance of drilling and pulling of anti-separation bolt								**1b**	
4.8.8.1	5.11.7.1	Resistance to forcing of anti-lifting device in sliding door lock									**1a**
4.8.8.2	5.11.7.2	Resistance to forcing of anti-locking device in sliding door lock with drill protection									**1b**
4.8.9	5.11.8	Torque resistance of lockable follower				**3**					

			test sample identification								
Sub clause	**Test clause**	**Test**	**U/S**[a]	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
		(burglar)									
4.8.10	5.11.9	Strong key attack on lever locks									
4.9.4	5.12.4	Non-interpassing of keys with just one interval differ		**9**							
4.5	Annex A	Suitability for use in fire/smoke doors	**Essential characteristic see Table B1**								

a U/S = unsupported or supported test rig.

b On Sample A in case of shared latch action instead of Sample B.

Table B.3 — Key test sample and sequence

Key test sample identification			A
Sub clause	**Test clause**	**Test**	
4.1.5	5.4.4	Strength of lever lock key	1

Table B.4 — Verification of locks and key

Locks and Key verification			Check with reference to manufacturer's documentation
Sub clause	**Test clause**	**Test**	
4.1.2	5.4.1	Dangerous substances	
4.1.4	5.4.3	Product information	
4.1.8	5.4.7	Protection against removal from door	
4.4.1	5.7	Door mass	
4.8.2	5.11.1	Locking	
4.9.1 4.9.2 4.9.3 4.9.5	7.2.8	Key identification of lever locks	

Table B.5 — Locking plate test sample and sequence for classification

Locking plate test sample identification			A	B	C	D
Sub clause	**Test clause**	**Test**				
4.8.12	5.11.10.1	Resistance to force on box protected locking plate	1			
4.8.13	5.11.10.2	Resistance to side force on locking plate		1		
4.8.14	5.11.10.3	Resistance to pulling of locking plate			1	
4.8.15	5.11.10.4	Resistance to lifting force on locking plate				1

Annex C
(informative)

Product information

The following product information can be presented differently by the manufacturer.

This can be made available in different ways, paper, internet etc.

Table C.1 is an example.

Table C.1 — Product information

Intended use	Yes/No	Comments (additional information to the classification)	Reference
On hinged doors		Locks are tested for side force and end force	
Supported lock application		Tested in accordance with 5.5.1 and 5.11.3 using the fixture 20 or 29 and/or 5.11.5 using fixture 32 with support	
Unsupported lock application		Tested in accordance with 5.5.1 and 5.11.3 using the fixture 19 or 28 and/or 5.11.5 using fixture 31 without support	
Suitability for use on smoke doors		See manufacturers declaration referring to a test according to EN 1634–3 or declaration of melting point of the relevant latching parts and if applicable the duration of the proven smoke resistance	
Suitability for use on smoke control /fire resistance doorset		See manufacturers declaration referring to a test according to EN 1634–1 or declaration of melting point of the relevant latching parts and if applicable the duration of the proven smoke control and/or fire resistance	
Lock for use with unsprung handle		The lock shall conform to 5.4.6, minimum follower restoring torque of 0,8 Nm	
Lock for use with spring supported handle		The manufacturers declaration of the restoring torque.	

Application for locks locked from the inside (Where use of key from inside needed to gain egress)		It shall not be possible from the inside to remove parts which contribute to the burglary resistance of lock, except with special tools	

Annex ZA
(informative)

Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation (305/2011)

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under Mandate M/101 "External doors and windows, roof openings and roof lights (including fire resistance doors and shutters)" – amended, given to CEN by the European Commission and the European Free Trade Association.

If this European standard is cited in the Official Journal of the European Union (OJEU), the clauses of this standard, shown in this annex, are considered to meet the provisions of the relevant mandate, under the Regulation (EU) No. 305/2011.

REMINDER: Other requirements and other EU Directives, not affecting the fitness for intended use, can be applicable to locks falling within the scope of this European Standard.

This annex establishes the conditions for the CE marking of locks intended for the uses indicated in Table ZA.1 and shows the relevant clauses applicable.

This annex deals with the CE marking of the mechanical lock, latches and locking plate intended for the uses indicated in Table ZA.1 and shows the relevant clauses applicable.

This annex has the same scope as the relevant part in Clause 1 of this standard related to the aspect covered by the mandate and is defined by Table ZA.1.

Table ZA.1 — Relevant clauses for locks for the product and the intended use

Product:	Mechanical locks and their locking plates, as covered by the scope of this standard.		
Intended use:	on fire resisting and/or smoke controlled doors: a) in conjunction with an appropriate door closing device, to fulfil the self-closing requirement of such doors. b) thereafter to ensure that the fire integrity of the door and frame is not compromised.		
Essential characteristics	**Clauses in this and other European Standard (s) related to essential characteristics**	**Regulatory Clauses**	**Notes**
Self-closing - Ability to close and keep the door in a closed position			
- return force of latch bolt	4.1.3	-	Threshold value
- Door closing force	4.4.2	-	technical classes of performance
Durability of self-closing against aging and degradation			
- Durability of latch	4.3.1	-	technical classes of

action			performance
- corrosion resistance	4.7.1	-	technical classes of performance
- Suitability for use on fire resistance and/or smoke control doorset	4.5		technical classes of performance
Dangerous substances	4.1.2	-	description

The declaration of the product performance related to certain essential characteristics is not required in those Member States (MS) where there are no regulatory requirements on these essential characteristics for the intended use of the product.

In this case, manufacturers placing their products on the market of these MS are not obliged to determine nor declare the performance of their products with regard to these essential characteristics and the option "No performance determined" (NPD) in the information accompanying the CE marking and in the declaration of performance (see ZA.3) may be used for those essential characteristics.

ZA.2 Procedure for AVCP of locks and locking plates

ZA.2.1 System(s) of AVCP

The AVCP system(s) of mechanical locks indicated in Table ZA.1, established by EC Decision(s) 1999/93/EC (OJEU L29 of 3.2.1999) is shown in Table ZA.2 for the indicated intended use(s) and relevant level(s) or class(es) of performance.

Table ZA.2 — System of attestation of conformity

Product	Intended use	Level(s) or class(es) of performance	AVCP system(s)
Building hardware related to doors, gates and windows	On fire resistance and/or smoke control doors	—	1
System 1: See Regulation (EU) No. 568/2014 (CPR) Annex V, 1.2.			

The AVCP of the mechanical locks in Table ZA.1 shall be according to the AVCP procedures indicated in Table ZA.3 resulting from application of the clauses of this or other European Standard indicated therein. The content of tasks of the notified body shall be limited to those essential characteristics as provided for, if any, in Annex III of the relevant mandate and to those that the manufacturer intends to declare.

Table ZA.3 — Assignation of AVCP for locks and locking plates under system 1

Tasks		Content of the task	AVCP clauses to apply
Tasks for the manufacturer	Factory production control (FPC)	Parameters related to essential characteristics of Table ZA.1 relevant for the intended use which are declared	6.3

	Further testing of samples taken at the manufacturing plant by the manufacturer in accordance with the prescribed test plan.	Essential characteristics of Table ZA.1 relevant for the intended use which are declared	6.3.2.6
Tasks for the notified product certification body	Decide on the issuing, restriction, suspension or withdrawal of the certificate of constancy of performance of the construction product on the basis of the outcome of the following assessments and verifications carried out by that body:		
	Determination of the product type on the basis of type testing (including sampling), type calculation, tabulated values or descriptive documentation of the product	Essential characteristics of Table ZA.1 relevant for the intended use - Self-closing - Durability of self-closing against aging and degradation - Suitability for use on fire resistance and smoke control doorset	6.2
	Initial inspection of the manufacturing plant and of FPC	Parameters related to essential characteristics of Table ZA.1 relevant for the intended use which are declared Documentation of FPC	6.3.4
	Continuous surveillance, assessment and evaluation of FPC	Parameters related to essential characteristics of Table ZA.1 relevant for the intended use which are declared Documentation of FPC	6.3.5

ZA.2.2 Declaration of performance (DoP)

ZA.2.2.1 **General**

The manufacturer draws up the DoP and affixes the CE marking on the basis of the different AVCP systems set out in Annex V of the Regulation (EU) No 305/2011:

— the factory production control and further testing of samples taken at the factory according to the prescribed test plan, carried out by the manufacturer; and

— the certificate of constancy of performance issued by the notified product certification body on the basis of determination of the product type on the basis of type testing (including sampling), type calculation, tabulated values or descriptive documentation of the product; initial inspection of the manufacturing plant and of factory production control and continuous surveillance, assessment and evaluation of factory production control.

ZA.2.2.2 **Content**

The model of the DoP is provided in Annex III of the Regulation (EU) No 574/2014.

According to this Regulation, the DoP shall contain, in particular, the following information:

— the reference of the product-type for which the declaration of performance has been drawn up;

— the AVCP system or systems of the construction product, as set out in Annex V of the CPR;

— the reference number and date of issue of the harmonized standard which has been used for the assessment of each essential characteristic;

— where applicable, the reference number of the Specific Technical Documentation used and the requirements with which the manufacturer claims the product complies.

The DoP shall in addition contain:

a) the intended use or uses for the construction product, in accordance with the applicable harmonized technical specification;

b) the list of essential characteristics, as determined in the harmonized technical specification for the declared intended use or uses;

c) the performance of at least one of the essential characteristics of the construction product, relevant for the declared intended use or uses;

d) where applicable, the performance of the construction product, by levels or classes, or in a description, if necessary based on a calculation in relation to its essential characteristics determined in accordance with the Commission determination regarding those essential characteristics for which the manufacturer shall declare the performance of the product when it is placed on the market or the Commission determination regarding threshold levels for the performance in relation to the essential characteristics to be declared;

e) the performance of those essential characteristics of the construction product which are related to the intended use or uses, taking into consideration the provisions in relation to the intended use or uses where the manufacturer intends the product to be made available on the market;

f) for the listed essential characteristics for which no performance is declared, the letters “NPD” (No Performance Determined).

Regarding the supply of the DoP, Article 7 of the Regulation (EU) No 305/2011 and commission delegated regulation (EU) No 157/2014 applies.

The information referred to in Article 31 or, as the case may be, in Article 33 of Regulation (EC) No 1907/2006, (REACH) shall be provided together with the DoP.

ZA.2.2.3 **Example of DoP**

The following gives an example of a filled-in DoP for mechanical locks

DECLARATION OF PERFORMANCE

No. xxx (to be given by the manufacturer)

1. Unique identification code of the product-type:

to be given by the manufacturer

2. Intended use/es of the construction product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:

to fulfil the self-closing requirement on fire compartmentation doors and thereafter to ensure that the fire integrity of the door and frame is not compromised.

3. Manufacturer

Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 11(5):

AnyCo SA,

PO Box 21

B-1050 Brussels, Belgium

Tel. +32987654321

Fax: +32123456789

Email: anyco.sa@provider.be

4. Authorized representative

Where applicable, name and contact address of the authorized representative whose mandate covers the tasks specified in Article 12(2):

NA

5. Harmonized standard

In case of the declaration of performance concerning a construction product covered by a harmonized standard:

EN 12209:2016

6. Notified body/ies

Notified product certification body No. xxxx performed the determination of the product type on the basis of type testing, initial inspection of the manufacturing plant and of the factory production control and continuous surveillance, assessment and evaluation of factory production control and issued the certificate of constancy of performance of the product.

Notified product certification body No. xxxx

7. Declared performance/s

Essential characteristics	Performance	Harmonized technical specification
Return force of latch bolt	Force ≥ 2,5 N	EN 12209:2016
Door closing force	Grade 4: ≤ 25 N	
Durability of latch action	Grade B: 100 000 test cycles	
Corrosion resistance	Grade C: high corrosion resistance (96h); — no temperature requirement;	
Suitability for use on fire resistance and/or smoke control doorset	Grade B: for use on smoke control and fire resisting doorset assemblies based on a test in accordance with EN 1634–1 or EN 1634–2 where the mechanical lock contributes to the integrity as described in Annex A;	
Dangerous substances	Substance x, content: xx mg	

8. Appropriate Technical Documentation and/or Specific Technical Documentation:

N/A

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

……

(name and function)

…… ……

(place) (date of issue)

……

(signature)

ZA.3 CE marking and labelling

The CE marking symbol shall be in accordance with the general principles set out in Article 30 of Regulation (EC) No 765/2008 and shall be affixed visibly, legibly and indelibly:

— to the mechanical lock, locking plate or

— to a label attached to it.

Where this is not possible or not warranted on account of the nature of the product, it shall be affixed:

— to the packaging or

— to the accompanying documents.

The CE marking shall be followed by:

— the last two digits of the year in which it was first affixed;

— the name and the registered address of the manufacturer, or the identifying mark allowing identification of the name and address of the manufacturer easily and without any ambiguity;

— the unique identification code of the product-type;

— the reference number of the declaration of performance *[see example of DoP]*;

— the level or class of the performance declared;

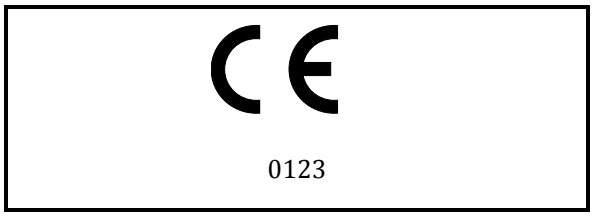
— the dated reference to the harmonized technical specification applied;

— the identification number of the notified body;

— the intended use as laid down in the harmonized technical specification applied.

The CE marking shall be affixed before the construction product is placed on the market. It may be followed by a pictogram or any other mark notably indicating a special risk or use.

Figures ZA.1 and ZA.2 give examples of the information related to products subject to AVCP under each of the different systems to be given on the product and on the accompanying documents.



CE marking, consisting of the "CE"-symbol

Identification number of the product certification body

Figure ZA.1 — Example CE marking information to be placed on the product

CE 0123	*CE marking, consisting of the "CE"-symbol* *Identification number of the product certification body*
AnyCo Ltd **P.O.BOX. 21** **B-1050 Brussels, Belgium**	*name and the registered address of the manufacturer, or identifying mark*
13	*Last two digits of the year in which the marking was first affixed*
DOP 0001	*Reference number of the DoP*
EN 12209:2016	*No. of European standard applied, as refer-enced in OJEU*
Product ABC	*Unique identification code of the product-type*
Intended use: on fire resisting and/or smoke controlled doors: a) in conjunction with an appropriate door closing device, to fulfil the self-closing requirement of such doors b) thereafter to ensure that the fire integrity of the door and frame is not compromised.	*Intended use of the product as laid down in the European standard applied*
Return force of latch bolt: ≥ 2,5 N **Door closing force:** Grade 4: ≤ 25 N **Durability of latch action:** Grade B: 100 000 cycles **Corrosion resistance:** Grade C: high corrosion resistance (96h); **Suitability for use on fire resistance and/or smoke control doorset:** Grade B: Suitability for use on fire resistance and/or smoke control doorset:	*Level or class or description of the performance declared*
Dangerous substances: Substance x, content: xx mg	*Name and content or release of dangerous substance(s) > threshold levels*

Figure ZA.2 — Example of CE marking information to be placed on the accompanying documentation

Bibliography

[1] EN 179, *Building hardware - Emergency exit devices operated by a lever handle or push pad, for use on escape routes - Requirements and test methods*

[2] EN 1125, *Building hardware - Panic exit devices operated by a horizontal bar, for use on escape routes - Requirements and test methods*

[3] EN 1906, *Building hardware - Lever handles and knob furniture - Requirements and test methods*

[4] EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

[5] EN 13501-2, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services*

[6] EN 14846, *Building hardware - Locks and latches - Electromechanically operated locks and striking plates - Requirements and test methods*

[7] EN 15269, *(all parts) Extended application of test results for fire resistance and/or smoke control for door, shutter and openable window assemblies, including their elements of building hardware*

[8] prEN 15685, *Building hardware - Locks and latches – Multipoint locks and their locking plates - Requirements and test methods*

[9] EN 16034, *Pedestrian doorsets, industrial, commercial, garage doors and openable windows - Product standard, performance characteristics - Fire resisting and/or smoke control characteristics*

[10] EN 12519, *Windows and pedestrian doors - Terminology*

[11] EN ISO 9001, *Quality management systems — Requirements (ISO 9001)*

[12] ISO 10899, *High-speed steel two-flute twist drills — Technical specifications*

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