

Specification for

Locks and latches for doors in buildings

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The Hardware and Ironmongery Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following Government department and scientific and industrial organizations:

- Aluminium Federation
- Aluminium Window Association
- Association of Builders' Hardware Manufacturers*
- British Hardware Federation*
- British Ironfounders' Association
- British Lock Manufacturers' Association*
- Department of the Environment (Building Research Establishment)
- Department of the Environment (Housing and Construction)*
- Greater London Council*
- Guild of Architectural Ironmongers*
- Metropolitan Police
- Royal Institute of British Architects*
- Royal Institution of Chartered Surveyors
- Steel Window Association
- Zinc Development Association*

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

- Association of Burglary Insurance Surveyors
- British Plastics Federation
- British Woodworking Federation
- Consumer Standards Advisory Committee of BSI
- Hardware Manufacturers' Federation
- Incorporated Association of Architects and Surveyors
- Institute of Carpenters

This British Standard, having been prepared under the direction of the Hardware and Ironmongery Standards Committee, was published under the authority of the Executive Board and comes into effect on 30 June 1980

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Foreword

This British Standard has been prepared under the direction of the Hardware and Ironmongery Standards Committee and is a revision and combination of two earlier British Standards, covering locks and latches primarily for wooden doors:

BS 455:1957, *Schedule of sizes for locks and latches for doors in buildings*.

BS 2088:1954, *Performance tests for locks*.

This revision and combination of BS 455 and BS 2088, which are hereby withdrawn, includes a change to SI metric units.

The standard now divides locks and latches into two categories of use, as follows:

category A, locks and latches for use in housing;

category B, locks and latches for use in other buildings where a more robust construction is necessary.

Dimensions are specified for locks and latches in category A only but all other requirements apply to both categories. The dimensions specified will permit preparation of woodwork in advance and maximum interchangeability, both important considerations for housing schemes.

It should be noted that clause 4 of this standard, which effectively replaces BS 455, omits some rim locks and rim latches for which demand is now infrequent, but does include for the first time tubular mortice latches and bored lock and latch sets. However, test requirements for rim locks and latches are still included as these types may still be required for purposes other than housing.

Since locks and latches are articles of which the main performance requirement is a long efficient life under conditions of hard usage, the tests are designed to accelerate the conditions of use in order to produce in a short time the effects of normal wear over a long period. Using samples taken at random the wearing qualities of a stock of locks and latches may be determined within a reasonable space of time. The tests are graded where necessary to take account of the extra durability required for use in category B. The materials to be chosen are not specified as the tests ensure that only those of suitable strength and durability can be used.

The manufacture and fitting of locks and latches for fire resisting doors require special consideration. The design and the materials used are governed by the purpose and the type of door in question and such considerations lie outside the scope of this standard.

Similarly, while it is not within the scope of this standard to specify design features in detail, attention is drawn to the fact that locks and latches used in situations which render them prone to interference by vandals may also require special attention.

Where conditions demand locks of higher performance and security, such as may be required by insurance surveyors, attention is drawn to BS 3621 "Specification for Thief resistant locks".

Certification. Attention is drawn to the certification facilities described on the inside back cover of this standard.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 18, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard specifies tests and levels of performance for locks and latches for doors used in buildings. For locks and latches for doors used in housing it also specifies dimensions. Locks and latches for fire doors are not included.

2 References

The titles of the publications referred to in this standard are listed on the inside back cover.

3 Definitions

For the purposes of this British Standard the following definitions, together with those given in BS 3827-1 and BS 3827-2, apply.

3.1

category A locks and latches

locks and latches primarily intended for use in housing

3.2

category B locks and latches

locks and latches primarily intended for use in public and other buildings, these being of more robust construction than those in category A

4 Dimensions of locks and latches

4.1 Locks and latches in category A. The dimensions and dimensional tolerances which affect fixing shall be as shown in the appropriate figure given in Table 1.

Table 1 — Figures showing dimensions for locks and latches in category A

Type	Number of sizes	Figure number
Cylinder rim night latch	4	Figure 1 and Figure 2
Horizontal mortice lock	2	Figure 3
Upright mortice lock and bathroom lock	3	Figure 4
Striking plates for upright mortice locks	1	Figure 5
Mortice latch (flat case)	2	Figure 6
Mortice latch (tubular case)	2	Figure 7
Bored lock and latch sets	1	Figure 8
NOTE The figures are not intended to illustrate design details.		

Where no dimensions are specified they shall be at the discretion of the manufacturer, provided the lock or latch can be accommodated in the mortice illustrated.

4.2 Locks and latches in category B. The dimensions shall be at the discretion of the manufacturer.

5 Finishes

Where any of the finishes specified in the following British Standards are used, they shall comply with the requirements and the conditions of service specified therein.

BS 1224, *Electroplated coatings of nickel and chromium*.

BS 1615, *Anodic oxidation coatings on aluminium*.

BS 1706, *Electroplated coatings of cadmium and zinc on iron and steel*.

BS 3189, *Phosphate treatment of iron and steel*.

6 Test sample

6.1 Three locks or latches shall be taken from stock and shall be tested in accordance with Appendix A in the as received condition. No lubricant shall be added except as permitted in the tests specified in A.14 and A.17.

6.2 If each lock or latch complies with all the appropriate requirements of clauses 7 and 8, the stock shall be deemed to comply with the test requirements of this British Standard.

6.3 If any lock or latch fails to comply with all the appropriate requirements of clauses 7 and 8, then a second test sample of three locks or latches shall be taken from the same stock and shall be tested in accordance with Appendix A. If any lock or latch in the second sample fails to comply with all the appropriate requirements of clauses 7 and 8, then the stock shall be deemed not to comply with the test requirements of this British Standard.

7 Sequence of tests

Each lock or latch in the test sample shall be prepared for testing as specified in A.1 and shall undergo all the tests appropriate to its type specified in Appendix A, in the same order in which they are listed.

8 Performance requirements

8.1 Freedom of operation of follower, knob and spring bolt action. After testing by the methods described in A.2, A.3, A.4 and A.5, the bolt shall return to its normally extended position under its own spring pressure.

8.2 Strength of bolt spring. When depressed to its full extent by the method described in A.6, the bolt shall just support a force within the limits given in Table 2.

8.3 Strength of follower or cam, knob, spring bolt and stopping medium. After testing by the methods described in A.7, A.8 and A.9, no part of the lock or latch shall be damaged or distorted.

8.4 Axial force on knobs of bored lock or latch sets. After testing by the method described in A.10, no part of the lock or latch shall be damaged or distorted.

8.5 Strength of security mechanism of bored lock or latch sets. After testing by the method described in A.11, the mechanism of the product shall not be damaged.

8.6 Strength of connecting bar in rim cylinders. After testing by the method described in A.12, the connecting bar shall not have taken on a permanent set of more than 8°, measured over the 38 mm distance specified.

8.7 Dead bolt against end pressure. When the mechanism is tested by the method described in A.13.1, turning the key to throw the bolt shall fully extend the bolt and lock it. A reverse turn of the key shall unlock and withdraw the bolt.

After testing by the method described in A.13.2, there shall be no damage to the mechanism, and the key shall continue to operate the mechanism correctly.

8.8 Operation of security mechanism. After testing by the methods described in A.14.1, A.14.2 or A.14.3, the lock or latch shall still be operable by the key. In the case of deadbolt mechanisms, it shall not be possible to remove the key from the lock before the bolt is fully thrown and properly detained. Any failure of the key or the lock or latch shall be deemed to be a failure of the test.

8.9 Strength of keys. After testing by the methods described in A.15 a) or b), there shall be no permanent set to the key.

8.10 Spring bolt through follower or knob. After testing by the method described in A.16, the spring bolt action shall continue to function correctly.

8.11 Spring bolt through striking plate or staple. After testing by the method described in A.17, the spring bolt shall continue to function correctly.

8.12 Locking snib action on cylinder rim night latches. After testing by the method described in A.18.1, there shall be no damage or distortion to any part of the bolt or snib mechanism.

After testing by the method described in A.18.2, the snib mechanism shall continue to function correctly.

8.13 Strength of lock or latch case, forend and bolt. After testing by the method described in A.19, there shall be no damage or distortion to the lock or latch case, forend or bolt.

8.14 Strength of staple. After testing by the method described in A.20, there shall be no damage or distortion to the staple.

8.15 Strength of striking plate. After testing by the method described in A.21, there shall be no damage or distortion to the striking plate.

9 Marking

Locks and latches shall be marked with the name, trade mark or other means of identification of the manufacturer.

Appendix A Test methods

A.1 Fixing to test block. With the exception of the tests given in A.2, A.3, A.4 and A.5, fix the sample locks, latches, striking plates or staples to test blocks of whitewood (European) according to the manufacturer's instructions. The test blocks shall be not less than 35 mm thick for mortice locks, latches and striking plates in category A and for bored lock and latch sets, and not less than 40 mm thick for all other locks and latches.

Where fixing is by wood screws they shall be as supplied or recommended by the manufacturer.

The mortice for locks and latches in category A shall be as shown in Figure 3 to Figure 7. For locks and latches in category B the mortice shall give a clearance of not less than 1 mm above each face of the lock or latch case.

A.2 Freedom of operation of follower and spring bolt action in rim and mortice locks and latches. With the lock or latch held against the face of the block, mount a test spindle concentrically and perpendicularly in bearings fitted to the block and passing through the follower (see Figure 9). Turn the spindle sufficiently to withdraw the bolt. If the lock or latch design allows, turn the spindle in both directions sufficiently to withdraw the bolt.

A.3 Freedom of operation of cap follower and spring bolt action in cylinder rim night latches. With the latch held against the face of the block, mount a test spindle simulating a cylinder connecting bar concentrically and perpendicularly in bearings fitted to the block and coupled to the cap follower (see Figure 10). Turn the spindle sufficiently to withdraw the bolt. If the latch design allows, turn the spindle in both directions sufficiently to withdraw the bolt.

A.4 Freedom of operation of knob or handle and spring bolt action in cylinder rim night latches. With the latch held against the face of the block, turn the knob or handle on the latch case sufficiently to withdraw the bolt. If the latch design allows, turn the knob or handle in both directions sufficiently to withdraw the bolt.

A.5 Freedom of operation of knob and spring bolt action in bored latch sets. Turn the knob sufficiently to withdraw the bolt. If the latch design allows, turn the knob in both directions sufficiently to withdraw the bolt.

A.6 Strength of bolt spring. Support the lock or latch with the forend horizontal. Gradually apply a force in accordance with Table 2 to the end of the spring bolt.

Table 2 — Strength of bolt spring

Type of lock or latch	Force	
	min.	max.
Cylinder rim night latch	9	14
Mortice locks and latches, plain action	11	16
Mortice locks and latches, easy action	6	12
Bored latch sets, easy action	6	12

A.7 Strength of follower, spring bolt and stopping medium in rim and mortice locks and latches. Connect the follower to a spindle supported as described in A.2. Subject the follower to a torque of 11 N m for 0.5 min in each direction.

A.8 Strength of knob, cams, spring bolt and stopping medium in rim night latches

A.8.1 Attach a clamp to the knob so that, when turned to its full extent, the knob is subjected to a torque of 3 N m. Maintain the torque for 0.5 min in each direction.

A.8.2 Connect the cap follower to a spindle as described in A.3. Subject the cap follower to a torque of 3 N m for 0.5 min.

A.9 Strength of knob spindle, knob, spring bolt and stopping medium in bored latch sets.

Attach a clamp to each knob in turn, so that when turned to its full extent the knob is subjected to a torque of 11 N m (see Figure 11). Maintain the torque for 0.5 min.

A.10 Axial strength of knobs of bored lock and latch sets. Mount the bored lock or latch set on an apparatus that permits an axial force to be applied to each knob (see Figure 12). Apply the following force:

category A, 1 120 N;

category B, 1 320 N.

Maintain the force for 0.5 min.

A.11 Strength of locking mechanism of bored lock or latch sets. Test the security of the locking mechanism by subjecting the locked knob to the following torque:

category A, 17 N m;

category B, 23 N m.

Maintain the torque for 0.5 min in each direction.

A.12 Strength of connecting bar in rim cylinders. Test the strength of the connecting bar by applying a torque of 3.75 N m at a distance of 38 mm from the end of the cylinder (see Figure 13). Maintain the torque for 0.5 min.

A.13 Dead bolt against end pressure

A.13.1 Support the lock with the forend horizontal and the dead bolt withdrawn, and apply a force of 14 N vertically to the end of the dead bolt. Throw and withdraw the bolt, operating the key with hand pressure only.

A.13.2 With the lock set up as in **A.13.1**, and with the dead bolt in the extended position, apply the following force vertically to the end of the dead bolt:

category A, 490 N;

category B, 980 N.

A.14 Operation of security mechanism

A.14.1 *Detainer alignment by key rotation.* If detainer alignment is obtained by rotation of the key in the lock, test the security mechanism by the following method.

Mount the lock with the forend vertical. Mount the key loosely in a supporting chuck. Throw and withdraw the dead bolt by turning the key through an angle of approximately 180° in each direction, or through an angle sufficient to ensure that the mechanism operates correctly. When repeating the test, turn the key from only one side of the lock, selected by the person conducting the test. Repeat the test at a speed not exceeding 70 operations per minute as follows:

category A, 60 000 operations;

category B, 100 000 operations.

NOTE The key may be cleaned and lubricated, at the start of the test and after each 10 000 operations, using a lubricant recommended by the manufacturer.

A.14.2 *Detainer alignment by key insertion.* If detainer alignment is obtained simply by insertion of the key in the lock, test the security mechanism by the following method.

Mount the lock with the forend vertical. Test the security mechanism by inserting the key. Test the bolt mechanism by rotating the key through an angle sufficient to throw the dead bolt. Reverse the rotation of the key through an angle sufficient to withdraw the dead bolt. Finally return the key to its neutral position.

If, however, by virtue of the design of the lock or of the test apparatus it is difficult to test the security mechanism and the bolt mechanism in one cycle, the test may be carried out as follows.

Insert the key into the security mechanism. Rotate the key through approximately 45° and then return it to the neutral position and withdraw it.

Throw and withdraw the dead bolt by the security mechanism with the key permanently inserted in the security mechanism.

Repeat the test at a speed not exceeding 70 operations per minute as follows:

category A, 60 000 operations;

category B, 100 000 operations

NOTE The key may be cleaned and lubricated at the start of the test and after each 10 000 operations, using a lubricant recommended by the manufacturer.

A.14.3 *Bored lock and latch sets and cylinder rim night latches.* Test the security mechanisms of bored lock and latch sets with night latch action and of cylinder rim night latches by the following method.

Mount the bored lock or latch set, or cylinder rim night latch, with the forend vertical, in the case of a cylinder rim night latch with the cylinder supported in correct alignment with the body of the latch. Operate the lock or latch by inserting the key and turning it to withdraw the bolt to within 1 mm of its full travel. Then release the bolt and withdraw the key. When repeating the test, turn the key in only one direction, selected by the person conducting the test.

Repeat the test at a speed not exceeding 70 operations per minute for 150 000 operations.

NOTE The key may be cleaned and lubricated at the start of the test and after each 10 000 operations, using a lubricant recommended by the manufacturer.

A.15 **Strength of keys.** Test the strength of one of the keys provided with the lock, latch, cylinder rim night latch, or bored lock or latch set by applying torque to the bow of the key as follows:

- If detainer alignment is obtained by key rotation, test the key by locating it in a suitable test fixture (see Figure 14).
- If detainer alignment is obtained simply by key insertion, insert the key fully, turn it to its full extent, and then subject it to a torque of 3 N m by means of a clamp engaging the bow to a depth of 12 mm.

Support the key as necessary to avoid forces other than the applied torque. Maintain the torque for 0.5 min.

A.16 Spring bolt through follower or knob.

Mount the rim or mortice lock or latch with the forend vertical and with the spindle supported as described in **A.2** and operated by either:

- a handle attached to the spindle and driven by a cam [see Figure 15(a)]; or
- a rack and pinion mechanism [see Figure 15(b)].

Alternatively, mortice locks and latches shall be mounted as described in **A.1** and fitted with a set of suitable lever handle furniture.

Mount the bored latch set as described in **A.1** with the forend vertical, and with a clamp or similar device on the knob coupled to the test apparatus.