

Building hardware — Cylinders for locks — Requirements and test methods

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British Standard

ICS 91.190

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The UK participation in its preparation was entrusted by Technical Committee B/538, Doors, windows, shutters, hardware and curtain walling, to Subcommittee B/538/4, Building hardware, which has the responsibility to:

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CEN

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 33, Doors, windows, shutters and building hardware, the secretariat of which is held by AFNOR.

The European Federation of Associations of Lock and Builders Hardware Manufacturers, ARGE, collaborated in the drafting of this European Standard.

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of an identical text or by endorsement, at the latest by September 1998, and conflicting national standards shall be withdrawn at the latest by September 1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

The aim of the test methods described in this European Standard is to keep human influence on the test results to a minimum, thus improving reproducibility.

1 Scope

This European Standard applies to cylinders for such locks as are normally used in buildings and are designed to be used with cylinders.

This European Standard specifies performance and other requirements for the strength, security, durability, performance and corrosion resistance of cylinders and their original keys. It establishes two categories of use based on performance tests and five grades of security based on design requirements and on performance tests that simulate attack. This European Standard includes tests of satisfactory operation at temperatures between -20°C and $+80^{\circ}\text{C}$. It specifies test methods to be used on cylinders and their protective measures linked with these cylinders and recommended by the manufacturer.

Corrosion resistance is specified by reference to the requirements of prEN 1670 on the protection of corrosion for locks and building hardware, see annex B.

The suitability of cylinders for use on fire/smoke-door assemblies is determined by fire performance tests conducted in addition to the performance testing required by this European Standard. Since suitability for use on fire doors is not essential in every situation, the manufacturer has the option to state if the cylinder has to conform to these additional requirements or not. If so claimed, the requirements laid down in prEN 1634-1 apply, see annex A.

On occasions there may be a need for additional functions within the design of the cylinder. Purchasers should ensure that the products are suitable for their intended use. This is particularly important when the operation of such additional functions is safety-related.

Accordingly, this European Standard includes obligatory assessment of such functions when they are included in the cylinder design.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

prEN 1670:1994, *Building hardware — Corrosion resistance of hardware for doors, windows, shutters and curtain walling — Requirements and test methods*.

prEN 1634-1, *Fire testing of door and shutter assemblies — Part 1: Method of test for fire resistance of fire doors and shutters*.

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1

cylinder

device, usually distinct from its associated lock or latch, operated by a key

3.2

effective differ

difference between cylinders of similar design, achieved only by the movable detainer, which allows each cylinder to be operated only by its own key. 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

3.3

movable detainer

part of the mechanism of a cylinder which has to be moved by the key into a pre-determined position before the key and/or plug can move

3.4

plug

part of a cylinder that moves when the key is turned

3.5

step

cut in the surface of a bit or blade which operates movable detainers

4 Requirements

The structure of this clause reflects the classification as given in clause 6.

4.1 Category of use

4.1.1 Operation at extremes of temperature

During testing in accordance with 5.1.1, it shall be possible to operate a cylinder with the proper key using a maximum torque of 1,5 N·m at both -20°C and $+80^{\circ}\text{C}$.

This requirement shall apply to cylinders of grade 1.

4.2 Test cycles — Durability

4.2.1 Durability

When tested in accordance with 5.2.1, it shall be possible to operate the cylinders with a new original key after the number of test cycles indicated in Table 1.

Table 1 — Number of cycles

Durability	Number of cycles
Grade 4	25 000
Grade 5	50 000
Grade 6	100 000

4.2.2 Key strength

When tested in accordance with 5.2.2, the key shall not break under the applied maximum torque of 2,5 N·m.
After the test, the key shall be capable of being removed from the cylinder and re-used to operate the same cylinder.

4.3 Door mass

No requirement.

4.4 Fire resistance

Reference is made to annex A.

4.5 Safety

No requirement.

4.6 Corrosion resistance

Cylinders for grade 1 shall conform to the corrosion resistance requirements of grade 3 of prEN 1670 as a minimum (see annex B).
No distinction is made between the inside and the outside of cylinder and/or door.
After the corrosion test, the cylinder shall operate, using a maximum torque on the key of 1,5 N·m.

4.7 Security

The grade of security required can differ from one side of a double cylinder to the other.

4.7.1 Minimum number of effective differs

The minimum number of effective differs shall be as indicated in Table 2.

Table 2 — Minimum number of effective differs

Security grade	Minimum number of effective differs
1	100
2	300
3	15 000
4	30 000
5	100 000

4.7.2 Minimum number of movable detainers

The minimum number of movable detainers shall be as indicated in Table 3.

Table 3 — Minimum number of movable detainers

Security grade	Minimum number of movable detainers
1	2
2	3
3	5
4	6
5	6

4.7.3 Maximum number of steps on the same level

The choice of key steps for movable detainer operation which have the same operating level shall be restricted as indicated in Table 4.

Table 4 — Maximum number of steps on the same level

Security grade	Maximum number of steps on the same level
1	100 %
2	70 % , max. 2 adjacent
3	60 % , max. 2 adjacent
4	60 % , max. 2 adjacent
5	50 % , max. 2 adjacent
NOTE Only one row of movable detainers is not permitted to contain more than two adjacent steps on the same level.	

4.7.4 Direct coding on key

Direct key coding shall not be permitted on keys for grades 3, 4 and 5.

4.7.5 Resistance to drilling

When tested in accordance with 5.7.5, the requirements of Table 5 shall apply.

Table 5 — Drilling time

Security grade	Max. net drilling time min	Total test time min
4	3	5
5	5	10

After testing in accordance with 5.7.5, it shall not be possible to rotate the lock driving element of the cylinders without the correct key, using a maximum torque of 5 N·m. It is not necessary for the correct key to operate the cylinder after testing.