

## Loss Prevention Standard

LPS 1242: Issue 2.1

Requirements and testing procedures for the LPCB approval and listing of cylinders for locks

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## **PARTICIPATING ORGANISATIONS**

This standard was approved by the LPC Fire and Security Board and Expert Group G. The following organisations participated in the preparation of this standard:-

Association of British Insurers  
 Association of Building Engineers  
 Association of Chief Police Officers  
 Association of Insurance Surveyors  
 Association for Specialist Fire Protection  
 British Automatic Fire Sprinkler Association  
 British Security Industry Association  
 BT Redcare  
 Cabinet Office (Observers)  
 Chief Fire Officers Association  
 Door & Hardware Federation  
 Electrical Contractors Association  
 European Fire Sprinkler Network  
 FIA  
 Health & Safety Executive  
 Home Office Scientific Development Branch  
 Metronet  
 Post Office  
 Risk Engineering Data Exchange Group  
 Royal and Sun Alliance  
 Royal Institution of Chartered Surveyors  
 Security Services Group  
 TPS Consult

## **REVISION OF LOSS PREVENTION STANDARDS**

Loss Prevention Standards will be revised by issue of revised editions or amendments. Details will be posted on our website at [www.redbooklive.com](http://www.redbooklive.com)

Technical or other changes which affect the requirements for the approval or certification of the product or service will result in a new issue. Minor or administrative changes (e.g. corrections of spelling and typographical errors, changes to address and copyright details, the addition of notes for clarification etc.) may be made as amendments. (See amendments table on page 32)

The issue number will be given in decimal format with the integer part giving the issue number and the fractional part giving the number of amendments (e.g. Issue 3.2 indicates that the document is at Issue 3 with 2 amendments).

**USERS OF LOSS PREVENTION STANDARDS SHOULD ENSURE THAT THEY POSSESS THE LATEST ISSUE AND ALL AMENDMENTS.**

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## FOREWORD

This standard identifies the evaluation and/or testing practices undertaken by LPCB for the purposes of approval and listing of products and services. LPCB listing and approval of products and services is based on evidence acceptable to LPCB:-

- that the product or service meets the standard
- that the manufacturer or service provider has staff, processes and systems in place to ensure that the product or service delivered meets the standard

and on:-

- periodic audits of the manufacturer or service provider including testing as appropriate
- compliance with the contract for LPCB listing and approval including agreement to rectify faults as appropriate

Full details of the LPCB scheme for approval and listing of cylinders for locks are provided in scheme document SD188.

## NOTES

Compliance with this LPS does not of itself confer immunity from legal obligations. Users of LPSs should ensure that they possess the latest issue and all amendments.

LPCB welcomes comments of a technical or editorial nature and these should be addressed to “the Technical Director” at [enquiries@breglobal.co.uk](mailto:enquiries@breglobal.co.uk).

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## 1 SCOPE

This standard describes requirements and test methods for classifying strength, durability, general security and burglary resistance to physical attack of mechanically operated cylinders and their original keys, and applies to cylinders that may be employed in lock sets used on the doors of buildings, or in padlocks.

The resistance of the cylinder to surreptitious manipulation is not tested. This will be the subject of a future Loss Prevention Standard.

Likewise, the requirements and test methods for classifying electronically coded keys and cylinders are beyond the scope of this standard and will be the subject of a future Loss Prevention Standard for mechatronic cylinders.

The suitability of cylinders certificated to LPS 1242 for use on fire/smoke-door assemblies is determined by fire performance tests conducted as described in Annex A of EN 1303: 2005.

The compatibility of cylinders and products which the cylinders may be incorporated in, or used with, is beyond the scope of this standard.

The requirements and test procedures described in this standard have, as far as possible, been rationalised and harmonised with the following corresponding British, European, LPCB and BSI standards:

BS 3621: 2007 <sup>(i)</sup>	Thief resistant lock assembly - Key egress
BS 8621: 2007 <sup>(i)</sup>	Thief resistant lock assembly - Keyless egress
BS 10621: 2007 <sup>(i)</sup>	Thief resistant dual-mode lock assembly
EN 1303: 2005 <sup>(i)</sup>	Building hardware - Cylinders for locks - Requirements and test methods
LPS 1175: Issue 7 <sup>(ii)</sup>	Specification for testing and classifying the burglary resistance of building components, strongpoints and security enclosures
PAS 24: 2007 <sup>(i)</sup>	Enhanced security performance requirements for door assemblies - Single and double leaf, hinged external door assemblies to dwellings

### Notes:

- (i) *Normative reference. Subsequent amendments to or revision of the referenced publication shall only apply to this Loss Prevention Standard when incorporated in it by amendment or revision.*
- (ii) *Informative reference.*

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## **2 DEFINITIONS**

The following definitions, in addition to those of EN 1303: 2005 shall apply for the purposes of this standard.

### **2.1 Attack side(s)**

The face of the product confronting the person attempting forced entry.

### **2.2 Manual attack resistance**

The capacity of the cylinder to withstand the attempt of forced operation by manual intervention when that cylinder is protected by the escutcheon or other security device(s) supplied with that cylinder.

### **2.3 Manual attack resistance rating**

Numeric indication of the degree of manual attack resistance afforded by the cylinder.

### **2.4 Manual attack resistance rating expectation**

The anticipated attack resistance rating for which the cylinder was designed.

### **2.5 Classification expectation**

The anticipated classifications according to this standard for which the cylinder was designed.

### **2.6 Manual intervention attack test**

A manual attempt at operating the cam or other operating element of the cylinder by forcing or removing the plug with the aid of tools but without using the original (change) key.

### **2.7 Next closest key**

Key which has one step at the next operating level, either up or down, from the corresponding step on the original key.

### **2.8 Original (change) key**

Key profiled to specifically operate the mechanism of the cylinder being tested.

### **2.9 Thumbturn**

A fitting on the non-attack side of some cylinders which is used to operate the cam directly.

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## 2.10 Total test time

The maximum duration of an individual manual intervention attack test. It is the accrued sum of the:

- working time;
- rest time of an operative for wellbeing and safety reasons;
- time taken to change tools or exchange defective expendable tool elements; and
- inspection time called by the project leader.

## 2.11 Working (resistance) time

The time of an individual manual intervention attack test in which a tool or tools is used to attempt to create a change in the test specimen.

The working time excludes:

- rest time of an operative for wellbeing and safety reasons;
- time to change tools or exchange defective expendable tool elements; and
- inspection time called by the project leader.

## 3 REQUIREMENTS

### 3.1 Information to be supplied by the applicant

The applicant shall provide comprehensive information about the product for consideration prior to examination and testing. This shall define the construction of the product over the range to be covered by the evaluation, together with any associated hardware (e.g. security escutcheons) and optional features (e.g. thumbturns). It shall include:

- a) Details of the applicant and, if different, the manufacturer of the product(s)/systems(s), including:
  - i) Name of manufacturer.
  - ii) Place of manufacture.
  - iii) Year of manufacture.
  - iv) Relationship of applicant to manufacturer.
  - v) Company responsible for design and quality assurance.
  
- b) Specifications and drawings accurately detailing the lock cylinder and any associated hardware (e.g. security escutcheons) and optional features (e.g. thumbturns). These shall include:
  - i) General assembly.
  - ii) Cross sections.
  - iii) Specifications for the various tumbler and disc designs and materials used, and rules relating to the minimum numbers of each type of moveable detainer employed in each cylinder of the type to be tested.



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- iv) The location and design of any local areas of special protection.
  - v) Details of any other elements relevant to physical security.
- c) A description of the materials used to construct the product if not shown on the drawings. This shall include material thicknesses and full details of any special finishes/processes applied, e.g. hardening.
  - d) Details of any materials or device(s) fitted to, or incorporated within, the product that may harm those testing/using/attacking the product together with associated material safety data sheets.
  - e) Instructions and specifications for secure and effective installation/use of the lock cylinder and the associated hardware (e.g. security escutcheons). These shall confirm limitations for use and recommendations for compatible door and lock materials/designs and anchorage where applicable.
  - f) Whether the product to be tested is a prototype or is in series production.
  - g) Confirmation of the end(s) of the cylinder designed to resist attack.
  - h) Differ chart and/or manufacturers calculations confirming the effective differs available on the cylinder to be evaluated.
  - i) Evidence of any patents relating to the key used to operate the cylinder.
  - j) The applicant's classification expectation.

All documents shall be dated and given a reference number and issue description.

If the applicant is not the manufacturer then an application must be accompanied by written permission from the manufacturer for testing to be undertaken.

### **3.2 Specimens to be supplied for testing**

The following shall be observed subsequent to the acceptance of an application for approval:

- a) The applicant shall supply an agreed number of specimens.
- b) The number of specimens to be supplied for test is dependent upon the test schedule specified for the product type, the classification sought by the applicant, together with the range of design variations and alternative hardware to be covered by the assessment.

All specimens shall be complete with associated hardware, fixings and instructions. Additional specimens of hardware may be required for separate tests.

- c) Additional component parts, such as spare keys, may be requested for testing purposes.

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- d) The type and configuration of specimens selected for testing shall be at the discretion of the test laboratory. The normal size and configuration of the product and its intended application shall be taken into account. Where the product is offered in a range of sizes and configurations, specimens of those sizes and configurations likely to be least effective against attack shall be chosen to ensure the test results are representative of the complete range.
- e) The test specimens shall incorporate optional features/accessories that could decrease the cylinder's manipulation resistance. They shall not incorporate optional features/accessories that could increase the intruder resistance provided by the product (e.g. chemicals or other additives designed to temporarily enhance the cylinder's resistance to manipulation).
- f) All specimens shall be supplied complete with specified fixings for secure installation and installed by the manufacturer or their nominated representative.
- g) The laboratory may request additional components or elements of products for testing purposes.
- h) If a prototype product or associated hardware/accessories is supplied for testing, then classification cannot not be provided until the drawings for subsequent series production have been examined and confirmed that they accord with the tested prototype or that any changes will not reduce the security rating.

*Note: Changes to production methods (e.g. machining to casting) or designs between prototype and final production stages may affect the products' performance. Therefore, it is not automatically possible to attribute security ratings achieved by prototype test samples to subsequent series production.*

- i) When the product incorporates advances or changes in technology, then additional sample pieces, parts or sections may be requested for evaluation prior to the supply of the agreed specimens.

### **3.3 Design requirements**

#### **3.3.1 Indication of attack side on double cylinders**

Double cylinders whose two ends are not designed to achieve the same classification shall be marked to indicate which end is designed to achieve each classification.

#### **3.3.2 User instructions**

Operating and maintenance instructions shall be provided with the product. These shall include instructions for lubricating the cylinder, including the specification of the lubrication to be used and recommended frequency of applying such lubrication.

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*Note: Suppliers have a duty of care to ensure that those fitting and/or using the products know how that product should be fitted and used to achieve the performance attributed to that product. The instructions submitted for evaluation must reflect those supplied with the product and must cover all aspects of installation and use that may affect the security provided by the product when installed.*

### **3.3.3 Installation methods**

The installation methods defined for the product shall include limitations and recommendations for compatible locks and doorset constructions relevant to the scope of use for which a classification to LPS 1242 is sought.

Instructions relating to double cylinders whose two ends do not achieve the same classification shall confirm how to determine which end achieves each classification (see also clause 3.3.1) and advice on which orientation the cylinder should be mounted in when fitted to a doorset to offer the designed performance.

- Notes:*
- i) Where suitability for use on fire doors is claimed within the classification box, the instructions supplied with the product shall reflect the limitations noted within the fire assessment reports that support the claims of suitability made. Where reference is made to the fire assessment report, copies of that report shall be accessible to those likely to wish to purchase or install the product.*
  - ii) It is recommended that all fixings and security features on products primarily intended for use in commercial properties are, as far as is reasonably possible and where applicable, tamper resistant on the non-attack side to prevent surreptitious interference of the designed level of security by an attacker's accomplice.*
  - iii) Any exposed fixings that can be accessed from the attack side may be exploited as part of the manual attack tests.*

### **3.3.4 Key related security**

#### **3.3.4.1 Differs**

The minimum number of effective differs shall be as indicated in Table 5.

#### **3.3.4.2 Minimum number of moveable detainers:**

The minimum number of moveable detainers shall be as indicated in Table 5.

#### **3.3.4.3 Maximum number of steps at the same level**

The choice of key steps for moveable detainer operation which have the same operating level shall be restricted as indicated in Table 5.

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A maximum of two adjacent steps in any one row of retainers may be on the same level for security grades 1, 2, 3, 4 and 5. No two adjacent retainers in cylinders of security grades 6, 7, 8 and 9 shall be at the same step height in any of the rows.

#### **3.3.4.4 Direct coding of keys**

Keys for cylinders of security grades 3, 4, 5, 6, 7, 8 and 9 shall not be directly coded.

#### **3.3.4.5 Key availability**

The following requirements shall be met according to the key related security classification sought:

- (a) Keys for cylinders of grades 6, 7, 8 and 9 shall be covered by a valid UK patent.
- (b) Cylinders (and their keys) of grades 5, 6, 7, 8 and 9 shall be subject to registration by the manufacturer. In addition, procedures for controlling updates to the registration database and the release of information shall be in place. Data relating to registration of keys of grades G and H shall be stored on a database approved to LPS 1224 Issue 3 (Requirements for Secure Database Registers).
- (c) The cylinder manufacturer shall have suitable controls in place, such that the issue of duplicate keys for cylinders of grades 7, 8 and 9 is restricted to being undertaken by the cylinder manufacturer only. Duplicate keys shall only be issued to persons nominated on written authorisation from the registered holders of the cylinder and original key.
- (d) The cylinder manufacturer shall have suitable controls in place such that issue of duplicate keys for cylinders of grades 5 and 6 is restricted to being undertaken by the cylinder manufacturer, and/or other bodies nominated by the cylinder manufacturer. Duplicate keys shall only be issued to persons nominated on written authorisation from the registered holders of the cylinder and original key.
- (e) Master keying of cylinders of grades 8 and 9 is not permitted.

### **3.4 Performance requirements**

#### **3.4.1 Key strength**

The lock cylinder and its associated key shall meet the requirements of clause 4.2 in EN 1303: 2005.

#### **3.4.2 Durability**

The lock cylinder and its associated key shall meet the requirements of clause 4.3 in EN 1303: 2005 appropriate to the durability class sought.

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### **3.4.3 Door mass**

No requirement.

### **3.4.4 Fire resistance**

The lock cylinder shall meet the requirements of clause 4.5 in EN 1303: 2005 appropriate to the fire resistance classification sought.

### **3.4.5 Safety**

No requirement.

### **3.4.6 Corrosion and temperature resistance**

The lock cylinder and its associated keys shall meet the requirements of clause 4.7 in EN 1303: 2005 appropriate to the corrosion and temperature resistance classification sought.

### **3.4.7 Key related security**

#### **3.4.7.1 Operation of security mechanism**

Lock cylinders of key related security grades 1 to 6, together with their associated keys, shall meet the requirements of clause 4.8.6 in EN 1303: 2005 appropriate to the key related security grade sought.

Lock cylinders of key related security grades 7 to 9, together with their associated keys, shall meet the requirements relating to cylinders of grades 4 to 6 defined in clause 4.8.6 in EN 1303: 2005.

#### **3.4.7.2 Torque resistance of the plug/cylinder relevant to key related security**

It shall not be possible to rotate the plug and/or cylinder when tested in accordance with clause 5.8.6 in EN 1303: 2005 using torque specified in Table 5.

### **3.4.8 Attack resistance**

#### **3.4.8.1 Resistance to drilling**

It shall not be possible to rotate the lock driving element of the cylinder without the correct key using a torque of 5 Nm when tested in accordance with clause 4.2.7.1.

*Note: It is not necessary for the correct key to operate the cylinder after conducting the tests to clause 4.2.7.1.*

#### **3.4.8.2 Resistance to attack by chisel**

It shall not be possible to rotate the lock driving element of the cylinder without the correct key using a torque of 5 Nm when tested in accordance with clause 4.2.7.2.

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The cylinder and its associated protection devices/hardware shall also be deemed to meet the requirements of this clause if the protection devices/hardware supplied with the cylinder prevents the chisel being applied to the cylinder in accordance with clause 4.2.7.2.

*Note: It is not necessary for the correct key to operate the cylinder after conducting the tests to clause 4.2.7.2.*

#### **3.4.8.3 Resistance to twisting**

It shall not be possible to rotate the lock driving element of the cylinder without the correct key using a torque of 5 Nm when tested in accordance with clause 4.2.7.3.

The cylinder and/or its associated protection devices/hardware shall also be deemed to meet the requirements of this clause if they cannot be gripped and the cylinder does not project beyond the protecting device and/or face of the door by more than 3 mm.

*Note: It is not necessary for the correct key to operate the cylinder after conducting the tests to clause 4.2.7.3.*

#### **3.4.8.4 Resistance to plug/cylinder extraction**

It shall not be possible to rotate the lock driving element of the cylinders manually with 5 Nm through 360°, or in the case of cylinders with restricted plug movement, to the maximum permitted by the design after testing in accordance with clause 4.2.7.4.

**The cylinder shall also be deemed to meet the requirements of this clause if the cylinder or associated protection/hardware supplied with that cylinder prevents the extraction force specified in Table 6 being applied to the cylinder in accordance with clause 4.2.7.4.**

*Note: It is not necessary for the correct key to operate the cylinder after conducting the tests to clause 4.2.7.4.*

#### **3.4.8.5 Torque resistance of plug/cylinder relevant to attack resistance**

**It shall not be possible to rotate the plug and/or cylinder when tested in accordance with clause 5.8.6 in EN 1303: 2005 using the torque specified in Table 6**

*Note: It is not necessary for the correct key to operate the cylinder after conducting the tests to clause 5.8.6 in EN 1303: 2005.*

#### **3.4.9 Manipulation resistance**

In order that a '1' manipulation resistance classification may be claimed in accordance with clause 5.9, it shall not be possible to rotate the lock driving element of the cylinders manually with 5 Nm through 360°, or in the case of

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cylinders with restricted plug movement, through the maximum angle permitted by the design during tests conducted in accordance with clause 4.2.8.

### **3.4.10 Manual attack resistance**

It shall not be possible to operate the cylinder's lock driving element as a result of conducting manual attack tests in accordance with clause 4.2.9 without using the original key.

*Note: It is not necessary for the correct key to operate the cylinder after conducting the tests to clause 4.2.9.*

## **4 TESTING**

### **4.1 Test requirements**

#### **4.1.1 General**

The overall objective is to confirm the classification achieved by the product by conducting a series of checks of documentation and samples submitted and testing the samples in accordance with this section to determine whether they meet the requirements of the classifications sought specified in clause 3.

Each box within the classification shall only be completed when all the requirements relating to that classification box are met.

#### **4.1.2 Data**

All documentation supplied shall be reviewed to ensure its suitability for testing and approval purposes.

The instructions and recommendations for secure installation and maintenance of the product shall be reviewed for adequacy of information; to include limitations of use and recommendation for compatible door and lock materials/designs and anchorage where applicable; and to assess any potential weaknesses for test purposes.

#### **4.1.3 Test specimens**

##### **4.1.3.1 General**

A minimum of thirteen cylinders shall be submitted for testing in accordance with clauses 4.2.2, 4.2.3, 4.2.5, 4.2.6 and 4.2.7.

Each of the cylinders shall be supplied with:

- the associated protection/hardware the manufacturer specifies should be used in order to achieve the classification sought; and
- a minimum of two keys.

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All specimens submitted for the above tests shall be selected at random from normal production.

#### 4.1.3.2 Manipulation test specimens

Six additional cylinders shall be submitted for manipulation testing in accordance with clause 4.2.8 if a '1' manipulation resistance classification is sought in accordance with clause 5.9.

These cylinders shall be representative of current production quality and shall meet the requirements of clause A.6i) in Annex A of BS 3621: 2007 *Thief resistant lock assembly - Key egress*.

These specimens shall be:

- (a) Mounted in accordance with clause A.6ii) in Annex A of BS 3621: 2007 using a lock representative of a type that the cylinder is designed to be mounted in/on.
- (b) Accompanied by one key blank of the design/material used to produce the keys supplied with that cylinder together with:
  - two test keys complying with clauses A.6iii), A.6iv) and A.6v) in Annex A of BS 3621: 2007.
  - One original key cut to suit the position of the detainers within the cylinder.

*Note: A further two samples may be requested for manipulation testing if a vulnerability that requires further testing is identified during the manipulation test conducted in accordance with clause 4.2.8.*

#### 4.1.3.3 Manual intervention attack test specimens

A minimum of six further cylinders shall be submitted for testing in accordance with clause 4.2.9 if a manual attack resistance classification of '1' to '8' is sought in accordance with clause 5.10.

Each of the cylinders shall be supplied with:

- the associated protection/hardware the manufacturer specifies should be used in order to achieve the classification sought; and
- a minimum of two keys.

All specimens submitted for the manual intervention attack tests shall be selected at random from normal production.



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#### **4.1.4 Conformity between specimens and documentation**

The test specimens shall be visually examined for conformity with the details supplied by the applicant prior to testing.

*Note: A lack of conformity identified at this stage or during testing may prevent the issue of a test report and subsequent approval / certification unless promptly corrected.*

#### **4.1.5 Conformity of specimens and documentation with design requirements**

The test specimens and documentation submitted shall be reviewed to confirm whether they meet the design requirements specified in clause 3.3 and specimen requirements defined in clause 4.1.3 prior to testing.

### **4.2 Test methods**

#### **4.2.1 General**

General laboratory procedures, confidential handling of specimens, event record requirements and presentation of the test report shall be in accordance with the requirements specified in BS EN ISO/IEC 17025 (General Requirements for the competence of testing and calibration laboratories).

Both ends of a double (key:key) cylinder specimen shall be subjected to each test appropriate to the classification sought with the exception of those submitted for manipulation testing to clause 4.2.8. If one end of the double cylinders is designed to be always orientated such that it faces the protected (non-attack) face of the doorset in which it is mounted, then the manipulation test need not be conducted on that end of the double cylinder.

#### **4.2.2 Key strength**

Two cylinders and their associated keys shall be tested in accordance with the requirements contained in clause 5.2 in EN 1303: 2005.

#### **4.2.3 Durability**

Two cylinders and their associated keys shall be tested in accordance with the requirements contained in clause 5.3 in EN 1303: 2005.

The number of test cycles each specimen is subjected to shall equal that defined in Table 3 appropriate to the durability classification sought.

#### **4.2.4 Fire resistance**

The cylinder shall be tested in accordance with the requirements contained in Annex A of EN 1303: 2005.

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#### **4.2.5 Corrosion and temperature resistance**

Two cylinders and their associated keys shall be tested in accordance with the requirements contained in clause 5.7 of EN 1303: 2005 and Annex B of EN 1303: 2005 appropriate to the corrosion and temperature resistance classification sought.

#### **4.2.6 Key related security**

##### **4.2.6.1 Operation of security mechanism**

Two cylinders and their associated keys shall be fitted in metal fixtures of the design illustrated in annex C of EN 1303: 2005.

The specimens tested to this clause depend on the key relate security classifications sought, as summarised below:

- Key related security classes 1 to 3 - New specimens, i.e. specimens that have not been subjected to any other tests.
- Key related security classes 4 to 9 - Specimens that have completed the durability tests defined in clause 4.2.3.

The correct key appropriate to each cylinder shall be placed in that cylinder and the key turned with a maximum torque of 1.5 Nm to verify the cylinder operates using that key.

Keys of the next closest step, as specified on the differ chart provided by the manufacturer, shall then be placed in each cylinder and a torque of 1.5 Nm applied to the key.

##### **4.2.6.2 Torque resistance of the plug/cylinder relevant to key related security**

Two cylinders shall be tested in accordance with clause 5.8.6 of EN 1303: 2005 using the torque specified in Table 5 appropriate to the key related security classification sought.

#### **4.2.7 Attack resistance**

##### **4.2.7.1 Resistance to drilling**

This test does not apply to cylinders for which attack resistance classification '0' is sought.

For all other attack resistance classifications, two cylinders shall be tested in apparatus of the design illustrated in figure C.2 in Annex C of EN 1303: 2005.

The method of mounting the cylinders used, the drill employed and the force applied shall be in accordance with clause 5.9.1 of EN 1303: 2005.

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**The drill bits defined in Table 1 shall be used according to the attack resistance classification sought, as defined in Table 6. The test authority shall choose the points of application to the face of the cylinder.**

A maximum of three drill bits can be used per cylinder and each cylinder shall be tested using new drill bits.

**Table 1** Drill bits

Drill bit (refer to Table 6)	Type	Maximum diameter (mm)
I	HSS	12
II	Carbide tipped	12
III	Carbide fluted	13

**Drilling shall continue for the appropriate maximum net drilling time within the total time allowed for each test, as defined in Table 6, including any time taken to attempt rotation of the cylinder.**

It shall not be possible to rotate the lock driving element of the cylinder to the opening position by means of a suitable tool using a maximum torque of 5 Nm.

#### **4.2.7.2 Resistance to attack by chisel**

This test does not apply to cylinders for which attack resistance classification '0' is sought.

For all other attack resistance classifications, two cylinders and their associated protection devices/hardware shall be tested in apparatus of the design illustrated in figure C.3 in Annex C of EN 1303: 2005.

The test shall be carried out with a steel chisel of the type defined in clause 5.9.2 in EN 1303: 2005.

The cylinders, including any reinforcement or protection device with them, shall be mounted as defined in clause 5.9.2 in EN 1303: 2005.

**A maximum of 'n' blows (where 'n' is the number of blows specified in Table 6) shall be applied to the chisel by a drop hammer with a mass of 6 kg ± 0.25 kg and falling from a height of 700 mm ± 10 mm.**

This test may be discontinued if failure to comply with the requirements of clause 3.4.8.2 becomes evident during the test.

#### **4.2.7.3 Resistance to twisting**

This test does not apply to cylinders for which attack resistance classification '0' is sought.

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For all other attack resistance classifications, two cylinders and their associated protection devices/hardware shall be tested in apparatus of the design illustrated in figure C.3 in Annex C of EN 1303: 2005.

**The cylinders, including any reinforcement or protection device with them, shall be mounted as defined in clause 5.9.2 in EN 1303: 2005 and a torque applied to the cylinder and/or protection device in accordance with clause 5.9.3 of EN 1303: 2005 'm' times (where 'm' is the number of twists specified in Table 6).**

The test laboratory shall select the combination of directions in which they apply the torque to the cylinder and/or protection device/hardware (i.e. clockwise and anticlockwise) that they believe is most likely to cause the cylinder to fail to meet the requirements of clause 3.4.8.3.

#### **4.2.7.4 Resistance to plug/cylinder extraction**

This test does not apply to cylinders for which attack resistance classification '0' is sought.

For all other attack resistance classifications, two cylinders and their associated protection devices/hardware shall be tested in apparatus of the design illustrated in figure C.4 in Annex C of EN 1303: 2005.

The cylinders, including any reinforcement or protection device with them, shall be mounted as defined in clause 5.9.4 in EN 1303: 2005.

**The cylinder shall be tested in accordance with clause 5.9.4 of EN 1303: 2005 using the force to retract the traction screw and attack time specified in Table 6.**

#### **4.2.8 Manipulation resistance**

This test only applies to cylinders for which a '1' manipulation resistance classification is sought.

Three lock experts acting independently of the manufacturer and in accordance with clause 4.2.1 shall each be supplied two of the samples defined in clause 4.1.3.2. One of these specimens is to be treated as a 'practice specimen' while the second specimen is to be treated as the 'live test specimen'.

Each expert shall inspect and test the specimens they are supplied to confirm whether the specimens comply with clause 4.1.3.2.

##### **4.2.8.1 Examination of the specimens**

Prior to conducting the lock cylinder manipulation test, each specimen submitted for this test shall be checked to ensure:

- (a) The original key supplied with the cylinder can be used to operate the cylinder.
- (b) The cylinder specimens comply with the requirements of clause A.6i) of BS 3621: 2007.

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- (c) The test keys comply with the requirements of clauses A.6iii), A.6iv) and A.6v) in Annex A of BS 3621: 2007.

#### 4.2.8.2 Development of lock cylinder manipulation methods

Each expert may use the 'practice specimen' to determine:

- (a) The most effective method of overcoming the cylinder using the 'test key'; and
- (b) The modifications to the length of the 'test key' and the shoulder on the 'test key' that would enable it to be used to operate the cylinder.

The expert shall limit their evaluation of the 'practice specimen' to two hours and may not discuss their methods or findings with the other experts selected to test that cylinder design.

#### 4.2.8.3 Manipulation test

The 'live test specimen' shall be mounted in accordance with clause 4.1.3.2 and subjected to a cylinder manipulation test using the 'test key'.

Each expert shall be permitted 4 minutes to modify the length of the 'test key' and its shoulder, as identified during investigations conducted on their 'practice specimen'. Each expert shall then have the maximum working time defined in Table 7\* in which to operate the cylinder using the 'test key', by:

- (a) forcing the 'test key' into the cylinder; using manual dexterity, any proprietary key impactor or the tools listed in the tool kits detailed in clause 4.2.9.2\*; and
- (b) turning the 'test key' by hand through 360° or, in the case of cylinders with restricted plug movement, turning the 'test key' by hand through the maximum angle permitted by the design.

#### 4.2.9 Manual attack resistance

##### 4.2.9.1 General

The attack side of the cylinder samples are attacked using tools selected from the tool category appropriate to the expected attack resistance rating, defined in Table 7, with a view to operating the lock driving element without the use of the original key.

The working time (resistance time) shall be recorded in order to determine whether the cylinder is capable of meeting the expected attack resistance rating.

Double-sided cylinders shall be tested on both sides, in turn, using tools from the tool categories appropriate to the attack resistance rating expectations for each side so as to confirm the relative ratings.

\* Relevant to the manual attack resistance rating sought for that cylinder in accordance with clause 5.10. If no rating is sought or the cylinder fails to achieve a manual attack resistance rating greater than '0' then the time and tools used shall reflect those of security rating 1.

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#### 4.2.9.2 Test facility

The cylinders, including any reinforcement or protection devices supplied with them, shall be mounted in apparatus of the design illustrated in figure C.2 in Annex C of EN 1303: 2005.

The test facility shall also comprise attack tools selected from the tool categories listed below appropriate to the manual attack resistance rating sought, as defined in Table 7.

All dimensions specified for each tool are the maximum permitted unless otherwise specified.

No alterations shall be made to the tools other than those required to maintain the tools in good working order. Likewise, tool safety devices such as guards, fuses and other current limiting features and/or maximum speed controls, shall not be removed or altered.

The test team and anyone else present during the tests shall wear appropriate personal protective equipment.

#### **TOOL CATEGORY A**

Adhesive tape

1 Cable cutter - 150 mm long

Fishing line (e.g. polypropylene multi fibre)

Flexible plastic coupon

1 Glass cutter

Hexagon wrenches - selection 120 mm long

Hooks

1 Knife - blade 125 mm long x 3 mm thick

1 Lever (including nail pullers, prybars and utility bars) - 0.7 kg/300 mm long

Pliers (including self gripping and cutting) - selection 200 mm long

Punches

Rope

1 Screwdriver - 6.5 mm diameter/square x 150 mm long

1 Scriber

Socket/screwdriver set -150 mm long ratchet arm

Spanners - selection 150 mm long

Traction screws (*otherwise known as 'self tapping' screws or 'self drilling' screws*) - selection 5.5 mm diameter x 60 mm long (carbon steel, single and twin start versions with choice of two varieties of thread/tip: deep thread and gimlet point; and self tapping thread with drill point)

Tweezers

Wire

WD40

Wood/plastic wedges

*Note: The tools of this category are selected in order to simulate an opportunist attack by bodily physical force and by stealth using minimal tools.*

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### **TOOL CATEGORY B**

Tool category A plus:

- 1 Bolt cutter - 350 mm long
- 1 Claw hammer - 350 mm long/0.7kg
- 1 Drill bit (6 mm diameter jobber - HSS / HSCO / Carbide)
- 1 Hand drill - 400 mm long/1.5kg
- 1 Junior hacksaw plus 2 HSS blades
- 1 Metal plate shears - 200 mm long
- 1 Multiple slip joint pliers - 250 mm long
- 1 Pipe wrench - 250 mm long
- Pliers (including self gripping) - selection 250 mm long
- 1 Screwdriver - 7 mm diameter/square x 250 mm long
- 1 Screwdriver - 14 mm diameter/square x 400 mm long
- Socket/screwdriver set - 250 mm long ratchet arm
- 1 Tube - 38 mm diameter x 300 mm long

*Note: This tool category provides a more determined opportunist attack by bodily physical force and tools with a higher mechanical advantage.*

### **TOOL CATEGORY C**

Tool category A and B plus:

- 1 Axe - 350 mm long/1.5 kg
- 1 Bolt cutter - 400 mm long
- Brick bolsters - 250 mm long x 75 mm wide blade
- Cold chisels - 250 mm long x 25 mm wide blade
- 1 Crowbar - 700 mm long/2.5 kg
- 1 Drill (cordless with rotary action only) - 7.2 V d.c.\*
- 1 Drill bit (10 mm diameter jobber - HSS / HSCO / Carbide)
- Fluorocarbon based freeze spray - 400 ml
- 1 Gas torch (Butane / Propane)
- 1 Hacksaw plus 2 HSS blades
- 1 Hammer - 400 mm long/1.5 kg
- 1 Pad saw plus 2 HSS blades
- 1 Scissor jack - 1500 kg capacity, 100 mm minimum retracted, 200 mm stroke
- Wood chisels - 250 mm long x 25 mm wide blade

*\* Complete with a spare power pack.*

*Note: The tool category is for deliberate forced entry of well-protected premises using bodily physical force and a wide selection of attack options.*

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### **TOOL CATEGORY D**

Tool category A, B and C plus:

- 1 "A-tool" lock puller - 500 mm long
- 1 Bolt cutters - 500 mm long
- 1 Disc grinder (cordless)\* - 12 V d.c with 3 cutting discs
- 1 Drill (cordless with rotary action only) - 12 V d.c\*
- 5 Drill bits (13 mm diameter jobber - HSS / HSCO / Carbide)
- 1 Felling/fire axe - 850 mm long/3 kg
- 1 General purpose saw - 750 mm long
- 1 Hole saw - 50 mm diameter
- 1 Hooligan bar - 760 mm long
- 1 Jigsaw (cordless) - 12 V d.c with 3 HSS / HSCO / Carbide blades\*
- 1 "K-tool" lock remover
- 1 Plate shears - 300 mm long
- 1 Sledgehammer - 900 mm long/3 kg
- Steel wedges - 150 mm long
- 1 Tube - 75 mm diameter x 500 mm long

\* Complete with one spare power pack.

*Note: This tool category is for experienced attempts at forced entry.*

### **TOOL CATEGORY D+**

Tool category A, B and C plus:

- 1 "A-tool" lock puller - 500 mm long
- 1 Bolt cutters - 500 mm long
- 1 Circular saw (cordless) - 18 V d.c/200mm diameter with 3 blades
- 1 Disc grinder (cordless)\* - 18 V d.c with 3 cutting discs
- 1 Drill (cordless with rotary action only) - 18 V d.c\*
- 5 Drill bits (13 mm diameter jobber - HSS / HSCO / Carbide)
- 1 Felling/fire axe - 850 mm long/3 kg
- 1 General purpose saw - 750 mm long
- 1 Hole saw - 50 mm diameter
- 1 Hooligan bar - 760 mm long
- 1 Jigsaw (cordless) - 18 V d.c with 3 HSS / HSCO / Carbide blades\*
- 1 "K-tool" lock remover
- 1 Plate shears - 300 mm long
- 1 Reciprocating saw - 18 V d.c with 3 HSS / HSCO / Carbide blades\*
- 1 Sledgehammer - 900 mm long/3 kg
- Steel wedges - 150 mm long
- 1 Tube - 75 mm diameter x 500 mm long

\* Complete with one spare power pack.

*Note: This tool category is for experienced attempts at forced entry.*



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### **TOOL CATEGORY E**

Tool category A, B, C and D+ plus:

- 1 Circular saw - 1100 W/200 mm diameter with 3 blades
- 1 Disc grinder - 1100 W/125 mm diameter with 3 cutting discs
- 1 Drill (with rotary / hammer action) - 750 W
- 5 Drill bits (13 mm diameter jobber and long series - HSS / HSCO / Carbide)
- 1 "Glasmaster" saw
- 1 Hole saw - >50 mm diameter
- 1 Pinch bar - 1500 mm long
- 1 Reciprocating saw - 750 W with 3 HSS / HSCO / Carbide blades
- 1 Sledgehammer - 900 mm long/6 kg
- 1 Tube - 75 mm diameter x 1000 mm long
- 2 Wood boring spade bits

*Note: This tool category provides a professional means of attempting forced entry into higher value storage areas generally after penetrating the facade.*

*Although the tool category incorporates mains powered tools, this serves to cover those risks where the criminal may use tools of powers greater than those permitted in tool kit D, including battery powered, petrol driven and mains powered up to that possible with the tools specified in this tool kit.*

### **TOOL CATEGORY F**

Tool category A, B, C, D+ and E plus:

- 1 Circular saw - 2100 W/300 mm diameter with 3 blades
- 1 Disc grinder - 2300 W/250 mm diameter with 3 cutting discs
- 1 Drill (with rotary / hammer action) - 2000 W
- 5 Drill bits (20 mm diameter - HSS / HSCO/ Carbide)
- 1 Enforcer - 450 mm long/12kg
- 1 Hooligan bar - 910 mm long
- 1 Oxyacetylene "Saffire Portapak" cutting kit – 50 l/min oxygen consumption\*
- 1 Reciprocating saw - 2000 W with 3 blades
- 1 Tube - 75 mm diameter x 1500 mm long

*\*Measured at standard ambient temperature and pressure, purity <99.0%.*

*Note: This tool category is an enhancement of category E.*

*Although the tool category incorporates mains powered tools, this serves to cover those risks where the criminal may use tools of powers greater than those permitted in tool kit D, including battery powered, petrol driven and mains powered up to that possible with the tools specified in this tool kit.*

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### **TOOL CATEGORY G**

Tool category A, B, C, D+, E and F plus:

- 1 Breaker - 1900 W/15 kg plus up to 3 bits
- 1 Concrete chainsaw (2-stroke) - 15kg/300 mm maximum cut depth
- 1 Cut-off (“Stihl”) saw - 5kW/450 mm diameter/15 kg with three blades
- 1 Diamond core drill bit - 125 mm diameter
- 1 Enforcer - 600 mm long/15kg
- 1 Hydraulic head and toe jack (“Rabbit tool”) - 15kg/5 tonne (S.W.L) output/180 mm spread
- 1 Oxyacetylene cutting kit – 250 l/min oxygen consumption\*
- 1 Pneumatic impact tool (self contained with one spare air cartridge) - 600 blows per minute / 48.263301052 kPa pressure

*\*Measured at standard ambient temperature and pressure, purity <99.0%.*

*Note: This tool category provides extreme means of attempting forced entry into higher value storage areas before resorting to the use of vehicles, firearms or explosives.*

#### **4.2.9.3 Test team**

The test team shall comprise a team leader whose function is to direct, time, compile an event record and control the testing work on the specimens and a test operative whose prime function is to carry out the testing work on the specimens as directed by the team leader.

At any time during testing the team leader may substitute himself for the test operative, the operative assuming the role of timekeeper whilst maintaining the event record.

A different test operative may be used for different styles of attack but only one operative (other than the team leader) shall partake in any individual attack test.

#### **4.2.9.4 Test method**

Mount the cylinders, including any reinforcement or protection devices supplied with them as defined in clause 4.2.9.2 in accordance with the manufacturer’s instructions, with the attack side of the cylinder confronting the test operative.

Conduct a series of attack tests using tools of the appropriate category relative to the attack resistance rating expectation.

The attack tests conducted shall be those most likely to cause the specimen to fail to meet the requirements defined in clause 3.4.10.

Each individual attack test shall be continued until either:

- (a) The objective is achieved, that is, the lock driving mechanism can be operated without using the original key; or
- (b) The maximum test duration defined in Table 7 is exceeded; or

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- (c) The team leader decides that the attack is ineffective for classification purposes.

Each individual attack test shall be undertaken on a new specimen.

During each individual attack test the timing device used to measure test duration shall remain activated. The resolution of this device shall be at least 1 second. The timing device(s) used to record working time shall have a resolution of at least 0.01 second. At the conclusion of the test the working time shall be rounded to the next full second.

## 5 CLASSIFICATION

Cylinders that comply with the requirements of this standard are classified using an 11 box classification bar as shown in Table 2 and defined in clauses 5.1 to 5.11.

*Note: The attributes addressed by the first eight classification boxes, running left to right, and the order in which those attributes are addressed reflect those contained in the classification system contained within EN 1303: 2005. The remaining three classifications are specific to this standard as are the higher three key related security classifications and the higher three attack resistance classifications available in this standard.*

**Table 2** Classification

1	2	3	4	5	6	7	8	9	10	11
Category of use	Durability	Door mass	Fire resistance	Safety	Corrosion resistance	Key related security	Attack resistance	Manipulation resistance	Manual attack resistance	Patent expiry date
1	4, 5 or 6	-	0 or 1	-	0, A, B or C	1 to 9	0 to 5	0 or 1	0 to 8	month/year

### 5.1 Category of use

Cylinders shall be classified as grade '1' in box 1 of the classification bar, as per clause 6.2 of EN 1303: 2005.

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## 5.2 Durability

Durability shall be classified in box 2 of the classification bar, as grade 4, 5 or 6, according to the durability classification achieved in accordance with clause 3.4.2 and Table 3.

**Table 3** Durability classification

Durability class	Test cycles
4	25 000
5	50 000
6	100 000

## 5.3 Door mass

No classification exists relating to restriction of use according to door mass. A horizontal line shall therefore be placed through box 3 in the classification bar.

## 5.4 Fire resistance

Fire resistance shall be classified in box 4 of the classification bar, as grade 0 or 1, where '0' is no resistance claimed and '1' confirms evidence exists to support use on fire doors providing they are installed in strict accordance with the instructions supplied with the cylinder and within any restrictions contained within the fire testing and/or assessment reports forming the basis of that classification.

## 5.5 Safety

No classification exists relating to safety. A horizontal line shall therefore be placed through box 5 in the classification bar.

## 5.6 Corrosion and temperature resistance

Corrosion and temperature resistance shall be classified in box 6 of the classification bar, as grade 0, A, B or C according to the corrosion and temperature resistance performance achieved in accordance with clause 3.4.6 and Table 4.

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**Table 4** Corrosion and temperature resistance classification

Classification	Corrosion performance	Temperature performance
0	No minimum corrosion performance	No minimum temperature performance
A	High corrosion resistance in accordance with grade 3 of EN 1670: 1998	No minimum temperature performance
B	No minimum corrosion performance	Torque to operate the cylinder using the original key at -20 °c and + 80 °c is no greater than 1.5 Nm
C	High corrosion resistance in accordance with grade 3 of EN 1670: 1998	Torque to operate the cylinder using the original key at -20 °c and + 80 °c is no greater than 1.5 Nm

### 5.7 Key related security

Key related security shall be classified in box 7 as grade 1 to 9, where '9' is the highest, according to the performance achieved to the requirements defined in clause 3.3.4 when tested in accordance with the requirements of clause 3.4.7 and Table 5.

A horizontal line shall be entered into this box when classifying the side of a double cylinder that incorporates a thumbturn. This is because the key related security requirements defined in clauses 3.3.4 do not apply to thumbturns.

### 5.8 Attack resistance

**Attack resistance shall be classified in box 8 as grade 0 to 5, where '5' is the highest, according to the performance achieved to the requirements defined in clause 3.4.8 when tested in accordance with the requirements of clause 4.2.7 and Table 6.**

A '0' classification shall be placed in box 8:

- (a) if no attack resistance is claimed; or
- (b) when classifying the side of a double cylinder that incorporates a thumbturn. This is because the attack resistance requirements defined in clause 3.4.8 do not apply to thumbturns.

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**Table 5** Key related security requirements

Clause	Associated clause in EN 1303: 2005	Requirement	Test clause	Key related security classification <sup>(i)</sup>								
				1	2	3	4	5	6	7	8	9
4.7.1	4.8.2	Minimum number of effective differs	N/A	100	300	15000	30000	30000	100000	250000	500000	1000000
4.7.2	4.8.3	Minimum number of moveable detainers	N/A	2	3	5	5	6	6	7	8	9
4.7.3	4.8.4	Maximum number of steps at the same level (%)	N/A	100	70	60	60	60	50	50	50	40
		Maximum number of adjacent steps at the same operating level		2	2	2	2	2	2	0	0	0
3.3.4.4	4.8.5	Direct coding on keys	N/A	Yes	Yes	No	No	No	No	No	No	No
3.4.7.1	4.8.6	Operation of security mechanism (Nm)	4.2.6.1	1.5 <sup>(ii)</sup>	1.5 <sup>(ii)</sup>	1.5 <sup>(ii)</sup>	1.5 <sup>(iii)</sup>	1.5 <sup>(iii)</sup>	1.5 <sup>(iii)</sup>	1.5 <sup>(iii)</sup>	1.5 <sup>(iii)</sup>	1.5 <sup>(iii)</sup>
3.4.7.2	4.8.7	Torque resistance of plug/cylinder - maximum torque (Nm)	4.2.6.2	2.5	5	15	15	15	15	20	30	40
		Tolerance (Nm)		+0.25 -0	+0.5 -0	+1.5 -0	+1.5 -0	+1.5 -0	+1.5 -0	+2 -0	+3 -0	+4 -0
3.3.4.5 (a)	N/A	Patented key design	N/A	N/A	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes
3.3.4.5 (b)	N/A	Manufacturer key registration - General	N/A	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes	N/A
		Manufacturer key registration - LPS1224 database		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes
3.3.4.5 (c)	N/A	Restricted key cutting (manufacturers only)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	Yes	Yes
3.3.4.5 (d)	N/A	Semi - restricted key cutting (manufacturers and approved stockists only)	N/A	N/A	N/A	N/A	N/A	Yes	Yes	N/A	N/A	N/A
3.3.4.5 (e)	N/A	Cylinder can be part of a master key system	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Indication of security level				Low	→	Domestic front door	→	High security	→	Very high security		

Notes:

(i) Shaded boxes indicate requirements that exceed those contained within EN 1303: 2005.

(ii) Before commencing the durability test.

(iii) After completing the durability test.

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**Table 6** Attack resistance requirements

Clause	Associated clause in EN 1303: 2005	Requirement	Test clause	Attack resistance classification				
				1	2	3	4	5
3.4.8.1	4.9.1	Resistance to drilling - maximum net test time (minutes)	4.2.7.1	3	5	5	5	10
		Resistance to drilling - maximum total test time (minutes)		5	10	20	20	30
		Drill Type (refer to Table 1)		I	I	II	III	III
3.4.8.2	4.9.2	Resistance to attack by chisel - n (number of blows)	4.2.7.2	30	40	50	50	50
3.4.8.3	4.9.3	Resistance to twisting - m (total number of twists)	4.2.7.3	20	30	40	50	50
3.4.8.4	4.9.4	Resistance to plug/cylinder extraction (kN)	4.2.7.4	15	15	17	17	17
		Time allowed (minutes)		3	3	5	5	10
3.4.8.5	4.9.5	Torque resistance of plug/cylinder - maximum torque (Nm)	4.2.6.2	20	30	40	40	50
		Tolerance (Nm)		-0 +2	-0 +3	-0 +4	-0 +4	-0 +5
<i>Indication of security level</i>				Low	→	Domestic front door	→	High security
<i>Note:</i> Shaded boxes indicate requirements that exceed those contained within EN 1303: 2005.								

## 5.9 Manipulation resistance

A '1' may be placed within box 9 when the manipulation resistance requirements defined in clause 3.4.9 are met.

A '0' shall be entered into box 9 when classifying:

- (a) cylinders that have not been tested in accordance with clause 4.2.8; or
- (b) cylinder that have failed to comply with the requirements of manipulation resistance classification '1' defined in clause 3.4.9; or

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- (c) the end of a double cylinder that incorporates a thumbturn. This is because the manipulation resistance requirements defined in clause 3.4.9 do not apply to thumbturns.

### 5.10 Manual attack resistance

Manual attack resistance shall be classified in box 10 as rating 0 to 8, where '8' is the highest, according to the performance achieved to the requirements defined in clause 3.4.10 when tested in accordance with the requirements of clause 4.2.9 and Table 7.

A '0' shall be entered into box 10 when classifying:

- (a) cylinders that have not been tested in accordance with clause 4.2.9; or
- (b) cylinders that have failed to comply with the requirements of manual attack resistance rating '1' defined in clause 3.4.10; or
- (c) the end of a double cylinder that incorporates a thumbturn.

**Table 7** Manual attack resistance rating requirements for each manual intervention attack test

Security rating classification	Tool category	Maximum working time (minutes)	Maximum test duration (minutes)
0	Not applicable	0	0
1	A	1	10
2	B	3	15
3	C	5	20
4	D	10	30
5	D+	10	30
6	E	10	30
7	F	10	30
8	G	20	60

*Note:*

*The manual attack resistance classification system reflects that defined in LPS 1175: Issue 7 and is based on the following: domestic security risks (1 and 2), commercial (2, 3 and 4), high risk (5 and 6) and significant risk (8).*

### 5.11 Patent expiry date

The month and year of expiry of a valid UK patent of the key shall be placed in box 11 where a patent is required in accordance with clause 3.3.4.5 (a) to achieve the key related security entered in box 7<sup>†</sup>.

<sup>†</sup> This only relates to cylinders attributed a key related security classification of 6, 7, 8 or 9 in accordance with clause 5.7.



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The patent expiry date shall be entered in box 11 in the following format:

**xx/####**

where: *xx is the month, i.e. '01' = January and '12' = December.  
#### is the year, e.g. 2010.*

## **6 PUBLICATIONS REFERRED TO:**

BS EN ISO/IEC 17025: 2005	General requirements for the competence of testing and calibration laboratories
BS 3621: 2007	Thief resistant lock assembly - Key egress
BS 8621: 2007	Thief resistant lock assembly - Keyless egress
BS 10621: 2007	Thief resistant dual-mode lock assembly
EN 1303: 2005	Building hardware - Cylinders for locks - Requirements and test methods
EN 1670: 1998	Building hardware - Corrosion resistance - Requirements and test methods
LPS 1175: Issue 7	Requirements and testing procedures for the LPCB approval and listing of intruder resistant building components, strongpoints, security enclosures and free-standing barriers
PAS 24: 2007	Enhanced security performance requirements for door assemblies - Single and double leaf, hinged external door assemblies to dwellings
SD188	LPCB scheme document - Cylinders for locks

For undated references the latest edition of the publication referred to applies.

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Amendments Issued Since Publication

DOCUMENT NO.	AMENDMENT DETAILS	SIGNATURE	DATE
LPS 1242-2.0	<ol style="list-style-type: none"> <li>1. Requirements and classification system updated to reflect EN 1303: 2005 because LPS 1242: Issue 1 was based on EN 1303: 1998.</li> <li>2. Previous 'attack resistance' classification requirements updated to reflect LPS 1175: Issue 7 and name has changed to read 'manual attack resistance' because EN 1303: 2005 includes an attack resistance classification</li> <li>3. New manipulation resistance requirements and classification added to address issues raised by ACPO and Home Office. These largely reflect test methods contained within standards, for locks and doorsets that incorporate cylinders, which already address these issues, e.g. BS 3621: 2007 and PAS 24: 2007.</li> </ol>		
LPS 1242-2.1	<ol style="list-style-type: none"> <li>1. New front cover</li> <li>2. Title added to header</li> <li>3. Notes added on Page 4</li> <li>4. Repagination</li> <li>5. Update to copyright information</li> </ol>	DC	Jan.2014