

Loss prevention standards

Security

Locks

This document provides guidance on the types of security door locks available, which should be fitted as part of a robust security system.



Introduction

The range of security locks available is very wide, and as a result, choosing a suitable lock can be a daunting prospect, especially with locks often looking similar. However, in fact, locks can be deceiving and locks are very different in terms of their security, quality and general reliability. It should be noted that the doors and frames to which the locks are fitted, should be strong and maintained in a good condition.

This Loss Prevention Standard describes the basic lock types and related British or European standards.



Lock Types

Locks consist of four main parts:

- Lock case
- Key/locking mechanism
- Lock bolt mechanism
- Receiving recess

Taking each of the above items in turn:

Lock Case

There are three basic forms of lock case as follows:

Mortice Lock

A lock case designed to be fitted within a door or window, where a handle operated latch is incorporated. Such locks are called mortice sash locks.

Rim Lock

A lock case designed to be fitted to the internal surface of a door or window.

Padlock

A lock that is designed to be removable. It has a shackle (lockbolt) that passes through a separate staple/hasp and the two general types are:

- Open shackle - has a shackle that, when placed through the staple, would permit a bolt cutter to be used on the shackle, or space for a jemmy to be inserted to attack the shackle or staple
- Closed shackle - does not permit such ready access and is thus inherently more secure. A hardened steel lock case, or plates within it, can hinder an attack by drilling

Key/Locking Mechanism

The two most common key/locking mechanisms are:

Lever Locks

A lock where the key has a number of stepped notches along its 'bit'. When the key is put in the lock and first turned, these notches engage with a set of levers within the lock case and lift them. When all the levers are correctly raised, the key can turn and operate the lockbolt.

Cylinder Locks

A lock where the key has a number of ridges along its length. When the key is inserted into the cylinder it engages with sprung pins inside it. When all the pins are correctly raised the key can turn the cylinder to operate the lockbolt.

Increasing the numbers of levers/pins in any lock allows for more key variations, thus making it harder for thieves to **break into or 'pick' the lock** - 5 levers/pins is the usual minimum for a secure lock.

Lock Bolt Mechanism

All locks have a lock bolt which is designed to move in and out of the lock case and engage in a suitable recess. Use of hardened steels or inserts within the bolt can hinder attack from cutting.

A 'deadlocking' lockbolt is one that when it is in the locked position, it cannot be pushed back into the lock case.

Receiving Recess

For all locks except padlocks, a lock bolt receiving recess will need to be created. For mortice locks this will be a recess in the door frame, or another door if securing double doors. To protect the edge of this recess from wear, it usually has a metal 'flush striking plate' fitted, but ideally, to hinder attack on the bolt once engaged within, it should be fitted with a 'boxed striking plate', i.e. one with an integral steel box to receive the bolt.

For rim locks a suitable surface fixed metal housing receives the lockbolt.

Lock Standards

The security of a lock cannot reliably be assessed simply by looking at it, so tests that simulate common attack methods and usage are required to help prove its security.

Various European (EN) lock standards exist with those adopted within the UK being given a BS EN prefix.

Sometimes called Central European Norm (CEN) Standards, these EN Standards are particularly complicated, with compliant locks having an 11-digit code to indicate various product features – although only the 7th digit in the sequence is usually used to indicate the security grade.

The CEN Standards:

- Require the code to be shown on the lock packaging, but not the lock itself
- Do not usually require testing against lock picking, sawing or an expert review

As a result of these perceived limitations/weaknesses, CEN Standards are infrequently referred to in the UK, except perhaps for padlocks, where there is no comparable British Standard.

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British Standards

Of the various UK test standards that can apply to locks, the one most commonly cited by UK insurers over the years has been [BS 3621](#). A few years ago, this standard was set to be withdrawn when the UK needed to adopt the European Standards for door locks (EN 12209 and EN 1303). However, it was retained by redrafting it to cross refer to a security level within the European Standards and because of a unique UK requirement for a General Vulnerability Assessment (GVA) - a further review/test against possible weaknesses, as determined by a panel of expert locksmiths who study the lock design.

X621 Series

BS 3621 has since evolved into a suite of similar standards known as the x621 Series, which relate to both single point mortice and cylinder rim locks (as BS 3621, [8621](#) and [10621](#)) and multi-point locks (as [PAS 3621](#), [8621](#) and [10621](#)). Whether chosen in a BS or PAS version, the respective differences in use are as follows:

- 3621 – key lockable from both sides of the door
- 8621 – key lockable from outside only; emergency escape always being possible from inside without using a key, e.g. by means of a handle/latch/thumb turn, etc.
- 10621 – as 8621, key lockable from the outside. However, if you are 100% sure no personnel remain inside the building in question (be aware of the potential trapping risk), the internal emergency release can be disabled

Such locks are most commonly identified by them carrying the BSI 'Kitemark' on the lock face and packaging.

Note: Most BS 3621 rim locks have an internal lockable handle, which can be used as a 'daytime latch'. However, this should always be locked to maintain door security, especially if the door has a letter flap or glazing in or adjacent to it. This should help prevent persons outside gaining access to the handle to release it.

Additional Standards

- [BS EN 12209](#) – This is a UK version of a European Standard for door locks. Numerous different combinations (Grades) of lock case/lock mechanism and key security are available. This also includes related testing for attack resistance, force, durability, fire and safety
 - To achieve the x621 Series the door lock must achieve a Security Grade 7, Key Security B - the latter is only for lever locks
 - If a cylinder lock is used reference is made instead to BS EN 1303
- [BS EN 1303](#) – This is a UK version of a European Standard for cylinder locks. Various security levels against attack and for key security are available
 - To achieve the x621 Series the cylinder lock must achieve a Key Security Grade 5 and Attack Grade 2
- TS 007 - **This is a UK Standard developed to recognise and protect against the risk of 'snapping attacks' on door lock cylinders.** Snapping attacks relate to a form of criminal attack whereby a protruding cylinder is gripped by a wrench, or similar tool and twisted until it snaps in its narrow middle section
 - TS 007 cylinders with a 3 Star rating can resist such attacks on their own
 - A 1 Star cylinder needs to be matched with a 2 Star surrounding door handle to give an overall 3 Star level of protection
 - Note: The [Sold Secure](#) organisation have a similar test standard for stand-alone cylinders called SS312 – Diamond rating

- TS 008 - A UK Standard for testing letter flaps for resistance to external access/manipulation of internal door lock mechanisms
- [PAS 24](#) - Applies to manual attack testing of single leaf domestic door sets and windows, including locks (but excluding picking/sawing) and hinges
 - If the door/window can be opened from inside, without a key, any:
 - Glazing must be laminated
 - Letter/post flap must be able to prevent external manipulation of the internal door lock release
 - It now covers composite, sliding and bi-folding doors, along with parallel opening windows
- [BS 8607](#) - This is a UK Standard for mechanically operated push button locksets
 - A Grade 4 rating is intended to be comparable to a x621 Series lock
- [BS EN 12320](#) - This standard reflects a European Standard for padlocks and staples (padbars) of all types, i.e. open and closed shackle
 - Security Grades range from 1-6, with 6 being the highest
- [BS EN 179](#) & [BS EN 1125](#) - These standards are UK versions of European Standards for emergency escape door mechanisms at premises:
 - Where no panic is likely to occur, e.g. a factory/office and
 - Where panic might occur, e.g. a shop or club/pub
 - Where an external key lock is incorporated, it should be tested to a security level chosen from BS EN 12209 (for external attack only)

Lock Certification

Claims that a lock has been tested to a particular standard can only be relied upon where the test has been undertaken and certified by a recognised independent test body. As an example, in the UK typically by the [British Standards Institute \(Kitemark scheme\)](#), the [Master Locksmiths Association \(Sold Secure scheme\)](#) or the [Building Research Establishment \(LPCB scheme\)](#).

Given the complexity of some standards, the omission from some of certain desirable security tests and the need to consider a lock alongside the intended type of door/window, the Master Locksmiths Association (MLA) and Loss Prevention Certification Board (LPCB) operate their own lock security grading and testing schemes. These reflect and build upon relevant British or European Standards. The police initiative [Secured by Design \(SBD\) scheme](#) is another good check on overall security, as 'approved' products must be certified as meeting all relevant BS/EN or other relevant UK Standards.

Insurer's Minimum Security Standards

When insurance is sought against theft, its provision may be conditional upon premises having a certain level of physical security, often termed Minimum Security Standard or Minimum Security Condition. Minimum Security Standards tend to concentrate on the fitting and use of common locks on typical doors and windows and may vary according to your insurer and based on the:

- Nature of the insurance policy
- Type of property and its construction
- Occupancy of the building and its contents
- Geographic area
- Values exposed
- Loss history

The RISC Authority (the UK Insurers technical advice body) has published a useful guide on the subject of minimum security standards at homes - [S24 – Physical Security for Homes: Guidance for Occupiers](#).

Checklist

A generic Locks Checklist is presented in Appendix 1 which can be tailored to your own organisation.

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Sources and Useful Links

- [RISCAuthority](#)
- [British Security Industry Association \(BSIA\)](#)
- [Door and Hardware Federation](#)

Additional Information

Relevant Loss Prevention Standards include:

- Security: Intruder Alarms – European Standards
- Security: Intruder Alarms – Guidance for Customers
- Security: An introduction to CCTV Systems
- Security: Doors and Windows

To find out more, please visit [Aviva Risk Management Solutions](#) or speak to one of our advisors.

Email us at riskadvice@aviva.com or call 0345 366 6666.*

*Calls may be recorded and/or monitored for our joint protection.

Appendix 1 – Locks Checklist



Location	
Date	
Completed by (name and signature)	

	Locks	Y/N	Comments
1.	<p>Has a risk assessment been undertaken of the current physical security at your premises, including the following:</p> <ul style="list-style-type: none"> • Local history of security related events? • Nature of contents/occupancy, especially close to each opening and its attractiveness to theft? • Accessibility of the area for criminals? • Provision of anything that could improve access to upper levels of the building/roof? • Strength and nature of the building construction in comparison to any doors/windows and securing mechanisms? • The nature of any other electronic security measures or human presence on site? 		
2.	<p>Has independent crime prevention advice been sort from:</p> <ul style="list-style-type: none"> • The Police? • A security consultant? • Your insurer? 		
3.	<p>Have you checked whether your insurer has applied a Minimum Security Standard/Condition?</p> <ul style="list-style-type: none"> • If applied, do your existing locks and wider security arrangements comply with the Minimum Security Standard/Condition? • If not do you have formal insurer agreement for any alternative arrangements? <ul style="list-style-type: none"> ○ Are these clearly described? ○ Are these audited against? 		

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	Locks Contd.	Y/N	Comments
4.	<p>Has a full review/audit been undertaken of current locks used at your premises?</p> <p>Including any outbuildings?</p> <ul style="list-style-type: none"> • Are you aware of the devices installed, their age and the design standard they were installed to? Are they: <ul style="list-style-type: none"> ○ Of suitable type? ○ Correctly fitted to or within, a door/window constructed of suitable material and or appropriate thickness? 		
5.	<p>Have you sourced locks and security devices that have the relevant certification from competent locksmiths, e.g. a member of the Master Locksmiths Association (MLA)?</p>		
6.	<p>Are all your locks on an inspection and maintenance schedule?</p> <p>If any issues are raised are remedial measures expedited and treated as a priority?</p>		
7.	<p>Have you considered improving the glazing as part of a set of joined-up and balanced security measures?</p>		
8.	<p>Are security arrangements and the basis for the risk assessment reviewed following any security issues, local incidents, intrusions or losses?</p> <p>Note: If not, you are likely to be at more risk of a repeat incident.</p>		
9.	<p>Additional comments:</p>		

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