



**Association of Building
Hardware Manufacturers**

Best practice guide

**Door and window
bolts to
BS EN 12051**

in association with



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• ABHM BEST PRACTICE GUIDES

This publication is one in a series of guides addressing the major issues that should be considered when specifying, ordering or using the products it describes. It aims to provide the reader with a concise document which includes a summary of relevant sections from the new European product standard. The reader will then be in a position to seek further specialist advice where necessary and recognise **GENUINE** conformity to the new standards.

• BS EN 12051 Door and window bolts

This standard details performance requirements and test methods in relation to use (abuse), durability, fire resistance, safety in use, corrosion resistance, and security, with information on classification and marking.

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• SCOPE

The standard covers single point bolts and associated keeps, used to secure, or increase the security of doors and windows in buildings providing that movement of the shoot is by direct hand or foot operation. It includes bolts operated by lever, knob, slide, pull, etc. or by a removable device, though not a multiple differ key, from the protected side of the leaf only. Spring engaging bolts and bolts with locking facility are included if they are, by definition, bolts.

Types of bolt covered by the standard include:

- Barrel bolts, tower bolts
- Foot bolts, drop bolts, square spring bolts, garage door bolts
- Flush bolts (slide, knob, lever or automatic action)
- Padlock bolts
- Privacy bolts
- Mortice bolts (operated by removable device, knob, lever, etc.)

The standard does not include cremone/espagnolette type bolts or bolts used for emergency exit or panic devices.

• SPECIFICATION ISSUES

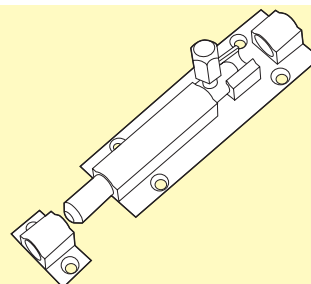
- 1) All European countries will use the same product standard.
- 2) Products complying with the new European standard provide peace of mind and evidence of professional specification.
- 3) Product selection should be made on the basis of the building use, occupancy and particular application.

NOTE:

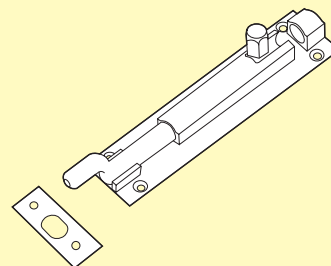
This standard has been adopted as a British standard and should be used in specifications.

If in doubt contact your local GAI registered architectural ironmonger, master locksmith or manufacturer.

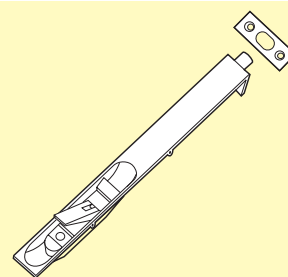
• TYPES OF BOLT



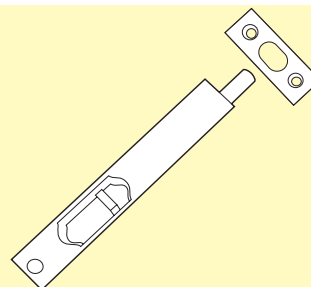
Barrel Bolt - Straight.



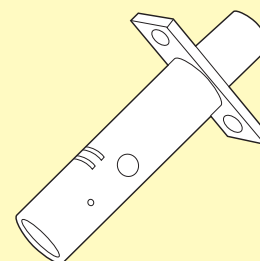
Barrel Bolt - Necked.



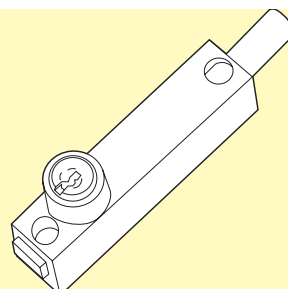
Flush Bolt - Lever Action.



Flush Bolt - Slide Action.



Mortice Rack Bolt.

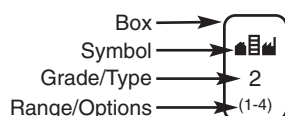


Press Bolt (removable key).

• CLASSIFICATION

BS EN 12051 classifies door and window bolts by using a 7-digit coding system. A similar classification system applies to all building hardware product standards so that complementary items of hardware can be specified to, for instance, a common level of corrosion resistance, category of use, etc. Each digit refers to a particular feature of the product measured against the standard's performance requirements.

The ABHM recommends the use of graphic icons to enhance clarity of information and has devised a system to facilitate assimilation of the various product classifications. Each feature within the product classification is represented by an icon comprising four elements; Symbol, Grade/Type, Range/Options and Box:-



The icon above is for a product which meets Grade 2 in the Category of Use classification, where EN 12051 stipulates a range of four possible grades from 1 to 4.

Full details on the ABHM graphic icons system can be found [on this CD](#) or at www.abhm.org.uk

Digit 1 **Category of use**

Four grades are specified for category of use:

- grade 1: low frequency of use by those with a high incentive to exercise care.
- grade 2: medium frequency of use, primarily by those with some incentive to exercise care
- grade 3: high frequency of use by the public and others with little incentive to exercise care.
- grade 4: subject to frequent violent usage

Table 1 of the standard quotes figures for the maximum abuse force within each category of use that a product can be expected to withstand at the operating point (lever, knob, key, etc.).

Digit 2 **Durability (no. of test cycles)**

Four grades are specified as follows:

- grade 1: 2 500 cycles
- grade 2: 5 000 cycles
- grade 3: 10 000 cycles
- grade 4: 50 000 cycles

Digit 3 **Door mass**

No requirement

Digit 4 **Fire resistance**

Two grades are identified:

- grade 0: not suitable for fire/smoke resistant door assemblies
- grade 1: suitable for fire/smoke resistant door assemblies subject to satisfactory assessment of the contribution of the single-axis hinge to the fire resistance of the specified fire/smoke door assemblies. Such assessment is beyond the scope of this European standard (see EN 1634-1).

Digit 5 **Safety in Use**

Two grades are identified:

- grade 0: no requirement
- grade 1: products shall be capable of operating with a side load of 250 N on the bolt, and also after a side load of 1000 N has been applied.

Digit 6 **Corrosion resistance**

Five grades of corrosion resistance are identified according to BS EN 1670.

- grade 0: no defined corrosion resistance
- grade 1: mild resistance (normally dry interiors)
- grade 2: moderate resistance (interiors subject to condensation)
- grade 3: high resistance (damp interior/exterior)
- grade 4: very high resistance (polluted exterior - industrial/coastal)

Digit 7 **Security**

Five grades of security are identified with figures for end load on shoot, resulting projection, resistance to sawing, and sideload on shoot.

Grade	Resistance to end load N	Resulting projection mm	Resistance to sawing (time) min	Resistance to side load N
1	0	12	0	500
2	1 500	12	0	1 500
3	3 000	12	0	4 500
4	4 000	15	2	7 000
5	5 000	17	5	10 000

• EXAMPLE:

The following marking denotes a door bolt meeting category of use grade 3, durability grade 4, no door mass requirement, no fire resistance or safety in use requirement, corrosion grade 3 and security grade 5:-



• MARKING

This standard requires that the classification relevant to the product shall be quoted in literature, accompanying documentation, on its labelling or packaging and/or by marking the product itself.

The marking/labelling shall include:-

- (a) Manufacturer's name, trade mark or other means of positive identification
- (b) The 7 digit classification coding
- (c) The number and date of the European standard
- (d) The month and year of manufacture (may be coded)

• CE marking

BS EN 12051 has not been designated as a harmonised product standard under the Construction Products Directive, and therefore CE Marking of such door & window bolts is NOT permitted.

Additional important considerations

In addition to ensuring that products satisfy the requirements of this standard, other factors should be taken into consideration when selecting door and window bolts. These not only include sourcing products from a reputable manufacturer, but also quality assurance, support services and unequivocal conformity to the standard as detailed below:

• QUALITY ASSURANCE

The internationally recognised standard for quality assurance, BS EN ISO 9000 provides confidence that the products are being manufactured to a consistent quality level. All ABHM members operate recognised BS EN ISO 9000 Quality Assurance Schemes.



Companies displaying this symbol are registered under the BSI Registered Firm Scheme.

• SUPPORT SERVICE

The correct specification and installation of door and window bolts is essential to ensure that they are able to operate efficiently within the performance levels described in this standard. Specialist advice is available from ABHM members in support of their products from specification stages through supply to effective operation on site.

• CONFORMITY

Conformity to the standard must be clearly and unequivocally stated. Such phrases as “tested to ...”, “designed to conform to ...”, “approved to ...”, are not sufficient. To avoid misleading or confusing claims it is recommended that one of the following phrases is used when stating conformity:

- This product has been successfully type-tested for conformity to all of the requirements of BS EN 12051. Test reports and/or certificates are available upon request.
- This product has been successfully type-tested for conformity to all of the requirements of BS EN 12051 including the additional requirements for fire/smoke door use*. Test reports and/or certificates are available upon request.
**Add as appropriate.*
- This product has been successfully type-tested for conformity to all of the requirements of BS EN 12051 including the additional requirements for fire/smoke door use*. Regular audit testing is undertaken. Test reports and/or certificates are available upon request.
**Add as appropriate.*

It is recommended that an [ARGE Declaration of Compliance](#) is also completed, as this gives a clear and unambiguous method of demonstrating test evidence and compliance.

ABHM PROFILE

Formed in 1897 to represent the interests of brassfounders, the ABHM and its members has been instrumental in the industry's advancement over the last 100 years.

Innovations in material and manufacturing technologies as well as changes in the building industry throughout the world have resulted in the development of a wide range of new products and practices. These advances have, in turn, required new skills and knowledge from the designer and manufacturer of the products themselves through to the specifiers, stockists and installers in the various sectors of the building industry.

The Association and its members have consistently risen to this challenge, creating products which meet the needs of a changing world and developing performance standards alongside national and international organisations, such as BSI

and CEN, which enable the industry to select and compare hardware with confidence.

The advances made throughout the industry are reflected in the Association's structure, the diversity of its membership and the wide range of activities in which it is involved. The ABHM now represents the United Kingdom's leading manufacturers of building hardware, architectural ironmongery and door and window fittings as well as providing the technical expertise essential for the formulation of performance standards at home and abroad.

All members are listed [on this CD](#) and on the [ABHM website \(www.abhm.org.uk\)](#), which includes a guide to the products and services available from each member.

British Hardware Federation

BHF represents some 3,500 ironmongery, hardware and DIY shops in the United Kingdom. In addition, it embraces the Independent Builders Merchants Service, a specialist division of the Federation.

Builders Merchants' Federation

The Builders Merchants' Federation represents the majority of bona fide merchants in the UK. Its members have a combined turnover of £6 billion a year. Members range from large nationals to small independents.

Guild of Architectural Ironmongers

Founded in 1961, the Guild represents 95% of bona fide distributors within the UK and the majority of manufacturers of architectural ironmongery. The Guild serves to further all aspects of architectural ironmongery by promoting the interchange of information to encourage better product design and high professional standards of ironmongery scheduling and specification.

Master Locksmiths Association

The MLA is recognised by the Home Office, Police and The British Standards Institution as being the authoritative body for locksmithing. It was formed to promote the membership to Central and Local Governments, Industry, Commerce and the Public.



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1.0 Introduction

Fire resisting door sets may be required to be held in the closed position using bolts. The most common application is on double doors, but bolts may also be used on restricted access openings that need to be fire-resistant.

For the purpose of this document door bolts are divided into two categories:-

- (i) Surface mounted bolts
- (ii) Recessed (flush) bolts and mortice bolts

Note: This does not imply suitability of any device for fire door use (see sections 2.0 and 3.0 for further information).

2.0 Critical recommendations

- 2.1 The door bolt, keep and fixings should comply fully with BS EN 12051 Building Hardware Door and Window Bolts, including Annex B. Preferably this evidence should be provided by an approved third party certification or testing body (see Notified Bodies in the '[Guidance Notes on CE Marking](#)' section of this CD, clause 2.3).
- 2.2 The door bolt, keep and fixings should have demonstrated their suitability for the intended purpose, by inclusion in satisfactory fire tests to BS 476: Part 22 or EN 1634-1, on a type of door set and configuration in which it is proposed to use them. This evidence should be provided by an approved third party certification or testing body (see Notified Bodies in the '[Guidance Notes on CE Marking](#)' section of this CD, clause 2.3).
- 2.3 Bolts should **NOT** be fitted to single leaf door assemblies on escape routes without prior consultation with appropriate fire authorities.
- 2.4 The size, strength and type of door bolt must be correct for the door to which it is fitted, bearing in mind:
 - the type of door
 - the way it is likely to be used
 - whether subject to other factors such as air pressure, heavy traffic use, abusive treatment, use by elderly, infirm or disabled.
- 2.5 A regular programme of maintenance should be undertaken, to ensure that the correct function is maintained for the life of the building (see '[Installation and maintenance advice](#)').

3.0 Commentary

- 3.1 General Door bolts are available in a range of sizes and types, all of which are potentially suitable for use on fire-resisting door sets. In addition to fire resistance requirements, BS EN 12051 also details graded requirements and tests for durability, safety in use, corrosion resistance, security, and ability to resist abuse forces, which can be used to provide the basis for selection in 2.4. Wherever possible, surface mounted bolts should be used in preference to recessed or mortice bolts.
- 3.2 *Installation:* The mounting position on the door, and the relationship to intumescent seals for instance should be chosen carefully to minimise the risk of "burn through" in the event of a fire. Bolts should **NOT** be fitted to door edges unless sufficiently wide strips of intumescent material can be fitted down each side of the bolt - within the thickness of the door edge. As a general guide these strips should be at least 5mm wide for FD30 fire door assemblies, and at least 10mm wide for FD60 fire door assemblies.
- 3.3 *Surface mounted bolts:* Provided they are **NOT** let in or wrapped around the door edge and surface fixing screws are used (**NOT** bolt through fixings) these types of bolts do not significantly affect a fire-resisting door's performance.

Any deviation from the above will require test evidence or assessment to validate the application.
- 3.4 *Recessed (flush) & Mortice Bolts:* These types replace wood with metal and, however fixed, conduct heat more effectively. In consequence they will almost certainly require additional intumescent protection and will always require test evidence or assessment to validate the application.

- 3.5 *Use on Escape Routes:* Whilst provision is made within BS EN 12051 to ensure that operating forces are kept within reasonable limits (even after periods of abuse) door bolts are **NOT** suitable for emergency exit situations, and should **NOT**, therefore, be used on escape routes, except on the second leaf of double door assemblies where the first leaf in use is wide enough to meet relevant escape requirements.

4.0 Fire issues

Many of the best practice guides in this section refer to classification of the suitability of the associated products for use on fire resistant and/or smoke control doors.

Currently the following test methods and classification documents are relevant:

BS EN 1634-1: 2000 - *Fire resistance tests for door and shutter assemblies: Part 1 – Fire doors and shutters;*

BS EN 1634-3: 2001 - *Fire resistance tests for door & shutter assemblies: Part 3 - Smoke control doors & shutters*

BS EN 13501-2: 2003* - *Fire classification of construction products and building elements: Part 2 – Classification using data from fire resistance tests (excluding products for use in ventilation systems).*

BS 476: Part 22 - *Fire tests on building materials and structures: Part 22 - Methods for determination of the fire resistance of non-loadbearing elements of construction*

* Standard in course of publication

See also the Product /application related questions in the [FAQ section](#) of this CD.