



**Association of Building
Hardware Manufacturers**

Best practice guide

**Door coordinator
devices
to
BS EN 1158**

in association with



Builders Merchants Federation



*Extracts from BS EN 1158: 1997 +
A1: 2003 are reproduced with the
permission of BSI.*

• 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 1158 - Door coordinator devices (Door selectors)

The standard provides details on product types, classification by use, test cycles, door mass, corrosion resistance, as well as definitions, product performance requirements, test apparatus, test methods and marking of products. In addition, the published standard includes annexes illustrating the various points made through diagrams and supplementary text.

Extracts from BS EN 1158 are reproduced with the permission of the British Standards Institution. BSI publications can be obtained from BSI Customer Services, 389 Chiswick High Road, London W4 4AL Tel +44 (0)20 8996 9001 Email: cservices@bsi-global.com.

No previous British Standard for these products existed.

Amendment A1 to BS EN 1158 was published early in 2003 and this amendment provides for CE marking of conforming products in accordance with the EU Construction Products Directive.

• INTRODUCTION

To ensure effective fire compartmentation in buildings, it is essential that the individual leaves of pairs of doors with rebated meeting stiles close in the correct sequence. This function is achieved by the use of door coordinator devices.



Examples of rebated meeting stiles

Door coordinator devices manufactured in accordance with this European standard are recommended for use wherever there is a requirement for reliable sequential closing of double leaf fire/smoke doors incorporating rebated meeting stiles.

• SCOPE

This European standard specifies requirements for both separately mounted devices and mechanisms incorporated in door closers. There are additional requirements for devices for use on fire/smoke door assemblies.

A number of different types and designs are available as shown in the following illustrations.

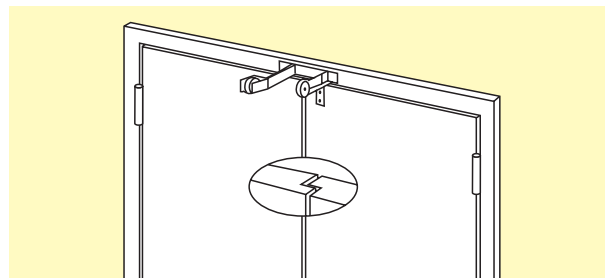


Figure 1. Gravity arm coordinator - example 1

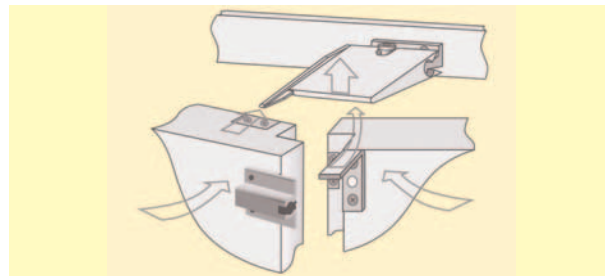


Figure 2. Gravity arm coordinator - example 2

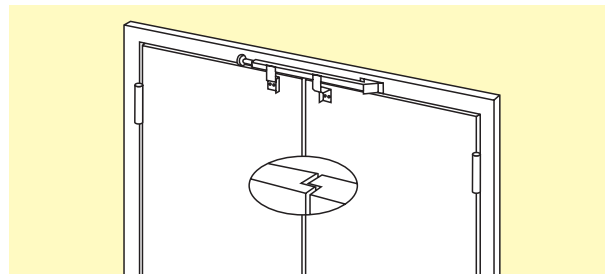


Figure 3. Swing arm coordinator

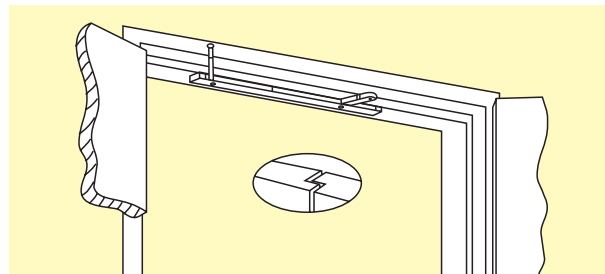


Figure 4. Double arm swing coordinator

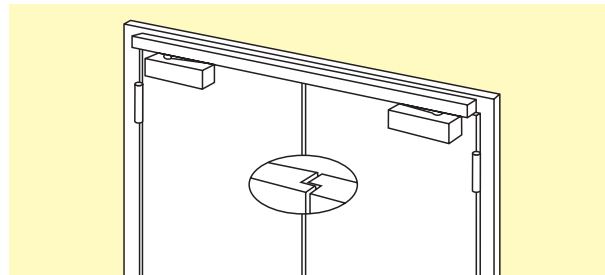
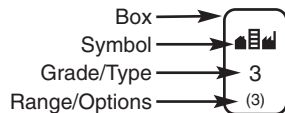


Figure 5. Coordinator incorporated in door closing device

• CLASSIFICATION

BS EN 1158 classifies door furniture by using an 6 digit coding system. A similar classification 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 3 in the Category of Use classification, where EN 1158 stipulates only grade 3.

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

Digit 1 Category of use

Only one category is identified:

- grade 3: for all internal and external doors for use by the public, and others, with little incentive to take care, i.e. where there is some chance of misuse of the door.

Digit 2 Number of test cycles

Two test durations are identified:

- grade 5: 50 000 test cycles: for all other door coordinator devices. Figures 1, 2 & 3.
- grade 8: 500 000 test cycles: for door coordinator devices incorporated in, or for use in conjunction with, automatic swing door operators, and for devices incorporated in a door closer. Figures 4 & 5.

Digit 3 Test door mass

Five door mass grades and related coordinator sizes are identified according to table 1 of this European standard.

Where a door coordinator device is suitable for a range of door closer power sizes, both the minimum and maximum sizes shall be identified.

Table 1

Door coordinator size	Test door leaf mass kg	Recommended door leaf width max. mm	Distance between hinge centrelines max. mm
3	60	950	1900
4	80	1100	2200
5	100	1250	2500
6	120	1400	2800
7	160	1600	3200

Note: This table relates to doors with equal leaves only.

Digit 4 Fire resistance

Two grades of fire resistance are identified for door coordinator devices manufactured to this European standard:

- grade 0: not suitable for use on fire/smoke door assemblies
- grade 1: suitable for use on fire/smoke door assemblies, subject to satisfactory assessment of the contribution of the door coordinator device to the fire resistance of specified fire/smoke door assemblies. Such assessment is outside the scope of this European standard (see EN 1634-1). Annex A indicates additional requirements for door coordinator devices.

Digit 5 Safety

All door coordinator devices are required to satisfy the essential requirement of safety in use. Therefore, only grade 1 is identified.

Digit 6 Corrosion resistance

Five grades of corrosion resistance are identified in accordance with EN 1670.

- grade 0: no defined corrosion resistance.
- grade 1: mild resistance.
- grade 2: moderate resistance.
- grade 3: high resistance.
- grade 4: very high resistance.

• EXAMPLE:

The following marking denotes a door coordinator device suitable for a range of door closer power sizes from 4 to 6, for use on fire doors and with moderate resistance to corrosion.



• MARKING

Each door coordinator device manufactured to this European standard shall be marked with the following:

- manufacturer's name or trademark, or other means of identification.
- product model identification.
- the six digit classification listed above.
- number of this European standard.
- year and week of manufacture.

Note: This information can be in coded form

• CE marking

Door coordinator devices intended for use on fire resisting doors and smoke control doors are covered by a Construction Products Directive mandate issued by the European Commission. Consequently, this standard is regarded as a "harmonised" standard and compliance with it, supported by suitable evidence, allows the application of the CE mark.

As door coordinator devices have a critical safety function, application of the CE mark will require the involvement of a notified certification body to provide verification of the compliance claims. This will involve initial type-testing of the product to EN 1158, initial

inspection of the manufacturer's factory production control and continuing surveillance and approval of the factory production control. On satisfactory fulfilment of these tasks, the notified body issues an EC Certificate of Conformity which then permits the manufacturer to declare compliance and affix the CE marking to his product.

The standard requires the following additional information to accompany the CE marking:-

- the identification number of the notified certification body
- the name or identifying mark of the manufacturer
- the registered address of the manufacturer
- the last two digits of the year in which the marking was applied
- the number of the EC certificate of conformity
- reference to EN 1158: 1997
- the classification code of the product

Note that, although the notified body has to be involved to verify the manufacturer's claims, the manufacturer remains responsible for designing and producing the product, for affixing the CE marking, and for ensuring that the product meets the requirements of the Directive.

• SPECIFICATION ISSUES

- Door coordinators incorporated on a fire door assembly shall have satisfied the appropriate criteria of a fire test (currently BS 476: Pt. 22).

- A door coordinator shall not include a hold open device unless it is an electrically powered device in accordance with BS EN 1155.

- Door closers which incorporate integrated door coordinators shall conform to the requirements of BS EN 1154 including those additional requirements for door closing devices intended for use on fire/smoke door assemblies as indicated in the annex of BS EN 1154 covering those requirements where applicable.

- Manufacturer's advice should be sought if door leaves are unequal or if projection hinges are being used as variations in door geometry may affect the efficient operation of the coordinator.

• RELATED STANDARDS

As companion to BS EN 1158, two further amended and harmonised product standards have been published. The first, BS EN 1154 covers controlled door closing devices and has replaced BS 6459. The second, EN 1155 covers electrically powered hold-open devices and replaces BS 5839:Pt.3. Both these amended standards were published early in 2003.

Where to place the CE mark

	On product – and visible after installation	On product	With installation instructions	On product packaging	On commercial documents
CE symbol	R	E	E	R	O
Notified Body number	R	E	E	R	O
Name of Producer	O	O	E	O	O
Address of Producer	O	O	E	O	O
Year of marking	O	O	E	O	O
C of C number	O	O	E	O	O
Product std number	O	R	E	R	O
Classification code	O	R	E	R	O

E = Essential
 O = Optional
 R = Recommended

For some products it may be appropriate to specify a combination of locations for the CE marking and the accompanying information. For example, a minimum of information could appear on the product itself, with the complete information appearing on the installation instructions or on the accompanying commercial documents. Where the information is split in this way, the location(s) lower in the hierarchy must always repeat that part of the information already placed higher up in the hierarchy.

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 coordinators. 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 coordinator devices 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 1158. 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 1158 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 1158 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.



ABHM

42 Heath Street, Tamworth, Staffs B79 7JH

Tel: 01827 52337 Fax: 01827 310827

E-mail: info@abhm.org.uk

Website: www.abhm.org.uk

1.0 Introduction

Fire-resisting doorsets, other than those to locked cupboards and service ducts, may require to be self closing, in accordance with any local regulations. When pairs of doors are used for fire-resisting purposes, the door closing device fitted on each individual leaf should be able to close the door leaf reliably from any angle to which that leaf has been opened and overcome the resistance of any latches or seals when fitted.

However, when these pairs of doors have rebated meeting edges it becomes essential that the individual leaves also close in the correct sequence, to maintain the fire integrity of the complete double doorset assembly.

There is thus a need in these circumstances for a door coordinating device (also known as a door selector) to ensure that after opening, the first opening leaf of a pair of doors is held back from closing fully, until the second opening leaf has closed back fully into the frame.

For the purpose of this Code of Practice door coordinator devices are divided into the following categories:

- a) Gravity arm coordinators
- b) Swing arm coordinators
- c) Double arm swing coordinators
- d) Coordinators incorporated into door closing devices

Note: This list does not imply suitability of any particular device for fire door use (see clauses 2.0 and 3.0 of the [Controlled door closing devices](#) section of this CD).

2.0 Critical recommendations

- 2.1 The door coordinator device and its accessories should comply fully with BS EN 1158 – *Building hardware – Door coordinator devices*, including its Annex A. Preferably, this compliance should be demonstrated by application of the CE marking.
- 2.2 The product and any accessories should have demonstrated their ability to be suitable for the intended purpose, by inclusion in satisfactory fire tests to BS EN 1634-1, on a type of doorset and configuration in which it is proposed to be used. 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 The strength and features of the coordinator must be correct for the size of door to which it is to be fitted, bearing in mind:
 - the application to the door;
 - whether subject to other factors such as air pressure; draughts, heavy traffic use; abusive treatment; use by elderly, infirm or disabled;
 - whether smoke or other seals are fitted to the doorset.

(For further information see section 3.1).
- 2.4 Concealed overhead coordinators should **NOT** be used unless they are provided with specially designed and proven intumescent protection (see section 3.5).
- 2.5 Door or frame preparation any for morticed components such as carry-bars, must be protected to maintain the fire integrity of the doorset. This may require specially designed and proven intumescent protection. (see section 3.2).
- 2.6 Coordinators incorporated with electrical hold-open devices should comply additionally with the recommendations of made in 'Critical recommendations' in the [electrically powered hold open devices](#) section of this CD, clause 2.0.
- 2.7 A regular programme of maintenance should be undertaken to ensure that the correct operational performance is maintained for the life of the building.

3.0 Commentary

3.1 General

The Building Regulations Approved Document B requires that all fire doors (with the exception of locked cupboard/duct doors) be fitted with an appropriate self-closing device. This applies equally to pairs of doors (double doorsets) with rebated meeting edges and therefore requires the use of a door coordinating device for these doorsets.

Door coordinator devices intended for use on fire resisting and smoke control doors are covered by a Construction Products Directive mandate issued by the European Commission. Consequently, BS EN 1158 is regarded as “harmonised” and compliance with it, supported by suitable evidence, allows application of the CE mark. It is strongly recommended that, once these products are available, only door coordinator devices bearing the CE mark should be specified.

Door coordinator devices are available in a range of sizes which relate to the available closing power of the door closers fitted, whether the coordinator is separately mounted or integral with the closing device. The minimum performance requirements are laid down in BS EN 1158 and include manipulation tests, durability and abuse resistance.

The following table, extracted from BS EN 1158, shows the range of coordinator sizes and related maximum recommended door leaf widths, together with some of the relevant test parameters:

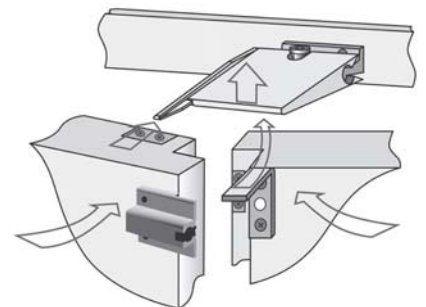
Table 1				
Door coordinator size	Maximum recommended door leaf width mm	Test door leaf mass kg	Maximum distance between hinge centrelines mm	Maximum test door Friction Nm
3	950	60	1900	0.3
4	1100	80	2200	0.4
5	1250	100	2500	0.5
6	1400	120	2800	0.6
7	1600	160	3200	0.8
NOTE: This table relates to doors with equal leaves only.				

From the above table it can be seen that coordinator sizes are related to the door leaf width and the mass of the door to be controlled, in exactly the same manner as door closing devices (see section 3, Table 1). This is important, not only to ensure that the coordinator size is matched with the power size of the door closer that is to be fitted, but also to make sure that the coordinator is able to withstand the normal forces and mechanical stresses experienced in daily use.

Smoke seals can sometimes prevent the door closer from fully closing the door, considerable force being required to deflect or compress the seal, particularly if they are not correctly installed and maintained. Very careful consideration should be given to these issues when specifying door coordinators that incorporate closing controls to ensure that extra spring strength is not applied just to overcome poor seal efficiency.

3.2 Gravity arm coordinators

These devices consist of simple gravity components such as flaps or roller arms, which are attached to the transom on the opening side of the doorset, and control the door leaves by blocking the last few degrees of return of the active leaf (the first opening and last closing leaf) until the inactive leaf (the last opening and first closing leaf) has closed into the frame. Generally they are surface mounted and, being of small mass in themselves, are unlikely to reduce the fire resisting properties of the doorset. However, for correct operation they also require a “carry bar” device to enable the active leaf to be opened to its holding position, in instances when the inactive leaf is opened first. The carry bar and associated striking plate are generally morticed into the rebate of the door leaves and could be a source of failure in a fire situation. It is therefore essential to check that appropriate fire test evidence exists for these components and that it is suitable for the rebate dimensions of the doors for which it is intended.



As a general rule, wherever components have to be morticed into the door leaves or frame, there is an increased chance of adversely affecting the fire resistance of the doorset, and there may be a need for additional intumescent protection. The fire test evidence should always be examined.

3.3 Swing arm coordinators

These devices consist of a simple spring controlled arm which is attached to the transom on the opening side of the doorset, and controls the door leaves in a similar manner to the gravity type of coordinator. They require some form of plate/carry bar fixed to each door leaf, but generally all components are surface mounted and relatively small, and therefore unlikely to adversely affect the fire resisting properties of the doorset assembly. In operation the spring loaded arm swings out to hold the inactive leaf open until the active leaf has closed, and as a result this type of design can be vulnerable to misuse or vandalism. It is especially important that such devices are subjected to regular checks to ensure they continue to work correctly.

3.4 Double arm swing coordinators

To minimise the vulnerability of single swing arm coordinators to abuse, versions are available which contain very short operating arms and which hold the inactive leaf from a position nearer to the hanging edge of the door leaf. The coordinating mechanism is contained in a long tube which is mounted under the transom. In this position the mass of metal could be a source of integrity failure under fire conditions and it will almost certainly require the use of intumescent material to protect the transom and adjacent door leaves in this area.

The test report should be checked to determine whether additional protection is required.

3.5 Coordinators incorporated into door closing devices

These devices offer the most effective way of providing both the closing function and the coordinating function in one device. They consist of two door closing devices (one for each door leaf) and a common track assembly or concealed cable which connects the two closers and provides the coordinating action.

For overhead, surface fixed coordinators, the track assembly is usually fixed to the underside of the transom so again, the mass of metal could be a source of integrity failure under fire conditions and it will almost certainly require the use of intumescent material to protect the transom and adjacent door leaves in this area. Some versions can also provide smoke detectors built into the coordinator assembly and with these devices it is essential to have a regular maintenance programme to ensure that the detectors are kept clean and all parts remain in good operational order.

Some other versions use closers concealed in the door leaves, with the track assembly concealed in the transom. As so much timber is removed when installing these devices, it is absolutely imperative to ensure that all intumescent protection recommended or supplied by the manufacturer is fitted during installation. The fire test report should be examined closely to ensure that it covers the particular application envisaged.

Several manufacturers provide floor springs with a coordinator function, achieved by means of a cable running under the finished floor level that connects the two floor springs mechanisms together. From a fire door control point of view, these are very satisfactory devices as all elements are concealed and away from the worst effects of a fire or misuse. Such an arrangement is most unlikely to have any adverse effect on the fire integrity of the doorset.

With all of these devices it is most important to check that the fire test evidence is appropriate to the particular application for which it is intended to be used, and that any intumescent protection recommended is actually fitted during installation.

Further information on [door closers](#) and [electrically powered hold-open devices](#) can be found in the relevant product sections of this CD.

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.