

IRONMONGERY FOR SPECIALIST APPLICATIONS GAI SPECIFIER'S GUIDE

The specifier's guide to specifying the correct ironmongery solutions for specialist applications in buildings.

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Based on the RIBA Approved CPD of the same name, the specifier's guide to Ironmongery for Specialist Applications covers the specification of the correct ironmongery solutions for buildings with specialist applications.

To ensure that your project meets the latest standards, regulation, legislation and best practice, it is strongly recommended that the ironmongery should be specified by a GAI Registered Professional such as a Registered Architectural Ironmonger (RegAI). All RegAI's have successfully completed the GAI Diploma in Scheduling qualification, and continue to maintain and update their knowledge through the GAI continuing professional development (CPD) programme. RegAI status is a clear demonstration of professional competence in matters which are critical to building safety, accessibility and security. Visit www.gai.org.uk/RegAI.

If you would like to receive a presentation of the CPD, this is available through GAI member companies. Please visit the GAI website (www.gai.org.uk) for more details.

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1. ACCESSIBILITY

Detailed knowledge of specialist ironmongery is required in order to specify the correct products in relation to accessibility.

Accessibility refers to the design of products, devices, services, or environments for people who experience disabilities.

Awareness of local building regulations and legislation regarding accessibility is a necessity for a specifying ironmonger.

DISABILITY DISCRIMINATION ACT (DDA)

The DDA was introduced in a number of stages starting in December 1996. From October 1999 it required “service providers” to take reasonable steps to change practices, provide auxiliary aids, and remove physical barriers to make their facilities more accessible for users with disabilities.

From October 2004, they have had to “make reasonable adjustments to the physical features of their premises, if it is impossible or difficult for disabled people to access their service” i.e. all existing buildings had to be upgraded where practical and reasonable. All new buildings and extensions must comply.

THE EQUALITY ACT

The Equality Act (EA) came in to force on 1st October 2010. All civil rights legislation covering discrimination of various kinds (including the DDA, Sex Discrimination Act, Race Discrimination Act, etc.) was amalgamated into the Equality Act.

This consolidated 116 different pieces of equality legislation, 35 Acts of parliament, 52 Statutory Instruments, numerous Codes of Practice and 16 EC Directives and Recommendations. Combined, they provide a legal framework to protect the rights of individuals and advance equality of opportunity for all.

It has a much wider remit than the building regulations, applying as it does to owners and operators of all buildings, new and existing, that lie within its scope. With respect to providing suitable access and facilities for people with a disability, consideration should be given to equality requirements.

Equality law recognises that bringing about equality for disabled people may mean changing the way in which services are delivered, providing extra equipment and/or the removal of physical barriers. This is the ‘duty to make reasonable adjustments’.

This aims to make sure that a disabled person can use an organisation’s services as close as it is reasonably possible to the standard usually offered to non-disabled people.

If an organisation providing goods, facilities or services to the public or carrying out public functions, or running an association identifies barriers to disabled people in how it does things, it must consider making adjustments. If those adjustments are reasonable for that organisation to make, then it must make them.

The duty is ‘anticipatory’. An organisation cannot wait until a disabled person wants to use its services, but must think in advance (and on an ongoing basis) about what disabled people might reasonably need.

WHAT IS ‘REASONABLE’?

The Equality Act mentions “reasonable adjustments” yet it is impossible to list a solution for every door type within every building, so we are pointed in the direction of existing legislation to give us guidance on best practice:

- Approved Documents relating to Building Regulations.
- BS 8300-1:2018 Design of an accessible and inclusive built environment External Environment: Code of Practice.
- BS 8300-2:2018 Design of an accessible and inclusive built environment. Buildings.: Code of Practice.

WHAT IS AN APPROVED DOCUMENT?

Approved Documents are a series of documents that give practical guidance about how to meet the requirements of Building Regulations.

Approved documents set out what, in ordinary circumstances, may be accepted as reasonable provision for compliance with the relevant requirements of the Building Regulations.

Different regions of the UK and Ireland have different interpretations, with their own versions of approved documents.

- England: Approved Document M (2015).
- Wales: Approved Document M (2014).
- Scotland: Technical Handbook, domestic and non-domestic: Safety (2015).
- Northern Ireland: Technical Booklet Part R (2012).
- Republic of Ireland: Technical Guidance Document M (TGDM) (2010).





Plunger type force gauge

2. SPECIALIST CLOSING DEVICES

The prime role of a mechanical door closer is to ensure that a door returns to the closed position after it has been used, generally on fire doors. The forces applied by door closers can sometimes make it difficult for users to open the door and these forces need to be carefully considered.

RECOMMENDED OPENING FORCES FOR DOORS

BS 8300-2 states "For most disabled people to have independent access through single or double swing doors the opening forces when measured at the leading edge of the door should be:

- not more than **30N** from **0°** (the door in the closed position) **to 30° open.**
- not more than **22.5N** from **30° to 60°** open.

It is also stated that it is preferable that backchecks should not operate before about 80° open and that the maximum closing force should occur between 0° and 15° of final closing.

It is recommended that plunger type force gauges should be used to measure the opening force of a door.

SPECIALIST CLOSING DEVICES

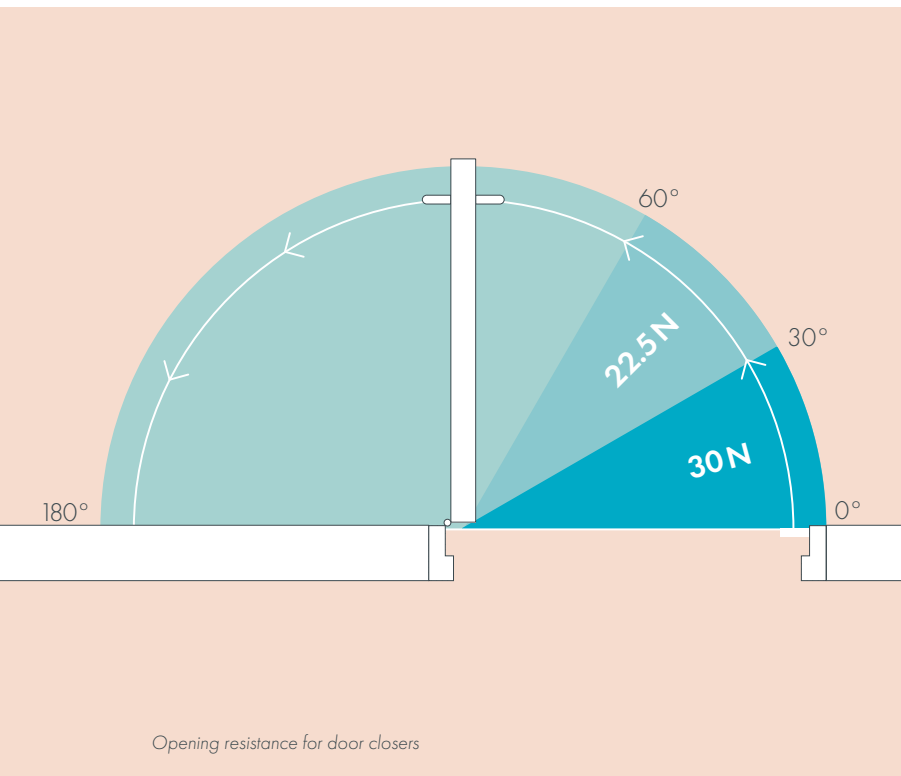
In areas where the opening forces of the doors could prove to be an obstacle or whether they do not comply with the recommendations within BS 8300-2 specialist closing devices are available.

Approved Document M in England and Wales states that "a powered door opening and closing system, either manually controlled or automatically operated by sensors, is the most satisfactory solution for most people".

Approved Document B in England and in Wales states "where self-closing devices could present an obstacle to the residents of the building then the following hardware... would be appropriate".

- Bedrooms - Free swing devices.
- Circulation spaces - Hold open devices.

Any of these systems would be most useful in buildings requiring increased accessibility.



2. SPECIALIST CLOSING DEVICES CONT'D

Where it is not possible for a controlled door closing device to close a door and keep it closed without exceeding the opening force limits as mentioned in BS 8300, then the following systems should be considered.

Swing free device



SWING FREE DEVICES

Swing free closing devices allow a door to operate without resistance, as if the closer were not present. This means the door can be left in any position.

Once the fire alarm is activated electromagnetic control will release the door, this enables the door to close securely.

Devices must be tested to BS EN 1155 which is a harmonised standard. They are available in overhead, concealed in door and floor springs. New models are now available featuring an anti-slam finger protection function.

ELECTROMAGNETIC HOLD OPEN UNITS

Electromagnetic hold open units are used to hold open fire doors on circulation routes. Their performance is dependent upon doors being closed at the time of fire.

These units can be either in an electro-magnetic unit or else as using an independent electro-magnet. They can be surface or flush mounted.

Devices must be tested to BS EN 1155 which is a harmonised standard. Single swing doors require closing devices that conform with BS EN 1154.



Motion sensor activated automatic operators

POWER-OPERATED DOORS

A power-operated door – either sliding, folding, balanced or swing, which should be one of the following two types:

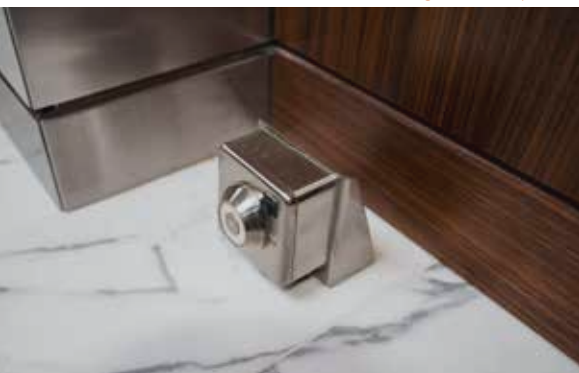
- A manually activated door controlled by a push pad, coded entry system, card swipe or remote control device.
- An automatically activated door controlled by a motion sensor or a hands-free proximity reader.

Note that installation of automatic operators must be to BS EN 16005.

POWER-OPERATED REVOLVING DOORS

Power-operated revolving doors are not considered accessible. Therefore a complementary accessible door should be provided immediately adjacent to the revolving door.

Floor mounted electromagnetic hold open unit



3. VISUAL CONTRAST AND LRV

When specifying architectural ironmongery, it is important to consider the visual contrast between operable door furniture and the surface that it is mounted on, to ensure that they can be easily identified by those with visual impairments.

Example of door furniture with good visual contrast



Contrasting intumescent seals for leading edges of doors



WHAT IS VISUAL CONTRAST?

Visual contrast is the perception of a visual difference between one surface element of a building and another.

The main feature of a surface, which appears to be strongly correlated with the ability of visually impaired people to identify differences in colour, is the amount of light the surface reflects, or its light reflectance value (LRV).

LRVs are measured by using a hand held colorimeter or reflectometer of 0/45 degree geometry. BS8493:2008 is the British Standard which describes the test method for measuring LRVs.

The LRV scale runs from 0 which is totally black to 100 which is perfect white.

VISUAL CONTRAST OF DOOR FURNITURE

BS 8300-2 states:

“For easy identification by blind and partially sighted people, all door opening furniture should contrast visually with the surface of the door”.

It is considered that a difference in LRV between the door opening furniture and the door of at least **15 LRV points** is acceptable. If the LRV value of the door surface is subtracted from the LRV value of the door handle finish, this will give the differential.

DOORS LEADING INTO CORRIDORS

Where doors are held open, the leading edge of the door must contrast visually with the face of the door. Two examples of how this could be achieved are given:

- A contrasting intumescent seal of a minimum 15mm wide fitted in the edge of the door.
- A self-adhesive contrasting strip at least 1m long, starting at least 500mm from finished floor level, covering at least 60% of the door edge thickness.



Example of handrails with good visual contrast

HANDRAILS

BS 8300-2 states that handrails should be “finished so as to provide visual contrast with the surroundings”.

It states in Appendix B that generally there is considerable confidence in recommending differences in LRV of 30 points although 20 points might still be acceptable depending on surface illumination.

SIGNAGE

A difference in LRV of 70 points between letters, symbols or pictograms and the signboard is recommended. This is also recommended between the signboard and the background to ensure good visual contrast.

Light coloured text and symbols or pictograms on a dark background are preferred, while tactile features, Braille and adequate lighting will all assist those with impaired vision.

4. ANTI LIGATURE

PRODUCTS

An anti-ligature product is one from which there is, through design, a reduction in the opportunity for a ligature to remain secured to it.

The purpose is to deny individuals the opportunity to use the hardware as a means of attaching a ligature for the purpose of inflicting harm to themselves or others.

It should be noted that it is there to reduce the risk – it doesn't mean "ligature-proof". Different products will suit different circumstances – there's no "one size fits all". It is always best to consult with the facility manager/architect to determine the best products for any particular institution.

SPECIFICATION

Anti ligature furniture can be specified traditionally using separate levers or knobs and combining them with the appropriate locks.

Specify locks carefully – a standard latch can give a ligature point, and has edges which could be used for self-harming. Roller bolts are therefore often used.

Also remember when specifying lock cases that anti ligature levers tend to have larger roses so it can be advisable to use lock cases with the follower above the keyway and with sufficient distance between the two.



Witches nose pull handle



Anti-ligature pull handle



Anti ligature knob handle



Anti ligature lever/knob handle



Anti ligature lever handle



Anti ligature hinge

4. ANTI LIGATURE CONT'D

LOCKSETS

It is possible to specify locks and handles as an integrated lockset package – this can provide additional protection against barricading when someone holds the lever from the inside to prevent entry from outside. There are 5 means of being able to overcome a barricade scenario as follows:

- 1) **Key** - The lock and the internal turn/pull operate independently, so the key always dominates. It's a direct mechanical override, so there's no geared cylinder to disengage the turn/pull or clutch mechanism involved.
- 2) **Keyway** - Concealed backup override directly turns the spindle, allowing entry if keyway is blocked with foreign objects, like chewing gum or paper.
- 3) **Turn leverage** - T-bar emergency tool provides superior leverage to rotate the turn/pull, even if the service user is stronger.
- 4) **Spindle** - Safety spindle shears under heavy resistance, ensuring entry if turn/pull is immobilised. So even in the most serious barricade attempts, where the service user attempts to jam the turn/pull with their bed or body, swift access is achieved without lockcase damage.
- 5) **Pull advantage** - T-bar provides significant power advantage to pull the door open – offering better grip than an anti-ligature handle and foiling attempts by a service user to hold the door shut.

STANDARDS

TS 001:2013 – is the Technical Schedule developed by DHF which is the “Enhanced requirements and test methods for anti-ligature hardware”.

Aimed at addressing the safety of people that may be at risk of self-harm whilst in special care environments. TS001 standard has 3 tests:

- **Test A** - Fixed hardware devices and fixed mounting devices tested in multiple directions (Graded A1 to A4).
- **Test B** - Fixed hardware devices tested only in a downwards direction (Graded B1 to B4).
- **Test C** - Load release hardware devices (Graded C1 to C4).

Testing involves fitting hardware to a testing block and attempting to unscrew hardware as well as applying loads in vertical or horizontal direction to see if test wire remains attached to the device.

5. ANTI MICROBIAL

DOOR FURNITURE

Approximately, 300,000 patients a year in England are affected by a HCAI - healthcare-associated infection as a result of care within the NHS (NICE England).

2007 MRSA and C-Diff infections were recorded as the underlying cause of approximately 9,000 deaths in hospital and primary care in England.

It is estimated that 14-16% of beds are occupied by HCAI bed occupants. The value of this is approximately £2.4 billion PA to the UK.

Research is ongoing as to how HCAIs can be reduced and what are the practical measures which could be taken.

It has been stated that 80% of infections are spread by touch. Furthermore, a contaminated hand can contaminate the next seven surfaces touched.

The commonly touched surfaces in a hospital are touched by patients, staff and visitors and present a reservoir of infection, waiting to be spread. It is not practical to clean each of these surfaces every time they are contaminated.

TYPES OF ANTI MICROBIAL FURNITURE

A variety of anti-microbial and anti-bacterial coatings and materials have been developed to help combat the rise of HCAIs- Healthcare acquired Infections such as C-Diff or MRSA:

- **Silver** - Silver surfaces contain silver ions which destroy the cell membrane of the germ and stops further cell division.
- **Copper** - Copper is a solid material (not a coating) and its antimicrobial properties last the lifetime of the product. It is continuously active, rapidly reducing pathogens.
- **Applied finishes** - Applied finishes can create a chemical reaction on the surface once UV light strikes the particles in the coating and emit electrons. This breaks down bacteria and viruses in to water and carbon dioxide.
- **Built in protection** - Antimicrobial technology is built-in to solid products during manufacture. Since the protection is built into the product during manufacture, it cannot be washed or wiped off.



6. FINGER PROTECTION

The NHS has published extrapolated figures suggesting that circa 80,000 accidents occur per annum, primarily involving children, who have trapped their fingers in doors, leading to serious injury and even amputations. Prevention of injury at the hinge side is possible using integrated or surface-fixed products.

BS 8613:2017 is the standard for finger protection devices for pedestrian doors. It specifies requirements and test methods for durability, strength and effective function of finger protection devices fitted at the hanging stile of pedestrian doors with the main purpose of preventing inadvertent injury.

Where automatic swing doors are fitted it is a requirement of BS EN 16005 that finger trap protection be used at the hanging stile(s) of the door.

There are a number of types of finger protection which are available in the market place. Here are some of the most commonly specified types:

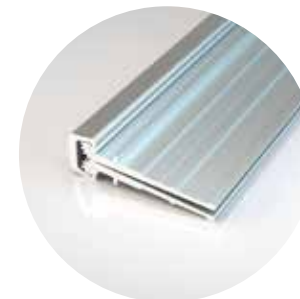
- Gap cover – roller blind.
- Gap cover – rigid shield.
- Hinge knuckle protection.
- Gap and hinge knuckle protection.
- Integrated door and finger protection device.
- Integrated door and finger protection system.



Gap cover - roller blind



Gap cover - rigid shield



Hinge knuckle protection



Gap and hinge knuckle protection



Integrated door/ finger protection device



Integrated door/ finger protection system

7. SPECIALIST SIGNAGE

Architectural ironmongers are often called upon to provide signage solutions for buildings. There are occasions when specialist signage is required which can include Braille, tactile, bi-lingual or visually stimulating for areas such as care homes.

Tactile and Braille signage



Dementia care signage



TACTILE AND BRAILLE

In the UK there are almost 20,000 people using Braille and over 2 million people with a visual impairment.

Braille is a way of representing text with a series of raised dots allowing blind people to read with their fingers. The six dots that make up Braille translate into letters of the alphabet, numbers, symbols and common words. The sharp contrasting and prominent tactile letters allow partially sighted people to visualise signs much easier.

There are 2 grades of Braille signage:

- **Grade 1 Braille** which represents letter for letter is used for single and shorter wording signs.
- **Grade 2 Braille** which is a contracted form of Braille, is used for longer sentenced signs and notices.

Braille signage is usually manufactured under the guidance of the RNIB – Royal National Institute for the Blind.

DEMENTIA CARE

Dementia is an incurable disorder that affects how the brain works and there can be a wide range of symptoms. For example, early symptoms of Alzheimer's, the most common form of dementia, include minor memory problems and, as the condition progresses, disorientation, confusion and wandering.

Because memory loss and wandering are particular problems, the use of purpose designed, dementia signage has an important role to play in helping people with orientation difficulties to find their way more easily and safely around.

Signs are also available which can have photos and names inset within them to assist with familiarity. These signs feature the room name in a plain, easy to read typeface, usually black or white on a bold background colour such as yellow as it has been found that yellow is one of the last colours to go in those with dementia.

There may be occasions when a deliberate lack of visual contrast can be specified for rooms which are not designed to attract attention to by patients such as private staff areas or doors leading to lifts.



Example of signage with good visual contrast

VISUAL CONTRAST

These are recommendations on LRV difference on signage when specified under BS 8300 2:

- A difference in LRV of 70 points between letters, symbols or pictograms and the signboard is recommended in BS 8300-2.
- Also between the signboard and the background to ensure good visual contrast.
- Light coloured text and symbols or pictograms on a dark background are preferred.



Guild of Architectural Ironmongers

The Guild of Architectural Ironmongers (GAI) is the only trade body in the UK that represents the interests of the whole architectural ironmongery industry - architectural ironmongers, wholesalers and manufacturers.

Formed in 1961, the GAI is internationally recognised and respected as the authority on architectural hardware, building its reputation on three key pillars; education, technical support and community.

Its technical information service is the only specialist service of its kind, providing comprehensive advice on issues relating to the legislation, regulations and standards governing the use of architectural ironmongery and related hardware.