

UCL Locking & Door Ironmongery

Technical Specification & Design Guidance Document

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Contents

1.0		Introduction	Relevant Standard	Page 3
2.0		Purpose of document		Page 4
3.0		UCL requirements and provision of master keyed cylinders		Page 5
	3.1	Design process and locking requirements		Page 6
4.0		British & European Standards - Introduction		Page 8
5.0		Hanging the door		Page 8
	5.1	Hinges	BS EN 1935	Page 9
6.0		Closing the door		Page 14
	6.1	Mechanical door closers	BS EN 1154	Page 14
	6.2	Electromechanical door closers	BS EN 1155	Page 18
	6.3	Door coordinating devices	BS EN 1158	Page 20
7.0		Locking the door		Page 22
	7.1	Lock cases	BS EN 12209	Page 23
	7.2	Bolts	BS EN 12051	Page 27
	7.3	Cylinders	BS EN 1303	Page 32
	7.4	Digital locks		Page 35
	7.5	Panic escape hardware	BS EN 1125	Page 36
	7.6	Emergency escape hardware	BS EN 179	Page 40
8.0		Dressing the door		Page 43
	8.1	Lever/Knob furniture	BS EN 1906	Page 43
	8.2	Push/Pull handles	BS EN 8424	Page 47
9.0		Accessibility	BS 8300	Page 50

1.0 Introduction

The scope of British and European standards that relate to door hardware, define a wide range of performance characteristics that include specific performance criteria applicable to the function and use of the hardware. When applying hardware to fire rated and escape doors some of this performance criteria is essential to the life safety critical performance of the door, to provide the function for which it is designed, i.e. fire compartmentation or ability of occupants to escape.

Under the UK Construction Products Regulation (UK-CPR) it is a mandatory requirement for products, covered by a UK designated standard, to achieve the minimum performance criteria in respect of these essential characteristics. Under current building regulations it is a mandatory requirement to use hardware that is UK-CA Marked (where covered by a designated standard) on fire doors or escape doors.

Note: Following the UK leaving the EU (BREXIT) we are currently in a transition period whereby the European Construction Products Regulation (EU-CPR) will additionally apply until 31st Dec 2022, as of 1st January 2023 the UK-CPR will replace the EU-CPR, therefore European CE Certificated products are additionally acceptable during this transition period. It should also be noted that products placed on the market by this date which are CE marked can continue to be accepted beyond 1st January 2023, if they were placed on the market by this date.

It is essential that these critical performance aspects and compliance requirements are focused on as part of the design process. Additionally, there is also a need to create accessible buildings that are open and inclusive to all.

The design process should therefore focus on

- Escape Route Compliance
- Fire Door Integrity
- Accessibility and Inclusion

It is critical that we create safe, secure and inclusive environments at UCL that are easy to navigate, and the correct choice of door ironmongery is a key component to ensure this, and it is essential that solutions are fit for purpose and suitably secure, robust and reliable.

In addition, the university environment represents some specific challenges for doors and their operation, and the following should be considered as part of the design:

- General robustness: Some of the university areas receive hard use from, for example, large numbers of public and students using busy doors; and impacts from trollies in labs and service areas. Consideration should be given to the robustness of the solutions used and their suitability for the environment in which they're installed.
- Easy operation: Particularly with specialist door sets, we have often seen complicated combinations of manufacturer installed items, and retro fitted components that overall present a complicated solution to operate and maintain; and as a result often fail to comply with the relevant standards. Many of our buildings are used by a wide variety of groups, from members of the public and students who may not be familiar with the building, to inducted staff. Consideration should be given to how easy the overall solution is to operate; and this is also key to ensuring that these doors are truly accessible.

Within the scope of this document are not only buildings owned or wholly leased by UCL, but also where UCL is a tenant in other buildings; in this case the use of the term 'perimeter' must be taken to be the perimeter of UCL space within the landlord's building.

2.0 Purpose of document

The purpose of this document is to guide and inform UCL Estates Project Officers, design consultants and contractors of the required standards to which we expect installation of locks and ironmongery to conform; and to highlight the relevant standards in an easy to access document. This will help to ensure the correct specification of ironmongery against UCL's requirements and the relevant standards.

The standards and specifications defined in this document should be taken as part of the Employer's Requirements of UCL Estates. Where requirements appear to differ from, or not be covered by this document, advice from the relevant UCL Estates Manager must be sought. You can contact us directly through estates.locks@ucl.ac.uk.

In this guide, ironmongery relating to doors covers the following elements:

- The hanging of door sets
- The closing of door sets
- The locking of door sets
- The dressing of door sets
- The protecting of door sets
- The signing of door sets

Particular note must be made to all references to BS 8300 to ensure that specifications of door ironmongery help to enable the design of an accessible and inclusive environment. This standard will inform not only the choice of products, but also how these are arranged on the door, and how they work together to create straightforward solutions that are easy to operate. Please refer to UCL's Inclusive Design Strategy document for further information.

For all of the relevant standards, for a full understanding, you may require access to the relevant BSI documents.

This document should be read in conjunction with the UCL Employers Requirements for Fire Safety from the UCL Fire Safety Manager - Please contact fire@ucl.ac.uk for access to the latest fire standards and technical notes from the UCL Fire Safety Manager.

3.0 UCL requirements and provision of master keyed cylinders

UCL has installed comprehensive master keyed lock cylinder systems in all university buildings. These are protected by world patents and are on unique key profiles for security.

UCL Security controls centrally, the specification and supply of these patented master keyed systems.

UCL Security provides all mechanical lock cylinders and issues these to contractors for installation as part of projects. All other door ironmongery is provided by the relevant project/principal contractor. The lock cylinders are provided by a dedicated on-site team based in the Andrew Huxley Building on the Bloomsbury Campus via our nominated contracted supplier.

This will include all perimeter and departmental areas within the building (or scope of works) as well as all plant, IT & cleaners' spaces. Specific master keying will be applied to each of these areas and is used to subdivide key control between different departments' spaces in the academic areas.

The locks team will require the following information in order to get lock cylinders ordered and supplied:

- A lock schedule identifying all lockable doors.
- A cylinder specification, identifying cylinder shapes, sizes, and finishes.
- A departmental contact to allow the team to design the correct suiting of lock cylinders.
- Plans showing both UCL room numbering and project room/door numbering (if different).
- Drawings to clearly identify departmental ownership and the designation of room types (academic space, plant rooms, IT room, cleaner's cupboards etc.).
- A purchase order covering the costs (provided by UCL Project Officer (UPO)).

It is essential to allow the locks team sufficient time to collate the information above, communicate with the department with regard to their requirements, order, and arrange for the lock cylinders to be manufactured, for installation by the contractor. Please refer to table below for minimum supply timescales – once all the information has been provided to us.

Volume (lock cylinders)	Time required
1-9	4 working weeks
10-49	8 to 12 working weeks
50-200	12-16 working weeks
200 and above	6 months

For all projects we would expect to be engaged at an early stage and be reviewing the information well in advance of these time periods.

Once the cylinders have been manufactured, they will be issued by the lock team to the nominated contractor for installation, marked up with the relevant door/room numbers.

Any references to electronic access control should be read in conjunction with other UCL Security technical documents – 'UCL – Security System Specification and Design Guidance Document' and 'UCL – Security System Specification – Appendix High Security Doors'.

3.1 Design process and locking requirements

UCL requires mechanical locking in the following instances. Please ensure that this is included in the design of all projects:

Door type	Requirement
Electronic access control	All perimeter doors to UCL space must have an additional europrofile deadlock installed for use in the event of power or system failure.
Plant rooms (housing plant equipment/electrical intake/roof access)	These must have electronic access control installed and require an additional europrofile deadlock as per perimeter doors.
Other plant spaces and risers	Require mechanical deadlock only.
IT main equipment rooms (MER)	These must have fail-locked electronic access control installed.
IT equipment rooms (SER)	Require mechanical deadlock only.
Cleaner's cupboards	Require mechanical deadlock only.
Cellular offices	Normally installed with cylinder operated sash lock.
Mechanical digital locks	All digital locks must be of the ASSA Codoor type and installed as per 7.4 of this document.
Laboratory	Normally installed with either cylinder operated sash lock, deadlock or digital lock. ACS would only be installed in specific high security environments – Please contact us for advice.
LPS 1175 SR rated doors	UCL requires the use of Stafford Bridge SR rated door sets on all areas requiring SR3 and above rating. Please contact UCL security for detailed specification of all these areas.
Push/pull ironmongery	Any door not fitted with lever handles, which has a lock installed must also have 'Push & Pull' handles clearly signed for the direction of opening, to ensure there is a means to pull the door shut and locked if the door closer is not working effectively.
Accessible toilets	These should not normally be locked, to ensure maximum accessibility. Some areas housing high value Changing Places equipment will require either RADAR locks or card operated access control – please refer to UCL Access & Inclusion Manager

For any areas requiring electronic access control, please refer to the 'UCL – Security Systems Specification and Design Guidance Document'. The interaction between electronic systems and mechanical ironmongery should be carefully considered and UCL Security consulted on all projects. It is important to ensure that we don't end up with conflicting ironmongery or complicated solutions that do not comply with the relevant standards, and can be difficult or confusing to operate

The onsite locks team can also provide specification advice related to all door ironmongery, and panic/escape hardware and their use at UCL. UCL Security welcomes the opportunity to discuss locking requirements and general ironmongery specification details for all projects. Please contact us for this, and to submit the request for mechanical lock cylinders detailed in this section, using – estates.locks@ucl.ac.uk

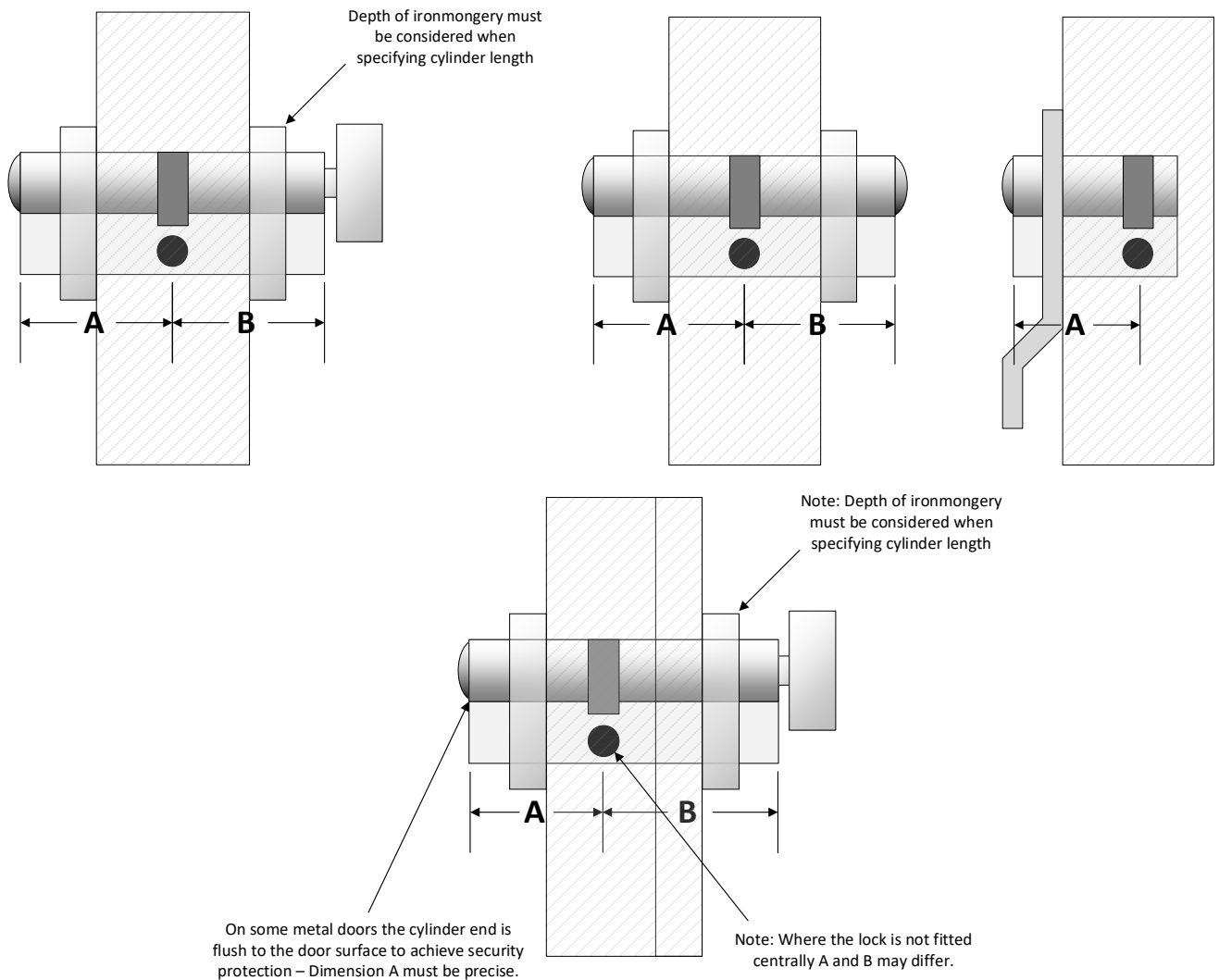
Please see below for the dimensional detail we require.

Cylinder Types and Measurements

The diagrams below show the measurements we will require to enable us to order the locks cylinders.

Ensure you consider the following:

- Door thickness.
- Thickness of the ironmongery affecting the length of the cylinder required.
- If a non-centred lock is installed (typically on metal exterior or specialist doors), it is essential you identify the two measurements, and on which side of the cylinder the thumbturn should be installed.










Please contact us to discuss this in more detail.

4.0 British & European Standards – Introduction

Introduction to the standard’s digit classification system

Almost all British and European architectural hardware standards follow a common format for consistency. Each product is classified under a number of performance headings and, generally, these are the same for all products. All products are “marked” with a six or more-digit classification coding which shows, in detail, what levels of product performance have been tested for the item.

This classification system, when applied to all items of architectural hardware, will enable complementary items also to be specified to, for instance, a common level of corrosion resistance, category of use, door mass, etc. The Digit classification is shown below:

Digit 1	Digit 2	Digit 3	Digit 4	Digit 5	Digit 6	Digit 7
						
Category of use	Durability	Test door mass	Suitable for fire/smoke door use	Safety	Corrosion resistance	Security

5.0 Hanging the door

Relevant standards that apply to this section:

- BS EN 1935: 2002 Single-axis hinges









Other documents referenced in this section:

- British Standards Institute (BSI) (www.bsi.co.uk)
- Door Hardware Federation (DHF) (www.dhfonline.org.uk)
- Guild of Architectural Ironmongery (GAI) (www.gai.org.uk)

Note: Harmonised/Designated Standard – Mandatory requirement for EU CE or UK CA certification of the hardware in accordance with the UK Construction Products Regulation.

5.1 Hinges

This section covers hinges and defines the UCL requirements for the standard BS EN 1935, this standard uses an 8 digit coding system.

Digit	Pictogram	Category	Minimum UCL requirement
1		Category of use	Grade 3 or above
2		Durability	Grade 7 only
3		Test door mass	To match or exceed mass of door
4		Fire suitability	To match use of door
5		Safety	Grade 1
6		Corrosion resistance	All internal doors to be grade 2 or above All external doors to be grade 3 or above Grade 4 may be required in environments where specific corrosive substances may be present (e.g. specialist labs, and/or harsh environments)
7		Security	To match use of door. Any lockable door shall be deemed as grade 1
8		Hinge grade	Grade 11, taking into account the adjusted door weight after the installation of any ironmongery, see appendix text



Digit 1, Category of use

Four categories of use are identified:

- Grade 1: Light duty
- Grade 2: Medium duty
- Grade 3: Heavy duty
- Grade 4: Severe duty

Grade	UCL Minimum requirement
Grade 3: Heavy duty	Cellular office doors, low traffic corridor doors & all lockable doors
Grade 4: Severe duty	Building main entrance & high traffic doors



Digit 2, Durability:

Three grades are identified for single-axis hinges identified

- Grade 3: 10,000 test cycles, for light duty hinges on window only
- Grade 4: 25,000 test cycles, for light duty hinges on windows and doors
- Grade 7: 200,000 test cycles, for heavy duty on doors



Digit 3, Test door mass

Eight door mass grades related to single axis hinges are identified in this standard as shown in Table 1:

Table 1:

Test door mass grade	Door mass
0	10kg
1	20kg
2	40kg
3	60kg
4	80kg
5	100kg
6	120kg
7	160kg

Please use the following tables from the GAI guide, to aid with calculating this to ensure the load effect from the door closer is considered:

External Reference

Side Loading Calculation Table A taken from 'GAI Guide to Standards' 2, May 2019

The below table A must be used to calculate the increased door mass for hinges where doors are of increased width:

Door height (mm)	Door width (mm)	Factor	Normal increase of mass of door leaf %
2000	1000	2.0	0
2000	1050	1.9	10
2000	1100	1.82	18
2000	1150	1.74	26
2000	1200	1.66	33
2000	1250	1.6	40

External Reference

Side Loading Calculation Table B

The below Adjusted door weight calculation chart is based on a consensus of guidance from various manufactures and is recommended in identifying adjusted door weights particularly after the installation of a door closer, virtually all manufacturers will provide a back check function as standard. The adjusted door weight should be used in all cases to specify door mass rating for the hinges.

Adjusted door weight calculation table		
Door weight	Doors of excess width please refer to Side Loading Calculation table Door closer + 20%	= Adjusted door weight
	Door closer (Back check) + 75%	
	Extra heavy use + 10%	
	Light use - 10%	



Digit 4, Suitability for fire/smoke door use

Two grades of suitability are identified for single axis hinges 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 door resistance of the specified fire/smoke door assembly.

Note: In order to achieve Grade 1, additional intumescent pads must be installed.



Digit 5, Safety

Single axis hinges are required to satisfy the essential requirements of safety in use. Therefore, only grade 1 identified:

- Grade 1: Satisfies the essential requirements of safety in use



Digit 6, Corrosion resistance

Five grades of corrosion resistance are identified:

- Grade 0: No defined corrosion resistance
- Grade 1: Mild resistance
- Grade 2: Moderate resistance
- Grade 3: High resistance
- Grade 4: Very high resistance

Grade	Minimum Requirement	Recommended Use
Grade 2	Minimum required standard for internal doors	Cellular office doors, corridor doors & all lockable doors
Grade 3	Minimum required standard for external doors	Building main entrances & perimeter doors
Grade 4		May be required in environments where specific corrosive substances may be present (e.g. specialist labs, and/or harsh environments)



Digit 7, Security

Two grades of security for single axis hinges are identified:

- Grade 0: Not suitable for use on burglar resistant door assemblies.
- Grade 1: Suitable for applications requiring a degree of security.

Note: Any lockable door must be grade 1.



Digit 8, Hinge grade

Fourteen grades are identified in the table below:

Hinge grade	Usage	Test cycles	Door mass
1	Window	10 000	10kg
2	Window	10 000	20kg
3	Window/Door	25 000	20kg
4	Door	200 000	20kg
5	Window	10 000	40kg
6	Window/Door	25 000	40kg
7	Door	200 000	40kg
8	Window	10 000	60kg
9	Window/Door	25 000	60kg
10	Door	200 000	60kg
11	Door	200 000	80kg
12	Door	200 000	100kg
13	Door	200 000	120kg
14	Door	200 000	160kg

Minimum UCL requirement Grade 11 however higher grades are acceptable if they are more cost effective and are suitable for the application.

6.0 Closing the door

Relevant standards that apply to this section:







- BS EN 1154:1997 Controlled door closing devices
- BS EN 1155:1997 Electrically powered hold-open devices for swing doors
- BS EN 1158:1997 Door coordinator devices
- BS 8300-2: 2018 Design of an accessible and inclusive built environment

Other documents referenced in this section:

- British Standards Institute (BSI) (www.bsi.co.uk)
- Door Hardware Federation (DHF) (www.dhfonline.org.uk)
- Guild of Architectural Ironmongery (GAI) (www.gai.org.uk)

6.1 Mechanical door closers

This section covers mechanical door closers and defines the UCL requirements for the standard BS EN 1154, this standard uses a 6 digit coding system.

Digit	Pictogram	Description	Minimum UCL requirement
1		Category of use	Angles of operation
2		Durability	Grade 8
3		Test door mass	Closer to be rated to relevant door width and mass
4		Fire suitability	To match use of door
5		Safety	Grade 1
6		Corrosion resistance	All internal doors to be grade 2 or above All external doors to be grade 3 or above Grade 4 may be required in environments where specific corrosive substances may be present (e.g. specialist labs, and/or harsh environments)



Digit 1, Category of use

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:

- Grade 3: For closing doors from at least 105° open
- Grade 4: For closing doors from 180°* open

*Note 1: *Grade 4 classification assumes standard installation according to the manufacturer's instructions.*

Note 2: For application subject to extremes of abuse, or for particular limitations of opening angle, door closers incorporating a backcheck function or the provision of a separate doorstop should be considered.



Digit 2, Durability/number of test cycles

Only one test duration is identified for door closers in this standard:

- Grade 8: 500,000 test cycles



Digit 3, Test door mass/size

Seven test door mass grades and related door closer power sizes are identified according to table 1 of this standard. Where a door closer provides a range of power sizes both the minimum and the maximum sizes shall be identified:

Table 1

Door closer power size	Recommended door leaf width max.	Test door mass
1	750mm	20kg
2	850mm	40kg
3	950mm	60kg
4	1100mm	80kg
5	1250mm	100kg
6	1400mm	120kg
7	1600mm	160kg

Note 1: The door widths given are for standard installations. In the case of unusually high or heavy doors, windy or draughty conditions, or special installations, a larger power size of door closer should be used.

Note 2: The test of door masses shown are only related to door closer power sizes for the purpose of the test procedure. These test door masses are not intended to indicate maximum values for actual use.



Digit 4, Suitability for fire/smoke door use

Two grades of suitability are identified for door closing devices:

- 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 door resistance of the specified fire/smoke door assembly.



Digit 5, Safety

All door closers are required to satisfy the essential requirements of safety in use. Therefore, only grade 1 identified:

- Grade 1: Satisfies the essential requirements of safety in use



Digit 6, Corrosion resistance

Five grades of corrosion resistance are identified:

- Grade 0: No defined corrosion resistance
- Grade 1: Mild resistance
- Grade 2: Moderate resistance
- Grade 3: High resistance
- Grade 4: Very high resistance

External Reference

Taken from BS 8300-2: 2018 Design of an accessible and inclusive built environment

For many people to have independent access through single or double swing doors, the opening force, when measured at the leading edge of the door, should be not more than 30 N from 0° (the door in the closed position) to 30° open, and not more than 22.5 N from 30° to 60° of the opening cycle.

The opening force should be checked using a plunger-type force measuring instrument.

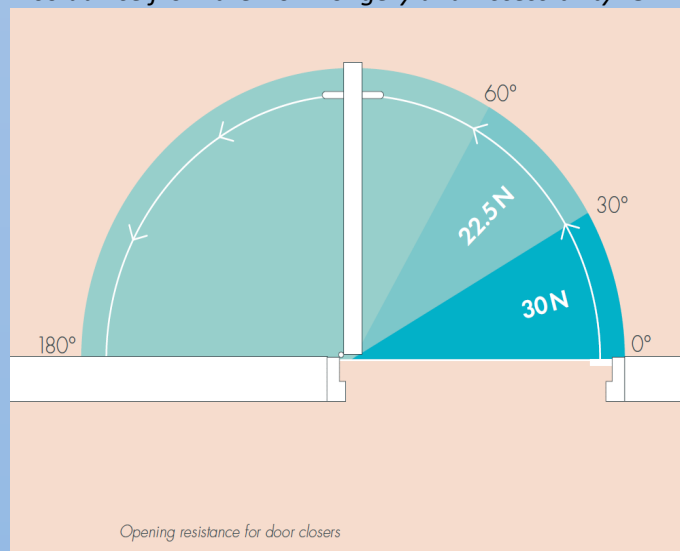
NOTE 1: Without regular maintenance of all door fittings, the resistances to opening and closing can increase to an extent that the ability of disabled people to pass through the door can be affected.

NOTE 2: Where measurements cannot be taken at the leading edge, they may be taken at a point on the face of the door up to 60 mm from the leading edge, a position approximately in line vertically with the spindle of a lever handle or the centre line of a pull handle or push plate, in which case the opening force limits can be increased by approximately 2 N. The accuracy of force measuring instruments available on the market varies and there are inherent difficulties in measuring forces on site. It is recognized, therefore, that any measurements are subject to a degree of imprecision which could give rise to variations of between 2 N and 3 N.

The choice of controlled door closing devices should take account of the efficiency of the closer, as well as the resistances from edge seals, hinge friction, latch resistance and differential air pressure.

NOTE 3: The effect of using a low efficiency-controlled door closing device is to reduce the closing force to a point where, coupled with the other resistances to closing, the door might not latch, or stay closed if unlatched. The use of high efficiency closers can reduce the force required to open the door and increase the proportion of disabled people who can pass through independently.







Also advice from the Ironmongery and Accessibility 'GAI' Specifiers Guide, September 2019



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.

6.2 Electromechanical door closers

This section covers electromechanical door closers and defines the UCL requirements for the standard BS EN 1155, this standard uses a 6 digit coding system:

Digit	Pictogram	Description	Minimum UCL requirement
1		Category of use	Grade 3
2		Durability	To match use of door
3		Test door mass	To match or exceed mass of door
4		Fire suitability	To match use of door
5		Safety	Grade 1
6		Corrosion resistance	All internal doors to be grade 2 or above All external doors to be grade 3 or above Grade 4 may be required in environments where specific corrosive substances may be present (e.g. specialist labs, and/or harsh environments)



Digit 1, Category of use

Only one category of use is identified for electrically powered hold open devices:

- 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.

Note 2: For electrically powered hold and free swing door closers where the open angle is limited by the devices the provision of a separate doorstop should be considered



Digit 2, Durability/number of test cycles

Two test durations are identified for devices manufactured to this standard:

- Grade 5: 50,000 test cycles for all electrically powered hold open devices.
- Grade 8: 500,000 test cycles for all for all electrically powered hold and free swing door closers and devices that contain operating arms .



Digit 3, Test door mass/size

Five test door mass grades and related door closer power sizes are identified according to table 1 of this standard. Where a door closer provides a range of power sizes both the minimum and the maximum sizes shall be identified:

Table 1:

Door closer power size	Recommended door leaf width max.	Test door mass
3	950mm	60kg
4	1100mm	80kg
5	1250mm	100kg
6	1400mm	120kg
7	1600mm	120kg

Note 1: Where an electrically powered hold open device is suitable for a range of door closer power sizes both the minimum and maximum power sizes shall be shown



Digit 4, Suitability for fire/smoke door use

Only one grade of fire resistance is identified for electrically powered hold open devices manufactured to this standard:

- Grade 1: Suitable for fire/smoke resistant door assemblies subject to satisfactory assessment of the contribution of the electrically powered hold open device to the fire door resistance of the specified fire/smoke door assembly.



Digit 5, Safety

Electrically powered hold open devices are required to satisfy the essential requirements of safety in use. Therefore, only grade1 identified:

- Grade 1: Satisfies the essential requirements of safety in use.



Digit 6, Corrosion resistance







Five grades of corrosion resistance are identified:

- Grade 0: No defined corrosion resistance
- Grade 1: Mild resistance
- Grade 2: Moderate resistance
- Grade 3: High resistance
- Grade 4: Very high resistance

Note: Please refer to the External Reference information regarding BS 8300 in the previous section.

6.3 Door coordinating devices

This section covers door coordinating devices and defines the UCL requirements for the standard BS EN 1158, this standard uses a 6 digit coding system.

Digit	Pictogram	Description	Minimum UCL requirement
1		Category of use	Grade 3
2		Durability	To match use of door
3		Test door mass	To match or exceed mass of door
4		Fire suitability	To match use of door
5		Safety	Grade 1
6		Corrosion resistance	All internal doors to be grade 2 or above All external doors to be grade 3 or above Grade 4 may be required in environments where specific corrosive substances may be present (e.g. specialist labs, and/or corrosive environments)



Digit 1, Category of use

Only one category of use 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, Durability/number of test cycles

Two test durations are identified for devices manufactured to this standard:

- Grade 5: 50,000 test cycles: for all other door coordinator devices.
- Grade 8: 500,000 test cycles: for door coordinating devices incorporated in, or for use in conjunction with automatic swing door operators, and for devices incorporated in a door closer.



Digit 3, Test door mass/size

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

Where a door coordinator device is suitable for a range of power sizes both the minimum and the 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 mm
3	60kg	950mm	1900mm
4	80kg	1100mm	2200mm
5	100kg	1250mm	2500mm
6	120kg	1400mm	2800mm
7	160kg	1600mm	3200mm

Note 1: This table relates to doors with even leaves only.



Digit 4, Suitability for fire/smoke door use

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

- Grade 0: Not suitable for use on fire/smoke door assemblies.
- Grade 1: Suitable for fire/smoke resistant door assemblies subject to satisfactory assessment of the contribution of the door coordinating device to the fire door resistance of the specified fire/smoke door assembly.



Digit 5, Safety

All door coordinating devices are required to satisfy the essential requirements of safety in use. Therefore, only grade 1 identified:

- Grade 1: Satisfies the essential requirements of safety in use.



Digit 6, Corrosion resistance

Five grades of corrosion resistance are identified:

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

7.0 Locking the Door

Relevant standards that apply to this section:

- BS EN 12209:2016 Mechanically operated locks and locking plates
- BS EN 12051:2000 Door and window bolts
- BS EN 1303:2015 Cylinders for locks
- BS EN 1125:2008 Panic exit devices operated by a horizontal bar, for use on escape routes
- BS EN 179:2008 Emergency exit devices operated by a lever handle or push pad, for use on escape routes
- BS 8300-2: 2018 Design of an accessible and inclusive built environment









Other documents referenced in this section:

- British Standards Institute (BSI) (www.bsi.co.uk)
- Door Hardware Federation (DHF) (www.dhfonline.org.uk)
- Guild of Architectural Ironmongery (GAI) (www.gai.org.uk)

Note: Harmonised/Designated Standards – BS EN 12209, BS EN 1125, BS EN 179 - Mandatory requirement for EU CE or UK CA certification of the hardware in accordance with the UK Construction Products Regulation.

7.1 Mechanically operated Locks, Latches and Striking plates

This section covers lock cases and defines the UCL requirements for the standard BS EN 12209, this standard uses an 8 digit coding system:

Digit	Pictogram	Description	Minimum UCL requirement
1		Category of use	Grade 3
2		Durability and force on latch bolt	To match use of door
3		Door mass and closing force	To match or exceed mass of door
4		Fire suitability	To match use of door
5		Safety	Grade 1
6		Corrosion resistance and temperature	All internal doors to be grade 2 or above All external doors to be grade 3 or above Grade 4 may be required in environments where specific corrosive substances may be present (e.g. specialist labs, and/or harsh environments)
7		Security and drill resistance	To match use of door. Minimum of grade 3 where door is locked
8		Key identification of lever locks	To match use of door



Digit 1, Category of use

Three grades are identified:

- Grade 1: For use by people with a high incentive to exercise care and with a small chance of misuse, e.g., residential doors.
- Grade 2: For use by people with some incentive to exercise care but where there is some chance of misuse, e.g., office doors.
- Grade 3: For use by the public where there is little incentive to exercise care and where there is a high chance of misuse, e.g., doors in public buildings.



Digit 2, Durability/number of test cycles

Nine grades of durability are identified:

- Grade A: 50,000 test cycles; no force on latch bolt, or for locks without latch bolt.
- Grade B: 100,000 test cycles; no force on latch bolt; or for locks without latch bolt.
- Grade C: 200,000 test cycles; no force on latch bolt; or for locks without latch bolt.
- Grade L: 100,000 test cycles; 25 N force on latch bolt.
- Grade M: 200,000 test cycles; 25 N force on latch bolt.

- Grade R: 100,000 test cycles; 50 N force on latch bolt.
- Grade S: 200,000 test cycles; 50 N force on latch bolt.
- Grade W: 100,000 test cycles; 120 N force on latch bolt.
- Grade X: 200,000 test cycles; 120 N force on latch bolt.



Digit 3, Test door mass/closing force

Ten grades of door mass and closing force are identified:

- Grade 0: Locks without a latch bolt.
- Grade 1: Up to 100 kg door mass; 50 N maximum closing force.
- Grade 2: Up to 200 kg door mass; 50 N maximum closing force.
- Grade 3: Above 200 kg door mass as specified by the manufacturer; 50 N maximum closing force.
- Grade 4: Up to 100 kg door mass; 25 N maximum closing force.
- Grade 5: Up to 200 kg door mass; 25 N maximum closing force.
- Grade 6: Above 200 kg door mass as specified by the manufacturer; 25 N maximum closing force.
- Grade 7: Up to 100 kg door mass; 15 N maximum closing force.
- Grade 8: Up to 200 kg door mass; 15 N maximum closing force.
- Grade 9: Above 200 kg door mass as specified by the manufacturer; 15 N maximum closing force.



Digit 4, Suitability for fire/smoke door use

Four grades are identified:

- Grade 0: Not verified for use on fire resisting /smoke control door set assemblies.
- Grade A: For use on smoke control door set assemblies.
- Grade B: for use on smoke control and fire resisting door set assemblies.
- Grade N: for use on smoke control and fire resisting door set assemblies based on tests where the lock does not contribute to keeping the door in a closed position during the fire resisting and/or smoke control test.



Digit 5, Safety

Only one grade of safety is identified:

- Grade 0: No safety requirement

NOTE: See BS EN 179 and BS EN 1125 for locks, latches and locking plates that are part of exit devices for use on emergency or panic exit doors.



Digit 6, Corrosion resistance

Six grades of corrosion resistance and temperature requirement are identified:

- Grade 0: No defined corrosion resistance; no temperature requirement.
- Grade A: Low corrosion resistance (24 h); no temperature requirement.
- Grade C: High corrosion resistance (96 h); no temperature requirement.
- Grade D: Very high corrosion resistance (240 h); no temperature requirement.
- Grade F: High corrosion resistance (96 h); temperature requirement: from -10 °C to +60 °C.
- Grade G: Very high corrosion resistance (240 h); temperature requirement: from -10 °C to +60 °C.



Digit 7, Security, and drill resistance

Eight grades are identified:

- Grade 0: No security requirement.
- Grade 1: Minimum security and no drill resistance.
- Grade 2: Low security and no drill resistance.
- Grade 3: Medium security and no drill resistance.
- Grade 4: High security and no drill resistance.
- Grade 5: High security with drill resistance.
- Grade 6: Very high security and no drill resistance.
- Grade 7: Very high security with drill resistance.



Digit 8, Key identification of lever locks

Nine grades are identified:

- Grade 0: No requirements.
- Grade A: Minimum three detaining elements..
- Grade B: Minimum five detaining elements
- Grade C: Minimum five detaining elements, extended number of effective differs.
- Grade D: Minimum six detaining elements.
- Grade E: Minimum six detaining elements, extended number of effective differs.
- Grade F: Minimum seven detaining elements.
- Grade G: Minimum seven detaining elements, extended number of effective differs.
- Grade H: Minimum eight detaining elements, extended number of effective differs..

External Reference

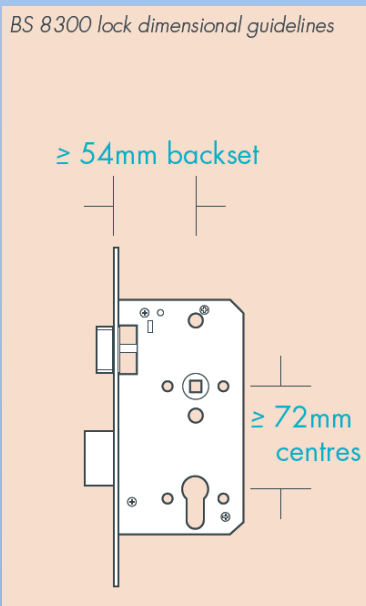
Taken from Ironmongery and Accessibility 'GAI' Specifiers Guide, September 2019

To ensure that blind and partially sighted people and/or people with limited dexterity have unobstructed access to the keyway of a lock, the cylinder should be:

- Positioned above the lever handle where it is more visible and accessible
or
- If the cylinder is below the handle, the minimum distance between the handle and the keyway of the locking mechanism should be 72mm








In addition, lock cases should have a minimum backset of 54mm to allow enough room between the keyway/handle and the door frame

BS 8300 lock dimensional guidelines



7.2 Door and Window Bolts

This section covers bolts and defines the UCL requirements for the standard BS EN12051, this standard uses a 7 digit coding system.

Digit	Pictogram	Description	Minimum UCL requirement
1		Category of use	To match use of door
2		Durability	Grade 8
3		Test door mass	To match or exceed mass of door
4		Fire suitability	To match use of door
5		Safety	Grade 1
6		Corrosion resistance	All internal doors to be grade 2 or above All external doors to be grade 3 or above Grade 4 may be required in environments where specific corrosive substances may be present (e.g. specialist labs, and/or harsh environments)
7		Security	To match door



Digit 1, Category of use

Classification is in four grades as follows:

- Grade 1: Light duty
- Grade 2: Medium duty
- Grade 3: Heavy duty
- Grade 4: Very heavy duty



Digit 2, Number of test cycles

Three grades of durability are identified as follows:

- Grade 1: 2,500 test cycles
- Grade 2: 5,000 test cycles
- Grade 3: 10,000 test cycles
- Grade 4: 50,000 test cycles



Digit 3, Test door mass

Only one grade of door mass is identified as follows:

- Grade 0: No door mass requirement.



Digit 4, Suitability for fire/smoke door use

Two grades of suitability are identified:

- Grade 0: Not suitable for fire smoke resistant door assemblies.
- Grade 1: The product should conform to the requirements .



Digit 5, Safety

Two grades of suitability are identified:

- Grade 0: No safety in use requirement.
- Grade 1: The product shall conform to the requirements detailed in 4.5.1 and 4.5.2*.



Digit 6, Corrosion resistance

Four grades identified as per below table:

Intended use	Grade
Internal door	1
Inside of external doors	2
Outside of external door (normal environment)	3
Outside of external door (extreme environment)	4
<i>Note: Products with no defined corrosion resistance are classified grade 0</i>	



Digit 7, Security

Five grades identified as per below table:

Security Requirement		Grade					Unit
		1	2	3	4	5	
4.7.1	Resistance to end load	0	1500	3000	400	5000	N
4.7.2	Resulting projection L1	12	12	12	15	17	MM
4.7.3	Resistance to sawing for time T2	0	0	0	2	5	MM
4.7.4	Resistance to side load F3	500	1500	4500	7000	10000	N

External Reference

*Relevant tables and additional helpful information can be found in the relevant standard documents BS EN 12051:1999 as well as The Best Practice Guides from the GAI & Door Hardware Federation

External Reference

Taken from BS 8300-2: 2018 Design of an accessible and inclusive built environment

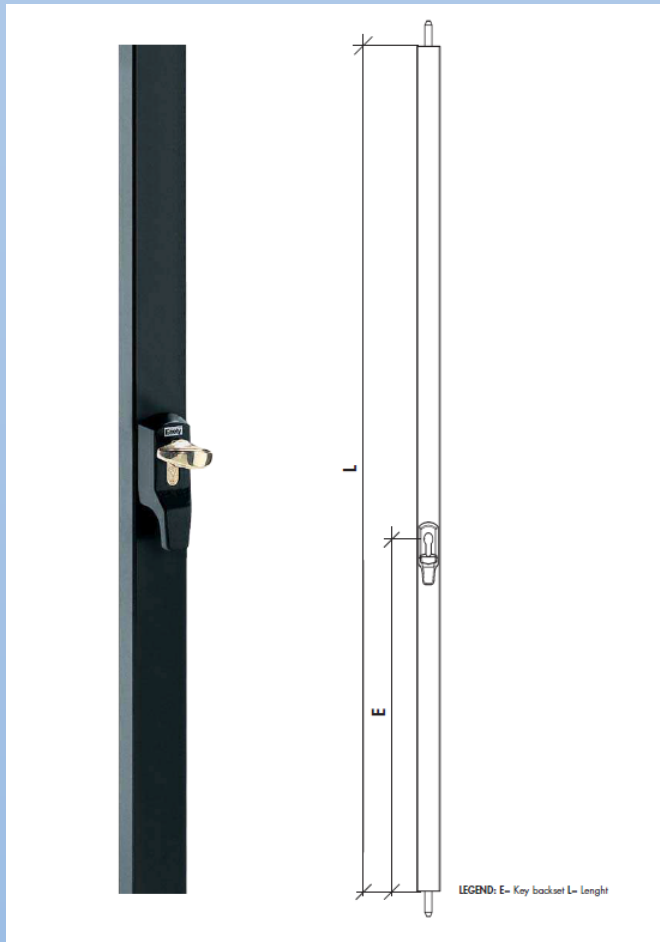
Where doors are required to be bolted for security purposes, one of the following types of door bolt should be used:

- a) knob slide flush bolts or surface bolts with a free moving slide action
- b) rack and pinion mortice bolts fitted with fixed knobs to enable the user to operate them easily (i.e. without the need to locate a loose key and insert it into a restricted hole)
- c) a surface-mounted or morticed espagnolette bolt with top and bottom shoots or side shoots operated by a single handle positioned at a height between 900 mm and 1 050 mm from finished floor level
- d) lever-action flush bolts, sunk slide bolts (both flush and surface-mounted) should be avoided

External Reference

Where control over the fixed leaf of a leaf and a half, or double door set is required then the use of the Mul-T-lock mini bar should be considered, this is a lockable espagnolette bolt that ensures the slave leaf is securely held, and controlled by a key holder.

Mul-T-lock MiniBars Brochure



STRIKES

GASM1 kit of accessories for vertical application

G9909 x 1
Adjustable strike



G9906C x 1
Floor strike with spring



N.B. The strikes must be separately ordered
(see page 26-27).

Mul-T-Lock locking bar installed on a leaf and a half door set:











Note: These locking bars should only be used where the escape width clearance is achieved with the full primary door leaf. Where both door leaves must be released in order to achieve the full escape width clearance, alternative escape compliant locking solutions should be utilised.

7.3 Lock Cylinders

ASSA 5800 and Triton 3900 series

This section covers cylinders and defines the UCL requirements for the standard BS EN 1303, this standard uses an 8 digit coding system.

Digit	Pictogram	Description	Minimum UCL requirement
1		Category of use	Grade 1
2		Durability and force on latch bolt	To match use of door
3		Door mass and closing force	Grade 0
4		Suitable for use on fire resistant / smoke control doors	To match use of door
5		Safety	Grade 0
6		Corrosion resistance and temperature	UCL supplies
7		Key related security	To match use of door
8		Attack resistance	To match use of door



Digit 1, Category of use

- Grade 1: for use by people with a high incentive to exercise care and with a small chance of misuse.



Digit 2, Durability/number of test cycles

Three grades of durability are identified as follows:

- Grade 4: 25 000 test cycles
- Grade 5: 50 000 test cycles
- Grade 6: 100 000 test cycles



Digit 3, Test door mass

Only one grade of door mass is identified as follows:

- Grade 0: no door mass requirement.



Digit 4, Suitable for use on fire resistant / smoke control doors

Three grades of suitability for use on fire resistant / smoke-controlled doors are identified:

- Grade 0: not approved for use on fire resistant / smoke control door assemblies.
- Grade A: suitable for use on smoke control door assemblies.
- Grade B: suitable for use on fire resistant and smoke control doors.



Digit 5, Safety

Only one grade of safety is identified:

- Grade 0: no safety requirement.



Digit 6, Corrosion resistance and temperature

Four grades of corrosion resistance and temperature requirement are identified:

- Grade 0: no corrosion requirement; no temperature requirement.
- Grade A: high corrosion resistance; no temperature requirement.
- Grade B: no corrosion requirement; temperature requirement: from – 25 °C to + 65 °C.
- Grade C: high corrosion resistance; temperature requirement: from – 25 °C to + 65 °C.



Digit 7, Key related security

Six grades of key related security are identified:

- Grade 1: 100 - Min. number of effective differs / 2 Min. number of movable detainers.
- Grade 2: 300 - Min. number of effective differs / 3 Min. number of movable detainers.
- Grade 3: 1,500 - Min. number of effective differs / 5 Min. number of movable detainers.
- Grade 4: 30,000 - Min. number of effective differs / 5 Min. number of movable detainers.
- Grade 5: 30,000 - Min. number of effective differs / 6 Min. number of movable detainers.
- Grade 6: 100,000 - Min. number of effective differs / 6 Min. number of movable detainers.



Digit 8, Attack resistance

Five grades of resistance against drilling and mechanical attack are identified:

- Grade 0: no resistance against drilling; no resistance against mechanical attack.
- Grade A: 3 / 5 min resistance against drilling; resistance against mechanical attack except plug/cylinder extraction.
- Grade B: 5 / 10 min resistance against drilling; resistance against mechanical attack except plug/cylinder extraction.
- Grade C: 3 / 5 min resistance against drilling; resistance against mechanical attack.
- Grade D: 5 / 10 min resistance against drilling; resistance against mechanical attack.

External Reference

Relevant tables and additional helpful information can be found in the relevant standard documents BSEN 12209 as well as The Best Practice Guides from the GAI & Door Hardware Federation

7.4 Digital Locks

ASSA CD30 Codoor digital lock

This is the only approved digital locks solution, and importantly provides:

- Modular lock body that can be easily changed to alternative operations (deadlock/ sash lock etc.)
- Key override for emergency/security access
- Key operated additional deadlock which prevents the code being used for secure/night mode
- Accessible lever handle operation (BS 8300)
- Single lever operation escape
- High standard of reliability

Note: Please ensure you do not install any other digital lock products.

Asa Codoor CD30 unit Specification:

Asa CD30 Codoor battery operated digital lock unit.

- ASSA 2356/*mm accessory sets, in satin chrome finish (*Available in different sizes, 13, 16, 18 & 22mm determined by door thickness).
- ASSA 640/* Connect split follower escape mortice sash lock, should be specified with the requirement of a strike plate. (BS EN 12209). (*Available in different backsets 35mm, 50mm & 70mm determined by door stile and size of door stop consideration should be made to use of 35mm backset with regards to the size cylinder accessory set diameter). Split follower locks incorporate different and separate functions on either side of the door. When ordering please specify hand direction of door opening.
- ASSA 6696 lever handles in satin chrome finish.
- ASSA C5801 Single Scandinavian oval cylinder in satin chrome finish.











Optional extras:

- ASSA Connect 8012/*mm rebate kit (*Available in different sizes, 12mm, 19mm & 25mm determined by size of rebate).



7.5 Panic Escape Hardware

This section covers panic escape hardware and defines the UCL requirements for the standard BS EN 1125, this standard uses a 10 digit coding system.

Digit	Pictogram	Description	Minimum UCL requirement
1		Category of use	Grade 3
2		Durability	To match use of door
3		Test door mass/closing force	To match or exceed mass of door
4		Suitability for fire/smoke door use	To match use of door
5		Safety	Grade 1
6		Corrosion resistance	All internal doors to be grade 2 or above All external doors to be grade 3 or above Grade 4 may be required in environments where specific corrosive substances may be present (e.g. specialist labs, and/or harsh environments)
7		Security	Grade 2
8		Projection of horizontal bar	To match use of door
9		Type of horizontal bar operation	To match use of door
10		Field of door application	To match door type

Important Note:

The main purpose of the performance requirements of this standard is to give safe and effective escape through a doorway with minimum effort and without prior knowledge of the device, i.e. for locked doors on escape routes where panic situations can be foreseen. These should be used in public spaces, where large numbers of people (App Doc B defines more than 60 persons) may be exiting and where people are not familiar with the operation of the door and exit device. Where devices are operated by a single operation, a full width panic bar would be used. The operating element of the push bar or touch-bar must equal a minimum of 60% of the width of the door when installed.



Digit 1, Category of use

Only one grade of use shall be identified:

- Grade 3: high frequency of use where there is little incentive to exercise care, i.e. where there is a chance of an accident occurring and of misuse.

Example: Doors to shops, hospitals, schools and other buildings which provide access to designated areas and which are used by the public and others frequently carrying or propelling bulky objects.



Digit 2, Durability

Two grades of durability shall be used:

- Grade 6: 100 000 test cycles
- Grade 7: 200 000 test cycles



Digit 3, Test door mass/closing force

Three grades of door mass shall be used:

- Grade 5: up to 100 kg
- Grade 6: up to 200 kg
- Grade 7: over 200 kg



Digit 4, Suitability for fire/smoke door use

Three grades shall be used:

- Grade 0: Not approved for use on fire / smoke door assemblies.
- Grade A: Suitable for use on smoke door assemblies - based on the requirements of B.1.
- Grade B: Suitable for use on fire and smoke door assemblies based on a test in accordance with EN1634-1.

*Note: *Annex B contains additional requirements for panic exit devices to this grade.*



Digit 5, Safety

Only one grade of safety shall be used:

- Grade 1: all panic exit devices have a critical safety function, therefore only the top grade is identified for the purpose of this European Standard.



Digit 6, Corrosion resistance

Two grades of corrosion resistance given in EN 1670: 2007 shall be used:

- Grade 3: 96 h (high resistance).
- Grade 4: 240 h. (very high resistance).



Digit 7, Security

Only one grade of security shall be used:

- Grade 2: panic exit devices are primarily for the operation of a door from the inside and the security requirements are secondary to those of safety.

NOTE: Grade 2 is a minimum specification. If additional specific tests are made to prove a higher level of security, the panic exit devices will be deemed to conform with this European Standard provided that all the requirements of this European Standard are met.



Digit 8, Projection of horizontal bar

Two grades of horizontal bar projection shall be used:

- Grade 1: projection up to 150 mm (large projection).
- Grade 2: projection up to 100 mm (standard projection).



Digit 9, Type of horizontal bar operation

Two types of operation shall be used:

- Type A: panic exit device with "push-bar" operation.
- Type B: panic exit device with "touch-bar" operation.



Digit 10, Field of door application

Three categories of fields of door application shall be used according to the end use of the panic exit device (see 6.3.4). A panic exit device shall be characterised for one field of door application only:

- Category A: single door, double door: active or inactive leaf.
- Category B: single door only.
- Category C: double door, inactive leaf only.

NOTE certain panic exit devices are restricted to particular doors within this broad categorization. The installer should check the specific application according to the producer's installation instructions.

External Reference

**Taken from BS EN 1125:2008 Panic exit devices operated by a horizontal bar, for use on escape routes*

The horizontal bar should normally be installed at a height of between 900 mm and 1 100 mm from the finished floor level, when the door is in the secured position. Where it is known that the majority of the occupants of the premises will be young children, consideration should be given to reducing the height of the bar.











4.1.2 Release function

A panic exit device shall be designed to release a door at all times from the inside in less than 1 s, when the horizontal bar positioned horizontally across the inside of the door is operated by hand or body pressure in one continuous movement in the direction of exit and/or in an arc downwards, anywhere along its effective length and not requiring the use of a key or other similar object. It shall be designed to release the door without any delay from the time the horizontal bar is operated to the released position of the mechanism.

The operation of the horizontal bar shall enable immediate exit from the inside at all times regardless of any auxiliary locking and/or unlocking means being incorporated, such as a deadbolt or outside access device.

7.6 Emergency Escape Hardware

This section covers emergency escape hardware and defines the UCL requirements for the standard BS EN 179, this standard uses a 10 digit coding system.

Digit	Pictogram	Description	Minimum UCL requirement
1		Category of use	Grade 3
2		Durability	To match use of door
3		Test door mass/closing force	To match or exceed mass of door
4		Suitability for fire/smoke door use	To match use of door
5		Safety	Grade 1
6		Corrosion resistance	All internal doors to be grade 2 or above All external doors to be grade 3 or above Grade 4 may be required in environments where specific corrosive substances may be present (e.g. specialist labs, and/or harsh environments)
7		Security	Grade 2
8		Projection of horizontal bar	To match use of door
9		Type of horizontal bar operation	To match use of door
10		Field of door application	To match door type

Important Note:

This standard covers devices to be used in emergency situations where people are familiar with the emergency exit and its hardware and therefore a panic situation is most unlikely to develop. Devices operated by a lever handle or push pad may therefore be used. The main purpose of the performance requirements of this standard is to give safe and effective escape through a doorway with one single operation to release the device. However, escape can require prior knowledge of the operation of the device which is consequently considered suitable for locked doors on escape routes only where panic situations are not foreseen.



Digit 1, Category of use

Only one grade of use shall be identified:

- Grade 3: high frequency of use where there is little incentive to exercise care, i.e. where there is a chance of an accident occurring and of misuse.

Example: Doors to shops, hospitals, schools and other buildings which provide access to designated areas and which are used by the public and others frequently carrying or propelling bulky objects.



Digit 2, Durability

Two grades of durability shall be used:

- Grade 6: 100 000 test cycles
- Grade 7: 200 000 test cycles



Digit 3, Test door mass/closing force

Three grades of door mass shall be used:

- Grade 5: up to 100 kg
- Grade 6: up to 200 kg
- Grade 7: over 200 kg



Digit 4, Suitability for fire/smoke door use

Three grades shall be used:

- Grade 0: Not approved for use on fire / smoke door assemblies.
- Grade A: Suitable for use on smoke door assemblies.
- Grade B: Suitable for use on fire and smoke door assemblies based on a test in accordance with EN1634-1.



Digit 5, Safety

Only one grade of safety shall be used:

- Grade 1: all panic exit devices have a critical safety function, therefore only the top grade is identified for the purpose of this European Standard.



Digit 6, Corrosion resistance

Two grades of corrosion resistance given in EN 1670: 2007 shall be used:

- Grade 3: 96 h (high resistance).
- Grade 4: 240 h. (very high resistance).



Digit 7, Security

Four grades of security shall be used:

- Grade 2: 1 000 N
- Grade 3: 2 000 N
- Grade 4: 3 000 N
- Grade 5: 5 000 N

NOTE: Additional specific tests may be carried out to prove a higher level of security. The emergency exit devices will be deemed to conform with this European Standard provided that all the requirements of this European Standard are met.



Digit 8, Projection of operating element

Two grades of projection shall be used:

- Grade 1: projection up to 150 mm (large projection).
- Grade 2: projection up to 100 mm (standard projection).



Digit 9, Type of operation device

Two types of operation shall be used:

- Type A: emergency exit device with “lever handle” operation.
- Type B: emergency exit device with “push pad” operation.



Digit 10, Field of door application

Four categories of field of door application shall be used according to the end use of the emergency exit device:

- Category A: outwardly opening single exit door, double exit door: active or inactive leaf.
- Category B: outwardly opening single exit door only.
- Category C: outwardly opening double exit door: inactive leaf only.
- Category D: inwardly opening single exit door only.

NOTE: certain emergency exit devices are restricted to particular doors within this broad categorization.

External Reference

Taken from BS EN 179:2008 Emergency exit devices operated by a lever handle or push pad, for use on escape routes.

The operating element should normally be installed at a height of between 900 mm and 1100 mm from the finished floor level, when the door is in the secured position. Where it is known that the majority of the users of the premises will be young children, consideration should be given to reducing the height of the operating element.

8.0 Dressing the Door

Relevant standards that apply to this section:









- BS EN1906:2012 Lever handles and knob furniture
- BS EN 8424:2004 Pull Handles
- BS 8300-2: 2018 Design of an accessible and inclusive built environment

Other documents referenced in this section:

- British Standards Institute (BSI) (www.bsi.co.uk)
- Door Hardware Federation (DHF) (www.dhfonline.org.uk)
- Guild of Architectural Ironmongery (GAI) (www.gai.org.uk)
- Fire Notes from UCL Fire Safety Manager (fire@ucl.ac.uk)

8.1 Lever Handles and Knob Furniture

This section covers lever handles & knob furniture and defines the UCL requirements for the standard BS EN 1906, this standard uses an 8 digit coding system.

Digit	Pictogram	Description	Minimum UCL requirement
1		Category of use	Grade 3 or above
2		Durability	To match use of door
3		Test door mass	N/A
4		Fire suitability	To match use of door
5		Safety	Grade 1
6		Corrosion resistance	All internal doors to be grade 2 or above All external doors to be grade 3 or above Grade 4 may be required in environments where specific corrosive substances may be present (e.g. specialist labs, and/or harsh environments)
7		Security	To match use of door
8		Type of operation	To match operation of lock



Digit 1, Category of use:

Four grades of use are identified:

- Grade 1: medium frequency of use by people with a high incentive to exercise care and with a small chance of misuse, e.g., internal residential doors.
- Grade 2: medium frequency of use by people with some incentive to exercise care but where there is some chance of misuse, e.g., internal office doors.

- Grade 3: high frequency of use by public or others with little incentive to exercise care and with a high chance of misuse, e.g., public office doors...
- Grade 4: high frequency of use on doors which are subject to frequent violent usage, e.g., football stadiums, offshore installations (oil rigs), barracks, public toilets, etc.



Digit 2, Durability

Two grades of durability are identified:

- Grade 6: medium frequency of use: 100 000 cycles.
- Grade 7: high frequency of use: 200 000 cycles.



Digit 3, Door mass

No classification.



Digit 4, Fire resistance

Five grades of fire resistance are identified:

- Grade 0: no performance determined.
- Grade A: for use on smoke-control doors.
- Grade A1: for use on smoke-control doors, tested with 200 000 cycles on a test door.
- Grade B: for use on smoke-control and fire-resistant doors.
- Grade B1: for use on smoke-control and fire-resistant doors, tested with 200 000 cycles on a test door.
- Grade C: for use on smoke-control and fire-resistant doors with requirements for fire protection inlays in backplate, rose and escutcheon.
- Grade C1: for use on smoke-control and fire-resistant doors with requirements for fire protection inlays in backplate, rose and escutcheon, tested with 200 000 cycles on a test door.
- Grade D: for use on smoke-control and fire-resistant doors with requirements for special core in the handle/knob.
- Grade D1: for use on smoke-control and fire-resistant doors with requirements for special core in the handle/knob, tested with 200 000 cycles on a test door.



Digit 5, Safety

Two grades of safety are identified:

- Grade 0: normal use.
- Grade 1: safety applications.



Digit 6, Corrosion resistance

Six grades of corrosion resistance are identified in accordance with EN 1670:2007 as follows:

- Grade 0: no performance determined.
- Grade 1: mild resistance.
- Grade 2: moderate resistance.
- Grade 3: high resistance.

- Grade 4: very high resistance.
- Grade 5: extremely high resistance.



Digit 7 Security

Five grades of security are identified:

- Grade 0: no performance determined.
- Grade 1: mild burglary resistance.
- Grade 2: moderate burglary resistance.
- Grade 3: high burglary resistance.
- Grade 4: extra high burglary resistance.



Digit 8, Type of operation

Three types of operation are identified:

- Type A: spring-assisted furniture.
- Type B: spring-loaded furniture.
- Type U: un-sprung furniture.

VISUAL CONTRAST OF DOOR FURNITURE

BS 8300:2009 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.

LRVs are measured by using a handheld colorimeter or reflectometer of 0/45 degree geometry. BS 8493:2008 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.



External Reference

Taken from Ironmongery and Accessibility 'GAI' Specifiers Guide, September 2019

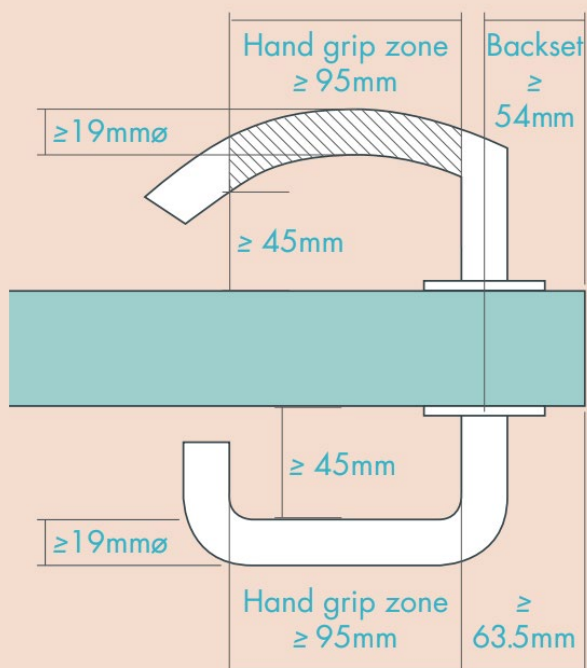
DIMENSIONAL GUIDELINES

BS 8300 stipulates a number of dimensional guidelines that the design of lever handles should adhere to as follows:

- Hand grip zone – Minimum 95mm
- 45mm from face of door to back of handle
- Lever section - Minimum 19mm \varnothing
- Minimum backset - 54mm
- Lever design either - return to door OR with upturn

These recommendations were created so that lever handles designs:







- allow the whole hand to hold the lever
- are easy to hold without gripping
- clear the frame-stop on closing face
- stop hands sliding off and prevents clothing catching on the handle



BS 8300 dimensional guidelines

8.2 Pull Handles

This section covers pull handles and defines the UCL requirements for the standard BS EN 8424, this standard uses a 6 digit coding system.

Digit	Pictogram	Description	Minimum UCL requirement
1		Category of use	Grade 3 or above
2		Durability	Grade 2
3		Test door mass	N/A
4		Fire suitability	To match use of door
5		Safety	Grade 1
6		Corrosion resistance	All internal doors to be grade 2 or above All external doors to be grade 3 or above Grade 4 may be required in environments where specific corrosive substances may be present (e.g. specialist labs, and/or harsh environments)



Digit 1, Category of use

Four grades of use are identified:

- Grade 1: Light duty [endures a force of 100 N]
- Grade 2: Medium duty [endures a force of 250 N]
- Grade 3: Heavy duty [endures a force of 600 N]
- Grade 4: Severe duty [endures a force of 1 200 N]



Digit 2, Durability

Two grades of durability are identified:

- Grade 2: 5 000 test cycles



Digit 3, Door mass

No classification.



Digit 4, suitability for fire/smoke door use

Two grades of suitability are identified:

- Grade 0: Not suitable for fire smoke resistant door assemblies.
- Grade 1: suitable for use on fire/smoke door assemblies.



Digit 5, Safety

Two grades of safety are identified:

- Grade 1: safe.



Digit 6, Corrosion resistance

Six grades of corrosion resistance are identified in accordance with EN 1670:2007 as follows:

- Grade 0: no performance determined.
- Grade 1: low resistance.
- Grade 2: moderate resistance.
- Grade 3: high resistance.
- Grade 4: very high resistance.

Please refer to UCL Fire Technical Notes **TN013** & **TN090**

External Reference

Taken from Ironmongery and Accessibility 'GAI' Specifiers Guide, September 2019

DIMENSIONAL GUIDELINES

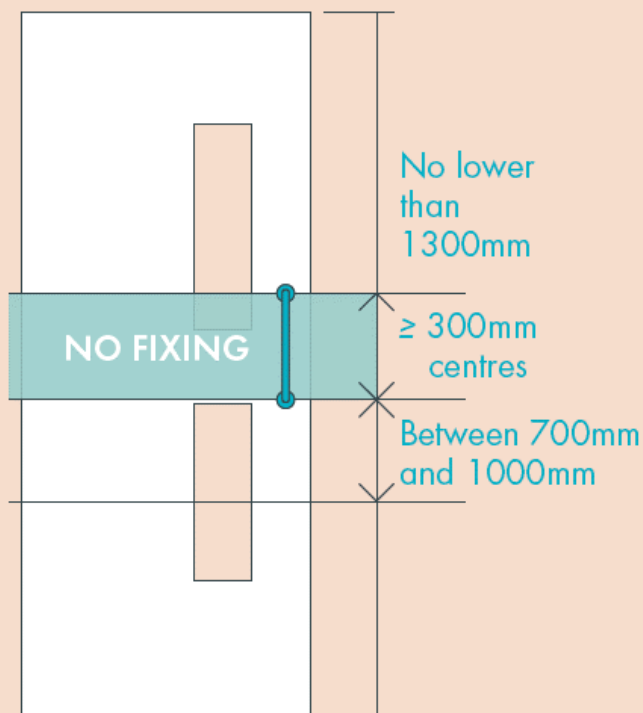
BS 8300-2 states that pull handle designs should meet the following dimensional criteria:

- Vertical pull handles should have a section diameter of between 19mm and 35mm
- Horizontal pull rail to help people close the door behind them

In addition to the above dimensions, the pull handle should be fixed to the door at a height so that it can be reached by all users. The fixing criteria is as follows:

- The bottom fixing of the pull handle should be fixed no lower than 700mm and no higher than 1000mm above the finished floor level
- The top fixing of the pull handle should be fixed no lower than 1300mm above the finished floor level

This therefore means that the minimum distance between fixing centres of the pull handle is 300mm.



Pull handle fixing positions

9.00 Accessibility

This section covers the design of an accessible and inclusive built environment and highlights some specifics related to the UCL requirements for the standard BS 8300, and how this relates to the specification and installation of door ironmongery.

Key points to consider:

Door Closers

- The opening force, when measured at the leading edge of the door, should be not more than 30 N from 0° (the door in the closed position) to 30° open, and not more than 22.5 N from 30° to 60° of the opening cycle.

Locks

To ensure that blind and partially sighted people and/or people with limited dexterity have unobstructed access to the keyway of a lock, the cylinder should be.

- Positioned above the lever handle where it is more visible and accessible.
or
- If the cylinder is below the handle, the minimum distance between the handle and the keyway of the locking mechanism should be 72mm.
- In addition, lock cases should have a minimum backset of 54mm to allow enough room between the keyway/handle and the door frame.
- Installed to achieve the height of the lever handle at between 800mm – 1,050mm (900mm preferred).

Radar Locks

- Accessible toilets should not be operated by card or key operated locks, such as RADAR locks unless requested specifically by the access and inclusion manager.

Bolts

- Lever action flush bolts & sunk slide bolts (both flush and surface mounted) should be avoided.

Door Furniture

- BS 8300 stipulates a number of dimensional guidelines that the design of lever handles should adhere to, please refer to section 8.2 of BS 8300 for details.
- Visual contrast of door furniture BS 8300:2009 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.
- BS 8300-2 states that pull handle designs should meet the following dimensional criteria:
 - Vertical pull handles should have a section diameter of between 19mm and 35mm.
 - Horizontal pull rail to help people close the door behind them. In addition to the above dimensions, the pull handle should be fixed to the door at a height so that it can be reached by all users. The fixing criteria is as follows:
 - The bottom fixing of the pull handle should be fixed no lower than 700mm and no higher than 1000mm above the finished floor level.
 - The top fixing of the pull handle should be fixed no lower than 1300mm above the finished floor level. This therefore means that the minimum distance between fixing centres of the pull handle is 300mm.