Best Practice ✓
Guide

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Mechanically operated locks and locking plates

to **BS EN 12209:2016**

dhf Best Practice Guide: Mechanically operated locks and locking plates to **BS EN 12209:2016**

dhf Best Practice Guides

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

NOTE: Unless stated otherwise, references in this document to BS EN 12209 refer to BS EN 12209:2016. Information in this guide is correct at time of publication and intended for guidance only. Information may since have changed and readers should consult the appropriate standards and authorities to confirm its veracity.

BS EN 12209

BS EN 12209:2016 Building hardware – Mechanically operated locks and locking plates – Requirements and test methods

Fundamental to the standard is a comprehensive classification system for assessing the wide range of products needed to satisfy the diverse requirements of the European market. Features assessed include normal use (and abuse) forces, long-term durability, fire/smoke resistance, corrosion and temperature resistance and security, both manipulative and physical. In addition, it contains information on marking, including CE marking.

dhf members can obtain printed standards through its Membership Benefit Scheme. Contact **dhf** for further details.

CE Marking

This standard is harmonized under the Construction Products Regulation (CPR) 2011, the main provisions of which came into force in July 2013. A harmonized standard is a product standard which is accepted as a means of demonstrating a product's compliance with a European directive or regulation. The CPR requires that anyone placing a construction product on the market in the European Economic Area (EEA) must, if the product falls within the scope of the harmonized standard and is intended for use on fire resisting and/or smoke control doors, issue a Declaration of Performance (DoP) against the standard and apply the CE marking.
NOTE: Only the requirements contained in Annex ZA of the harmonized standard are mandatory (Note needed here concerning the current harmonisation status of EN 12209?)

Placing on the market

Under the CPR, the duty to apply the CE Marking falls upon the manufacturers and must take place when products are "placed on the market", meaning first supplied in the EU for distribution or use. However, "manufacturers" includes persons who have products made for them and who then market the products under their names or trademarks. In addition, the duties of manufacturers can be assigned to importers who bring products into the EU.

Scope

This standard covers requirements and test methods for all types of mechanical lock or latch (including associated or separately supplied locking plates), intended for use on pedestrian doors in buildings but excluding electro-mechanically operated locks and striking plates, multi-point locks and their locking plates, locks for windows, padlocks, locks for safes, furniture locks and prison locks.

Requirements (classified)

BS EN 12209:2016 classifies mechanically operated locks, latches and locking plates using an 8 digit coding system (see below). To avoid a greater proliferation of boxes, certain features have been "doubled up": e.g. door mass and closing force; corrosion and temperature resistance.

1	2	3	4	5	6	7	8
Category of use	Durability and force on latch bolt	Door mass and closing force	Suitability for use on fire resisting and/or smoke control doors	Safety	Corrosion resistance and temperature	Security and drill resistance	Key identification of lever locks

Digit 1
Category of use

Three categories of use are identified:

Grade 1: for use in situations where the user has a high incentive to exercise care and there is only a small chance of misuse, e.g. residential doors

Grade 2: for use in situations where the user has some incentive to exercise care but where some misuse is likely, e.g. office doors

Grade 3: for use in situations where the user has little incentive to exercise care and there is a high chance of misuse, e.g. doors in public buildings

Digit 2
Durability

Nine grades are identified. There are three grades for single bolt deadlocks, or 2-bolt locks with no side load on the latch bolt, with figures for the minimum number of cycles as shown below:

Grade	Normal latch action (no side load)	Split latch action		Deadbolt manually locking	Deadbolt automatically locking	Snib mechanism
		By key	By handle			
A	50,000	12,500	37,500	12,500	500,000	10,000
B	100,000	25,000	75,000	25,000	100,000	25,000
C	200,000	50,000	150,000	50,000	200,000	25,000

In addition there are six grades for 2-bolt locks with side load on the latch bolt with figures for the minimum number of cycles as shown below:

Grade	Normal latch action		Split latch action		Deadbolt manually locking	Deadbolt automatically locking	Snib mechanism
	Number of cycles	Side load	By key	By handle			
L	100,000	25 N	25,000	75,000	25,000	100,000	25,000
M	200,000	25 N	50,000	150,000	50,000	200,000	25,000
R	100,000	50 N	25,000	75,000	25,000	100,000	25,000
S	200,000	50 N	50,000	150,000	50,000	200,000	25,000
W	100,000	120 N	25,000	75,000	25,000	100,000	25,000
X	200,000	120 N	50,000	150,000	50,000	200,000	25,000

Digit 3
Door mass and closing force

Ten grades are identified with maximum figures for the closing force of latches on doors of various masses as shown below. (NOTE: Closing force is from a standing start i.e. fully extended latch bolt in contact with striking plate at start of test)

Grade	0	1	2	3	4	5	6	7	8	9
Closing force (N)	No latch	50	50	50	25	25	25	15	15	15
Door mass (kg)	-	< 100	< 200	> 200	< 100	< 200	> 200	< 100	< 200	> 200

Digit 4

Suitability for use on fire resisting and/or smoke control doors: Four grades are identified as shown below:

Grade	Suitability
0	(Not verified for use on fire resisting or smoke control doors)
A	Suitable for use on smoke control doors in accordance with EN 1634-3
B	Suitable for use on smoke control and fire resisting doors in accordance with EN 1634-1 or 2 where a latch is used to keep the door in a closed position
N	Suitable for use on smoke control and fire resisting doors in accordance with EN 1634-1 or 2 where the lock does not contribute to keeping the door in a closed position

Digit 5

Safety

No requirement, but note: a lock conforming to this standard can at the same time be part of an exit device conforming to EN 179 or EN 1125

Digit 6

Corrosion and temperature resistance

Six grades are identified based on neutral salt spray (NSS) grades from EN 1670:2007, with and without resistance to extremes of temperature as shown below:

	Units	Grade					
		0	A	C	D	F	G
Time exposed to NSS	hrs	0	24	96	240	96	240
Temperature range	°C	-	-	-	-	-10/+60	-10/+60

Digit 7

Security and drill resistance

Eight grades are identified with minimum requirements for methods of attack such as the application of torque, side load, end load, etc. as shown below:

Attack method	Units	Grade							
		0	1	2	3	4	5	6	7
Torque on knob of bored lock or latch set	Nm	-	10	15	-	-	-	-	-
Torque on handle of bored lock or latch set	Nm	-	20	30	-	-	-	-	-
Pulling force on knob of bored lock or latch set	kN	-	1	1.5	-	-	-	-	-
Drilling of security bolt prior to side load test	mins	-	-	-	-	-	3	-	5
Side load on security bolt	kN	-	1	3	5	7	7	10	10
Projection of linear throw security bolt	mm	-	10	12	14	20	20	20	20
Projection of hooked security bolt	mm	-	5	5	5	5	5	5	5
Drilling of lock case prior to end load test	mins	-	-	-	-	-	3	-	5
End load on security bolt without box protection	kN	-	1	2	4	5	5	6	6
End load on security bolt with box protection	kN	-	1	2	2	2	2	2	2

Attack method	Units	Grade							
		0	1	2	3	4	5	6	7
Resulting projection of linear throw security bolt	mm	-	8	10	12	17	17	17	17
Resulting projection of hooked security bolt	mm	-	3	3	3	3	3	3	3
Drilling of hooked security bolt prior to pulling test	mins	-	-	-	-	-	3	-	5
Pulling force on hooked security bolt	kN	-	1	3	5	7	7	10	10
Drilling of anti-lift device prior to force attack	mins	-	-	-	-	-	3	-	5
Downward force on anti-lift device	kN	-	1	3	4	5	5	6	6
Torque on locked follower	Nm	-	60	80	100	150	150	200	200
Torque on locked integral handle/knob of rim lock	Nm	-	Maximum radius in mm						
Torque on strong key used to force lever lock	Nm	-	15	30	100	100	100	100	100
Load on box faces of box protected locking plate	kN	-	-	-	4	5	5	6	6
Side load on locking plate	kN	-	1	3	5	7	7	10	10
Pulling force on locking plate	kN	-	1	3	5	7	7	10	10
Lifting force on locking plate	kN	-	1	3	4	5	5	6	6

Digit 8

Key identification of lever locks

Nine grades are identified with minimum requirements for number of levers, number of differs, etc. as shown below:

Grade	Number of detaining elements	Number of effective differs	Number of differing step heights on key	Non-inter-passing of keys	Coding protection
0	No requirements				
A	3	100	2	Yes	No
B	5	1,000	3	Yes	Yes
C	5	10,000	3	Yes	Yes
D	6	4,000	3	Yes	Yes
E	6	20,000	3	Yes	Yes
F	7	6,000	4	Yes	Yes
G	7	50,000	4	Yes	Yes
H	8	100,000	4	Yes	Yes

Requirements (non-classified)

In addition to the classified requirements there are some non-classified requirements as follows:

Return force of latch bolt: Return force of latch bolt (2 mm from forend on the outward stroke) shall not be less than 2.5 N.

Strength of lever lock key: Lever lock key shall resist a torque of 2.5 Nm.

Strength of bolt actions: This requirement relates to follower actions (where applicable) and is in 2 parts:

1. With locking bolt blocked 2 mm from the forend, bolt throwing mechanism shall resist a torque on the follower of 30 Nm.

2. With latch bolt gripped, bolt withdrawal mechanism shall resist a torque on the follower of 20 Nm.

Minimum follower restoring torque: Restoring torque on latch bolt follower (5° from back stop position on return stroke) shall be at least 0.8 Nm.

Protection against removal from door: When door is closed and locked it shall not be possible to remove any exposed fixings:

a) From outside using any tool.

b) From inside (where security is required from the inside) using tools designed for use with any of the following types of screw head: hexagon, cross slot, Phillips, Posidriv, Allen, Torx, Torx with pin

Marking requirements

Minimum requirements

Marking	On product		On packaging	On instructions
	Visible before installation	Accessible after installation		
Identification of certification body	X			X
Manufacturer's name or trademark		X	X	X
Registered address of manufacturer				X
Last 2 digits of year marking first applied				X
Number of EC Certificate of Conformity				X
Number and year of this standard	X		X	X
Classification box				X
Product information				X
Year of assembly by manufacturer	X			
Manufacturer's product reference no.			X	X

Additional CE marking requirements (where applicable)

Marking	On product or attached label	On packaging or accompanying documentation
CE marking symbol	X (or →)	X
DoP reference number		X
Level or class of performance declared		X
Dated reference to harmonised technical specification		X
Identification number of notified body		X
Intended use		X

CE label example

(see Figure ZA.2 of standard)

Declaration of Performance (where applicable)

The person responsible for placing a relevant product on the market in the EEA must provide a Declaration of Performance (DoP) and apply the CE marking. The information required is specified in Regulation (EU) No. 305/2011 and in Annez ZA of the standard.

Because products intended for use on fire resisting and/or smoke control doors have a safety critical function, a notified body is required to verify the compliance claimed. Whilst the notified body is referenced in the CE marking and on the DoP, it is the manufacturer who is responsible for ensuring that the product meets the requirements of the CPR. This responsibility includes the design and manufacture of the product, application of the CE mark and preparation and issue of the DoP. The DoP may be issued in hard copy form or via e-mail or web-link.

DoP example

CONSTRUCTION PRODUCTS REGULATION (EU) 305/2011
DECLARATION OF PERFORMANCE

Company Logo

DoP Number: XXXXX

1. Unique identification code of the product type:

2. Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4) of the CPR:

3. Intended use or uses of the construction product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:

When used with an appropriate door closing device on fire and/or smoke control doors to fulfil the self-closing requirement of such doors, and thereafter to ensure that the door remains shut.

4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 11 (5): Any Co SA, PO Box 21, B-1050 Brussels, Belgium, Tel: +32987654321, Fax: +32123456789

5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2): N/A

6. System or systems of assessment and verification of constancy of performance of the construction product as set out in CPR, Annex V: System 1

7. In case of the declaration of performance concerning a construction product covered by a harmonised standard: EN 12209:2016. Notified testing laboratory No 1234 performed the type testing and issued test reports

8. European Technical Assessment: N/A

9. Declared performance

Essential characteristics	Performance	Harmonised technical specification
Self-closing ability 5.4.2 Closing force 5.1.2 Return force of latch bolt	 ≤ 25 N ≥ 2,5 N	EN 12209:2016
Durability of self-closing action 5.3.1 Durability of latch action	 Grade M: 200 000 test cycles with 25 N load on the latch bolt	
Ability to maintain door in closed position and not contribute to the spread of fire 5.5 Suitability for use on fire/smoke doors	 Grade 1: suitable for use on fire/smoke resisting door set assemblies	
Control of dangerous substances 5.1.1 Dangerous substances	 The materials in this product do not contain or release any dangerous substances in excess of the maximum levels specified in existing European material standards or any national regulations.	

10. Declaration: The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9.

The declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

.....
(name and function of the person producing the DoP)

....
(place and date of issue) (signature)

Quality assurance

The internationally recognised standard for quality assurance, BS EN ISO 9000 provides confidence that the products are being manufactured to a consistent quality level.

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

Support service

The correct specification and installation of panic and emergency exit devices is essential to ensure that they are able to operate efficiently within the performance levels described in this standard.

Specialist advice is available from **dhf** members in support of their products from specification stages through supply to effective operation on site.

Conformity

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

"This product has been successfully type-tested for conformity to all of the requirements of (BS 12209:2016), including the additional requirement for (fire/smoke door use*). Regular audit testing is undertaken. Test Reports and/or Certificates are available on request."
* Add as appropriate.

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

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dhf (Door and Hardware Federation) was created by a merger between the Association of Building Hardware Manufacturers (ABHM) and the Door and Shutter Manufacturers Association (DSMA), both of which have established excellent reputations in their respective industries, particularly in the area of technical expertise and the development of performance standards in national and international arenas.

dhf aims to build on these reputations by exploiting the synergies that exist between the two associations and combining their technical and financial resources to provide a unified, authoritative voice for the entire industry.

dhf and its members have consistently risen to the challenges posed by an ever-changing market, creating products which meet the needs of a changing world and developing performance standards alongside national and international organisations, such as BSI and CEN, which enable the industry to select and compare products with confidence.

dhf now represents all the key players in the following sectors: locks and building hardware, doorsets, industrial doors and shutters, domestic garage doors and automated gates/traffic barriers.

With the ultimate aim of maintaining and raising quality standards throughout the industry, all **dhf** members must meet minimum standards of competence and customer service. They all operate within a Code of Conduct governing standards of workmanship, quality assurance, training, safety, business integrity and CE marking compliance.

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