

ELECTRO-MAGNETIC LOCKING DEVICES

PERFORMANCE REQUIREMENTS



**Door & Hardware
Federation**

raising standards

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Electro-Magnetic Locking Devices

Performance Requirements

FOREWORD

This performance specification does not replace any existing performance specification.

This specification defines the type of products, the technical and performance requirements for electro-magnetic locking devices, including face to face fixed, morticed, external and shear electro-magnetic locks.

This specification does not provide for certification against European standards; it is designed to provide Door & Hardware Federation (DHF) approval for electro-magnetic locking devices.

Approval against the requirements of this performance specification is possible from April 2014. The aim of this specification is to provide approval for electro-magnetic locks from the Door & Hardware Federation.

The technical provisions of this specification have been adopted as a common basis for the approval of electro-magnetic locks.

This Technical Schedule does not cover the requirements for use on panic or emergency escape doors.

1 SCOPE

This performance specification gives the requirements and test methods for security, durability, fire and environmental for electro-magnetic locks, when used on hinged, pivoted or sliding, internal, external doors or gates.

This specification does not detail the requirements for a certified ISO 9001 quality management system, but will require compliance with the clause 6 which relates to the requirements of Factory Production Control.

The main purpose of the test is to prove the performance of the product when it is tested and passes to this specification.

In addition to the requirements of this technical document TS 010, if additional fire characteristics are needed then these shall be performed to EN 1634-1 or EN 1634-2.

This performance specification does not cover those locks and strikes that are covered by EN 14846 or products covered by prEN 13637 electro-mechanical exit systems.

2 REFERENCES

Normative references

EN 1634-1	Fire resistance and smoke control tests for doors, shutters and openable window assemblies and elements of building hardware. Part 1 fire resistance tests for doors, shutters and openable windows
EN 1634-2	Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware Part 2: fire resistance characterisation test for elements of building hardware
EN 1670	Building hardware corrosion resistance – requirements and test methods
prEN 13637	Electrically controlled exit systems for use on escape routes - requirements and test methods

3 TERMS AND DEFINITIONS

Electro-magnetic shear lock

The electro-magnetic shear lock which is designed to lock the door in the shear position

Face to face fixed electro-magnetic locks

The face to face fixed electro-magnetic locks are mounted under the top header rail or side frame, with the armature plate fixed to the door face

Mortice face to face fixed electro-magnetic locks

The mortice face to face fixed electro-magnetic locks are either morticed into a frame or a housing

Electro-magnetic external locks

The electro-magnetic external locks are suitable for external applications such as vehicle and pedestrian entrance gates, barriers and doors

Z & L brackets

The Z & L brackets are used with face to face fixed electro-magnetic locks so that they can be fitted to inward opening doors

L bracket

An L bracket is used for fixing a face to face fixed electro-magnetic lock on an outward opening door which has a shallow frame depth

Armature plate

Solid metal plate which is fixed to the door and aligned with the electro-magnetic lock to secure the door

Single action

Doors that can only open in one direction and close against a fixed stop

Double action

Doors that open in both directions

Safety bolts

A secondary fixing which prevents the electro-magnetic lock fixing bolts from becoming loose and providing a form of protection from anti-tamper

Safety straps

Safety straps are a secured chain which is fixed to the electro-magnetic lock's armature plate to prevent the armature plate from falling from its fixed position if the fixings work loose

Test specimen

Complete full working electro-magnetic lock supplied by the manufacturer ready for test

4 GENERAL REQUIREMENTS

4.1 Before the commencement of any testing, the applicant shall supply detailed information about the product to be tested including the following:

- a) Name and address of all relevant manufacturing facilities, if different to the applicant
- b) All configurations for which classification is required
- c) Detailed drawings of all configurations
- d) Manufacturer's installation instructions

4.1.1 The electro-magnetic lock sample shall be supplied for testing fully functioning, complete with all hardware, accessories / brackets / fixings and instructions

4.1.2 All tests shall be conducted in accordance with the appropriate grades detailed in clause 6 of this Technical Specification

4.1.3 Minimum level of IP54 is required for all electro-magnetic locks used externally

4.2 The test requirements cover the following characteristics:

- 4.2.1 Category of use
- 4.2.2 Durability
- 4.2.3 Suitable for use on fire / smoke doors
- 4.2.4 Safety
- 4.2.5 Corrosion resistance
- 4.2.6 Security - holding force
- 4.2.7 Security - electrical function
- 4.2.8 Type of device

Note: We recommend that test evidence be generated at an independent test facility with 3rd party accreditation

5 CLASSIFICATION

5.1 Category of use

Grade 3 – for doors used by the public and others with little incentive to exercise care and with a chance of misuse to the door

5.2 Durability

Grade 5 – 50,000 cycles
Grade 6 – 100,000 cycles
Grade 7 – 200,000 cycles
Grade 8 – 500,000 cycles

5.3 Suitable for use on fire / smoke doors

Grade 0 – not intended for use on fire doors
Grade A – suitable for use on smoke door assembly only
Grade B – suitable for use on smoke / fire door assemblies

5.4 Safety bolts & straps

Grade 0 = not supplied
Grade 1 = safety bolts supplied
Grade 2 = straps supplied
Grade 3 = safety bolts and straps supplied

5.5 Corrosion resistance

Grade 1 – up to 24 hours – mild resistance
grade 2 – up to 48 hours – moderate resistance
grade 3 – up to 96 hours – high resistance
grade 4 – up to 240 hours – very high resistance

5.6 Security - holding force

Grade 1 – holding force above 1000N
Grade 2 – holding force above 2000N
Grade 3 – holding force above 3000N
Grade 4 – holding force above 5000N
Grade 5 – holding force above 7000N
Grade 6 – holding force above 10000N

5.7 Security – electrical function

Grade 0 – no status indication
Grade 1 – audio or visual signal

5.8 Type of device

Grade A – face to face fixed electro-magnetic locks
Grade B – mortice face to face fixed electro-magnetic locks
Grade C – electro-magnetic shear lock
Grade D – electro-magnetic external locks

Example of classification

category of use	durability	fire	safety bolts & straps	corrosion resistance	security - holding force	security - electrical function	type of devices
3	8	B	0	4	6	1	B

6 TEST REQUIREMENTS AND PROCEDURES

A minimum of three samples will be required for durability, corrosion resistance and fire testing.

Security testing can be performed on either the durability or corrosion resistance samples prior to these tests.

6.1.1 Category of use

Grade 3

6.1.2 Durability

The durability test is to identify the correct function of the electro-magnetic lock, the electro-magnetic lock is to be assembled with the correct fixing brackets (if Z & L brackets are optional accessories then these are to be included in the durability testing).

The durability testing does not need performing on a test door; it can be performed on an apparatus that allows the armature plate to be moved in isolation to the electro-magnetic lock for example spring loaded.

Test method

Energize the electro-magnetic lock to the correct voltage (+or – 10%)

Attach the armature plate so it is secured correctly on to the face of the electro-magnetic lock

Leave energized for a minimum of 5 seconds

De-energize the electro-magnetic lock and remove the armature plate making sure there is a gap of at least 10mm between electro-magnetic lock and armature plate

Leave for a minimum of 5 seconds

Re-energize the electro-magnetic lock and repeat the cycle

6.1.3 Suitable for use on fire / smoke doors

The electro-magnetic lock shall be included in a full scale fire test to EN 1634-1. Pass and fail criteria are given in the fire test standards. Following the full scale fire test it could be possible to cover other designs / family members by having a fire assessment or using small scale testing to EN 1634-2

6.1.4 Safety bolts and straps

Safety bolts and straps shall be declared by the supplier of the electro-magnetic lock as per grading in clause 5.4

6.1.5 Corrosion resistance

The corrosion resistance test shall be performed to EN 1670 for the required exposure time.

Prior to the corrosion test the security holding force shall be performed in accordance with clause 6.1.6 and the figures recorded.

Whilst in the chamber the electro-magnetic lock face shall be covered by the armature plate for the required duration, the armature plate can be held in position with tape, elastic bands, etc.

After the required exposure time the security holding force shall be repeated and only a 20% reduction in holding force that was originally recorded is allowed, there is no visual inspection required.

If the holding force is reduced by more than 20% then this is a failure.

Electro-magnetic locks that are to be corrosion resistance tested can have the external wiring and locating position protected for the duration of the test.

6.1.6 Security – holding force

The security holding force test shall be tested on a rigid test apparatus.

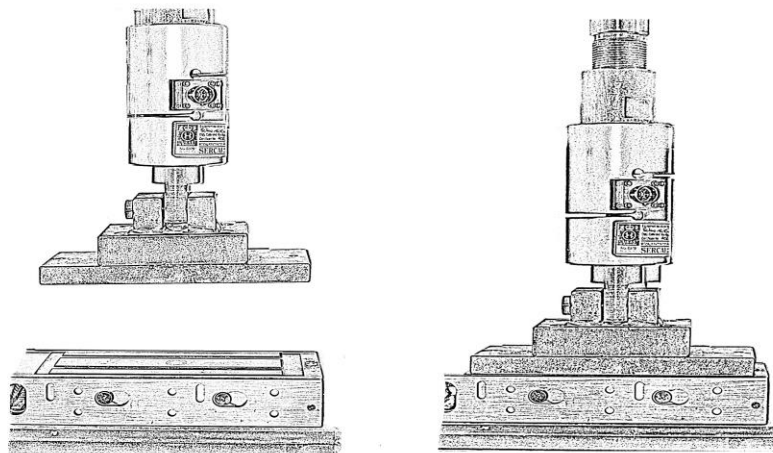
The electro-magnetic lock shall be securely mounted to the bed of the test rig, so it cannot move whilst under load.

The armature plate shall be connected to a load-cell for applying the correct holding force.

The armature plate shall be free to move whilst under load and fitted correctly (ie square to the face of the electro-magnetic lock prior to the load being applied).

Apply rated voltage to the electro-magnetic lock.

Measure the force required to fully separate the armature plate from the electro-magnetic lock. Repeat three times and take the average of the three readings.



Example of the set-up for the security – holding force test

6.1.7 Security – electrical function

Grade 0 = no status indication

Grade 1 = audio or visual (indicating energised or non-energised)

6.1.8 Type of Device

This shall be declared by the supplier

7 FACTORY PRODUCTION CONTROL

7.1 General

Factory Production Control (FPC) system is the permanent internal control of production exercised by the manufacturer. The aim of the FPC system is to ensure that the product characteristics are maintained within specified limits during production.

The manufacturer shall set up a systematic FPC system in the form of written policies and procedures taking into account the following aspects:

- Product types and range of application;
- Manufacturing processes (e.g. assembly of components purchased from external suppliers);
- Batch quantity.

The manufacturer shall appoint a person to be responsible for the FPC system in each factory.

The production control requirements shall be decided by the manufacturer and shall include the following operations appropriate to the manufacturing processes:

- Specification and verification of raw materials and constituents;
- Controls and tests, if any, to be carried out during manufacture in accordance with a frequency specified by the manufacturer;
- Verifications and tests, if any, to be carried out on finished products in accordance with a frequency specified by the manufacturer;
- Description of actions to be taken in case of non-conformity.

An FPC system according to EN ISO 9001:2000 or to similar international standards and made specific to the product is deemed to meet the FPC requirements of this specification.

8 MARKINGS AND LABELLING

Example of label for packaging

8.1

Ref to TS 010: 2014							
Classification							
3	8	B	0	4	6	1	B
Company Name / trade mark: Electro-Magnets - R - US							
Company Address: Electric Avenue, Birmingham, B1							

Example of a label for the product

Classification							
3	8	B	0	4	6	1	B
Company Name / trade mark: Electro-Magnets - R - US							

8.2 The classified electro-magnetic lock shall be provided with a tamper evident label fixed to the item

8.3 The label or means of identification should preferably be fitted so it is visible after installation. If it is not possible to locate it in a position so it is visible after installation, the fitting instructions will detail the location of the label or means of identification. The tamper evident label should be fitted at source of manufacture, not despatched separately. A loose label could lead to abuse.

9 AUDIT REQUIREMENTS

9.1 Audit tests will be performed every year on the holding force, audit testing every 2 years for durability and corrosion and fire testing will be reviewed every 5 years.

9.2 If any part of the audit test fails, the client will be notified and discussion on possible modifications and/or further samples to be taken and tested will be agreed.

10 INSTALLATION INSTRUCTIONS

10.1 Each electro-magnetic lock shall be supplied with full installation instructions and should contain information such as, maintenance, correct fixing positions, voltage requirements and correct labelling.

ANNEX A

A.1 ORGANISATIONS RATIFYING THIS SCHEDULE

- * Door & Hardware Federation (DHF)
- * Warrington Certification Limited (WCL)
- * Exova Warringtonfire
- * Securefast plc
- * Secured By Design (SbD)
- * ASSA ABLOY

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