



BSI Standards Publication

Building hardware — Padlocks and padlock fittings — Requirements and test methods

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

raising standards worldwide™

Full document details: BS EN 12320:2012

National foreword

This British Standard is the UK implementation of EN 12320:2012. It supersedes BS EN 12320:2001 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/538/4, Building hardware.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2012. Published by BSI Standards Limited 2012

ISBN 978 0 580 67831 8

ICS 91.190

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 October 2012.

Amendments issued since publication

Date	Text affected
------	---------------

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12320

October 2012

ICS 91.190

Supersedes EN 12320:2001

English Version

**Building hardware - Padlocks and padlock fittings -
Requirements and test methods**

Quincaillerie pour le bâtiment - Cadenas et porte-cadenas -
Exigences et méthodes d'essai

Baubeschläge - Hangschlösser und Hangschlossbeschläge
- Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 11 August 2012.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

© 2012 CEN All rights of exploitation in any form and by any means reserved
worldwide for CEN national Members.

Ref. No. EN 12320:2012: E

Contents

	Page
Foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 Requirements	6
5 Test methods	8
6 Classification	16
7 Marking	17
Annex A (normative) Sampling and sequencing - Tests on alternative design padlocks	18
Annex B (normative) Test rig illustrations	19

Foreword

This document (EN 12320:2012) has been prepared by Technical Committee CEN/TC 33 “Doors, windows, shutters, building hardware and curtain walling”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12320:2001.

The following is a list of technical changes since the previous edition:

- Limited manual attack
- Corrosion resistance
- Table 2 – security requirements
- Resistance to attack by plug/cylinder extraction
- Annex A, sampling and sequencing

The test methods are specified in detail to ensure reproducibility at any testing establishment within Europe, and the acceptance criteria are defined objectively to ensure consistency of assessment.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard applies to mechanical padlocks and padlock fittings used on buildings and general use and specifies the test methods to be used.

This European Standard specifies performance and other requirements for strength, security, durability, performance, and corrosion resistance of padlocks. It establishes one category of use, two categories of durability, six categories for corrosion resistance and six grades for security based on performance tests that simulate attack.

Limited manual attack testing is included in this European Standard because the machine testing does not replicate all known manual attacks.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1303:2005, *Building hardware – Cylinders for locks – Requirements and test methods*

EN 1670:2007, *Building hardware – Corrosion resistance – Requirements and test methods*

EN 10025-2, *Hot rolled products of structural steels – Part 2: Technical delivery conditions for non-alloy structural steels*

ISO 10899, *High-speed steel two-flute twist drills – Technical specifications*

3 Terms and definitions

For the purposes of this document, the following terms and definitions and symbols apply.

3.1 Terms and definitions

3.1.1

cam

part of the key and cylinder mechanism which operates the locking mechanism

3.1.2

effective key differ

difference between the key mechanism of similar design, achieved only by the movable detainer, which allows each key mechanism to be operated only by its own key

Note 1 to entry: The number of effective differs is equal to the number of theoretical differs after deduction of the differs suppressed by the manufacturer due to technical constraints and those differs suppressed in accordance with the restraints of 4.5.1

3.1.3

hasp

part of the padlock fitting which goes over the staple.

3.1.4

key mechanism

part of the mechanism which recognises a correct key

3.1.5

locking mechanism

part of the mechanism which is operated by the key mechanism to lock/unlock the padlock

3.1.6

padlock

independent locking device comprising a body, a key mechanism, a locking mechanism and a shackle

3.1.7

padlock fitting

device fitted to the object which is to be locked with a padlock excluding cables and chains

3.1.8

shackle

part of the padlock which passes through and secures the padlock fitting

3.1.9

staple

part of the padlock fitting through which the padlock shackle is passed.

3.2 Symbols

Table 1

Symbol	Unit	Definition
d	mm	Diameter of shackle
F1	kN	Push/pull force on cylinder plug/locking mechanism
F2	kN	Pull force on shackle or staple
F3	kN	Cutting force on shackle or staple
F4	kN	Maximum possible push/pull force on cylinder plug/locking mechanism
h	mm	Height through which weight is dropped (impact test)
M1	Nm	Torque on key to test for interpassing
M2	Nm	Torque on cylinder plug/locking mechanism
M3	Nm	Twisting torque on shackle or staple
n		Minimum number of effective key differs
t	min	Drilling/sawing resistance time
T	°C	Temperature of product for impact testing
m	g	Drop mass for impact test

4 Requirements

4.1 General

The structure of this clause reflects the classification as given in Clause 6.

4.2 Category of use (first classification digit)

— Grade 1: according to requirements in 5.2

4.3 Durability (second classification digit)

— Grade 0: no requirements

— Grade 1: 10 000 cycles

When tested in accordance with 5.3 it shall be possible to operate the padlock.

The padlock fittings are excluded from the durability test.

4.4 Corrosion Resistance (third classification digit)

Products shall be classified in accordance with EN 1670.

— Grade 0: no defined corrosion resistance

— Grade 1: 24h ^{+1h/-0 h};

— Grade 2: 48h ^{+1h/-0 h};

— Grade 3: 96h ^{+1h/-0 h};

— Grade 4: 240h ^{+1h/-0 h};

— Grade 5: 480h ^{+1h/-0 h};

After the corrosion test, the padlock shall operate using a maximum torque on the key of 2.5 Nm.

This corrosion test shall apply to the functionality only (not appearance).

4.5 Security (fourth classification digit)

4.5.1 General

Some of the requirements can be confirmed with a certificate and test report according to EN 1303.

In grades 4, 5 and 6 it shall not be possible to remove the key until the shackle is deadlocked in the closed position and the key retained in open position.

4.5.2 Minimum number of effective key differs

Padlocks shall have a minimum of *n* effective key differs (Table 2).

For a mechanical padlock, the maximum number of steps on the same level shall be 60 %, maximum two adjacent and a minimum of three levels.

4.5.3 Non-interpassing of keys with just one interval effective differ

When tested in accordance with 5.5.2, it shall not be possible to operate the padlock with keys differing from the correct key by one interval, i.e. the next closest key. The next closest key shall be defined by the manufacturer according to its key coding system.

4.5.4 Resistance to force on cylinder plug or locking mechanism

When tested in accordance with 5.5.3, the cylinder plug or the locking mechanism shall resist a force F_1 (Table 2).

4.5.5 Resistance to torque on cylinder plug or locking mechanism

When tested in accordance with 5.5.4, the cylinder plug or the locking mechanism shall resist a torque M_2 (Table 2).

4.5.6 Resistance to pulling of shackle or staple

When tested in accordance with 5.5.5, the shackle and the staple shall each resist a force F_2 (Table 2).

4.5.7 Resistance to twisting of shackle or staple

When tested in accordance with 5.5.6, the shackle and the staple shall each resist a torque M_3 (Table 2).

4.5.8 Resistance to cutting of shackle or staple

When tested in accordance with 5.5.7, the shackle and the staple shall each resist a force F_3 (Table 2).

4.5.9 Resistance to impact on padlock body, shackle and staple at low temperature

When tested in accordance with 5.5.8, the padlock body, the shackle and the staple cooled to temperature T , shall each resist the blows from the steel pole with the mass m and from the height h (Table 2).

4.5.10 Resistance to drilling of padlock body, shackle and staple

When tested in accordance with 5.5.9, the padlock body, the shackle and the staple shall each resist drilling for a time t (Table 2).

4.5.11 Resistance to sawing of padlock body, shackle and staple

When tested in accordance with 5.5.10, the padlock body, the shackle and the staple shall each resist sawing for a time t (Table 2).

4.5.12 Attack resistance

When tested in accordance with 5.5.11, the padlock shall resist attacks with manual tools for a time t (see Table 2).

Table 2 — Security requirements

Requirement clause number	Requirement	Test method clause number	Test parameter	Grade						Unit
				1	2	3	4	5	6	
4.5.1	Key retained in open position		yes / no	-	-	-	yes	yes	yes	
4.5.2	Minimum number of effective key differs	5.5.1	<i>n</i>	300	1 000	2 500	5 000	10 000	20 000	-
4.5.3	Non-interpassing of keys with just one interval differ - Torque on key	5.5.2	M1	1	1	1,5	1,5	1,5	1,5	Nm
4.5.4	Resistance to force on cylinder plug or locking mechanism	5.5.3	F1	-	-	4	5	10	15	kN
4.5.5	Resistance to torque on cylinder plug or locking mechanism	5.5.4	M2	-	2,5	5	15	20	30	Nm
4.5.6	Resistance to pulling of shackle and staple	5.5.5	F2	3	5	15	30	70	100	kN
4.5.7	Resistance to twisting of shackle and staple	5.5.6	M3	40	100	200	600	1 200	2 500	Nm
4.5.8	Resistance to cutting of shackle and staple	5.5.7	F3	6	15	25	45	70	100	kN
4.5.9	Resistance to impact on padlock body, shackle and staple at low temperature	5.5.8	<i>T</i> <i>m</i> <i>h</i>	- - -	- - -	- 20 1 250 800	- 20 3 050 1 000	- 40 6 550 1 400	- 40 7 150 1 500	°C g mm
4.5.10	Resistance to drilling of padlock body, shackle and staple	5.5.9	<i>t</i>	-	-	-	2	4	8	min
4.5.11	Resistance to sawing of padlock body, shackle and staple	5.5.10	<i>t</i>	-	-	-	2	4	8	min
4.5.12	Manual attack	5.5.11	<i>t</i> toolsets	-	-	-	3	5	10	min
NOTE Classification is in six grades where grade 1 has the lowest requirement.										

5 Test methods

5.1 General

5.1.1 Introduction

The manufacturer will provide assembly and component drawings to enable the tester to carry out a preliminary product assessment prior to testing.

The padlock shall be tested in the locked position with the key removed.

It is not necessary for the correct key to operate the padlock after testing.

Padlocks/ padlock fittings and their original keys shall be taken at random and submitted for each test.

In the event of one of the original two samples failing the test, the padlocks/ padlock fittings shall be deemed to have failed and a further two shall be tested, both of which shall pass the test.