



SLOVENSKI STANDARD
SIST EN 15496:2008
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Cycles - Requirements and test methods for cycle locks

Fahrräder - Anforderungen und Prüfverfahren für Fahrradschlösser

Cycles - Exigences et méthodes d'essai pour les antivol pour cycles

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English Version

Cycles - Requirements and test methods for cycle locks

Cycles - Exigences et méthodes d'essai pour les antivols
pour cycles

Fahrräder - Anforderungen und Prüfverfahren für
Fahrradschlösser

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 15496:2008) has been prepared by Technical Committee CEN/TC 333 “Cycles”, the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by July 2008, and conflicting national standards shall be withdrawn at the latest by July 2008.

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.

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Introduction

This European Standard has been developed in response to demand throughout Europe aimed to ensure that locking systems manufactured in compliance with this standard will offer unattended bicycles a high, practical level of security. The tests have been designed and evaluated in practical tests by experts in the lock industry and consideration has been given to the latest techniques employed by professional cycle-thieves whose methods are constantly changing.

The scope has been limited to security and durability requirements and, to some extent, the safety of the rider.

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1 Scope

This European Standard specifies performance requirements and describes test methods for strength, security, function and corrosion resistance of locks for cycles. It also covers certain aspects regarding the safety of the rider of the cycle on which the lock is mounted. This standard covers permanently-mounted cycle locks and removable locks.

2 Normative references

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

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

EN 10277-1, *Bright steel products – Technical delivery conditions – Part 1: General*

EN 10277-2, *Bright steel products – Technical delivery conditions – Part 2: Steels for general engineering purposes*

EN ISO 9227, *Corrosion tests in artificial atmospheres – Salt spray tests (ISO 9227:2006)*

EN ISO 9994, *Lighters - Safety specification (ISO 9994:2005)*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005)*

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3 Terms and definitions

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

3.1

cable lock

cable made of steel wire, in a single or spiral loop, with one end permanently attached to the lock housing

3.2

chain and lock combination

chain with a detachable lock

3.3

chain lock

chain combined with a padlock or U-shackle lock

3.4

combination lock

lock that can be operated without a key and unlocked by moving parts of the lock in a certain pattern (combination of movements)

3.5

cycle

any vehicle that has at least two wheels and is propelled solely or mainly by the muscular energy of the person on that vehicle, in particular by means of pedals

3.6

cycle lock

device which, when locked, is intended to mechanically prevent the use of a bicycle

3.7**depth of incision**

depth of transverse notches on the length of a key

3.8**detainer**

part of the key mechanism of a locking mechanism which should first be moved by the key into a pre-determined position before the key can be used for unlocking or locking

3.9**diamond frame**

traditional type of cycle-frame consisting of a head-tube, a top-tube, a seat-tube, and a down-tube

3.10**key**

device, supplied by the manufacturer, for locking and unlocking a lock and that is capable of being used only through direct physical contact with the lock

3.11**key-operated lock**

lock that is operated with a key

3.12**keyway**

aperture extending along the whole or part of the length of the plug into which the key is inserted

3.13**key mechanism**

part of the mechanism that recognises a correct key. A key mechanism is also used as a synonym to "identification number" (regarding electronic locks) and "combination code" (for combination locks)

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3.14**lock housing**

part of the lock containing the key mechanism and blocking mechanism

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3.15**locking mechanism**

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

3.16**padlock**

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

3.17**plug**

part of the key-mechanism that can be moved when the proper key is used

3.18**permanently-mounted cycle lock**

cycle lock that forms one unit (excluding accessories and keys), which is mounted on a cycle and that can be considered as a permanent part of that cycle. A permanently-mounted lock can also be equipped with accessories such as chains or cables which can be locked with the same locking unit as that of the permanently-mounted lock

NOTE

One of the most common types of lock of this type is the so-called frame lock.

3.19**practical effective differ**

difference between key mechanisms of similar design, achieved only by the movable detainers, which allow each key mechanism to be operated only by its own key. The number of practical effective differs is equal to

the number of theoretical differs after deduction of the differs suppressed by the manufacturer due to technical constraints and deduction of the differs suppressed by requirements in this standard (see clause 4)

3.20

removable cycle lock

cycle lock that consists of one or more than one unit and that can be used for locking a cycle but that cannot be considered as a permanent part of that cycle since it is detachable without the use of any tools other than a key. Removable locks are often used for the connection of a cycle to other cycles or to fixed objects such as a ground-anchor

3.21

shackle

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

3.22

u-shackle lock

lock housing with a partially or totally detachable shackle in which the legs of the shackle may or may not be parallel to each other

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4 General requirements

NOTE In Table 1, a summary of the requirements and test parameters, specified in this standard, is presented.

Table 1 — Summary of requirements and test parameters

Test parameter	Requirement clause	Test clause	Requirement value	Unit
General requirements	4	-		
Maximum operational unlocking torque	6.1.1	6.1.2	1	Nm
Non-interpassing of keys with just one interval effective differ	6.2.1	6.2.2	1,5	Nm
Key strength	6.3.1	6.3.2	2	Nm
Durability	6.4.1	6.4.2	5000	n
Strength	6.5.2			
Tensile strength				
U-shackle locks: Tensile strength in the direction of opening	6.5.2	6.5.3.2.1	30	kN
U-shackle locks: Tensile strength transverse or inclined to the direction of opening	6.5.2	6.5.3.2.2	10	kN
Other locks	6.5.2	6.5.3.3	10	kN
Torsional strength				
U-shackle locks	6.5.2	6.5.4.2	500	Nm
Chains for chain locks	6.5.2	6.5.4.3	500	Nm
Chain and lock combinations	6.5.2	6.5.4.4	500	Nm
Other locks	6.5.2	6.5.4.5	500	Nm
Cutting resistance	6.5.2	6.5.5.2	55	kN
Impact resistance of lock-housings in the direction of opening	6.5.2	6.5.6	3050 g 1,0 m -20 °C	5 strokes
Impact resistance of shackle-bolts or chain-links of locks – Test methods	6.5.2	6.5.7	3050 g 1,0 m -20 °C	5 strokes
Resistance to pulling or pushing of locking mechanism	6.5.2	6.5.8	5	kN
Drill resistance of locking mechanism	6.6.1	6.6.3	2	min
Resistance to attacks with hand tools	6.7.1	6.7.3	180	seconds
Picking	6.8.2	6.8.5	228	m*
Corrosion resistance	6.9.1	6.9.2		
Marking	7.1	7.2		

4.1 A cycle lock shall be so designed that when it is mounted according to the manufacturer's instructions and locked, it shall fulfil all of the following requirements:

- a) cycle cannot be either ridden or pushed along in a normal way and the rotation of at least one wheel is prevented, and
- b) it is not possible to remove the lock by detaching a part of the cycle that is easy to detach and attach (e.g. a wheel or a seat-post), and
- c) it is not possible to remove or unlock it by deforming a part of the cycle (e.g. the front fork or the seat-stays) unless such deformation prevents the future normal use of the cycle.

4.2 For safety reasons, it shall not be possible for a permanently-mounted cycle lock or for a removable cycle lock, when mounted according to the manufacturer's instructions, to interfere with the normal and safe use of the cycle.

4.3 For the requirements in clauses 4.3.1 to 4.3.5 deviations from the requirements are permitted if the same level of security can be achieved with other solutions. The assessment of any other such solutions shall be presented in the test report.

4.3.1 The key mechanism shall have at least five active retainers.

4.3.2 The key must be provided with at least three different depths of incision.

4.3.3 Only 60 % of the number of blocking elements shall be permitted to have the same incision. When the 60 % value does not result in a whole number, the immediately lower whole number shall apply

4.3.4 Not more than two equal, adjacent blocking elements shall be permitted.

4.3.5 The lock shall have a minimum number of practical effective differs (n), thus:

- a) for key- operated locks: 2 500 with a minimum of 1 000 per keyway
- b) for combination locks: 9 000
- c) for key-operated electronic locks: 50 000
- d) for electronic locks operated by a remote device: 100 000. After each operation, the receiver shall require a new code, generated in a random pattern, in order to operate again.

4.4 Combination locks and electronic locks shall be so designed that it is not possible to determine the correct code by visually inspecting external scratches or marks after 500 times of opening and closing the lock.

4.5 Cycle locks shall be so designed that it is not possible to determine the correct code by visual inspection through the key-hole or other openings.

4.6 All locks except combination locks shall be delivered with at least two, but not more than four, keys or remote devices.

4.7 A permanently-mounted key-operated cycle lock shall be so designed that the locking is positive, i.e. the key shall not be removable from the lock until the blocking element of the shackle is in the blocked and locked position.

4.8 Electronic locks shall have a function that makes the lock capable of preventing opening by random or systematic generation and transmission of codes. An example of such a function is a time-delay function that blocks reception of further codes for a certain time after each reception of an incorrect code.