SLOVENSKI STANDARD
SIST EN 15194:2017

01-december-2017

Nadomešča:
SIST EN 15194:2009+A1:2012

Kolesa - Kolesa z električnim pomožnim pogonom - Kolesa EPAC

Cycles - Electrically power assisted cycles - EPAC Bicycles

Fahrräder - Elektromotorisch unterstützte Räder - EPAC

Cycles - Cycles à assistance électrique - Bicyclettes EPAC

Ta slovenski standard je istoveten z: EN 15194:2017

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ICS:

43.120	Električna cestna vozila	Electric road vehicles
43.150	Kolesa	Cycles

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2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English Version

Cycles - Electrically power assisted cycles - EPAC Bicycles

Cycles - Cycles à assistance électrique - Bicyclettes EPAC

Fahrräder - Elektromotorisch unterstützte Räder - EPAC

This European Standard was approved by CEN on 28 May 2017.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 15194:2017) 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of an identical text or by endorsement, at the latest by April 2018, and conflicting national standards shall be withdrawn at the latest by April 2019.

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

This document supersedes EN 15194:2009+A1:2011.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

Compared to the previous edition, this standard has been revised to align it to the essential applicable requirements of EU Directive 2006/42/EC (Machinery Directive).

This standard also includes all mechanic requirements applicable to the EPACs and is therefore a stand-alone document.

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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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

This European Standard gives requirements for electrically power assisted cycles (EPAC).

This European Standard has been developed in response to demand throughout Europe. Its aim is to provide a standard for the assessment of electrically powered cycles of a type which are excluded from type approval by Regulation (EU) No 168/2013.

Due to the limitation of the voltage to 48 V d.c., there are no special requirements applicable to the EPAC in regard to protection against electrical hazards.

Following the completion of a risk analysis, the focus in this standard is on EPAC as bicycles for city and trekking. Folding bicycles are included.

This document is a type C standard as stated in EN ISO 12100. The machinery concerned and the extent to which hazards, hazardous situations and hazardous events covered are indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

In real life situation an EPAC can fall over to the side causing the battery holder to break without damage to the battery case itself. While the standard contains a strength test for the battery an additional test is required for the situation described. This will be considered at the next revision. The battery holder needs to withstand this realistic and typical situation. Risk assessment carried out by the manufacturer should identify suitable measures to deal with this situation until it can be dealt with in the standard.

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1 Scope

This European Standard applies to EPAC bicycles for private and commercial use with exception of EPAC intended for hire from unattended station.

This European Standard is intended to cover all common significant hazards, hazardous situations and events (see Clause 4) of electrically power assisted bicycles, when used as intended and under condition of misuse that are reasonably foreseeable by the manufacturer.

This European Standard is intended to cover electrically power assisted bicycles of a type which have a maximum continuous rated power of 0,25 kW, of which the output is progressively reduced and finally cut off as the EPAC reaches a speed of 25 km/h, or sooner, if the cyclist stops pedalling.

This European Standard specifies requirements and test methods for engine power management systems, electrical circuits including the charging system for the design and assembly of electrically power assisted bicycles and sub-assemblies for systems having a rated voltage up to and including 48 V d.c. or integrated battery charger with a nominal 230 V a.c. input.

This European Standard specifies safety and safety related performance requirements for the design, assembly, and testing of EPAC bicycles and subassemblies intended for use on public roads, and lays down guidelines for instructions on the use and care of such bicycles.

This European Standard applies to EPAC bicycles that have a maximum saddle height of 635 mm or more and that are intended for use on public roads.

This European Standard is not applicable to EPACs which are manufactured before the date of its publication as EN.

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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.

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ISO 11452-2:2004, *Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 2: Absorber-lined shielded enclosure*

ISO 11452-3:2016, *Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 3: Transverse electromagnetic (TEM) cell*

ISO 11452-4:2011, *Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 4: Harness excitation methods*

ISO 11452-5:2002, *Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 5: Stripline*

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3 Terms and definitions

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

3.1
cycle
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

3.2
bicycle
two-wheeled vehicle that is propelled solely or mainly by the muscular energy of the person on that vehicle, in particular by means of pedals

3.3
electrically power assisted cycle
EPAC
cycle, equipped with pedals and an auxiliary electric motor, which cannot be propelled exclusively by means of this auxiliary electric motor, except in the start-up assistance mode

3.4
city and trekking bicycle
bicycle designed for use on public roads primarily for means of transportation or leisure

3.5
mountain-bicycle
bicycle designed for use off-road on rough terrain, on public roads and on public pathways equipped with a suitably strengthened frame and other components, and, typically, with wide-section tyres with coarse tread patterns and a wide range of transmission gears

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3.6
racing-bicycle
bicycle intended for high-speed amateur use on public roads having a steering assembly with multiple grip positions allowing for an aerodynamic posture, a multi-speed transmission system, tyre width not greater than 28 mm, and a maximum mass of 12 kg for the fully assembled bicycle

3.7
recumbent bicycle
bicycle that places the rider in a laid-back reclining position

3.8
young adult bicycle
bicycle designed for use on public roads by a young adult whose weight is less than 40 kg with maximum saddle height of 635 mm or more and less than 750 mm

3.9
fully assembled bicycle
bicycle fitted with all the components necessary for its intended use

3.10
folding bicycle
bicycle designed to fold into a compact form, facilitating transport and storage

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3.11
bar-end
extension secured to the end of a handlebar to provide an additional hand-grip and usually with its axis perpendicular to the axis of the end of the handlebar

3.12
brake-lever
lever that operates a braking device

3.13
disc-brake
brake in which pads are used to grip the lateral faces of a thin disc attached to or incorporated in the wheel-hub

3.14
braking distance
distance travelled by a bicycle between the commencement of braking (3.16) and the point at which the bicycle comes to rest

3.15
braking force
F_{Br}
tangential rearward force between the tyre and the ground or the tyre and the drum or belt of the test machine

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3.16
commencement of braking
point on the test track or test machine at which the brake actuating device operated directly by the riders hand or foot or by a test mechanism starts to move from its rest position

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Note 1 to entry: On the test track, this point is determined by the first brake-actuating device (front or rear) to operate.

3.17
brake-lever cut-off switch
device that cuts off the motor assistance while using the brake lever

3.18
composite materials
component that is entirely or partially made of a non-metallic matrix materials which is reinforced by metallic or non-metallic materials such as short or long fibres, fabric or particles

3.19
composite wheels
wheel assembly containing any composite material

3.20
continuous rated power
output power specified by manufacturer, at which the motor reaches its thermal equilibrium at given ambient conditions

3.21
thermal equilibrium
temperatures of motor parts which do not vary more than 2K per h

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3.22
crank assembly
assembly for fatigue testing consisting of the drive side and the non-drive side crank arm, the pedal spindle-adaptors, the bottom-bracket spindle, and the first component of the drive system

EXAMPLE The chain-wheel set.

3.23
cut off speed
speed reached, by the EPAC, at the moment the current has dropped to zero or to the no load current value

3.24
drive belt
seamless ring belt which is used as a means of transmitting motive force

3.25
dummy fork
test fork manufactured to specific characteristics that can be substituted within a test for either the fork supplied by the manufacturer or where a fork has not been supplied

3.26
electromagnetic compatibility
ability of an EPAC or one of its electrical/electronic systems to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbance to anything in that environment

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3.27
electromagnetic disturbance
electromagnetic phenomenon such as electromagnetic noise, an unwanted signal or a change in the propagation medium itself which may degrade the performance of an EPAC or one of its electronic/electrical systems

3.28
electromagnetic environment
all electromagnetic phenomena present in a given situation

3.29
electromagnetic immunity
ability of an EPAC or one of its electronic/electrical systems to perform without degradation of its performance in the presence of specific electromagnetic disturbance

3.30
electronic/electrical subassembly
ESA
electronic and/or electrical component, or an assembly of components provided for installation into an EPAC, together with all electrical connections and associated wiring for the execution of several specific functions

3.31
ESA test
test carried out on one or more specific ESAs

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3.32
ESA type in relation to electromagnetic compatibility
separate technical ESA unit that does not differ from other units in its essential design and construction aspects

Note 1 to entry: For example:

— the function performed by the ESA;

— the general layout of the electronic and/or electrical components;

— direct vehicle control performed by the rider acting on the steering, the brakes and the accelerator control.

3.33
exposed protrusion
protrusion which through its location and rigidity could present a hazard to the rider either through heavy contact with it in normal use or should the rider fall onto it in an accident

3.34
fork steerer
fork stem
part of a fork that rotates about the steering axis of a bicycle frame head tube

Note1 to entry: It is normally connected to the fork crown or directly to the fork legs, and is normally the point of connection between the fork and the handlebar stem.

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3.35
fracture
unintentional separation into two or more parts

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3.36
full discharge of the battery
point at which the battery does not deliver any power/energy to the motor, according to the battery manufacturer's specifications

Note1 to entry: It is recommended that the battery cells be never fully discharged and residual current of battery be used by other devices.

3.37
highest gear
gear ratio which gives the greatest distance travelled for one rotation of the cranks

3.38
hub-brake
brake which acts directly on the wheel-hub

3.39
hub-generator
electric generating device built in the wheel-hub

3.40
integrated charger
charger which is a part of the bicycle and needs tools to be disassembled from it

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3.41
electrical control system
electronic and/or electrical component, or an assembly of components provided for installation into a vehicle, together with all electrical connections and associated wiring for the engine electrical power assistance

3.42
lowest gear
gear ratio which gives the shortest distance travelled for one rotation of the cranks

3.43
maximum inflation pressure
maximum tyre pressure recommended by the tyre or rim manufacturer for a safe and efficient performance

Note 1 to entry: If the rim and tyre both indicate a maximum inflation pressure, the maximum inflation pressure is the lowest of the two pressures indicated.

3.44
maximum saddle height
vertical distance from the ground to the point where the top of the seat surface is intersected by the seat-post axis, measured with the seat in a horizontal position and with the seat-post set to the minimum insertion-depth mark

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3.45
maximum assisted speed by design
maximum designed speed up to which assistance is provided

3.46
minimum insertion-depth mark
mark indicating the minimum insertion-depth of handlebar stem into fork steerer (fork stem) or seat-post into frame

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3.47
narrow-band emission
emission which has a bandwidth less than that of a specific receiver or measuring instrument

3.48
no load current point
current for which there is no torque on the driving wheel

3.49
off-road rough-terrain
coarse pebble tracks, forest trails, and other general off-road tracks where tree-roots and rocks are likely to be encountered

3.50
pedal tread-surface
surface of a pedal that is presented to the underside of the foot

3.51
primary retention system
system that keeps the front/rear wheel securely attached to the frame/fork dropouts whilst riding