SLOVENSKI STANDARD
oSIST prEN 17128:2017

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Neodobrena lahka motorna vozila za prevoz ljudi in blaga ter s tem povezanih naprav - Lahka osebna električna vozila (PLEV) - Varnostne zahteve in preskusne metode

Non-approved light motorized vehicles for the transportation of persons and goods and related facilities - Personal light electric vehicles (PLEV) - Safety requirements and test methods

Nicht-Typ zugelassene leicht motorisierte Fahrzeuge für den Transport von Personen und Gütern und damit verbundene Einrichtungen - Persönliche leichte Elektrofahrzeuge (PLEV) - Sicherheitstechnische Anforderungen und Prüfverfahren

Véhicules légers motorisés non soumis à réception pour le transport de personnes, de marchandises ainsi que les installations d'utilisation - Véhicules électriques personnels légers (PLEV) - Exigences de sécurité et méthodes d'essai

Ta slovenski standard je istoveten z: **prEN 17128**

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43.120	Električna cestna vozila	Electric road vehicles

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English Version

Non-approved light motorized vehicles for the transportation of persons and goods and related facilities - Personal light electric vehicles (PLEV) - Safety requirements and test methods

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 354.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 17128:2017) has been prepared by Technical Committee CEN/TC 354 “Non-type approved light motorized vehicles for the transportation of persons and goods and related facilities”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

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 Annexes ZA and ZB, which are an integral part of this document.

Introduction

This European Standard has been developed in response to an increased demand throughout Europe. Its aim is to provide a standard for the assessment of electrically powered personal light vehicles which are concerned with type approval by both Directive 2014/30/EU (Electromagnetic Compatibility – EMC) and Directive 2006/42/EC (Machinery).

As a result of Article 2.2(i) and 2.2(j) in the agreement between Council and Parliament on a Regulation on the approval and market surveillance of category L vehicles (e.g. two-or three-wheel vehicles and quadricycles, self-balancing vehicles and vehicles not equipped with at least one seating position) are excluded from the Regulation text see: http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-%2f%2fEP%2f%2fTEXT%2bTA%2bP7-TA-2012-0424%2b0%2bDOC%2bXML%2bV0%2f%2fEN&language=EN.

This has created the possibility to initiate a European standardization work for personal light electric vehicles. Such standardization will help the manufacturers to ensure that safe product are put into European market, will give to testing institutes common guidelines to assess the products, will initiate confidence to users and also be useful to convince member states to apply harmonized rules for the use of these vehicles with the aim decrease existing legal uncertainty due to variable interpretations by national authorities.

This European Standard aims to cover all common significant hazards, hazardous situations and events related to the use of PLEV which could be mechanical (e.g. moving parts, hazardous edges, inadequate stability, inadequate structural integrity, inadvertent release of folding mechanism, etc.), thermal (e.g. flammability, hot surfaces, overheating, etc.), but also electrical (electric shock, electric emission and/or immunity, etc.) and those related to product/user information.

This European Standard will not deal with topics like comfort of the user, quality of the product or ergonomic issues unless there is an impact on the safety of the user.

The purpose of this document is to become a type-C standard as described in EN ISO 12100.

To date, there is no type-A, B or C standard covering these products. However, standards exist for non-electric scooters which are mentioned in the clause on normative references.

Furthermore, EN ISO 13482 deals with requirements and guidelines for the inherently safe design, protective measures, and information for use of personal care robots used in personal care applications (in particular mobile servant robot, physical assistant robot and person carrier robot) and it covers some products that are complementary to the scope of this standard, in particularly concerning self-balancing vehicles. It is advised that the reader consult that standard when applying this European standard.

1 Scope

This draft European Standard applies to personal light electric vehicles totally or partially electrically powered from self-contained power sources with or without self-balancing system.

This draft European Standard applies to vehicles having battery voltages up to 100VDC, and/or an integrated battery charger with up to a 240VAC input.

It specifies safety requirements, test methods, marking and information relating to personal light electric vehicles to reduce the risk of injuries to both third parties and the user during intend use, i.e. when used as intended and under condition of misuse that are reasonably foreseeable by the manufacturer.

This draft tandard does not apply to:

— vehicles that are considered as toys;

— vehicles without self-balancing system with a seat;

— vehicles intended for competition;

— electrically powered assisted cycle (EPAC);

— vehicles and/or devices intend for use under medical care;

— electric vehicles having a maximum speed above 25 Km/h;

— vehicles having a rated voltage of more than 100VDC or 240VAC.

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 22248, *Packaging — Complete, filled transport packages — Vertical impact test by dropping (ISO 2248:1985)*

EN 60068-2-27:2009, *Environmental testing — Part 2-27: Tests — Test Ea and guidance: Shock (IEC 60068-2-27:2008)*

EN 60068-2-64, *Environmental testing — Part 2-64: Tests — Test Fh: Vibration, broadband random and guidance (IEC 60068-2-64)*

EN 60068-2-75, *Environmental testing — Part 2-75: Tests — Test Eh: Hammer tests (IEC 60068-2-75)*

HD 60364-5-52:2011, *Low-voltage electrical installations — Part 5-52: Selection and erection of electrical equipment — Wiring systems (HD 60364-5-52:2009, modified)*

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 61000-4-2, *Electromagnetic compatibility (EMC) — Part 4-2: Testing and measurement techniques — Electrostatic discharge immunity test (IEC 61000-4-2)*

EN 61000-6-1, *Electromagnetic compatibility (EMC) — Part 6-1: Generic standards — Immunity standard for residential, commercial and light-industrial environments (IEC 61000-6-1)*

EN 61000-6-3, *Electromagnetic compatibility (EMC) — Part 6-3: Generic standards — Emission standard for residential, commercial and light-industrial environments (IEC 61000-6-3)*

EN 61140, *Protection against electric shock — Common aspects for installation and equipment (IEC 61140)*

EN ISO 12100:2010, *Safety of machinery —General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

IEC 60204–1:2016, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

IEC 60335-2-29, *Household and similar electrical appliances — Safety — Part 2-29: Particular requirements for battery chargers*

IEC 61851 (all parts), *Electric vehicle conductive charging system*

IEC 62133 (all parts), *Secondary cells and batteries containing alkaline or other non-acid electrolytes — Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications*

ISO 6742-1, *Cycles — Lighting and retro-reflective devices — Part 1: Lighting and light signalling devices*

ISO 6742-2, *Cycles — Lighting and retro-reflective devices — Part 2: Retro-reflective devices*

ISO 7176-8, *Wheelchairs — Part 8: Requirements and test methods for static, impact and fatigue strengths*

ISO 9022-3, *Optics and photonics — Environmental test methods — Part 3: Mechanical stress*

ISO 14878, *Cycles — Audible warning devices — Technical specification and test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and the following apply.

3.1
public space
place that is accessible to the public and that can be in the public domain or privately owned

Note 1 to entry: Examples are road, cycle tracks, sidewalks, public squares, parks, stations, airports…

3.2
private space
place that is not accessible to the public

Note 1 to entry: Enclosed or fenced area.

3.3
driving power
electric power enabling the PLEV to move

3.4
personal light electric vehicle
PLEV
wheeled vehicle partially or totally motorized used for the transportation of one person in a public and/or private space

Note 1 to entry For the purpose of this standard the word “vehicles” is used.

3.5
self-balancing PLEV
inherently instable PLEV that dynamically stabilizes in one direction (pitch) itself using a control system

Note 1 to entry: Some self-balanced PLEV can be stabilized without the action of the user.

Note 2 to entry: Self-balancing PLVE may oscillate slightly in order to maintain its balance.

Note 3 to entry: Rider can control its direction and speed by sifting his weight, without using any traditional device such as handle, steering, brake pedal, etc.

Note 4 to entry: Self-balancing PLEV controlled using inverted pendulum model is already in the market.

3.6
intended use
supposed use according to the manufacturer’s specification, instructions and other information including communication

3.7
fully-assembled PLEV
PLEV fitted with all of the equipment required for its intended use

3.8
direct braking system
system actuated directly by the user (for example, a brake handle or a brake pedal)

3.9
indirect braking system
system actuated without voluntary action by the user (for example, braking activated by a gyroscopic system or through the detection of obstacles/anomalies)

3.10
parking device
device to maintain the vehicle in a stationary position

3.11
braking device
device to reduce the speed of the vehicle

3.12
locking mechanism
assembly of components consisting of one or more *locking device(s)* and *one or more operating device(s)*

3.13
locking device
mechanical component that maintains part(s) of the vehicle erected in the position of use (e.g. latch(es), hooks, over centre lock...) which could be deactivated or activated by action(s) on the *operating device*

3.14
operating device
part of the *locking mechanism(s*) designed to be activated by the carer through one or several positive action(s)

3.15
automatic locking device
device that engages with no additional voluntary action by the carer, when the vehicle is erected to its position of use

3.16
folding or unfolding system
mechanism enabling the vehicle to be folded or unfolded in order to change from the configuration of use (unfolded) to the configuration of storage (folded) and vice versa

3.17
no-load current
current for which there is no torque on the driving wheel

3.18
full discharge of the battery
point at which the battery does not deliver power/energy to the motor according to the manufacturer's specifications

3.19
electromagnetic compatibility
ability of a vehicle or one of its electrical/electronic systems to function satisfactorily in its electromagnetic environment without producing intolerable electromagnetic disturbance to anything in that environment

3.20
electromagnetic disturbance
electromagnetic phenomenon that is likely to degrade the performance of a vehicle or one of its electronic/electrical systems

Note 1 to entry: An electromagnetic disturbance may be a noise, an unwanted signal or a change in the propagation medium itself.

3.21
electromagnetic immunity
ability of a vehicle or one of its electrical/electronic systems to function without degradation of its performance in the presence of specified electromagnetic disturbance

3.22
electromagnetic environment
all electromagnetic phenomena existing in a given point

3.23
reference limit
nominal level to which both the component type-approval of the vehicle and conformity of production limit value refer

3.24
reference antenna
balanced half-wave resonant dipole tuned to the measured frequency

3.25
broadband emission
emission which has a bandwidth greater than that of a given measuring apparatus or receiver

3.26
narrowband emission
emission which has a bandwidth is less than that of a given measuring apparatus or receiver

3.27
electrical/electronic subassembly
ESA
electrical and/or electronic device or assembly of such units intended, together with all electrical connections and the associated wiring, to form an integral part of a vehicle and perform several specialized functions

3.28
ESA test
test carried out on one or more given ESAs

3.29
vehicle type in relation to electromagnetic compatibility
vehicles that do not differ essentially in relation to design and manufacture, in particular with regard to the following elements:

— general layout of the electrical and/or electronic components

— overall sizes and shapes as well as the general layout of the engine compartment along with the layout of the associated high-voltage wiring (if any)

— raw material from which the vehicle bodywork, or bodyshell (if applicable) is constructed (for example, steel, aluminium or fibreglass bodywork or bodyshell)

3.30
ESA type in relation to electromagnetic compatibility
ESAs that do not differ essentially in relation to design and manufacture, in particular with regard to the following elements

— the function performed by the ESA

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

— the direct control of the vehicle by the driver acting on the steering, the brakes and the accelerator control

3.31
ESA
electrical and/or electronic components or set of components intended to be part of an earth-moving machine, together with any associated electrical connections and wiring, which performs one or more specialized functions

3.32
rated voltage
voltage declared by the manufacturer of the PLEV

3.33
continuous rated power
continuous (or constant) output power specified by the manufacturer at which the motor reaches its thermal equilibrium under given ambient conditions

Note 1 to entry: Thermal equilibrium: the temperature variation of the motor's parts does not exceed 2K per hour.

3.34
brake lever cut-off switch
device that cuts off the electric assistance while using the brake lever

3.35
integrated charger
charger forming an integral part of the PLEV and the dismantling of which requires the use of tools

3.36
suspension fork
front fork incorporating controlled, axial flexibility to reduce the transmission of road-shocks to the user

3.37
suspension frame
frame incorporating controlled, vertical flexibility to reduce the transmission of road-shocks to the user

[SOURCE: EN ISO 4210-1:2014]

3.38
braking distance
distance travelled by a PLEV between the commencement of braking and the point at which it comes to rest

[SOURCE: EN ISO 4210-1:2014]

3.39
commencement of braking
point on the test track or test machine at which the brake actuating mechanism, operated directly by the user's hand or foot or by a test device, starts to move from its rest position

[SOURCE: EN ISO 4210-1:2014]