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**E-prevozniki - 2-2. del: Varnostne zahteve in preskusne metode za avtonomne e-prevoznike tovora**

E-transporters - Part 2-2: Safety requirements and test methods for autonomous cargo e-transporters

E-transporteurs - Partie 2-2: Exigences de sécurité et méthodes d'essai relatives aux e-transporteurs de marchandises autonomes

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TITLE:

**E-Transporters – Part 2-2: Safety requirements and test methods for autonomous cargo e-Transporters**

PROPOSED STABILITY DATE: 2029

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**E-TRANSPORTERS –****Part 2-2: Safety requirements and test methods  
for autonomous cargo e-transporters****FOREWORD**

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International Standard IEC 63281-2-2 has been prepared by IEC technical committee 125.

The text of this International Standard is based on the following documents:

DIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,

- 284 • withdrawn,  
285 • replaced by a revised edition, or  
286 • amended.

287

288 The National Committees are requested to note that for this document the stability date  
289 is 20XX.

290 THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED  
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292

## INTRODUCTION

293 This International Standard has been developed to cope with the rapidly evolving autonomous  
294 driving 'cargo' e-transporters; ACeTs which mainly using in public road environments including  
295 public access spaces and those are autonomously using robot technologies, but partly human  
296 piloted at situation of over the operational design domain to be set by the manufacturer of  
297 ACeTs. The global market sizes and applications are expected to grow significantly due to the  
298 appearance of autonomous driving cargo e-transporters. Cargo e-Transporters are mainly  
299 operated autonomously at speeds below 6 *km/h* equivalent to human walking speed, or up to  
300 30 *km/h*. In addition, some products are recently operated at speeds exceeding 30 *km/h*, so it  
301 is necessary to take additional factors into consideration as well. This means that different  
302 hazards need to be considered than with conventional e-transporters that are used under the  
303 precondition of human piloted devices. So, in order to protect safety for persons and public  
304 facilities, besides basic safety requirements, comprehensive safety requirements and test  
305 methods such as autonomous driving devices safety for people, and road structures and  
306 specific signs for cargo e-transporters shall also be considered. Based on the current situation,  
307 this international standard provides comprehensive safety requirements and corresponding test  
308 methods for autonomous driving cargo e-transporters, which is convenient for manufacturers  
309 and test departments to use. This international standard is specific for cargo e-transporters with  
310 autonomous driving function.

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**E-TRANSPORTERS –**  
**Part 2-2: Safety requirements and test methods**  
**for autonomous cargo e-transporters**

## **1 Scope**

This international standard specifies that it applies to electrically powered autonomous driving cargo e-transporters; Autonomous cargo e-Transporters (ACeTs) that do not intended to drive by on boarded driver, that are primarily electrically/electronically controlled for speed and/or steering autonomously without human intervention. Even if in case of over the operational preconditions, an authorized users can operate remotely for the ACeTs manually via an external systems or supplementary telecommunication control devices. It operates in an Operational Design Domain(ODDa)-designated public road environments specified by a manufacturer and include a public access space where not public road environment is such as big shopping mall, airport facilities, big building corridor.

ACeT includes use cases where a remote monitoring operator is direct operating remotely by an authorized user using wireless system and/or supplemental operating devices from the outside.

ACeTs are design to purpose for direct delivery of cargo to personally and it may be for private or commercial use. This document is intended to cargo delivery devices and services provided user themselves and by service providers and not covered to purpose for ACeTs sharing service applications.

ACeTs might need to adhere to additional standards and regulations, where appropriate, e.g., hazardous goods or materials that require special controls may be transported, or the environment in which they operate may be subject to special regulations.

NOTE: Hazardous good or materials requiring special controls are explosive materials, radioactive controlled materials, biohazardous materials, pressure vessels and high heat source objects, opioid such as morphine and toxic substances.

ACeTs do not include non-autonomous driving e-transporters that are driven by an on-board driver or that transport only passengers without a driver. In addition, ACeTs do not have the function to loading and unloading cargo by itself, but the user has to loading and unloading cargo on the halted ACeT.

Electrically powered control product such as e-trailers equipped with propulsion drive and steering functions intended for cargo transport include hybrid assist or propelled power input driving is not covered by this document. Also electrically powered bicycles, mopeds, motorcycles and driver cars are not covered by this document because they are handled by other TCs:

- ISO TC 22
- IEC TC 69
- ISO TC 110
- ISO TC 149
- ISO TC 299

## **2 Normative references**

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies.

- 358 For undated references, the latest edition of the referenced document (including any  
359 amendments) applies.
- 360 IEC 60068-2-1:2007, *Environmental testing - Part 2-1: Tests - Test A: Cold*
- 361 IEC 60204-1:2016, *Safety of machinery - Electrical equipment of machines - Part 1: General*  
362 *requirements*
- 363 IEC 60335-1:2020, *Household and similar electrical appliances - Safety - Part 1: General*  
364 *requirements*
- 365 IEC 60335-2-29:2016, *Household and similar electrical appliances - Safety - Part 2-29:*  
366 *Particular requirements for battery chargers*
- 367 IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
- 368 IEC 60825-1:2014, *Safety of laser products - Part 1: Equipment classification and requirements*
- 369 IEC 60950-1:2005, *Information technology equipment - Safety - Part 1: General requirements*
- 370 IEC 60695-11-10:2013, *Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and*  
371 *vertical flame test method*
- 372 IEC 61000-6-1:2005, *Electromagnetic compatibility (EMC) - Part 6-1: Generic standards -*  
373 *Immunity standard for residential, commercial and light-industrial environments*
- 374 IEC 61000-6-2:2016, *Electromagnetic compatibility (EMC) - Part 6-2: Generic standards -*  
375 *Immunity standard for industrial environments*
- 376 IEC 61000-6-3:2020, *Electromagnetic compatibility (EMC) - Part 6-3: Generic standards -*  
377 *Emission standard for equipment in residential environments*
- 378 IEC 61000-6-4:2018, *Electromagnetic compatibility (EMC) - Part 6-4: Generic standards -*  
379 *Emission standard for industrial environments*
- 380 IEC 63281-1:2023, *E-Transporters - Part 1: Terminology and classification*
- 381 IEC 61032:1997, *Protection of persons and equipment by enclosures - Probes for verification*
- 382 IEC 61140:2016, *Protection against electric shock - Common aspects for installation and*  
383 *equipment*
- 384 IEC 61508-1:2010, *Functional safety of electrical/electronic/programmable electronic safety-*  
385 *related systems - Part 1: General requirements*
- 386 IEC 61558-1:2017, *Safety of transformers, reactors, power supply units and combinations*  
387 *thereof - Part 1: General requirements and tests*
- 388 IEC 61558-2-16:2021, *Safety of transformers, reactors, power supply units and combinations*  
389 *thereof - Part 2-16: Particular requirements and tests for switch mode power supply units and*  
390 *transformers for switch mode power supply units for general applications*
- 391 IEC 62061:2021, *Safety of machinery - Functional safety of safety-related control systems*
- 392 IEC 62368-1:2023, *Audio/video, information and communication technology equipment - Part 1:*  
393 *Safety requirements*
- 394 IEC 62471:2006, *Photobiological safety of lamps and lamp system*
- 395 ISO 7010 :2019, *Graphical symbols — Safety colours and safety signs — Registered safety*  
396 *signs*
- 397 ISO 7176-21:2009, *Wheelchairs — Part 21: Requirements and test methods for electromagnetic*  
398 *compatibility of electrically powered wheelchairs and scooters, and battery chargers*

- 399 ISO 8124-1:2022, *Safety of toys Part 1: Safety aspects related to mechanical and physical*  
400 *properties*
- 401 ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and*  
402 *risk reduction*
- 403 ISO 13482:2014, *Robots and robotic devices — Safety requirements for personal care robots*
- 404 ISO 13849-1:2023, *Safety of machinery -- Safety-related parts of control systems -- Part 1:*  
405 *General principles for design*

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