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E-Transporters - Part 3-2: Performance test methods for mobility of cargo e-Transporters

iTeh STANDARD PREVIEW
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TITLE:

E-Transporters – Part 3-2: Performance test methods for mobility of cargo e-transporters

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NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

84

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E-TRANSPORTERS –

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Part 3-2: Performance test methods for mobility of cargo e-transporters

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FOREWORD

- 90 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national
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- 118 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights.
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120 International Standard IEC XXXXX has been prepared by IEC technical committee 125: e-Transporters.

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

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

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

124 This standard is drafted in accordance with the ISO/IEC Directives, Part 2.

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

- 128 • reconfirmed,
129 • withdrawn,
130 • replaced by a revised edition, or
131 • amended.

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

133 THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE
134 PUBLICATION STAGE.

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135 INTRODUCTION

136 At present, the global market scale of cargo e-transporter is about US \$30 billion, with a wide range
137 application scenario, which can meet the needs of short-distance distribution, low-carbon and
138 environmental protection.

139 However, there is no international standard for this kind of products. The mobility of cargo e-transporter
140 is the key index of its performance, including maximum speed, rated speed, maximum climbing angle,
141 maximum climbing speed, turning characteristics, drop resistance, narrowest passing width, obstacle
142 avoidance, obstacle avoidance performance.

143 This project specifies the performance criteria and related test methods for cargo e-transporters.

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E-TRANSPORTERS – Part 3-2: Performance test methods for mobility of cargo e-transporters

1 Scope

148 This international document is applicable to electrically powered transport devices for use on
149 public road or in public spaces and which are primarily designed for transporting cargos ('cargo
150 e-transporters'). Typical operating scenarios of cargo e-transporters include hotels, restaurants,
151 office buildings, hospitals, industrial/recreational parks, public roads, etc.

152 This international document specifies performance criteria and evaluation methods for the
153 mobility of cargo e-transporters.

154 This international document does not include safety and performance requirements.

2 Normative references

156 The following documents are referred to in the text in such a way that some or all of their content
157 constitutes requirements of this document. For dated references, only the edition cited applies.
158 For undated references, the latest edition of the referenced document (including any
159 amendments) applies.

160 IEC 63281-1 ED1 E-Transporters - Part 1: Terminology and classification

3 Terms, definitions and abbreviations

162 For the purposes of this document, the terms and definitions given in IEC 63281-0 and the
163 following apply.

164 ISO and IEC maintain terminological databases for use in standardization at the following
165 addresses:

- 166 • IEC Electropedia: available at <http://www.electropedia.org/>
- 167 • ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

cargo e-transporters

CeT

171 e-Transporter that is primarily designed for transporting cargo/goods

172 [SOURCE: IEC 63281-1:202X, 3.4]

3.2

rated speed

175 the speed that the CeT can achieve in normal operating conditions with rated load without
176 degradation of any performance specification.

3.3

rated load

179 maximum allowed weight of cargo(s) transported by the CeT, as defined by the manufacturer

180 3.4**181 localization**

182 identify or distinguish the pose of the CeT on the environmental map.

183 3.5**184 trial**

185 a single instance of a performance measurement carried out under identical conditions that can
186 be repeated multiple times.

187 4 Test conditions**188 4.1 Overview**

189 Before testing, the CeT shall be set up and properly warmed up.

190 CeT shall be in normal working condition to ensure intended operation during the whole test
191 process.

192 Unless otherwise specified, CeT shall be tested at rated speed under rated load.

193 4.2 Environmental conditions

194 Unless otherwise specified by the manufacturer, all tests shall be performed under the following
195 environmental conditions:

196 —Humidity: (20~60) %;

197 —Temperature: (10~30)°C;

198 —Atmospheric pressure: (86 ~106) kPa;

199 —Illumination: >200 lux;

200 —Wind speed: The average wind speed measured 0,7 m above the ground shall be less than
201 3 m/s, and the maximum speed of gusts shall be less than 5 m/s.

202 NOTE For the repeatability and reproducibility of test avoiding changing the environmental conditions during the test
203 and record them in the test results.

204 4.3 Testing surface condition

205 In principle, select the severest test ground or slope surface according to the expected use
206 scenario so that it can reflect the most unfavorable condition (such as wooden, ceramic tile
207 floor, concrete or asphalt pavement, etc.), and usually the friction coefficient should meet
208 0.75~1.0.

209 NOTE The coefficient of friction for test travel surface is between 0,75 and 1,0 according with ISO 7176-13, unless
210 specified otherwise by the manufacturer.

211 4.4 Test equipment

212 Relative to the specified value or actual value, the accuracy of all control values or measured
213 values should be within the following tolerance range:

214 a) Voltage: $\pm 0.2\%$;

215 b) Current: $\pm 1\%$;

216 c) Temperature: $\pm 2^\circ\text{C}$;

- 217 d) Position resolution ≤ 1 cm;
- 218 e) Position accuracy ≤ 1 cm;
- 219 f) Angle resolution $\leq 3^\circ$;
- 220 g) Angle accuracy $\leq 5^\circ$;
- 221 h) Data sampling frequency ≥ 30 Hz;
- 222 i) Time resolution ≤ 0.01 s;
- 223 j) Time accuracy ≤ 0.02 s.

224 5 Preparation of CeT for testing

225 The tested CeT shall:

- 226 a) Adjust to the typical configuration specified by the manufacturer;
- 227 b) Function inspection shall be carried out before testing to ensure normal operation;
- 228 c) Before testing, the battery shall complete at least one charge-discharge cycle. The
- 229 operation of discharge limit defined by the manufacture shall be carried out under normal
- 230 operation according to the manufacturer's instructions;
- 231 d) Before the test, it shall be fully charged as specified by the manufacturer;
- 232 e) The rated load shall be reasonably and evenly distributed when tested under rated load
- 233 conditions.

234 6 Maximum speed

235 6.1 Test purposes

236 This test is to evaluate the maximum allowable driving speed of the CeT under the rated load.

237 6.2 Test facility

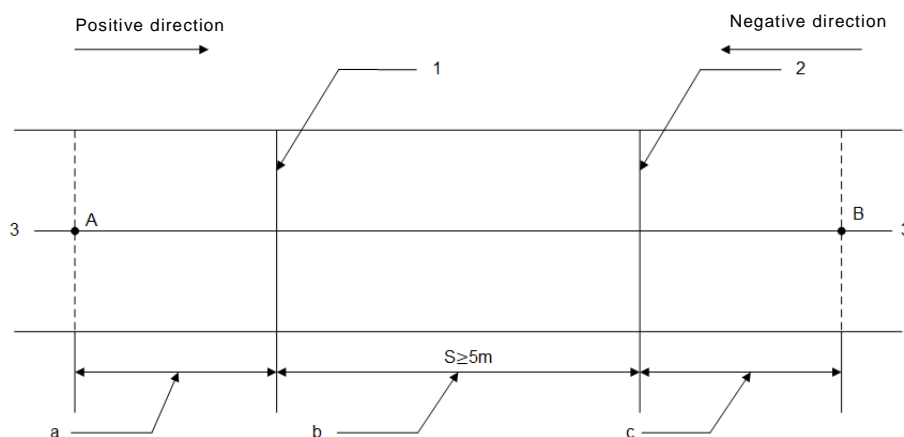
238 The test shall be conducted on a long straight flat pavement.

239 The demonstration of maximum speed test is shown in Figure 1. The length of the measurement

240 section is not less than 5m, and the width of the measurement section should ensure that the

241 CeT can pass normally. Sufficient space should be reserved at each end of the measurement

242 section for acceleration and deceleration of the CeT.



243

Key:
 A: initial point (+)
 B: initial point (-)
 1: start line (+)/stop line (-)