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| **Prüfbericht-Nr.:** *Test report no.*: | **CN24FR7R 001** | **Auftrags-Nr.:** *Order no.*: | 326044059 | Seite 1 von 30 *Page 1 of 30* |
| **Kunden-Referenz-Nr.:** *Client reference no.*: | 5138 | **Auftragsdatum:** *Order date:* | 2024-08-05 | |
| **Auftraggeber:** *Client*: | Ninebot (Changzhou) Tech Co., Ltd.<br>16F-17F, Block A, Building 3, No. 18, Changwu Mid Rd, Wujin Dist., Changzhou, Jiangsu, P.R.China | | | |
| **Prüfgegenstand:** *Test item*: | Segway SuperScooter GT3 | | | |
| **Bezeichnung / Typ-Nr.:** *Identification / Type no.*: | 060202D, 060202E | | | |
| **Auftrags-Inhalt:** *Order content*: | Test report | | | |
| **Prüfgrundlage:** *Test specification*: | EN 17128:2020<br>Light motorized vehicles for the transportation of persons and goods and related facilities and not subject to type- approval for on-road use - Personal light electric vehicles (PLEV) - Safety requirements and test methods | | | |

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|---|---|
| **Wareneingangsdatum:** *Date of sample receipt*: | 2024-08-02 |
| **Prüfmuster-Nr.:** *Test sample no:* | A003786896 001 |
| **Prüfzeitraum:** *Testing period*: | 2024-08-06 - 2024-09-20 |
| **Ort der Prüfung:** *Place of testing*: | Kunshan |
| **Prüflaboratorium:** *Testing laboratory:* | TÜV Rheinland (Shanghai) Co., Ltd. Kunshan Branch |
| **Prüfergebnis*:** *Test result**: | Pass |



**geprüft von:**
tested by:

**Datum:**
*Date:* 2024-10-08

2024.10.08 10:27:29 +08'00'

**genehmigt von:**
*authorized by*:

**Ausstellungsdatum:**
*Issue date:* 2024-10-08

Nan Jiang

**Stellung** / Position: John he / PE

**Stellung** / Position: Nan Jiang / Reviewer

**Sonstiges** / *Other*:
The respective national legal requirements shall be fulfilled additionally.
This test report is only valid together with: attachment 1-EMC test report_CN24BTDN.

**Zustand des Prüfgegenstandes bei Anlieferung:** *Condition of the test item at delivery*: Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

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| * Legende: | P(ass) = entspricht o.g. Prüfgrundlage(n) | F(ail) = entspricht nicht o.g. Prüfgrundlage(n) | N/A = nicht anwendbar | N/T = nicht getestet |
| ** Legend:* | *P(ass) = passed a.m. test specification(s)* | *F(ail) = failed a.m. test specification(s)* | *N/A = not applicable* | *N/T = not tested* |

**Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.**
*This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.*
V05

## Anmerkungen
*Remarks*

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| **1** | Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben.<br>Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.<br><br>*The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.* |
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| **3** | Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben.<br>Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.<br><br>*Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report.*<br>*Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.* |
| **4** | Die Entscheidungsregel für Konformitätserklärungen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird.<br><br>*The decision rule for statements of conformity in this test report is based on the “Zero Guard Band Rule” and “Simple Acceptance” in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report.* |

## Produktbeschreibung
*Product description*

| | | |
|---|---|---|
| 1 | **Produktdetails**<br>*Product details* | Class 2 vehicle.<br>Two aligned wheels in a single track. |
| 2 | **Maße / Gewicht**<br>*Dimensions / Weight* | Weight: 39.0kg. |
| 3 | **Bedienelemente**<br>*Operating elements* | Throttle on handlebar. |
| 4 | **Ausstattung / Zubehör**<br>*Equipment / Accessories* | Battery charger. |
| 5 | **Verwendete Materialien**<br>*Used materials* | Not provided. |
| 6 | **Sonstiges**<br>*Other* | Test sample(s), as well sample information, description, product details and intended usage was provided by customer. |
| 7 | **Prüfmusterbereitstellung**:<br>*Test sample obtaining* | ☒ Sending by customer ☐ Sampling by TÜV Rheinland Group<br>☐ others: |

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| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 1 | Scope | | |
| 2 | Normative references | | |
| 3 | Terms and definitions | | |
| 4 | Classes of vehicles<br><br>Various personal light electric vehicles (vehicles) exist covering as many different uses offered to different users based on their age, mass, size and driving experience.<br><br>The main classes of vehicle are defined below combined with the main design choices that characterize them.<br><br>**Table 1 — Classes of vehicle (Design elements)**<br>Classes / With self-balanced system / Maximum design speed (km/h) / Seating position<br>Class 1 / No / Up to 6 km/h / No<br>Class 2 / No / Up to 25 km/h / No<br>Class 3 / Yes / Up to 6 km/h / with or without<br>Class 4 / Yes / Up to 25 km/h / with or without<br><br>NOTE Examples of vehicles are given in Annex E. | No self-balanced system.<br>Maximum design speed:<br>060202D: 20km/h,<br>060202E: 25km/h.<br>No seating position.<br><br>Class 2 vehicle. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 5 | General safety requirements and protective measures<br><br>Vehicle shall comply with the specific requirements of all clauses of this standard.<br><br>NOTE Annex A shows the list of hazards considered this document.<br><br>For vehicles which are not sold fully assembled, there shall be a maximum of three separate parts requiring assembly (e.g. steering device, wheels and batteries), the necessary tools and detailed assembly instructions shall be provided which specify by a text and diagrams the operations to be carried out as well as the clamping force. | See following pages.<br><br>Not sold in fully assembled state. The handlebar needs installation with six screws with a 4mm hex key wrench supplied in the package. The tightening torque and instructions of assembly are given in the instructions. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 6 | Electrical components | | |
| 6.1 | General mechanical strength<br><br>The ESA including the battery shall have adequate mechanical strength and be constructed to withstand such rough handling that may be expected in intended use and foreseeable misuse.<br>Compliance is checked by:<br>— Applying impacts to the enclosures of ESA mounted on the vehicles by means of the spring hammer as specified in EN 60068-2-75:2014. The ESA is rigidly supported and three impacts are applied to every point of the enclosure that is likely to be weak with an impact energy of (0.7 ± 0.05) J.<br>— Detachable ESA are submitted to free fall on a rigid surface as specified in EN 22248:1992 at a height of 0.90 m in three different positions. The positions shall be one surface, one edge and one corner of the enclosure that are likely to be the most onerous position.<br>After the test the ESA shall show no damage that could lead to emission of dangerous substances (gas or liquid) ignition, fire or overheating. A temperature rise test shall be performed, in accordance with 6.3.2.2, During the test, the temperature rises are monitored continuously and shall not exceed the values shown in EN 60335-1:2012, Table 3 and after the test the ESA shall show no damage or malfunction that could impair the safe use of the vehicles.<br>Batteries and other electric conductive power supply systems shall be assessed and tested in accordance with EN 62133-1:2017 and EN 62133-2:2017 or other relevant standards.<br>NOTE Transportation regulations can give additional requirements for general design of the battery and battery pack. | <br><br><br><br><br><br>The controller and battery are mounted inside,<br>The impacts are performed on the display, motor, throttle and lights.<br><br>Non-detachable ESA.<br><br><br><br><br>No damage shown after the tests. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
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| 6.2 | Electrical power on/off control<br><br>An electrical power on/off control shall be fitted to on and power-off the driving power. It shall be apparent, easy to reach and unmistakable. This electrical power on/off control shall be activated voluntary by the user to enable the driving power.<br>The electrical power on/off system shall be designed such that, in the event of a malfunction, the vehicle shall still be able to stop or be able to be stopped with a smooth deceleration (as defined in 15.4.2.5 Electric failure braking compensation).<br>The electrical power on/off system shall be located in a position easily reachable by the user with appropriate symbol given in Annex F.<br>On self-balancing vehicles or vehicles with electric brake, the power-off control shall not disconnect the power while driving: the power -off control shall only work without user on the vehicle.<br>NOTE The electrical power on/off system is a mechanical solution (key-lock, button, etc.) or an electrical solution (user detection, turn off timer, etc.). | The power on/off control button is on the handlebar. Power on/off control is voluntary.<br><br>Power on/off symbol is used. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 6.3 | Electrical cables and connections | | |
| 6.3.1 | General<br>All electrical connectors shall be selected to prevent the corrosion. | | |
| 6.3.2 | Cable and plugs | | |
| 6.3.2.1 | Requirements<br><br>After the test according to 6.3.2.2, there shall be no deterioration of the insulation on either assembly.<br>The cable cross sections shall be selected in accordance with EN 61558-1:2005, EN 61558-2-16:2009, EN 60335-1:2012, EN 60335-2-29:2004, Table 11 or a temperature rise test shall be performed, in accordance with 6.3.2.2 the temperature of the cables and plugs in use shall be at least 5 °C lower than the maximum specified by the manufacturer.<br>NOTE 1 Cable used only for communication line is excluded.<br>NOTE 2 the rated current (accordance with EN 61558-1:2005, EN 61558-2-16:2009, EN 60335-1:2012, EN 60335-2-29:2004 Table 11) measured when the vehicle is supplied at rated voltage and operated under normal operation. | The temperature rise test is Performed.<br>No deterioration of the insulation occurred on either assembly after the test.<br><br>Tested with positive result. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 6.3.2.2 | Test method | | |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
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| 6.3.3 | Wiring<br><br>Wiring shall be checked according to the following sequence at an ambient room temperature (20 ± 5) °C.<br>a) Wireway shall be smooth and free from sharp edges.<br>b) Wires shall be protected so that they do not come into contact with burrs, cooling fins or similar sharp edges that may cause damage to their insulation.<br>c) Holes in metal through which insulated wires pass shall have smooth well-rounded surfaces or be provided with bushings.<br>d) Wires shall be effectively prevented from coming into contact with moving parts.<br>Compliance with a), b), c) and d) shall be checked by physical inspection.<br>e) Separate parts of the vehicles that can move in normal use or during user maintenance relative to each other, shall not cause undue stress to electrical connections and internal conductors, including those providing earthing continuity.<br>f) If an open coil spring is used to protect wire, it shall be correctly installed and insulated. Flexible metallic tubes shall not cause damage to the insulation of the conductors contained within them.<br>Compliance with e) f) shall be checked by inspection and by the following test method:<br>1) If flexing occurs in normal use, the product is placed in its normal operational position and is supplied at rated voltage under normal operation.<br>2) The movable part is moved from an extreme position to the opposite extreme position, so that the conductor undergoes maximum flexion.<br>3) For conductors that are flexed in normal use, flex movable part for 10 000 cycles at a test frequency of 0.5 Hz.<br>4) For conductors that are flexed during user maintenance, flex the movable part for 100 cycles at the same frequency. | <br><br><br>Checked ok,<br>Checked ok,<br><br>Checked ok,<br><br>Checked ok,<br><br><br>No undue stress occurred,<br><br><br>Open coil spring is not used,<br><br><br><br><br><br><br>Tested with positive result,<br><br>Tested with positive result. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 6.3.4 | Wiring harness<br><br>When a wiring harness is installed, it shall be positioned to avoid any damage related to contact with moving parts or sharp edges. All connections shall withstand a tensile force of 10 N in any direction. | Tested with positive result. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
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| 6.3.5 | Power cables and conduits<br><br>Conduit entries, cable entries and knockouts shall be constructed or located so that the introduction of the conduit or cable does not reduce the protection measures adopted by the manufacturer.<br>Compliance is checked by inspection.<br>NOTE Guidance for power cables size selection is given in HD 60364-5-52:2011, 5.22.1.2, 523.1523.3 and Table A 52–10.<br>The insulation of internal wiring shall withstand the electrical stress likely to occur in intended use. The wiring and its connections shall withstand an electrical strength test with the following characteristics.<br>The test voltage expressed in volts shall be equal to (500+2×Ur) where Ur is the rated voltage. The test voltage is applied for 2 min between live parts and other metal parts only. | Provided with bushings.<br><br>Tested with positive result. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 6.3.6 | External and internal electrical connections<br><br>Electrical connection shall comply with HD 60364-5-52:2011, 526.1 and tested in accordance with HD 60364-5-52:2011, 526.2. | Tested with positive result. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 6.4 | Moisture resistance<br><br>The enclosure of electrical components of a fully assembled vehicles shall comply with and be tested in accordance with IPX4 tested in accordance with EN 60335-1:2012, 15.1. | The IPX4 test was conducted, The vehicle was checked with all electric functions maintained. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 6.5 | Resistance to vibration for electric functions | | |
| 6.5.1 | Requirements<br><br>This requirements applies to all PLEV classes 1 to 4.<br>The vehicle shall withstand a vibration test representing the foreseeable use on roads and public areas.<br>When tested according to the method described in 6.5.2, all electric functions shall be fully maintained. Verification shall be by function test after the vibration test. | Wheel:<br>Pneumatic tire.<br>80/55-7.5.<br>Inflation pressure: 50PSI.<br><br>Suspension system is used.<br><br>Condition A is adopted. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 6.5.2 | Test method | | |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
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| 7 | Driving power management | | |
| 7.1 | Driving power activation | | |
| 7.1.1 | Requirements<br><br>Driving power shall only be provided following at least two independent and dissimilar intentional actions by the user. In addition:<br>a) For vehicles of class 1 or 2 with a partially electrically powered vehicle, the driving power shall not be delivered while moving forward at a speed of less than 3 km/h.<br>Verification shall be by the test of 7.1.2.<br>b) For vehicles of class 1 or 2, it shall be possible for the user to power-off the driving power at any time during use in accordance with the driving power procedure described by the manufacturer in the instruction manual (see 7.3 and 19.4). For vehicles of class 3 or 4, the Driving power management shall not power-off motor power at any specified speed.<br>Verification shall be by inspection and function test.<br>c) For vehicles of class 1 and 2, the cut-off of driving power shall take priority over the maintenance of power assistance (for example, if the user holds his accelerator grip while he is actuating the brake, the power assistance shall be cut off).<br>Verification shall be by the test of 7.1.2.<br>Compliance with the following requirements shall be checked by the test methods described in 7.1.2;<br>d) Vehicles of class 3 or 4 shall act as follows:<br>1) Horizontal level foot rests (maintain constant speed),<br>2) Tilt back of foot rest shall result in a progressive controlled braking,<br>3) Foot rest tilt to the front shall result in a progressive controlled acceleration,<br>4) The vehicle shall be self-balancing in all operating states.<br>Verification shall be by inspection and function test.<br>e) When the vehicle approaches the maximum speed of its class, the driving power shall be reduced in such a way that the maximum speed limit will not be exceeded. The driving power shall be managed smoothly and progressively.<br>f) In the case where a class 1 or 2 vehicle is equipped with a mechanical brake system, the driving power shall be cut off at the commencement of braking (according to 15.4.2).<br>g) In the case where the vehicle is equipped with an electric brake, the driving power management shall be such that braking starts immediately.<br>h) For self-balancing vehicles, the driving power shall ensure that the vehicle speed cannot exceed the maximum speed of the vehicle's class. | Driving power provided by three actions: Power on→Push the vehicle to 3 km/h→Operate the throttle.<br>Power-off the driving power can be achieved at any time by releasing the throttle or activating the brake lever.<br>When activating both throttle and brake lever, the power assistance is cut off.<br>Not such vehicle.<br>Maximum speed is not exceeded.<br>The driving power is cut off when activating the brake lever.<br>No electric brake.<br>Not such vehicle. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
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| 7.1.1 | i) In case of overspeed during driving, the following shall apply to vehicles of class 3 or 4:<br>1) There shall be audible and if possible (in the particular vehicle) visual and other (physical) warnings to alert the user of a system issue.<br>2) In all cases, the vehicle shall be slowed automatically and brought to a safe speed (lower than the maximum speed). | Not such vehicle. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| | j) In case of overheating of the driving power management during driving, the following shall apply for vehicles of class 3 or 4:<br>1) There shall be audible and if possible (in the particular vehicle) visual and other (physical) warnings to alert the user of a system issue.<br>2) In all cases, the vehicle shall be slowed automatically and brought to a safe stop.<br>3) It shall not be possible to drive the self-balancing vehicle until the vehicle's control system detects that the initiating problem has been corrected. | Not such vehicle. | |
| | k) In case of insufficient battery power, the following shall apply for vehicles of class 3 or 4:<br>1) There shall be audible and if possible (in the particular vehicle) visual and other (physical) warnings to alert the user of a system issue.<br>2) In all cases, the vehicle shall be slowed automatically and brought to a safe stop.<br>3) It shall not be possible to drive the self-balancing vehicle until the vehicle's control system detects that the initiating problem has been corrected. | Not such vehicle. | |
| | l) Acceleration Limitation<br>1) The acceleration of the vehicle shall be smooth without shocks and limited to 2 $m/s^2$ in order to avoid unstable riding conditions.<br>NOTE see D.3 and D.12. | The acceleration<2 $m/s^2$. | |
| 7.1.2 | Test method | | |
| 7.2 | Power failure of control system<br><br>For class 1 and class 2 vehicles, in the event of an electrical power failure the vehicle shall be able to brake normally or, shall come to a standstill with a deceleration between (1,5 – 2) $m/s^2$. | Mechanical brakes are fitted. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| | For class 3 and class 4 vehicles, a fault condition in the power control system shall be indicated by a warning signal (visual, audible, vibrating…) on the handlebar, the vehicle itself or to the remote control (see Clause 17). | Not such vehicle. | |
| | In a driving condition the loss of connection to the warning device, on the remote control, shall result in a speed reduction to 6 km/h or less for a Class 4 vehicle; the speed reduction shall happen in a safe manner without creating additional hazards with corresponding audio notification and tilt back of decks on self-balancing vehicles. | Not such vehicle. | |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
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| 7.3 | Unintended or unauthorized use of vehicle<br><br>Means shall be provided to prevent an unintended or unauthorized use of the vehicle, e.g. keys, locks, electronic control device.<br>NOTE see D.16. | The vehicle can be locked through the APP via the Bluetooth.<br>When the vehicle is locked, no power output can be provided. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 8 | Speed limitation | | |
| 8.1 | Pedestrian mode | | |
| 8.1.1 | General<br><br>Vehicles classes 2 and 4 shall be equipped with a pedestrian mode for limiting the speed to a maximum of 6 km/h.<br>A distinctive and visible warning light shall be provided to indicate both to the user and others in the vicinity of the vehicle when pedestrian mode is in operation. It shall be active only when the pedestrian mode is activated.<br>Verification shall be in accordance with 8.1.2. | Maximum speed<6 km/h.<br><br>Under pedestrian mode, the front and rear lights are used for warning light,<br>A walk symbol is shown on the display. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 8.1.2 | Test method | | |
| 8.2 | Maximum speed with power assistance | | |
| 8.2.1 | Requirements<br><br>The maximum speed for which the electric motor gives assistance shall be in accordance with the maximum permitted speed for the class. It may differ by (±10 %) of the maximum speed marked on the vehicle given in the instruction manual/sheet and determined according to the test method described in 8.2.2.The maximum speed in this mode shall not exceed 25 km/h. | Tested with positive result. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 8.2.2 | Test method | | |
| 8.3 | Reverse mode | | |
| 8.3.1 | Requirement<br><br>Vehicles with a reverse driving function shall be equipped with a device limiting its speed to 6 km/h when travelling in reverse. If travelling in reverse, an active sound signal shall be audible. | No such mode. | P ☐<br>F ☐<br>N/A ☒<br>N/T ☐ |
| 8.3.2 | Test method | | |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
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| 9 | Electromagnetic compatibility | | |
| 9.1 | Emission<br><br>Vehicle class 1 and 2 shall conform to Annex B.<br>Vehicle class 3 and 4 shall conform to EN 61000-6-3:2007 apply with the following modification.<br>The vehicle operated as described in B.2.2.3.<br>NOTE see D.11. | Details see EMC test report. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 9.2 | Immunity<br><br>Vehicle class 1 and 2 shall conform to Annex B.<br>Vehicle class 3 and 4 shall conform to EN IEC 61000-6-1:2019 apply with the following modification.<br>The vehicle operated as described in B.4.4.<br>Specific performance criterion for PLEV:<br>— Class A: all functions of vehicle perform as designed during and after exposure to a disturbance.<br>— Class B: all functions of vehicle perform as designed during exposure; however, one or more of them may go beyond the specified tolerance. All functions return automatically to within normal limits after exposure is removed. Memory functions shall remain class A.<br>— Class C: one or more functions of vehicle do not perform as designed during exposure but return automatically to normal operation after exposure is removed.<br>NOTE see D.11. | Details see EMC test report. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 9.3 | Battery charger<br><br>As a PLEV is not intended to be used while charging on the electric network, for integrated charger the whole PLEV plus integrated charger shall be tested for EMC according to the applicable standards.<br>The following European Standards are applicable<br>EN 55014-1, EN 55014-2, EN 61000-3-2, EN 61000-3-3. | Test report submitted by customer.<br><br>Test report no.:<br>EDG2310300252E01001R.<br><br>It is client's responsibility to ensure that compliance of the submitted sample with the requirements. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 10 | Charging of batteries | | |
| 10.1 | General<br><br>If a vehicle has an integrated and built-in battery charging system (i.e; integrated charger), the user shall be protected against hazards due to accidental contact with the charging connections on the vehicle and its charging systems. For enclosures of charging system, see 6.4 Moisture resistance.<br>Battery charging systems shall be in accordance with EN IEC 62485 series and EN 60204-1 or EN 60335-2-29:2004 as appropriate.<br>The charging system shall prevent any hazards arising because of overloading, overcharge and overcurrent and over discharge determined according to the test method described in 10.2. | External battery charger used. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 10.2 | Test method<br><br>Component parts in the charging system are faulted as below 1) to 4), one at a time, if the outcome of such a fault is uncertain based upon analysis.<br>1. open-circuit at the terminal of any component, other than a monolithic integrated circuit.<br>2. short-circuit of capacitors, unless they comply with EN 60384-14:2013.<br>3. short-circuit of any two terminals of an electronic component, other than a monolithic integrated circuit. This fault is not applied between the two circuits of an optocoupler.<br>4. short-circuit is introduced to the charging system across a component or between adjacent PCB tracks at a location expected to produce the most unfavourable results to evaluate the effect of back-feed from the battery.<br>For each fault condition introduced, the state of the battery before charging is as follows:<br>A series configured battery shall have a deliberate imbalance. The imbalance is introduced into a fully discharged battery by charging one cell to approximately 50 % of full charge or less.<br>Conduct the charging test, each cell voltage is continuously monitored to determine if it has exceeded the limit condition. Venting of the cells is permitted.<br>For vehicles with external battery charging system, charging contacts and plugs shall be designed in a way that accidently touching live parts is prevented (e.g. caps for plugs and outlets).<br>Voltage between charging contacts shall conform to appropriate standards according to the application and/or environment of the charging systems, such as EN 60204-1, EN 61140:2016, EN 60335-2-29:2004 and EN 61851:2001 (all parts).<br>Battery charging currents shall be chosen to be as low as reasonably practicable. | Plugs and appliance coupler shall comply with local regulations and evaluated with battery charger. | P ☐<br>F ☐<br>N/A ☒<br>N/T ☐ |
| 10.3 | Safeguarding and complementary protective measures<br><br>The following measures shall be applied where appropriate:<br>— charging systems shall be designed in such a way that the charging connections are only activated when the vehicle is connected to them;<br>— charging systems shall display the charging status or give a signal when the battery is fully charged;<br>— charging systems shall be designed in such a way that the correct charging of the battery is automatically supervised, and thus hazards caused by overloading or charging of deeply discharged batteries are prevented. | Charging connection is activated when the vehicle is connected to them.<br>A LED indicator displays the charging status. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 11 | Energy storage within the vehicle | | |
| 11.1 | Requirements<br><br>The vehicle as well as the sets of energy storage (i.e. battery) shall be designed and constructed such as to prevent any risk of fire and mechanical deterioration resulting from foreseeable abnormal use. Compliance with this requirement is checked by the test described in 11.2.<br>During the test, the vehicle and the batteries shall not emit any flames, molten metal or release any toxic or flammable gas in hazardous amounts. Protective enclosures shall show no damage when checked visually.<br>Safety and compatibility of the charger/battery assembly shall be provided in accordance with the charger/battery manufacturer's specifications.<br>Any exposed person shall be protected from direct or indirect contact with live parts on the vehicle.<br>The energy storage shall be protected in order to prevent any accidental short circuit. It is necessary to ensure that batteries are protected against any overcharging, a suitable protective device against overheating and short circuits shall be provided.<br>NOTE Examples of solutions are indicated in Annex C. | Tested with positive result. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 11.2 | Test method | | |
| 12 | Structural integrity | | |
| 12.1 | General | | |
| 12.1.1 | Numbers and conditioning of samples | | |
| 12.1.2 | Test condition tolerances | | |
| 12.1.3 | Crack detection | | |
| 12.2 | Static load test | | |
| 12.2.1 | Deck/frame | | |
| 12.2.1.1 | Requirement<br><br>When tested according to the method described in sub Clauses 12.2.1.2, 12.2.1.3 or 12.2.1.4 there shall be no cracks or fractures, or collapse of the structure, or unfolding. Where the construction of the vehicle does not allow the full mass to be applied in normal use to each deck then the maximum mass is divided by two to achieve the test load for each deck. | No cracks, factures, collapse of the structure or unfolding occurred after the test. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 12.2.1.2 | Test method – 2-wheeled single track vehicle | | |
| 12.2.1.3 | Test method – 3-wheeled vehicle | | |
| 12.2.1.4 | Test method – self-balancing vehicle | | |

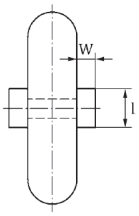
| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 12.2.2 | Handle bar and steering column | | |
| 12.2.2.1 | Bending test | | |
| 12.2.2.1.1 | Requirements<br><br>When tested according to the method described in 12.2.2.1.2, there shall be no cracks or fractures, or deterioration of the operation of the handlebar or steering column. | No cracks, fractures, deterioration occurred after the test. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 12.2.2.1.2 | Test methods | | |
| 12.2.2.2 | Vertical loading test | | |
| 12.2.2.2.1 | Requirements<br><br>Following the test performed according to the method described in 12.2.2.2.2, there shall be no cracks or fractures, or deterioration of the operation of the handlebar or steering column. Nor shall there be any movement of the telescopic part. | No cracks, fractures, deterioration occurred after the test. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 12.2.2.2.2 | Test method | | |
| 12.2.2.3 | Torque test | | |
| 12.2.2.3.1 | Requirement<br><br>When tested according to the method described in 12.2.2.3.2, there shall be no movement of the handlebar stem in relation to the steering tube. | No movement occurred. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 12.2.2.3.2 | Test method | | |
| 12.2.2.4 | Handlebar grips and plugs | | |
| 12.2.2.4.1 | Requirements<br><br>The ends of the handlebar shall be fitted with grips or end plugs. When tested according to the method described in 12.2.2.4.2, the grips or plugs shall withstand a dismantling force of 70 N. | Fitted with grips.<br><br>Not removed with a force of 70 N. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 12.2.2.4.2 | Test method | | |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 12.2.2.5 | Telescopic handlebar (if fitted)<br><br>The handlebar stem shall be provided with one of the two following means to guarantee a safe insertion depth into the steering column:<br>a) the handlebar stem shall be provided with a permanent, transverse mark, of a length greater than or equal to the external diameter of the handlebar stem clearly indicating the minimum depth for inserting its rod into the steering column. The insertion mark shall be positioned at least 2.5 times the external diameter of the rod from the lower end of the handlebar stem. The length of the solid section of the handlebar stem below the mark shall be at least equal to the external diameter of the rod;<br>b) the handlebar stem shall be provided with a permanent stop to prevent it from being drawn out of the steering column beyond the minimum insertion depth defined in a). | Not a telescopic handlebar. | P ☐<br>F ☐<br>N/A ☒<br>N/T ☐ |
| 12.3 | Frontal impact resistance | | |
| 12.3.1 | Requirements for class 2<br><br>When tested according to the method described in 12.3.3, there shall be no visible cracks or fractures in any point of the folding mechanism -head tube-handlebar assembly. There shall be no visible cracks or fractures in any part of the frame and there shall be no separation of any elements of the suspension system. The assembly remains operational even if significant clearances are found. These clearances are acceptable if they do not involve the safety of the user. In particular, the locking of the folding system, if any, shall be checked when the scooter is unfolded<br>If applicable, the folding mechanisms shall remain locked. | Tested with positive result. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 12.3.2 | Test method for vehicle of class 2 | | |
| 12.3.3 | Requirements for class 4<br><br>When tested according to the method described in 12.3.4, there shall be no visible cracks or fractures in any part of the frame and there shall be no separation of any elements of the suspension system. The assembly remains operational even if significant clearances are found. These clearances are acceptable if they do not involve the safety of the user. | Not such vehicle. | P ☐<br>F ☐<br>N/A ☒<br>N/T ☐ |
| 12.3.4 | Test method for vehicle of class 4 | | |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 12.4 | Fatigue test (dynamic) | | |
| 12.4.1 | General<br><br>All types of vehicles fitted with a mechanical linked handlebar shall be subjected to this test.<br>The head tube/steering clearance/fork link can influence failures during handlebar fatigue tests. For this reason, a handlebar shall always be tested on a complete product. When there is a folding mechanism, this enables the handlebar's strength to be tested at the same time.<br>In the case of suspension frames where the rigidity of the suspensions can be adjusted, adjust the suspensions to provide maximum stiffness.<br>In the case of a pneumatic damper for which the air pressure cannot be adjusted, replace the suspension unit with a rigid link, making sure that the end fastening systems and the lateral rigidity accurately simulate the characteristics of the original system.<br>For suspension frames on which the chain stays do not have pivots but use the bending phenomenon, check that any dampers are adjusted to provide the minimum strength in order to ensure a suitable check of the frame.<br>When a suspension frame has adjustable supports or links to vary the strength of the scooter against the ground-contact forces or to modify the attitude of the scooter, position these adjustable components to ensure maximum forces in the frame. | A complete product is tested.<br><br>Folding mechanism is fitted. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 12.4.2 | Requirements<br><br>When tested according to the method described in 12.4.3 to 12.4.5, there shall be no visible cracks or fractures in any point of the folding mechanism -head tube-handlebar assembly. There shall be no visible cracks or fractures in any part of the frame and there shall be no separation of any elements of the suspension system. The assembly remains operational even if significant clearances are found. These clearances are acceptable if they do not involve the safety of the user. In particular, the locking of the folding system, if any, shall be checked when the scooter is unfolded. | Tested with positive result. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 12.4.3 | Test method for a 2-wheeled single track vehicle | | |
| 12.4.4 | Test method for a 3-wheeled vehicle | | |
| 12.4.5 | Test method for a self-balancing vehicle | | |
| 12.5 | Procedure<br><br>a) The self-balancing vehicle is positioned on the vibration machine supporting if necessary in accordance with 12.4.5.2 and either, as appropriate, with the test load or test dummy applying the load(s) in accordance to 12.4.5.2.<br>b) Visible damage such as fractures, deformation, jiggling, looseness or disengagement of parts, and changes in self-balancing vehicle function shall be recorded. | Not such vehicle. | P ☐<br>F ☐<br>N/A ☒<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 13 | Edges and protrusions | | |
| 13.1 | General<br>These requirements are intended to address the hazards associated with the users of vehicles falling on projections or rigid components (e.g. handlebars, levers) on vehicle possibly causing internal injury or skin puncture.<br>NOTE see D.8. | | |
| 13.2 | Sharp edges<br><br>Adequate shape shall be given to avoid puncturing of the body. | No sharp edge was found which present puncturing hazard to the body. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 13.3 | Protrusions<br><br>Tubes and rigid components in the form of projections which constitute a puncture hazard to the user shall be protected.<br>Screw threads which constitute a puncture/cut hazard shall be limited to a protrusion length of one major diameter of the screw beyond the internally threaded mating part. | Checked ok.<br><br>The screw threads are not exposed. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 14 | Moving parts | | |
| 14.1 | Clearance between moving parts<br><br>To prevent crushing of fingers the distance separating accessible moving parts from other moving parts or from fixed parts of the vehicle shall, either be less than 5 mm, or greater than 18 mm in any position. This requirement does not apply to the wheel with its support systems, or to the rear brake/braking system, if any, or to brake actuating levers.<br>NOTE see D.7. | Checked ok. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 14.2 | Guarding of moving parts<br><br>Wheels shall be covered to avoid unintentional contact between a foot of the user and the moving wheel. | Front wheel:<br>Covered mudguard.<br>Rear wheel:<br>Covered mudguard. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 14.3 | Folding mechanism | | |
| 14.3.1 | General requirement | | |
| 14.3.1.1 | General<br><br>Vehicles that can be folded for storage or transportation shall be fitted with one or more locking mechanism(s). The locking mechanism(s) shall comply with the requirements in 14.3.1.3.<br>The function of any operating or locking device shall not be impaired after being tested in accordance with 14.3.1.2.<br>Folding mechanisms shall be designed so that the vehicles can be locked for use in a simple, stable and safe way and folding shall not damage cables.<br>No locking mechanism shall contact the wheels or tyres during riding, and it shall be impossible to unintentionally loosen or unlock the folding mechanisms during riding. | With one folding mechanism on the steering system. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 14.3.1.2 | Incomplete deployment<br><br>To avoid hazards due to incomplete deployment, at least one locking device shall engage automatically when the vehicle is unfolded for use.<br>If the locking device is not visible without damaging the vehicle, a second sample may be used. | The locking device can engage automatically when the vehicle is unfolded for use. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 14.3.1.3 | Unintentional release of locking mechanism(s)<br><br>To avoid unintentional release, one of the following conditions shall be fulfilled:<br>a) there shall be at least one operating device which fulfils the following:<br>1) the operating device shall require at least two consecutive actions, the second being dependent on the first having been carried out and maintained by the user ; and<br>2) the operating device shall not be activated or damaged in one single action during testing in accordance with 14.3.1.3;<br>or<br>b) there shall be two separate and independent operating devices which fulfil one of the following:<br>1) where one operating device is intended to be operated by foot (e.g. by its position, shape, according to the manufacturer's instructions for use.) it shall automatically return to its original status and the locking device shall reengage; or<br>2) where both operating devices are intended to be operated by hand(s) (e.g. by their position, shape, according to the manufacturer's instructions for use.) they shall both automatically return to their original status and the locking devices shall reengage.<br>When tested in accordance to 14.3.2, the vehicle shall not fold and the locking device(s) shall not be released. | Checked ok. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 14.3.2 | Test methods | | |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 15 | Adequate stability (see D.10) | | |
| 15.1 | Footrest/ deck<br><br>In case the user is standing permanently, each deck shall be equipped with an anti-slide surface with an area of at least 150 $cm^2$.<br>In case the user is seating normally (not standing) while driving, the footrest shall be anti-slide and shall have a minimum length of 6.5 cm.<br>In case the user is standing momentarily and the vehicle has an integrated seat, the footrest shall be anti-slide and shall have a minimum length of 6.5 cm and a minimum width of 10 cm (see Figure 15).<br><br>**Key**<br>W width<br>l length<br>**Figure 15 — example of decks (top view of a mono-wheel)** | Size of anti-slide surface > 150 $cm^2$.<br><br>No seating position.<br><br>No integrated seat. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 15.2 | Handlebar adjustment<br><br>The handlebar height adjustment system shall be fitted with devices to avoid inadvertent separation or detachment during use. | Not adjustable. | P ☐<br>F ☐<br>N/A ☒<br>N/T ☐ |
| 15.3 | Surface | | |
| 15.3.1 | Slippery surface | | |
| 15.3.1.1 | Requirements for wheel adhesion<br><br>The wheels shall be constructed from non-slip material. This requirement is considered to be fulfilled if a coefficient of adhesion, μ0, of at least 0.30 is achieved in the test according to 15.3.1.2. | Tested with positive result. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 15.3.1.2 | Wheel adhesion test | | |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 15.3.2 | Irregular surface<br><br>When loaded with a 90 kg mass, the dimensions of the tyres of the vehicle shall be:<br>a) For vehicle with aligned wheels or with one front wheel:<br>— the front tyre shall have a minimum diameter of 125 mm and a minimum width of 25 mm<br>— the rear tyre shall have a minimum width of 25 mm<br>b) For self-balancing vehicle:<br>— the tyre shall have a minimum diameter of 125 mm and a minimum width of 25 mm<br>c) For all others vehicles:<br>— the tyre shall have a minimum diameter of 125 mm or a minimum width of 25 mm | Complied with a),<br><br>Checked ok. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 15.4 | Braking devices | | |
| 15.4.1 | General<br><br>All vehicles shall be equipped with service brake system and, when indicated, a parking brake or parking device as follows:<br>a) Class 1 and 2 single track vehicles (e.g. vehicle with aligned wheels) shall be equipped with at least one braking device;<br>b) Class 1 and 2 multi-track vehicles (e.g. vehicle with unaligned wheels) shall be equipped with a parking device and one of the following:<br>1) If there are two rear wheels, the vehicle shall be equipped with a braking device on all rear wheels or an independent front and a combined rear wheels brake. The braking device shall be operated by the actuation of a single control or all wheel integrated braking system,<br>2) If there is one rear wheel, the vehicle shall be equipped with all wheel integrated braking system or with independent front wheel and rear wheel brakes;<br>c) Class 3 and 4 multi-track vehicles shall be equipped with an acceleration controlled braking system.<br>d) Class 3 and 4 single track self-balancing vehicles shall be equipped with a brake.<br>NOTE Small support wheels (wheels that are not used for normal driving and do not affect the braking) are not considered as a driving or braking wheels.<br>When a parking brake or parking device is not required, instructions to avoid the vehicle running away when unattended shall be provided in the owner's manual. | Class 2 single track vehicle.<br>Brake system:<br>Front mechanical brake,<br>Rear mechanical brake.<br><br>A kickstand is fitted at the left side of the vehicle. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 15.4.2 | Braking performance | | |
| 15.4.2.1 | General requirements<br><br>All vehicle shall meet each of the requirements specified in the following paragraphs unless otherwise indicated.<br>A vehicle shall have a configuration that enables a user to actuate the braking device by hand with a lever or by foot while being in a normal driving position and with both hands on the steering control.<br>In case the vehicle is not equipped with a handle bar, the actuation of the braking device shall be performed according to the instructions provided by the manufacturer in accordance with the second sentence of 7.1.1.d). These instructions shall be a part of the user's manual. | All brakes are activated through the brake levers on handlebar. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 15.4.2.2 | Hand operated braking system – Strength test<br><br>There shall be no failure of the braking system or of any component thereof when tested in accordance with 15.4.3.2. | No failure occurred after the test. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 15.4.2.3 | Dry stop<br><br>When the brakes are tested in accordance with the test procedure set out in 15.4.3.4, the following condition shall be met:<br>— the Mean Fully Developed Deceleration (MFDD) shall be: ≥ 1,7 ($m/s^2$).<br>The vehicle speed at the start of braking shall be 90 % of the maximum speed of the vehicle achievable solely by power assistance. | MFDD in Dry/Wet > 1.7 $m/s^2$. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 15.4.2.4 | Vehicle behaviour during braking<br><br>During the tests (see 15.4.3), the following shall not occur in a way which causes the user to have to use his feet, other than for the application of the brake, to control the vehicle:<br>a) excessive juddering;<br>b) front wheel locking;<br>c) vehicle instability (for example, uncontrollable lifting of the rear wheel);<br>d) user's loss of control or balance;<br>e) excessive side-skidding.<br>NOTE With certain types of braking systems, it is not possible to entirely avoid some skidding of the rear wheel during braking; this is considered acceptable provided that d) or e) do not occur as a result. | Such behaviours are not occurred. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 15.4.2.5 | Electric failure braking compensation<br><br>In the event of an electric braking failure, the vehicle shall be able to brake normally or, shall come to a standstill with a minimum deceleration of 1.25 (+/– 0.25) $m/s^2$ as describe in 15.4.3.5. | No electric brake. | P ☐<br>F ☐<br>N/A ☒<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 15.4.2.6 | Parking device<br><br>When required in accordance with 15.4.1, the parking device shall make it possible to maintain the vehicle stationary on up or down gradient of 18 % even in the absence of the user. The user shall be able to achieve this parking action from the riding position.<br>The parking device system shall have a control which is separate from the service braking device controls. The vehicle shall be held in the locked in the parking position by a purely mechanical device.<br>NOTE Types of parking device are given in Annex G (Table G.1 and G.2). | Parking device is not required for class 2 single track vehicle.<br><br>A kickstand is fitted at the left side of the vehicle. | P ☐<br>F ☐<br>N/A ☒<br>N/T ☐ |
| 15.4.3 | Test methods | | |
| 15.4.3.1 | Braking test force applications | | |
| 15.4.3.2 | Hand operated brake strength test | | |
| 15.4.3.3 | Brake performance test conditions (classes 2 and 4) | | |
| 15.4.3.4 | Stop performance calculation (classes 2 and 4) | | |
| 15.4.3.5 | Electric braking failure compensation test | | |
| 15.4.3.5.1 | Requirement<br><br>The requirement of 15.4.2.5 shall be achieved.<br>In case of electric braking failure, the vehicle shall stop with a smooth deceleration regarding 7.2. | No electric brake. | P ☐<br>F ☐<br>N/A ☒<br>N/T ☐ |
| 15.4.3.5.2 | Test method for an electrical braking system | | |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 16 | Presence awareness | | |
| 16.1 | Lighting | | |
| 16.1.1 | Retro-reflectors<br><br>Vehicles shall be fitted with front, side and rear retro-reflector according to ISO 6742-2:2015. The rear reflector shall be red in colour. The front reflector shall be white (clear) in colour. All side reflectors shall be of the same colour, either white (clear) or yellow. | Front reflector: white,<br>Rear reflector: red,<br>Side reflector: yellow.<br><br>Location / Model<br>Front reflector: KM133<br>CHP-777<br>Rear reflector: Z103<br>NT01<br>Side reflector: KM124<br>CHP-778<br><br>It is reminded to client that the national regulations apply to the lights and reflectors which shall be fulfilled before on-road use. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 16.1.2 | Front and rear lightning<br><br>Vehicles of class 2 and 4 shall be fitted with active front and rear lights according to ISO 6742-1:2015 (see D.12). The manufacturer shall indicate in the user's manual how an active front and rear light can be fitted to the vehicles of class 1 and 3. The controls for lighting shall be marked in accordance with Annex F.<br>NOTE 1 Local regulations can be applicable.<br>NOTE 2 see D.14. | Front light: white,<br>Rear light: red.<br><br>Location / Model<br>Front light: DS23017H<br>Rear light: Z103<br>NT01<br>Front direction indicator: ZXD002<br>Rear direction indicator: DS21040RT<br><br>It is reminded to client that the national regulations apply to the lights and reflectors which shall be fulfilled before on-road use. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 16.2 | Audible warning to alert persons<br><br>An audible device shall be provided to allow a warning to be given to persons in the vicinity of the vehicle.<br>The audible warning device shall be controlled by a command from a device on the handlebar.<br>On a vehicle without a handlebar, a warning device which can be carried by the user of a vehicle (remote control) shall be provided with the vehicle. The vehicle shall only be able to start if the remote control is connected either physically and/or via wireless.<br>The control for the audible warning shall be marked in accordance with Annex F.<br>The device shall comply with ISO 14878:2015 Class II.<br>A remote control shall comply with 17.1. | A bell is fitted.<br>Model: MB-GT.<br><br>Electric horn is fitted.<br>Model: DL128.<br><br>It is reminded to client that the national regulations apply to the audible device which shall be fulfilled before on-road use. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 17 | System failure and malfunction warning devices | | |
| 17.1 | General<br><br>The warning symbols audible signal are given in Annex F.<br>Audible warning devices provided with the vehicle shall be unambiguous and easily perceived. The operator shall be able to check the operation of the audible warning devices at all times.<br>If the vehicle is equipped with a remote control for any audible warning device required by this standard, the vehicle shall only be able to start if the remote control is connected either physically and/or via wireless. | No such device.<br><br>Remote control is not equipped. | P ☐<br>F ☐<br>N/A ☒<br>N/T ☐ |
| 17.2 | Audible/ vibrating signalling<br><br>Audible devices required by this standard shall comply with ISO 14878:2015 Class II. | No such device. | P ☐<br>F ☐<br>N/A ☒<br>N/T ☐ |
| 17.3 | Loss of connection to the warning system<br><br>Loss of connection to the warning system shall be relayed by a warning signal (visual, audible, vibrating,…) on the vehicle or on the remote control.<br>In a driving condition the loss of connection to the warning device shall result in a speed reduction to 6 km/h for a Class 4 vehicle; the speed reduction shall happen in a safe manner without creating additional hazards and with corresponding audio notification and tilt back of decks on self-balancing vehicles. | Remote control is not equipped. | P ☐<br>F ☐<br>N/A ☒<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 18 | Hot surfaces | | |
| 18.1 | Requirements<br><br>Hot surfaces of the vehicle (temperatures above 57 °C), except brake systems, which are not in continuous contact with the user shall be protected to prevent inadvertent contact.<br>The seat, handgrips, handgrip levers, footrests and decks are parts that are considered in continuous contact with the user. In no circumstance during the test of 18.2 shall their temperature exceed 43 °C. A durable visible warning shall be fixed as close as possible to the brake if the temperature of the brake system could be above 60 °C (see ISO 7010:2019, symbol W017).<br>The instructions manual shall contain a notice warning of the possible danger of burns if the brakes are touched after a prolonged or severe use.<br>Outer surface temperature of cables and connections that can be reached by the user shall not exceed 57 °C while in use on performance test rig.<br>NOTE 1 Due to the operational requirements of (disc) brakes, the variability of their working temperatures with the type of use, and the fact they are distant from the normal riding position, no temperature limit is defined for these parts.<br>NOTE 2 see D.4. | <br><br>The temperature of the hot surface is less than 57°C.<br><br>The temperature is less than 43°C during the test for the handgrips, footrest and deck.<br><br>The brakes cannot touch.<br><br>The temperature is less than 57°C. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 18.2 | Test method | | |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 19 | Product information and marking | | |
| 19.1 | General<br><br>The following product information should accompany each product.<br>All text shall be printed in the official language or at least one of the official languages of the country of sale. If other languages are included, they shall be easy to distinguish, e.g. by separate presentation.<br>All text shall be clearly legible. Sentences shall be short and of simple construction. The words used shall be uncomplicated and in everyday use.<br>Information and warnings on the vehicle should preferably be provided in the form of readily understandable symbols or pictograms when available. | Checked ok. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 19.2 | Marking | | |
| 19.2.1 | General<br><br>The vehicle shall be legibly, visibly and permanently marked with at least the following:<br>—the business name and full address of the manufacturer or, where applicable, his authorized representative, importer or organization responsible for its sale;<br>— designation of the vehicle;<br>— the mandatory marking;<br>— reference to this document, i.e. EN 17128:2020;<br>— designation of series or class with maximum speed (e.g. kick scooter, class 2, 25km/h);<br>— serial or identification number;<br>It is recommended that the identification number is in accordance with ISO 3779.<br>— year of construction, that is the year in which the manufacturing process is completed;<br>— nominal power expressed in watts (W);<br>— mass of the most usual configuration, in kilograms (kg);<br>— maximum permissible payload, user including luggage. | <br><br><br>Checked ok.<br><br><br>PLEV.<br>CE marking present.<br>EN 17128:2020.<br>20km/h, 25km/h.<br><br>Checked ok.<br><br><br><br><br>500W.<br><br>150kg. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 19.2.2 | Durability of marking of the frame or chassis<br><br>Rub the marking by hand for 15 s with a piece of cloth soaked in water and again for 15 s with a piece of cloth soaked in petroleum spirit.<br>After the test the marking shall remain easily legible.<br>It shall not be easy to remove any label nor shall any label show any sign of curling. After rubbing the text shall still be clearly legible. | Tested with positive result. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 19.2.3 | Battery<br><br>Information concerning the battery shall comply with existing corresponding standards.<br>Additionally, the following information shall appear on the battery:<br>— the output voltage;<br>— the charging voltage;<br>— the power;<br>— warning on the risks. | Checked ok. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 19.2.4 | Tyres<br><br>The maximum pressure for inflatable tyres (if present) shall be marked on the tyre or in the instructions for use. | Marked on the tyre. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 19.3 | Purchase information | | |
| 19.3.1 | General<br><br>Information at point of sale could be given on the packaging, on an information sheet in the store or on internet. | Given on the packaging. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 19.3.2 | Information at point of sale<br><br>The following information shall be given:<br>—Only use the product in accordance with local regulations;<br>— For which age the vehicle is designed;<br>— Protective helmet is strongly recommended.<br>All product information as required in this standard shall be provided in the official language(s) of the country of sale.<br>Warning sentences shall be written in letters whose upper case shall be at least 2.5 mm in height. The word “WARNING” shall be written in upper case. The word “WARNING!” can be given at the top of a list of warnings:<br>— “WARNING! Never use the product close to a water source”<br>— “WARNING! Stop using the product when damaged”<br>The information needed to control machinery shall be provided in a form that is unambiguous and easily understood. It shall not be excessive to the extent of overloading the operator.<br>Visual display units or any other interactive means of communication between the operator and the machine shall be easily understood and easy to use (see Annex F). | Checked ok. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 19.3.3 | Information on the packaging<br><br>In the case where the product is delivered in a package to the final customer, the following information shall appear on the packaging:<br>—the business name and full address of the manufacturer and, where applicable, his authorized representative,<br>— the designation: PLEV,<br>— use warnings:<br>“WARNING! Never use the product out of the spaces authorized by the regulations”<br>— the number of this standard followed by the use class, specified as follows: EN 17128 (class xx),<br>— for which age the vehicle is designed,<br>— indication of the maximum weight of the user in accordance with manufacturer recommendation, specified as follows: MAX XXX kg,<br>— indication of the maximum speed according with manufacturer declaration and within the range of permitted speed corresponding with the declared class, specified as follows: XX km/h. | Checked ok. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 19.4 | Instructions for use | | |
| 19.4.1 | General | Checked ok. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 19.4.2 | Noise emission | | |
| 19.4.2.1 | General<br><br>In case of doubt, a-weighted sound pressure levels shall be measured to a maximum 70 dB according to EN ISO 3744:2010, if necessary (see 19.4.2.2). | No doubt. | P ☐<br>F ☐<br>N/A ☒<br>N/T ☐ |
| 19.4.2.2 | Requirements<br><br>The following information shall be inserted in the instructions for use:<br>— the A-weighted emission sound pressure level at workstations, where this exceeds 70 dB(A); where this level does not exceed 70 dB(A), this fact shall be indicated,<br>— the peak C-weighted instantaneous sound pressure value at workstations, where this exceeds 63 Pa (130 dB in relation to 20 μPa),<br>— the A-weighted sound power level emitted by the machinery, where the A-weighted emission sound pressure level at workstations exceeds 80 dB(A). | Less than 70dB. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |

| **Absatz** *Clause* | **Anforderungen - Prüfungen /** *Requirements - Tests* | **Messergebnisse – Bemerkungen/** *Measuring results - Remarks* | **Ergebnis** *Result* |
|---|---|---|---|
| 19.4.3 | Battery charging<br><br>Information for use shall contain instructions for battery charging, in particular:<br>— recommendations on charging the battery and use of the charger;<br>— procedure for charging the battery;<br>— environmental conditions (e.g. outdoor or indoor charging);<br>— requirement to power-off the vehicle during charging, or into a certain non-operational mode;<br>— appropriate warnings. | Checked ok. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| 19.5 | Instructions on servicing and maintenance | Checked ok. | P ☒<br>F ☐<br>N/A ☐<br>N/T ☐ |
| Annex A | List of significant hazards<br>(informative) | | |
| Annex B | Electromagnetic compatibility of vehicle<br>(normative) | | |
| Annex C | Example of recommendation for battery charging<br>(informative) | | |
| Annex D | Rationale<br>(informative) | | |
| Annex E | Examples of vehicles<br>(informative) | | |
| Annex F | Light, warning device, on-off symbols<br>(normative) | | |
| Annex G | Types of parking devices<br>(informative) | | |

*** End of test report ***