# Summary Report

**Report No.: GZES190802190831**
**Date: 2019-10-30**

| | |
|---|---|
| Applicant: | Zhengzhou F-wheel Industrial Co., Ltd.<br>Lianyun Road 27 District No. 123 Huanghe Science and Technology College science and Technology Park (South) B, Zhengzhou, Henan, China |
| Manufacturer: | Same as applicant |
| Manufacturing location: | Same as applicant |
| Testing location/address: | SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch.<br>198 Kezhu Road, Science City, Economic & Technology Development Area, Guangzhou, Guangdong, China |
| The standards: | EN 15194: 2017 (Sub-clauses 4.2.1 to 4.2.10) |
| Test item description: | Electric Bike |
| Model/Type reference: | D2+, D3+ |
| Ratings: | 36 V ⎓ |
| Test result: | In the opinion of SGS – CSTC the presented appliance was found to be **in compliance with** the sub-clauses 4.2.1 to 4.2.10 of standard EN 15194: 2017 as indicated on the following pages. |
| Remark: | The sub-clauses were requested by the client. The following sample was submitted and identified on behalf of the client. |

Ye, Wing
Reviewer
E&E Safety Laboratory

Zach Lu
Project Engineer

**Copy of marking plate**

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**Summary of testing:**

According to the client's requirement, tests of sub-clause 4.2.1 to 4.2.10 of following standard were carried out on the submitted sample:

EN 15194: 2017

| | |
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| **Test item particulars** .....: | — |
| Classification of installation and use……: | Portable appliance |
| Supply connection……..: | — |

**Possible test case verdicts:**

| | |
|---|---|
| - test case does not apply to the test object .....: | N/A |
| - test object does meet the requirement .....: | P (Pass) |
| - test object does not meet the requirement .....: | F (Fail) |

**Testing**

| | |
|---|---|
| Date of receipt of test item .....: | 2019-08-26 |
| Date (s) of performance of tests .....: | 2019-08-27 to 2019-09-19 |

**General product information:**

The appliance for household and similar purposes used.

Models D2+ and D3+ are identical except for model name and wheel size. These models have the same construction, circuits designed and electrical components.

| EN 15194: 2017 | | | |
|---|---|---|---|
| **Clause** | **Requirement + Test** | **Result - Remark** | **Verdict** |
| **4.2.1** | **Electric circuit** | | — |
| | The electrical control system shall be designed so that, should it malfunction in a hazardous manner, it shall switch off power to the electric motor without causing a hazardous situation and it requires user interaction to switch on again. | | P |
| **4.2.2** | **Controls and symbols** | | — |
| | If symbols are used, their meaning shall be described in the instructions for use. “On” “Off” symbols, lightings symbols, start-up assistance symbols, audible warning device symbols design shall be in accordance with those described in Annex I and Annex J. | | P |
| | A master control device shall be fitted to switch on and shut off the assistance, which shall be apparent, easy to reach and unmistakable. | | P |
| | This master control device shall be activated by voluntary action to enable all assistance modes (start up and pedalling) before use of the EPAC. | | P |
| **4.2.3** | **Batteries** | | — |
| 4.2.3.1 | **Requirements** | | — |
| | a) The EPAC and batteries pack shall be designed in order to avoid risk of fire and mechanical deterioration resulting from abnormal use. Compliance is checked by the test described in 4.2.3.2. | | P |
| | b) During the test the EPAC and the batteries shall not emit flames, molten metal or poisonous ignitable gas in hazardous amounts and any enclosure shall show no damage that could impair compliance with this European Standard. Safety and compatibility of the battery/charger combination shall be ensured, according to the manufacturer's specifications. | | P |
| | c) The battery terminals shall be protected against creating an accidental short circuit. | | P |
| | d) An appropriate care shall be taken to ensure that the batteries are protected against overcharging. An appropriate overheating and short circuit protection device shall be fitted. | | P |

| EN 15194: 2017 | | | |
|---|---|---|---|
| **Clause** | **Requirement + Test** | **Result - Remark** | **Verdict** |
| | Batteries and the charger unit shall be labelled in order to be able to check their compatibility. | | P |
| 4.2.3.2 | **Test method** | | — |
| | Compliance with 4.2.3.1 a) is verified by the following test: | | P |
| | a) Battery terminals are short-circuited with the batteries in a fully charged condition. | | P |
| | b) Motor terminals are short-circuited; all commands are in “ON” position, while the batteries are fully charged. | | P |
| | c) The EPAC is operated with the electric motor or drive system blocked until the motor torque stops or the battery is fully discharged. | | P |
| | d) The battery is charged for double the recommended charging period or for 24 h whichever is greater. | 24 hours | P |
| **4.2.4** | **Battery charger** | | — |
| | Chargers for EPAC are considered to be operated in a residential (household) environment. | Approved with battery charger | P |
| **4.2.5** | **Electric cables and connections** | | — |
| 4.2.5.1 | **General** | | — |
| | All connectors for cable and wire shall be selected to prevent corrosion of electrical contact conductance. | | P |
| 4.2.5.2 | **Requirements.** | | — |
| | Cable and plug temperature shall be lower than that specified by the manufacturer of the cables and plugs. Damage to cable and plug insulation shall be prevented. | | P |
| | The cable cross sections shall be selected in accordance to EN 60335-1:2012, Table 11. If these requirements are not met, a temperature rise test shall be performed, in accordance to 4.2.5.3. | | P |
| 4.2.5.3 | **Test method.** | | — |

| EN 15194: 2017 | | | |
|---|---|---|---|
| **Clause** | **Requirement + Test** | **Result - Remark** | **Verdict** |
| | At an ambient room temperature (20 ± 5) °C, discharge the fully charged EPAC battery to the discharging limit specified by the EPAC or ESA manufacturer at the maximum current allowable by the system and record it. Measure the cable and plug temperatures and ensure, by examination, that there is no deterioration of the insulation on either assembly. | Measured temperature:<br>Plug: 7,8 K;<br>Electrical cable: 9,7 K | P |
| | The increase of outer surface temperature of parts that can be touched shall be ⩽ 60 K while in use on performance test rig. | Battery surface: 20,0 K | P |
| **4.2.6** | **Wiring** | | — |
| | Requirements on wiring shall be checked according to the following sequence at an ambient room temperature (20 ± 5) °C. | | P |
| | a) Wire ways shall be smooth and free from sharp edges. | | P |
| | 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. Holes in metal through which insulated wires pass shall have smooth well-rounded surfaces or be provided with bushings. | | P |
| | c) Wiring shall be effectively prevented from coming into contact with moving parts. | | P |
| | Compliance with a), b), c) shall be checked by inspection. | | P |
| | d) Separate parts of the EPAC 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 ground continuity. | | P |
| | 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. | | N/A |
| | Compliance with d) shall be checked by inspection and by the following test method. | | P |

| EN 15194: 2017 | | | |
|---|---|---|---|
| **Clause** | **Requirement + Test** | **Result - Remark** | **Verdict** |
| | If flexing occurs in normal use, the appliance is placed in its normal operational position and is supplied at rated voltage under normal operation. | | P |
| | The movable part is moved backwards and forwards through the largest angle permitted by its construction, so that the conductor is flexed. | | P |
| | For conductors that are flexed in normal use, flex movable part for 10 000 cycles at a test frequency of 0,5 Hz. | | P |
| | For conductors that are flexed during user maintenance, flex the movable part for 100 cycles at the same frequency. | | N/A |
| **4.2.7** | **Power cables and conduits** | | — |
| | 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. | | P |
| | Compliance is checked by inspection. | | P |
| | Guidance for power cables size selection is given in HD 60364-5-52:2011, 5.22.1.2, 523.1523.3 and Table A. | | P |
| | The insulation of internal wiring shall withstand the electrical stress likely to occur in normal use. | | P |
| | The wiring and its connections shall withstand the electrical strength test. The test voltage expressed in V shall be equal to (500 + 2×Ur) for 2 min and applied between live parts and other metal parts only. | | P |
| **4.2.8** | **External and internal electrical connections** | | — |
| | Electrical connection shall comply with HD 60364-5-52:2011, 526.1 and 526.2. | | P |
| **4.2.9** | **Moisture resistance** | | — |
| | The electrical components of a fully assembled EPAC shall be tested and shall comply with IPX4 requirements according to EN 60529:1991. | IPX4 | P |
| **4.2.10** | **Mechanical strength test** | | — |

| EN 15194: 2017 | | | |
|---|---|---|---|
| **Clause** | **Requirement + Test** | **Result - Remark** | **Verdict** |
| | The electrical components including the battery shall have adequate mechanical strength and be constructed to withstand such rough handling that may be expected in normal use. Compliance is checked by: | | P |
| | — Applying impacts to the battery pack mounted on the EPAC by means of the spring hammer as specified in EN 60068-2-75. The battery pack 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. After the test the battery pack shall show no damage that could impair compliance with this European Standard; | | P |
| | — Detachable batteries are submitted to free fall on a rigid surface as specified in EN 22248 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 is likely to be weak. | | N/A |
| | After the test the battery pack shall show no damage that could lead to emission of dangerous substances (gas or liquid) ignition, fire or overheating. | | P |

**Appendix 1: Photo**

Details of: Appearance

View:

☒ general

☐ front

☐ rear

☐ right

☐ left

☐ top

☐ bottom

Details of: Appearance

View:

☒ general

☐ front

☐ rear

☐ right

☐ left

☐ top

☐ bottom

Details of: Brake and control panel

View:

☒ general
☐ front
☐ rear
☐ right
☐ left
☐ top
☐ bottom


Details of: Charging port

View:

☒ general
☐ front
☐ rear
☐ right
☐ left
☐ top
☐ bottom

Details of: Wire fixed by cable ties

View:

☒ general

☐ front

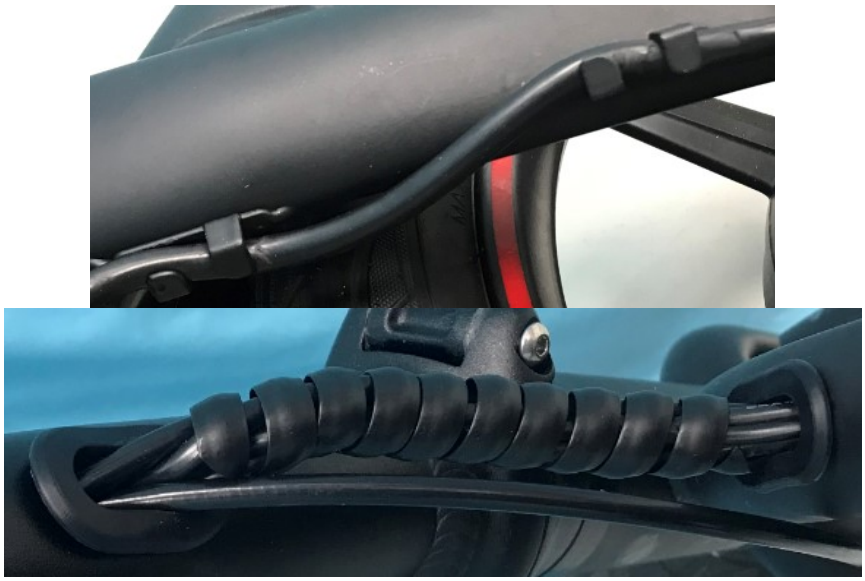
☐ rear

☐ right

☐ left

☐ top

☐ bottom



Details of: Internal view

View:

☒ general

☐ front

☐ rear

☐ right

☐ left

☐ top

☐ bottom

Details of: Internal view

View:

☒ general
☐ front
☐ rear
☐ right
☐ left
☐ top
☐ bottom

Details of: Internal view

View:

☒ general
☐ front
☐ rear
☐ right
☐ left
☐ top
☐ bottom

# Summary Report

**Report No.: GZES190802190831**
**Date: 2019-10-30**

Details of: Motor

View:

☒ general
☐ front
☐ rear
☐ right
☐ left
☐ top
☐ bottom


Details of: Charger

View:

☒ general
☐ front
☐ rear
☐ right
☐ left
☐ top
☐ bottom

--- End of Report ---