SAFETY AND COMPLIANCE REPORT FOR RAZOR USA

Tested Sample(s)	**:** Electric Bike
Brand	**:** Razor
Model	**:** MX 350
Color	**:** Blue
Size	**:** Not Specified
Stock / Model Number	**:** 15128040(15128042) (15189040) (1518070), (15128003), (15128095) 15128190 (15128160), (15128103
Country of Origin	**:** China
Age Grading	**:** 13+ years
Children's Product	**:** Yes

Prepared For:

RAZOR USA, LLC. SHANGHAI OFFICE
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Qingpu District, Shanghai
China

Issue Date: 19 February 2019

Final Report: 248.0553.001.UL2272.R1

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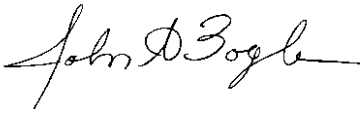
Contract File No.: 248.0553.001
T:\ACT Testing\Razor – 248.0553
Control Document Rev. 20 Dec. 2016

Technician: Fisher Yan

CONCLUSION

Razor, MX 350 (Blue) **15128040(15128042) (15189040) (15128070), (15128003), (15128095)**		
Purpose of Test - Each test performed is intended to check compliance with the following:	**Result**	**Comment**
UL 2272 Personal e-Mobility Devices Compliance Testing	C	See results within.

President,



John A. Bogler

SAMPLE IDENTIFICATION

Brand:	Razor	**Job No.:**	248.0553.001
Model:	MX 350	**Type:**	Electric Bike
Factory:	Zhejiang Feishen Vehicle Industry Co., Ltd	**Size:**	Not Specified
Alternative Factory:	ZHEJIANG JINBANG SPORTS EQUIPMENT CO., LTD.	**Color(s):**	Blue
Battery：	CP1270AC	**Weight (kg):**	22.35
Alternative Battery*：	Kaiying(Longway) 6FM7 Xiongtao(Vision) CP1270A Xiangrui (OD) 6-DW-7	**Country of Origin:**	China
Stock No.:	15128040(15128042)(15189040)(15128070),(15128003),(15128095)	**Serial No.:**	BX1J5003383

*the product was tested with the battery indicated in the Battery field

248.0553.001 – MX 350 (Blue)

DATE AND PLACE OF TEST

Sample(s) received : 10 September 2018
Testing was initiated on : 22 October 2018
Testing was completed on : 03 January 2019
Testing was performed at : Taicang ACT Sporting Goods Testing Company, LTD.
Taicang City, Jiangsu Province, China
Testing was performed at : Shanghai Lelangtek
2nd Floor, Building 1, No.158 Jinfeng Road, Pudong District, Shanghai
Testing was performed at : Guangdong Inspection &Quarantine Technology Center (IQTC)
Tower B, No.66 Huacheng Avenue
Zhujiang Xincheng, Guangzhou, China 510623

TEST METHODS

Method for each test conducted is as follows:

- UL2272 testing was performed utilizing the test methods from the UL2272: Investigation for Electrical Systems for Self-Balancing Scooter.

TEST RESULTS

C: Compliant; Product meets specified standard **NC:** Non-Compliant; Product does not meet specified standard **NA:** Not Applicable to this design **NR:** Not Requested by the Applicant **NP:** Not Present	**ND:** None Detected **IC:** Inconclusive **NT:** Not Tested **FTR:** Further Testing Recommended **PPM:** Parts Per Million ***:** See Comments

UL 2272: Personal e-Mobility Devices Compliance Testing

UL 2272 Standard for Electrical Systems for Self-Balancing Scooters			
Ref. #	**Test Description**	**Result**	**Observations and Notes**
CONSTRUCTION			
7	**Non-Metallic Materials**		
7.1	Enclosure Materials Comply with UL746C, Path III of Enclosure Requirements in Table 4.1 (or CAN/CSA-C22.2 No. 0.17)	C	
7.2	Polymeric Materials – Minimum Flame Rating of 94V-1 (UL 94 or CAN/CSA-C22.2 No. 017)	C	Lelangtek
7.3	Resistance to impact, crush resistance, abnormal operations, severe conditions, mold-stress relief distortion	C	
7.4	Polymeric Materials – Enclosure w/ Insulation shall have Relative Thermal Index ≥ 80°C (176°F) (UL 746B or CAN/CSA-C22.2 No. 017)	C	
7.5	Enclosure Materials Exposed to Sun/Rain Meet UV Resistance and Water Exposure/Immersion Tests (UL 746C or CAN/CSA-C22.2 No. 017)	NA	Not exposed to environment
7.6	Electrical Insulation shall be resistant to deterioration	C	
7.7	Gaskets and Seals Relied Upon for Safety Meet Environmental Requirements.	C	
8	**Metallic Parts Resistance to Corrosion**		
8.1	Metal Enclosures – Corrosion Resistant (UL 50E or CAN/CSA-C22.2 No. 94.2)	C	
8.2	Insulation of Metal Enclosures – Non-Moisture Absorbent Materials w/ Suitable Temperature Rating.	C	
8.3	Conductive parts at terminals and connections shall not be subject to corrosion due to electrochemical action.	C	
9	**Enclosures**		
9.1.1	Enclosure Strength and Rigidity	C	
9.1.2	Minimum Tool Requirement for Access to Enclosure (pliers, screwdriver, wrench…)	C	
9.1.3	Inadvertent Access to Hazardous Parts/Situations	C	
9.1.4	Openings in the enclosure shall be designed to prevent ingress of water (IPX4)	C	
9.2.1	Cell vents shall not be obstructed	C	
9.2.2	Battery Compartments – Proper Venting and Security from Excessive Movement/Stress	C	
10	**Wiring and Terminals**		
10.1	Wiring shall be insulated properly	C	
10.2	Internal Wiring Strain Relief – no loosening of connections or damage of insulation	C	
10.3	External Terminals – designed to prevent inadvertent shorting, reverse polarity, and misalignment	C	
10.4	Removable Battery Packs – Terminals not readily accessible	NA	
10.5	Removable Battery Packs – Endurance Test (UL 2251 or CAN/CSA C22.2 No. 282)	NA	
10.6	Holes for Wiring – smooth surface, free of burrs, fins, sharp edges, etc..	C	
10.7	Hazardous Voltage Warning Label (ISO 7010, No. W012 – i.e. lightning bolt within triangle)	NA	
11	**Chargers**		
11.1	Charger meets Standard for Class 2 Outputs (UL 1310) and is compatible with battery	C	
11.2	Charger Connector – shall be designed to prevent misalignment and reverse polarity.	C	
12	**Fuses**		
12.1	Fuses shall be acceptable for the current and voltage of the circuit they protect.	C	
12.2	Replaceable Fuses – Replacement properly/obviously marked adjacent to holder	C	

UL 2272 Standard for Electrical Systems for Self-Balancing Scooters			
Ref. #	**Test Description**	**Result**	**Observations and Notes**
13	Lighting – correctly rated bulbs. Replacement Care	NA	
14	**Electrical Spacings and Separation of Circuits**		
14.1	Circuits with reverse polarity shall have enough spacing (or insulated properly) to prevent inadvertent shorting.	C	
14.2	Electrical Spacings – Minimum over surface and through air spacing from Table 13.1	C	
14.4	Conductors of Circuits operating at different voltages shall be reliably separated (space or insulation)	C	
15	**Insulation Levels and Protective Grounding**		
15.1	Hazardous Voltage Circuits – Insulated from accessible conduction parts and safety extra low voltage circuits (60 Vdc or 48 Vrms)	C	
15.4	Protective Ground System – Max Resistance of 0.1 Ω	NA	
15.5	Ground Terminal Identification	NA	
15.6	Conductor shall be properly sized – shall be green or green & yellow striped in color	NA	
16	**Protective Circuits and Safety Analysis**		
16.2	Analysis of potential electrical and energy hazards (FEMA)	C	Client provided
16.4	Critical Safety Circuits – provided with redundant passive protection,	C	
16.5	Electronic and Software Protection Scheme (UL 991, UL 60730-1, IEC 61508-1)	C	
16.6	Scooter's Containing Hazardous Voltages – Manual Disconnect	C	
16.7	Manual Disconnect Requirements (no auto reset, disconnects both poles, capable of full load disconnects, and no hazardous conditions upon automatic actuation)	C	
17	**Cells**		
17.2	Lithium based Cells – comply with UL 2580 (UL 2271, or CAN/ULC-S2271)	NA	
17.4	Nickel Based Cells – comply with UL 2580 (UL 2271, or CAN/ULC-S2271)	NA	
17.5	Valve regulated lead acid batteries shall comply with pressure release test from UL 1989	NA	
17.6	Electrochemical capacitors shall comply with the capacitor requirements in UL 810A	NA	
18	**Motors**		
18.1	Not Hazardous Under Locked Rotor and Overload Conditions	C	
18.2	Motors shall be capable of carrying max normal anticipated load without exceeding temperatures on insulation and windings.	C	
18.3	Motors in Hazardous voltage Circuits – comply with UL 1004-1	C	
19	Manufacturing and Production Line Testing		
19.6	Continuity check of the grounding conductors	NT	
19.7	Documentation of production process	NT	
PERFORMANCE			
22	Post Test Cycle	C	
ELECTRICAL TESTS			
24	Overcharge Test	C	IQTC Report #01051800008940
25	Short Circuit Test	C	IQTC Report #01051800008940
26	Over-discharge Test	C	IQTC Report #01051800008940
27	Temperature Test	C	IQTC Report #01051800008940

UL 2272 Standard for Electrical Systems for Self-Balancing Scooters			
Ref. #	**Test Description**	**Result**	**Observations and Notes**
28	Imbalanced Charging Test	C	IQTC Report #01051800008940
29	Dielectric Voltage Withstand Test	NA	
30	Isolation Resistance Test	NA	
31	Leakage Current Test	NA	
32	Grounding Continuity Test	NA	
MECHANICAL TESTS			
33	Vibration Test	C	Lelangtek
34	Shock Test	C	Lelangtek
35	Crush Test	C	
36	Drop Test	C	
37	Mold Stress Relief Test	C	Lelangtek
38	Handle Loading Test	C	
39	Motor Overload Test	C	Lelangtek
40	Motor Locked Rotor	C	
41	**Strain Relief Test (cord Anchorages)**		
41.2	Strain Relief Pull Test	C	
41.3	Push-Back Test	C	
ENVIRONMENTAL TESTS			
42	**Water Exposure Tests**		
42.1	IPX4 Code Rating	C	
42.2	Partial Immersion	C	
43	Thermal Cycling Test	C	
44	Label Permanence Test	C	
MARKINGS			
45.1	Legible and Permanent Markings (adhesive-backed labels must comply with UL 969)	C	
45.2	Mandatory Markings: Manufacturer's Name, Part #, Model #, Electric Ratings, Max Weight (lbs), and Max Speed (mph)	C	
45.3	Date of Manufacture or Traceable Date Code	C	
45.4	Charging Instructions	C	
45.5	External Terminal and Connections – Proper ID and Polarity Markings	C	
45.6	Separable Battery Pack Specs – "Use only (---) battery pack with this scooter…"	NA	
45.7	Ground Connection Markings	NA	
45.8	Warning for Hazardous Voltage Circuits	NA	
45.9	Warning about reading instruction manual.	C	
45.10	Marks for IPX4 rating not required. Scooters marked with higher IP ratings shall comply with those ratings.	NA	
45.11	Plastic enclosure not evaluated for exposure to UV light and rain per 7.5 shall be marked with the equivalent, "Store Indoors When Not in Use."	NA	
INSTRUCTIONS			
46.1	**SHALL INCLUDE:**		
	Charging Instructions	C	

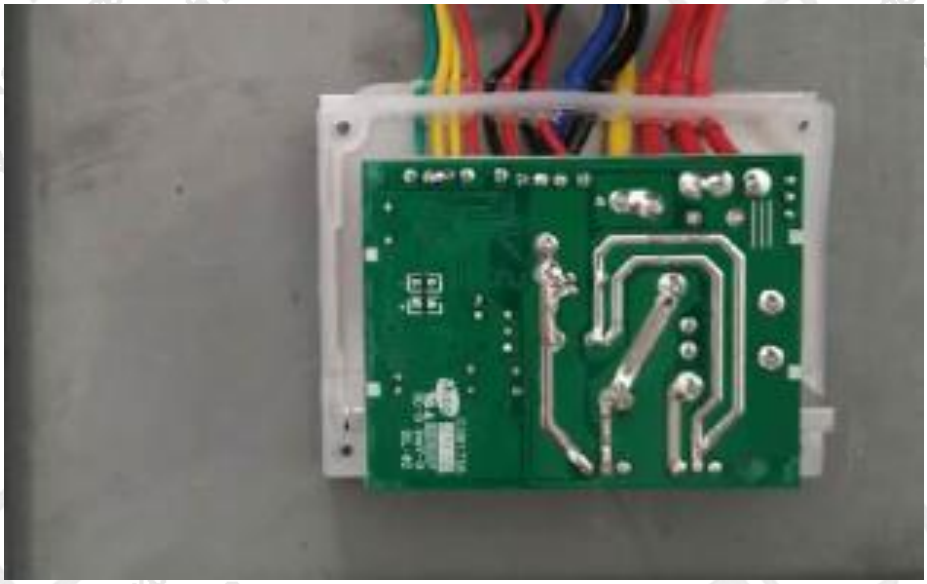
UL 2272 Standard for Electrical Systems for Self-Balancing Scooters			
Ref. #	**Test Description**	**Result**	**Observations and Notes**
	Operating Instructions	C	
	Storage and Disposal Instructions	C	
	Temperature Limits	C	
	Appropriate Charger Specs	C	
	Weight Limits (min and max)	C	
	Max Speed	C	
	Instructions for Water and Other Environmental Exposures	C	
	Instructions for Riding Surface/Terrain, Use on Gradients, etc.	C	
	Instructions for Replaceable Fuses and Light Bulbs	C	
46.2	Removable Battery Pack Instructions	NA	
46.3	Warning about Risk of Fire and Electric Shock – No User Serviceable Parts	C	
46.4	Devices not intended for use in high altitude locations shall indicated that they are not intended for use at elevations greater than 2000 m above sea level.	NA	
43.5	Devices intended for indoor storage shall have a warning about prolonged exposure to UV rays, rain, and other elements that may cause damage to enclosure materials – store indoor when in use	NA	

Battery


CP1270AC
VISION
12V 7Ah (20hr)
Made in China
SHENZHEN CENTER POWER TECH.CO.,LTD.


WARNING

Battery



Internal Battery

Battery Charger

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END OF REPORT