DOE and CEC Energy Conservation Standards for Battery Chargers
Technical Report No. 68.180.24.0062.01
Dated 2024-07-01

Client:	Name: Shenzhen Yunding Information Technology Co., Ltd. Address: 28G, Building 3, Dachong Business Center(Phase 3), No.18, Dachong 1st Road, Dachong Community, Yuehai Street, Nanshan District, 518054 Shenzhen City, Guangdong Province, PEOPLE'S REPUBLIC OF CHINA
Manufacturing place:	Manufacturer's name: same as client Address: same as client Factory's name: Xiamen Smart Tech Healthcare Co., Ltd. Address: The East of 4th Floor, Building Four, No.89, Dingshanzhong Road, Dongfu Street, Haicang District, 361000 Xiamen, Fujian province, PEOPLE'S REPUBLIC OF CHINA
Test Subject:	Product: Oclean Ease Rechargeable Electric Toothbrush Type: N1800 Trade Mark(s): oclean (Oclean)
Test Specification:	☒ DOE: Appendix Y to Subpart B of Part 430, 10 C.F.R.; 10 CFR Part 430 32(z). ☒ CEC: Appendix Y to Subpart B of Part 430, 10 C.F.R. (Federally Regulated Battery Chargers); Appendix Y to Subpart B of Part 430, 10 C.F.R. (Jan. 1, 2017) (State Regulated Battery Chargers); California Code of Regulations Title 20, Division 2, Chapter 4, Article 4, Sections 1601-1605, 1607: Appliance Efficiency Regulations – Battery Chargers and Battery Charger Systems.
Purpose of examination:	Testing and evaluation according to the test specification
Test result:	The test results show that the presented product is in compliance with the specified requirement.

1.1 Function

Oclean Ease Rechargeable Electric Toothbrush

1.2 Model description

Battery charger type:

☒ DOE Battery Charger defined in 10 CFR 430.2

☒ CEC Federally Regulated Battery Charger

☐ CEC State Regulated Battery Charger: Small Battery Charger Systems

☐ CEC State Regulated Battery Charger: Inductive Charger Systems

☒ Single-port, Single-voltage, Single-capacity Charger

☐ Multi-port Charger

☐ Multi-voltage Charger

☐ Multi-capacity Charger

☐ Others:

Battery chemistry:

☐ Valve-Regulated Lead Acid (VRLA) ☐ Flooded Lead Acid ☐ Nickel Cadmium (NiCd)

☐ Nickel Metal Hydride (NiMH) ☒ Lithium Ion (Li-Ion) ☐ Lithium Polymer

☐ Rechargeable Alkaline ☐ Lithium Iron Phosphate ☐ Silver Zinc

☐ Others, please specify:

Product class:	2
Number of the battery of tested battery charger:	1pcs
The manufacturer of the battery:	Huizhou Highpower Technology Co.,Ltd
The model number of the batteries:	14500

1.3 Consideration of the foreseeable misuse

☑ Not applicable

☐ Covered through the applied standard

☐ Covered by the following comment

☐ Covered by attached risk analysis

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1.4 Technical Data

- Ratings input:	Input: 5VDC, 0.5A
- Rated voltage of tested battery (V):	3.7
- Rated charge capacity of tested battery (Ah):	0.575
- Rated charge energy of tested battery (Wh):	2.13
- Number of charger ports:	1

2 Order

2.1 Date of Purchase Order, Customer's Reference

2024-06-11

2.2 Receipt of Test Sample, Location

Samples were received on 2024-05-14, TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch, Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, 518052 Shenzhen, China

2.3 Date of Testing

From 2024-06-13 to 2024-06-27

2.4 Location of Testing

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch,

Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District,

518052 Shenzhen, China

2.5 Points of Non-compliance or Exceptions of the Test Procedure

N/A

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3 Test results

3.1 General test condition

Ambient temperature (°C): (20±5)	23.1
Maximum air speed (m/s): ≤0.5m/s	0.3
For AC input:	
Test frequency tolerance: (±1.0%)	N/A
Maximum THD of voltage: (≤2%)	N/A
Crest factor: (1.34-1.49)	N/A
For DC input, the AC ripple voltage (RMS) shall be	
≤ 0.2 V for DC voltages up to 10 V, or	PASS
≤ 2 percent of the DC voltage for DC voltages over 10 V	N/A

3.2 Test results

Table 1	**DOE Battery Chargers and CEC Federally Regulated Battery Chargers**									**PASS**
Table 1.1	**Power measurement**									
Model	Sample No	U_{Input} (V)	F (Hz)	E_{24} (Wh)	P_m (W)	E_{Batt} (Wh)	t_{cd} (h)	P_{sb} (W)	P_{off} (h)	$UEC_{measured}$ (kWh/year)
N1800	1	5.0	--	3.1479	0.0004	2.4749	24	--	--	0.167
N1800	2	5.0	--	4.1861	0.0027	2.5840	24	--	--	0.396
Supplementary information: - Setting: as shipped - Other Non-Battery-Charger Functions: switch off. - UEC means unit energy consumption.										

Table 1.2	**Calculated value**	
Represented value of E_{Batt} (Wh):	2.529	--
Represented value of E_{24} (Wh):	3.667	--
Represented value of P_m (W):	0.002	--
Represented value of P_{sb} (W):	--	--
Represented value of P_{off} (W):	--	--
Represented value of t_{cd} (h):	24	--
Mean value of UEC (kWh/year):	0.281	--
UEC_{ULC}/1.05 (kWh/year):	1.650	--
Represented value of UEC (kWh/year) (greater than or equal to):	1.650	<=UEC_{max}
UEC_{max} (kWh/year):	3.314	>=$UEC_{measured}$

4 Remark

4.1 Appendix I – Product photo

Appendix II – Marking and Label

Appendix III – Equipment list

5 Documentation

N/A

6 Summary

The test specification(s) is (are) met.

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TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch, TÜV SÜD Group

Engineer:

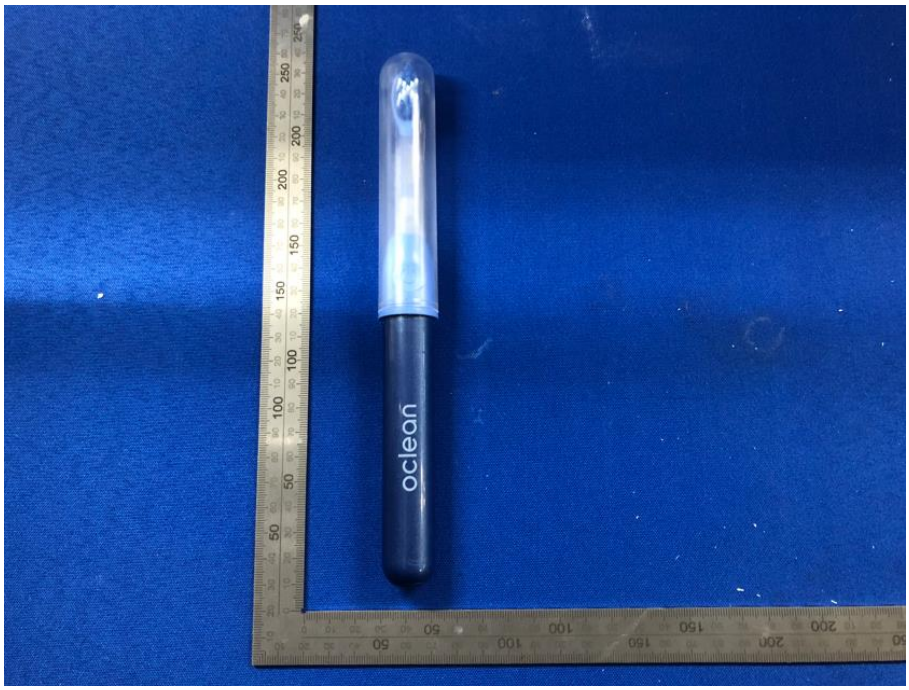
Monica Zhao
Project Handler

Technical report checked:

Tom Du
Designated Reviewer

Appendix I – Product photo

Details of: Overall view (blue enclosure)



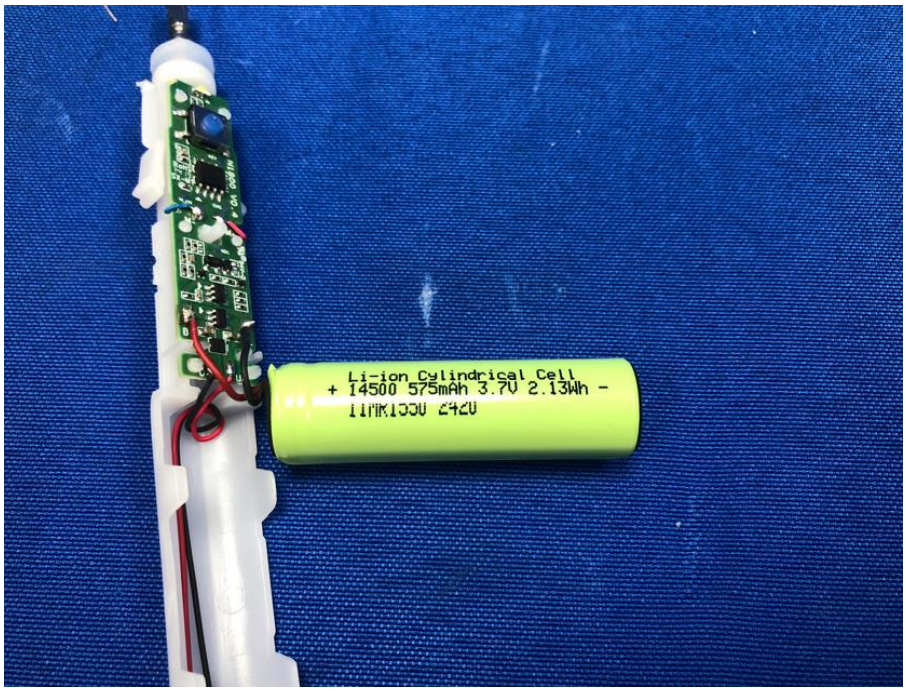
Details of: Overall view (pink enclosure)

Details of: Internal view

Details of: Input terminal view

Details of: Internal view

Details of: Battery view



Details of: Input wire view

Appendix II – Marking and Label

Remark:

SN: XXXXXXXXX2401XXXXXX
24 stands for year 2024; 01 stands for week 1st.

Appendix III – Equipment list

device no.	T-ID	designation	type	serial-no.	calibrated	calibrat. until
68-1-32-19-040	42640	Power Meter	WT310E-C2-H	C3VG28007E	29.01.2024	28.01.2025
68-1-32-20-041	45986	Power Meter	WT310E-C2-H/G5	C3WD27013E	31.08.2023	30.08.2024
68-1-53-20-042	46948	Temperature and humidity recorder	L92-1	200929380	13.11.2023	12.11.2024
68-1-39-18-012	38617	Stop Watch	PC894	-	14.09.2023	13.09.2024
68-1-11-15-004	15798	Anemometer	Testo 417	0052945	25.10.2023	24.10.2024
68-1-47-21-015	51353	Digital Balance	I-2000	-	05.09.2023	04.09.2024
68-1-66-15-003	21042	Battery charging system	CT-3024-60V3A-NTA	T1511-089202	31.08.2023	30.08.2024
68-1-18-20-243	46945	Metal measuring ruler	5m	-	20.11.2020	19.11.2025

– End of Report –