



Energy Performance Test Report

Report Reference No.: REP161249

Tested by: Jerry Liu
(printed name and signature)

Approved by: Zone Peng
(printed name and signature)

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Test Laboratory: Nemko Shanghai Ltd. Shenzhen Branch

Address: 2nd floor of Building 1, Yizhongli Science and Technology Park, No.36
Gaoxin North Third Road, Songpingshan Community, Xili Street, Nanshan
District, Shenzhen, Guangdong, China

Test location: Same as above

Applicant's name: Innovative Eyewear, Inc.

Address: 11900 Biscayne Blvd Suite 630 North Miami, Florida 33181 USA

Test specification

Regulation: NRCan: Amendment 1 through 18 to the Energy Efficiency Regulations for
Battery chargers in the Canada Gazette, Part II
ONTARIO REGULATION 509/18: ENERGY AND WATER EFFICIENCY -
APPLIANCES AND PRODUCTS, includes amendments up to O.Reg 399/24
Canada British Columbia: B.C. Reg. 14/2015, Energy Efficiency Standard
Regulation, Energy Efficiency Act, includes amendments up to B.C. Reg.
106/2023

Standards: New Brunswick Regulation 95-70 as amended by Regulation 2021-53

Standards: CAN/CSA C381.2-17
Appendix Y to Subpart B of Part 430_ Title 10
Appendix Y1 to Subpart B of Part 430_ Title 10

Test Report Form No.: TRF_BCS_202502

Test Report Form(s) Originator: Nemko CN

Master TRF: 2023/01

This test report is based on the content of the internal test program. The test program considered selected clauses of the a.m. standard(s) and experience gained with product testing.

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Test item description: Reebok Nautica Eddie Bauer Lucyd Smart Eyewear

Trademark: Lucyd

Manufacturer: Innovative Eyewear, Inc.
11900 Biscayne Blvd Suite 630 North Miami, Florida 33181 USA

Model name: LCD011, LCD011-10, LCD011-11, LCD011-20, LCD011-21, LCD011-30,
LCD011-40, LCD011-XX

Model number: LCD011, LCD011-10, LCD011-11, LCD011-20, LCD011-21, LCD011-30,
LCD011-40, LCD011-XX

Rating(s) (V; A; Hz): UUT input: 5Vdc, 0.4A or 5Vdc, 0.2A

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Test Standard & Equipment's Information

Test Equipments						
Ref. No	Equipments	Manufacturer	Model	Series No	Cal. Date	Due Date
NSZ2066	AC Power Source	Ainuo	AN97002H	1901970031WA	2025/7/4	2026/7/3
NSZ2015	Digital Power Meter	Yokogawa	WT210	91G849048	2025/7/3	2026/7/2
NSZ2068	Digital Power Meter	Yokogawa	WT210	91G849051	2025/7/3	2026/7/2
NSZ1252	Ambient Recorder /Wifi	Pingyang Miaoguan	TH40W-E	c002202012R1	2025/7/11	2026/7/10
NSZ2048-1	Wind Speed Meter	FLUKE	925	1101653	2025/7/10	2026/7/9
NSZ2073	Battery testing system	Neware	CT-4008-30V3A-A	N/A	2025/7/14	2026/7/13

Statement of Uncertainty	
Statement concerning the uncertainty of the measurement systems used for the tests (may be required by the product standard or client) ☐ Internal procedure used for type testing through which traceability of the measuring uncertainty has been established: Procedure number, issue date and title: Calculations leading to the reported values are on file with the certification body and testing laboratory that conducted the testing. ☒ Statement not required by the standard used for type testing (Note: When the standard requires a statement concerning the uncertainty of the measurement systems used for tests, this should be reported above. The informative text in parenthesis should be delete in both cases after selecting the applicable option)	
Calibration	All instruments used in the tests given in this test report are calibrated and traceable to national or international standards. Further information about traceability will be given on request.
Measurement uncertainty	Measurement uncertainties are calculated for all instruments and instrument set-ups given in this report. Calculations are based on the principles given in the standard EA-4/02, IEC Guide 115:2007 and other relevant internal Nemko-procedures. Further information about measurement uncertainties will be given on request.
Evaluation of results	If not explicitly stated otherwise in the standard, the test is passed if the measured value is equal to or below (above) the limit line, regardless of the measurement uncertainty. If the measured value is above (below) the limit line, the test is not passed - ref IEC Guide 115:2007. The instrumentation accuracy is within limits agreed by IECEE-CTL.

Power Supply Unit Information

Power Supply Unit (PSU), Ambient, Supply voltage, UUT information	
Items	Contents
Power Type	USB
EPS AC-DC/AC-AC:	N/A
Efficiency Level (EPS only):	N/A
EPS manufacture name:	N/A
EPS model name:	N/A
EPS Input rating:	N/A
EPS Output rating:	N/A
Test supply voltage fluctuation:	≤0.5%
THD harmonic in voltage:	≤2%
crest factor:	Selectable for 3 or 6 (≥ 3) for difference range.
accuracy (V):	≤ 1%
accuracy (Hz):	≤ 1%
wattmeter:	≤ 0.5%
resolution:	0.00001W (≤ 10W); 0.001W (10W ≤ W ≤ 100W); 0.01W(>100W)
scanning freq.:	100kHz
Level of confidence at	95% with k=2
Coverage factor	k=2
Ambient Temperature(°C):	23.5 °C
Humidity(%):	45.0 %
Air Speed(m/s):	0.1 m/s
Sample series no.	N/A
Date of receipt of test item	2026/3/24
Date(s) of performance of tests	2026/3/25-2026/3/27
Country of original	China
Model Difference	All models are the same in charger circuit, the only difference among the models are color and appearance. X:0-9,A-Z,a-z
Additional functions unrelated to battery charging	N/A
Additional Information	There are two batteries on the product, one on the left and the other on the right. Therefore, the total current capacity is 145mAh*2=290mAh, and the total energy capacity is 1.12Wh. Tested Model:LCD011

Product Information

General Product Technical Information			
Items	Contents		
End Product	Product Name:	Reebok Nautica Eddie Bauer Lucyd Smart Eyewear	
	Brand:	Lucyd	
	Model number:	LCD011, LCD011-10, LCD011-11, LCD011-20, LCD011-21, LCD011-30, LCD011-40, LCD011-XX	
	Sales name:	N/A	
	BC marking location:	N/A	
Charger	Manufacturer:	N/A	
	Model:	N/A	
	Charger Installation:	Integral	
	Input Rating:	N/A	
	Manual On/Off Switch:	Without	
	Indicator/Charge Information:	With	
	Selection of Charge Rate:	No	
	Multi-Voltage:	No	
	Multi-Ports:	No	
	Multi-Capacity:	No	
	Cell Connection:	Cells in parallel	
	A la carte charger:	No	
	Inductive charger:	No	
	USB-based charger:	Yes	
	Battery backup or UPS:	No	
Battery/Battery Pack documented:		Sample #1	Sample #2
	Manufacturer:	Guangdong Hongjie New Energy Co., Ltd.	Guangdong Hongjie New Energy Co., Ltd.
	Model:	400840A	400840A
	Chemistry:	Lithium Ion (Li-Ion)	Lithium Ion (Li-Ion)
	Rated Voltage (V dc):	3.85 V dc	3.85 V dc
	Rated Current Capacity (mAh):	290 mAh	290 mAh
	Rated Energy Capacity (Wh):	1.12 Wh	1.12 Wh
	Battery Pack:	Integral battery	Integral battery
	Product class	2	2
		Sample #4	Sample #5
	Manufacturer:		
	Model:		
	Chemistry:		
	Rated Voltage (V dc):		
	Rated Current Capacity (mAh):		
	Rated Energy Capacity (Wh):		
	Battery Pack:		
	Product class		
		Sample #7	Sample #8
	Manufacturer:		
	Model:		
	Chemistry:		
	Rated Voltage (V dc):		
	Rated Current Capacity (mAh):		
	Rated Energy Capacity (Wh):		
	Battery Pack:		
	Product class		
		Sample #7	Sample #8
These batteries are selected for test as representatives:		[X] Sample #1	[X] Sample #2
		[] Sample #4	[] Sample #5
		[] Sample #7	[] Sample #8
		[] Sample #3	[] Sample #6
		[] Sample #9	[] Sample #9

Setup, Testing Procedure, Measurement

Items	Contents			Verdict																																
Section 1: Setup for sample before the test																																				
1. Setup is based on factory / default setting.																																				
2. The fastest charge rate is selected for charging if any.																																				
3. If the charger has user controls for selecting special charge cycles that are recommended only for occasional use to preserve battery health, such as equalization charge, removing memory, or battery conditioning, these modes are not required to be tested. The settings of the controls shall be listed in the report for each test.																																				
4. The battery charger and its associated battery should be new products and condition that would be sold to a customer.																																				
5. If the battery is lead-acid chemistry and the battery is to be stored for more than 24 hours between its initial acquisition and testing, the battery shall be charged before such storage.																																				
Section 2: Selection of Batteries To Use for Testing																																				
<table><tr><td colspan="4">Table 3.2.1 - Battery Selection for Testing</td></tr><tr><td colspan="3">Type of charger</td><td>Tests to perform</td></tr><tr><td>Multi-voltage</td><td>Multi-port</td><td>Multi-capacity</td><td>Battery selection (from all configurations of all associated batteries)</td></tr><tr><td>No</td><td>No</td><td>No</td><td>Any associated battery.</td></tr><tr><td>No</td><td>No</td><td>Yes</td><td>Highest charge capacity battery.</td></tr><tr><td>No</td><td>Yes</td><td>Yes or No</td><td>Use all ports. Use the maximum number of identical batteries with the highest nameplate battery charge capacity that the charger can accommodate.</td></tr><tr><td>Yes</td><td>No</td><td>No</td><td>Highest voltage battery.</td></tr><tr><td>Yes</td><td colspan="2">Yes to either or both</td><td>Use all ports. Use the battery or configuration of batteries with the highest individual voltage. If multiple batteries meet this criteria, then use the battery or configuration of batteries with the highest total nameplate battery charge capacity at the highest individual voltage.</td></tr></table>					Table 3.2.1 - Battery Selection for Testing				Type of charger			Tests to perform	Multi-voltage	Multi-port	Multi-capacity	Battery selection (from all configurations of all associated batteries)	No	No	No	Any associated battery.	No	No	Yes	Highest charge capacity battery.	No	Yes	Yes or No	Use all ports. Use the maximum number of identical batteries with the highest nameplate battery charge capacity that the charger can accommodate.	Yes	No	No	Highest voltage battery.	Yes	Yes to either or both		Use all ports. Use the battery or configuration of batteries with the highest individual voltage. If multiple batteries meet this criteria, then use the battery or configuration of batteries with the highest total nameplate battery charge capacity at the highest individual voltage.
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Section 3: Limiting Other Non-Battery-Charger Functions																																				
(a) If the battery charger or product containing the battery charger does not have any additional functions unrelated to battery charging, this subsection may be skipped.																																				
(b) Any optional functions controlled by the user and not associated with the battery charging process (e.g., the answering machine in a cordless telephone charging base) shall be switched off. If it is not possible to switch such functions off, they shall be set to their lowest power-consuming mode during the test.																																				
(c) If the battery charger takes any physically separate connectors or cables not required for battery charging but associated with its other functionality (such as phone lines, serial or USB connections, Ethernet, cable TV lines, etc.), these connectors or cables shall be left disconnected during the testing.																																				
(d) Any manual on-off switches specifically associated with the battery charging process shall be switched on for the duration of the charge, maintenance, and no-battery mode tests, and switched off for the off mode test.																																				

Setup, Testing Procedure, Measurement

Items	Contents			Verdict
Section 4: Accessing the Battery for the Test				
(a) The technician may need to disassemble the end-use product or battery charger to gain access to the battery terminals for the Battery Discharge Energy Test in section 12 of this report. If the battery terminals are not clearly labeled, the technician shall use a voltmeter to identify the positive and negative terminals. These terminals will be the ones that give the largest voltage difference and are able to deliver significant current (0.2 C or 1/hr) into a load.				
(b) All conductors used for contacting the battery must be cleaned and burnished prior to connecting in order to decrease voltage drops and achieve consistent results.				
(c) Manufacturer's instructions for disassembly shall be followed, except those instructions that: (1) Lead to any permanent alteration of the battery charger circuitry or function; (2) Could alter the energy consumption of the battery charger compared to that experienced by a user during typical use, e.g., due to changes in the airflow through the enclosure of the UUT; or (3) Conflict requirements of this test procedure.				
(d) Care shall be taken by the technician during disassembly to follow appropriate safety precautions. If the functionality of the device or its safety features is compromised, the product shall be discarded after testing.				
(e) Some products may include protective circuitry between the battery cells and the remainder of the device. If the manufacturer provides a description for accessing the connections at the output of the protective circuitry, these connections shall be used to discharge the battery and measure the discharge energy. The energy consumed by the protective circuitry during discharge shall not be measured or credited as battery energy.				
(f) If the technician, despite diligent effort and use of the manufacturer's instructions, encounters any of the following conditions noted immediately below, the Battery Discharge Energy and the Charging and Maintenance Mode Energy shall be reported as "Not Applicable": (1) Inability to access the battery terminals; (2) Access to the battery terminals destroys charger functionality; or (3) Inability to draw current from the test battery.				
Section 5: Determining Charge Capacity for Batteries With No Rating				
(a) If there is no rating for the battery charge capacity on the battery or in the instructions, then the technician shall determine a discharge current that meets the following requirements. The battery shall be fully charged and then discharged at this constant-current rate until it reaches the end-of-discharge voltage specified in Table 3.3.2 of this report. The discharge time must be not less than 4.5 hours nor more than 5 hours. In addition, the discharge test (section Battery Discharge Energy Test' of this appendix) (which may not be starting with a fully-charged battery) shall reach the end-of-discharge voltage within 5 hours. The same discharge current shall be used for both the preparations step (section 12 of this report) and the discharge test (section 12 of this report). The test report shall include the discharge current used and the resulting discharge times for both a fully-charged battery and for the discharge test.				
(b) For this section, the battery is considered as "fully charged" when either: it has been charged by the UUT until an indicator on the UUT shows that the charge is complete; or it has been charged by a battery analyzer at a current not greater than the discharge current until the battery analyzer indicates that the battery is fully charged.				
(c) When there is no capacity rating, a suitable discharge current must generally be determined by trial and error. Since the conditioning step does not require constant-current discharges, the trials themselves may also be counted as part of battery conditioning.				
	Sample #1	Sample #2	Sample #3	
Discharge current rate	58 mA	58 mA		
Charge capacity in measurement (Wh)	1.16 Wh	1.15 Wh		
	Sample #4	Sample #5	Sample #6	
Discharge current rate				
Charge capacity in measurement (Wh)				
	Sample #7	Sample #8	Sample #9	
Discharge current rate				
Charge capacity in measurement (Wh)				

Setup, Testing Procedure, Measurement

Items	Contents	Verdict	
Section 6: Determining the Duration of the Charge and Maintenance Mode Test			
(a) The charging and maintenance mode test, described in detail in section 10 of this report, shall be 24 hours in length or longer, as determined by the items below. Proceed in order until a test duration is determined.		Complied	
(1) If the battery charger has an indicator to show that the battery is fully charged, that indicator shall be used as follows: If the indicator shows that the battery is charged after 19 hours of charging, the test shall be terminated at 24 hours. Conversely, if the full-charge indication is not yet present after 19 hours of charging, the test shall continue until 5 hours after the indication is present.		Complied	
(2) If there is no indicator, but the manufacturer's instructions indicate that charging this battery or this capacity of battery should be complete within 19 hours, the test shall be for 24 hours. If the instructions indicate that charging may take longer than 19 hours, the test shall be run for the longest estimated charge time plus 5 hours.		N/A	
(3) If there is no indicator and no time estimate in the instructions, but the charging current is stated on the charger or in the instructions, calculate the test duration as the longer of 24 hours or: $Duration = 1.4 \times \frac{RatedChargeCapacity(Ah)}{ChargeCurrent(A)} + 5h$		N/A	
(b) If none of the above applies, the duration of the test shall be 24 hours.		N/A	
	Sample #1	Sample #2	Sample #3
Selection of criteria	(a)(1)	(a)(1)	
Duration of T cd (hr)	24.00 hr	24.00 hr	
	Sample #4	Sample #5	Sample #6
Selection of criteria			
Duration of T cd (hr)			
	Sample #7	Sample #8	Sample #9
Selection of criteria			
Duration of T cd (hr)			

Setup, Testing Procedure, Measurement

Items	Contents	Verdict
Section 7: Battery Conditioning		
(a)	No conditioning is to be done on lithium-ion batteries. The test technician shall proceed directly to battery preparation, section 8 of this report, when testing chargers for these batteries.	Complied
(b)	Products with integral batteries will have to be disassembled per the instructions in section 4 of this report, and the battery disconnected from the charger for discharging.	Complied
(c)	Batteries of other chemistries that have not been previously cycled are to be conditioned by performing two charges and two discharges, followed by a charge, as below. No data need be recorded during battery conditioning.	N/A
(1)	The test battery shall be fully charged for the duration specified in section 6 of this report or longer using the UUT.	N/A
(2)	The test battery shall then be fully discharged using either:	N/A
(i)	A battery analyzer at a rate not to exceed 1 C, until its average cell voltage under load reaches the end-of-discharge voltage specified in Table 3.3.2 of this appendix for the relevant battery chemistry; or	N/A
(ii)	The UUT, until the UUT ceases operation due to low battery voltage.	N/A
(3)	The test battery shall again be fully charged as in step (c)(1) of this section.	N/A
(4)	The test battery shall again be fully discharged as per step (c)(2) of this section.	N/A
(5)	The test battery shall be again fully charged as in step (c)(1) of this section.	N/A
(d)	Batteries of chemistries, other than lithium-ion, that are known to have been through at least two previous full charge/discharge cycles shall only be charged once per step (c)(5), of this section.	N/A
Section 8: Preparing the Battery for Charge Testing		
	Following any conditioning prior to beginning the battery charge test (section 10 of this report), the test battery shall be fully discharged for the duration specified in section 6 of this report, or longer using a battery analyzer.	Complied
Section 9: Resting the Battery		
	The test battery shall be rested between preparation and the battery charge test. The rest period shall be at least one hour and not exceed 24 hours. For batteries with flooded cells, the electrolyte temperature shall be less than 30 °C before charging, even if the rest period must be extended longer than 24 hours.	Complied
Section 10: Testing Charge Mode and Battery Maintenance Mode		
(a)	The Charge and Battery Maintenance Mode test measures the energy consumed during charge mode and some time spent in the maintenance mode of the UUT. Functions required for battery conditioning that happen only with some user-selected switch or other control shall not be included in this measurement. (The technician shall manually turn off any battery conditioning cycle or setting.) Regularly occurring battery conditioning or maintenance functions that are not controlled by the user will, by default, be incorporated into this measurement.	Complied
(b)	During the measurement period, input power values to the UUT shall be recorded at least once every minute.	Complied
(1)	If possible, the technician shall set the data logging system to record the average power during the sample interval. The total energy is computed as the sum of power samples (in watts) multiplied by the sample interval (in hours).	Complied
(2)	If this setting is not possible, then the power analyzer shall be set to integrate or accumulate the input power over the measurement period and this result shall be used as the total energy.	Complied
(c)	The technician shall follow these steps:	Complied
(1)	Ensure that the user-controllable device functionality not associated with battery charging and any battery conditioning cycle or setting are turned off, as instructed in section 3 of this report;	Complied
(2)	Ensure that the test battery used in this test has been conditioned, prepared, discharged, and rested as described in sections 7 through 9 of this report;	Complied
(3)	Connect the data logging equipment to the battery charger;	Complied
(4)	Record the start time of the measurement period, and begin logging the input power;	Complied
(5)	Connect the test battery to the battery charger within 3 minutes of beginning logging. For integral battery products, connect the product to a cradle or wall adapter within 3 minutes of beginning logging;	Complied
(6)	After the test battery is connected, record the initial time and power (W) of the input current to the UUT. These measurements shall be taken within the first 10 minutes of active charging;	Complied
(7)	Record the input power for the duration of the "Charging and Maintenance Mode Test" period, as determined by section 6 of this report. The actual time that power is connected to the UUT shall be within ±5 minutes of the specified period; and	Complied
(8)	Disconnect power to the UUT, terminate data logging, and record the final time.	Complied



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Items	Contents		Verdict
Section 10: Testing Charge Mode and Battery Maintenance Mode			
	Sample #1	Sample #2	Sample #3
Input Voltage (V)	5V	5V	
Input Frequency (Hz)	DC	DC	
THD of the input voltage (%)	0.00%	0.00%	
Crest factor of the input voltage (CF)	N/A	N/A	
Discharge Start Time	2026/3/25	2026/3/25	
(Date: YYYY-MM-DD, hour: minutes)	12:20	12:20	
Discharge End Time	2026/3/25	2026/3/25	
(Date: YYYY-MM-DD, hour: minutes)	16:10	16:10	
Start time of Measurement Period	2026/3/26	2026/3/26	
(Date: YYYY-MM-DD, hour: minutes)	10:00	10:00	
Initial time of with battery connected	2026/3/26	2026/3/26	
(Date: YYYY-MM-DD, hour: minutes)	10:00	10:00	
Initial power of the input current to the UUT (W) (within first 10 minutes of active charging) (maximum)	4.380 W	4.380 W	
Final time	2026/3/27	2026/3/27	
(Date: YYYY-MM-DD, hour: minutes)	10:00	10:00	
Duration of the Charge and Maintenance Mode Test tcd (hours)	24 hr	24 hr	
Maintenance Mode Average Power, Pm (W)	0.005 W	0.005 W	
24 Hour Charge and Maintenance Energy, E24 (Wh)	1.268 Wh	1.243 Wh	
	Sample #4	Sample #5	Sample #6
Input Voltage (V)			
Input Frequency (Hz)			
THD of the input voltage (%)			
Crest factor of the input voltage (CF)			
Discharge Start Time			
(Date: YYYY-MM-DD, hour: minutes)			
Discharge End Time			
(Date: YYYY-MM-DD, hour: minutes)			
Start time of Measurement Period			
(Date: YYYY-MM-DD, hour: minutes)			
Initial time of with battery connected			
(Date: YYYY-MM-DD, hour: minutes)			
Initial power of the input current to the UUT (W) (within first 10 minutes of active charging) (maximum)			
Final time			
(Date: YYYY-MM-DD, hour: minutes)			
Duration of the Charge and Maintenance Mode Test tcd (hours)			
Maintenance Mode Average Power, Pm (W)			
24 Hour Charge and Maintenance Energy, E24 (Wh)			

Setup, Testing Procedure, Measurement

Items	Contents	Verdict
Section 10: Testing Charge Mode and Battery Maintenance Mode		
	Sample #7	Sample #8
Input Voltage (V)		
Input Frequency (Hz)		
THD of the input voltage (%)		
Crest factor of the input voltage (CF)		
Discharge Start Time		
(Date: YYYY-MM-DD, hour: minutes)		
Discharge End Time		
(Date: YYYY-MM-DD, hour: minutes)		
Start time of Measurement Period		
(Date: YYYY-MM-DD, hour: minutes)		
Initial time of with battery connected		
(Date: YYYY-MM-DD, hour: minutes)		
Initial power of the input current to the UUT (W)		
(within first 10 minutes of active charging) (maximum)		
Final time		
(Date: YYYY-MM-DD, hour: minutes)		
Duration of the Charge and Maintenance Mode Test		
tcd (hours)		
Maintenance Mode Average Power, Pm (W)		
24 Hour Charge and Maintenance Energy, E24 (Wh)		
Section 11: Resting the Battery		
The test battery shall be rested between charging and discharging. The rest period shall be at least 1 hour and not more than 4 hours, with an exception for flooded cells. For batteries with flooded cells, the electrolyte temperature shall be less than 30 °C before charging, even if the rest period must be extended beyond 4 hours.		Complied
Section 12: Battery Discharge Energy Test		
(a) If multiple batteries were charged simultaneously, the discharge energy is the sum of the discharge energies of all the batteries.		Complied
(1) For a multi-port charger, batteries that were charged in separate ports shall be discharged independently.		Complied
(2) For a batch charger, batteries that were charged as a group may be discharged individually, as a group, or in sub-groups connected in series and/or parallel. The position of each battery with respect to the other batteries need not be maintained.		Complied
(b) During discharge, the battery voltage and discharge current shall be sampled and recorded at least once per minute. The values recorded may be average or instantaneous values.		Complied
(c) For this test, the technician shall follow these steps:		Complied
(1) Ensure that the test battery has been charged by the UUT and rested according to the procedures above.		Complied
(2) Set the battery analyzer for a constant discharge rate and the end-of-discharge voltage in Table 3.3.2 of this appendix for the relevant battery chemistry.		Complied
(3) Connect the test battery to the analyzer and begin recording the voltage, current, and wattage, if available from the battery analyzer. When the end-of-discharge voltage is reached or the UUT circuitry terminates the discharge, the test battery shall be returned to an open-circuit condition. If current continues to be drawn from the test battery after the end-of-discharge condition is first reached, this additional energy is not to be counted in the battery discharge energy.		Complied
(d) If not available from the battery analyzer, the battery discharge energy (in watt-hours) is calculated by multiplying the voltage (in volts), current (in amperes), and sample period (in hours) for each sample, and then summing over all sample periods until the end-of-discharge voltage is reached.		Complied



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Items	Contents		Verdict
Section 12: Battery Discharge Energy Test			
	Sample #1	Sample #2	Sample #3
Discharge Start Time	2026/3/27	2026/3/27	
(Date: YYYY-MM-DD, hour: minutes)	11:30	11:30	
Discharge End Time	2026/3/27	2026/3/27	
(Date: YYYY-MM-DD, hour: minutes)	16:30	16:30	
Discharge Start Voltage (V)	4.38 V	4.38 V	
Discharge Current (mA)	58.0 mA	58.0 mA	
End-of-discharge voltage (V)	2.50 V	2.50 V	
Battery Discharge Energy , Eb (Wh)	1.158 Wh	1.152 Wh	
	Sample #4	Sample #5	Sample #6
Discharge Start Time			
(Date: YYYY-MM-DD, hour: minutes)			
Discharge End Time			
(Date: YYYY-MM-DD, hour: minutes)			
Discharge Start Voltage (V)			
Discharge Current (mA)			
End-of-discharge voltage (V)			
Battery Discharge Energy , Eb (Wh)			
	Sample #7	Sample #8	Sample #9
Discharge Start Time			
(Date: YYYY-MM-DD, hour: minutes)			
Discharge End Time			
(Date: YYYY-MM-DD, hour: minutes)			
Discharge Start Voltage (V)			
Discharge Current (mA)			
End-of-discharge voltage (V)			
Battery Discharge Energy , Eb (Wh)			

Setup, Testing Procedure, Measurement

Items	Contents	Verdict
Section 13: Standby Mode Energy Consumption Measurement		
The standby mode measurement depends on the configuration of the battery charger, as follows.		N/A
(a) Conduct a measurement of standby power consumption while the battery charger is connected to the power source. Disconnect the battery from the charger, allow the charger to operate for at least 30 minutes, and record the power (i.e., watts) consumed as the time series integral of the power consumed over a 10-minute test period, divided by the period of measurement. If the battery charger has manual on-off switches, all must be turned on for the duration of the standby mode test.		N/A
(b) Standby mode may also apply to products with integral batteries. If the product uses a cradle and/or adapter for power conversion and charging, then "disconnecting the battery from the charger" will require disconnection of the end-use product, which contains the batteries. The other enclosures of the battery charging system will remain connected to the main electricity supply, and standby mode power consumption will equal that of the cradle and/or adapter alone.		N/A
(c) If the product is powered through a detachable AC power cord and contains integrated power conversion and charging circuitry, then only the cord will remain connected to mains, and standby mode power consumption will equal that of the AC power cord (i.e., zero watts).		N/A
(d) Finally, if the product contains integrated power conversion and charging circuitry but is powered through a non-detachable AC power cord or plug blades, then no part of the system will remain connected to mains, and standby mode measurement is not applicable.		N/A
	Sample #1	Sample #2
Test Duration:	N/A	N/A
Standby (No Battery) Mode Power, P _{sb} (W)	0.000 W	0.000 W
	Sample #4	Sample #5
Test Duration:		
Standby (No Battery) Mode Power, P _{sb} (W)		
	Sample #7	Sample #8
Test Duration:		
Standby (No Battery) Mode Power, P _{sb} (W)		

Setup, Testing Procedure, Measurement

Items	Contents	Verdict
Section 14: Off Mode Energy Consumption Measurement		
The off mode measurement depends on the configuration of the battery charger, as follows.		N/A
(a) If the battery charger has manual on-off switches, record a measurement of off mode energy consumption while the battery charger is connected to the power source. Remove the battery from the charger, allow the charger to operate for at least 30 minutes, and record the power (i.e., watts) consumed as the time series integral of the power consumed over a 10-minute test period, divided by the period of measurement, with all manual on-off switches turned off. If the battery charger does not have manual on-off switches, record that the off mode measurement is not applicable to this product.		N/A
(b) Off mode may also apply to products with integral batteries. If the product uses a cradle and/or adapter for power conversion and charging, then "disconnecting the battery from the charger" will require disconnection of the end-use product, which contains the batteries. The other enclosures of the battery charging system will remain connected to the main electricity supply, and off mode power consumption will equal that of the cradle and/or adapter alone.		N/A
(c) If the product is powered through a detachable AC power cord and contains integrated power conversion and charging circuitry, then only the cord will remain connected to mains, and off mode power consumption will equal that of the AC power cord (i.e., zero watts).		N/A
(d) Finally, if the product contains integrated power conversion and charging circuitry but is powered through a non-detachable AC power cord or plug blades, then no part of the system will remain connected to mains, and off mode measurement is not applicable.		N/A
	Sample #1	Sample #2
Test Duration: (hour: minute)	N/A	N/A
Off Mode Power, P _{off} (W)	0.000 W	0.000 W
	Sample #4	Sample #5
Test Duration: (hour: minute)		
Off Mode Power, P _{off} (W)		
	Sample #7	Sample #8
Test Duration: (hour: minute)		
Off Mode Power, P _{off} (W)		

Setup, Testing Procedure, Measurement

Items	Contents		Verdict
Section 15: Unit Energy Consumption (UEC) Calculation			
Unit energy consumption (UEC) shall be calculated for a battery charger using one of the two equations (equation (i) or equation (ii)) listed in this section. If a battery charger is tested and its charge duration as determined in section 6 of this report minus 5 hours is greater than the threshold charge time listed in table 3.3.3 of this appendix (i.e. $(t_{cd} - 5) \cdot n > t_{a\&m}$), equation (ii) shall be used to calculate UEC; otherwise a battery charger's UEC shall be calculated using equation (i).			Pass
$(i) \ UEC = 365(n(E_{24} - 5P_m - E_{batt}) \frac{24}{t_{cd}} + (P_m(t_{a\&m} - (t_{cd} - 5)n) + (P_{sb}t_{sb}) + (P_{off}t_{off}))) \text{ or,}$			
$(ii) \ UEC = 365(n(E_{24} - 5P_m - E_{batt}) \frac{24}{(t_{cd}-5)} + (P_{sb}t_{sb}) + (P_{off}t_{off}))$			
	Sample #1	Sample #2	Sample #3
E 24	1.268 Wh	1.243 Wh	
E batt	1.158 Wh	1.152 Wh	
P m	0.005 W	0.005 W	
P sb	0.000 W	0.000 W	
P off	0.000 W	0.000 W	
t cd	24.00 hr	24.00 hr	
t a&m	7.82 hr	7.82 hr	
n	0.54	0.54	
T sb	5.29 hr	5.29 hr	
T off	0.00 hr	0.00 hr	
UEC	0.021 kWh/yr	0.016 kWh/yr	
UEC limit	3.117 kWh/yr	3.116 kWh/yr	
Verdict	Pass	Pass	
	Sample #4	Sample #5	Sample #6
E 24			
E batt			
P m			
P sb			
P off			
t cd			
t a&m			
n			
T sb			
T off			
UEC			
UEC limit			
Verdict			
	Sample #7	Sample #8	Sample #9
E 24			
E batt			
P m			
P sb			
P off			
t cd			
t a&m			
n			
T sb			
T off			
UEC			
UEC limit			
Verdict			

Conclusion

Items	Contents	Verdict
Result based on sampling size: Select the batteries that are tested in group. (max. 3 groups can be selected to further calculate represented UEC, each group with max. 6 battery sample)	Sample No.	Pass
	Sample Group (A, B, C)	
	UEC	
	Sample #1	
	A	
	0.021	
	Sample #2	
	A	
	0.016	
	Sample #3	
	N/A	
	Sample #4	
	N/A	
	Sample #5	
	N/A	
	Sample #6	
	N/A	
	Sample #7	
	N/A	
	Sample #8	
	N/A	
	Sample #9	
	N/A	

Sample Group A						
Represented value						
t _{cd} Duration of the charge and maintenance mode test (hour)			24.00			
E ₂₄ 24-hour energy consumption (Wh)			1.26			
E _{batt} Battery energy (Wh)			1.16			
P _m Maintenance mode power (W)			0.005			
P _{sb} Standby/no-battery mode (W)			0.000			
P _{off} Off mode power (W)			0.000			
Mean value of UEC	Standard deviation (s)	Number of sample (n)	t for 97.5% confidence	UCL	UCL/1.05	Conclusion of UEC
0.019	0.003	2	12.706	0.049	0.047	
Represented UEC value (Highest of Mean of sample or UCL/1.05)			Represented UEC limit			Pass
0.047 kWh/yr			3.116 kWh/yr			

Sample Group B						
Represented value						
t _{cd} Duration of the charge and maintenance mode test (hour)			N/A			
E ₂₄ 24-hour energy consumption (Wh)			N/A			
E _{batt} Battery energy (Wh)			N/A			
P _m Maintenance mode power (W)			N/A			
P _{sb} Standby/no-battery mode (W)			N/A			
P _{off} Off mode power (W)			N/A			
Mean value of UEC	Standard deviation (s)	Number of sample (n)	t for 97.5% confidence	UCL	UCL/1.05	Conclusion of UEC
N/A	N/A	N/A	N/A	N/A	N/A	
Represented UEC value (Highest of Mean of sample or UCL/1.05)			Represented UEC limit			N/A
N/A						

Sample Group C						
Represented value						
t _{cd} Duration of the charge and maintenance mode test (hour)			N/A			
E ₂₄ 24-hour energy consumption (Wh)			N/A			
E _{batt} Battery energy (Wh)			N/A			
P _m Maintenance mode power (W)			N/A			
P _{sb} Standby/no-battery mode (W)			N/A			
P _{off} Off mode power (W)			N/A			
Mean value of UEC	Standard deviation (s)	Number of sample (n)	t for 97.5% confidence	UCL	UCL/1.05	Conclusion of UEC
N/A	N/A	N/A	N/A	N/A	N/A	
Represented UEC value (Highest of Mean of sample or UCL/1.05)			Represented UEC limit		N/A	
N/A			N/A			

Reference Table

Table 3.3.2 - Required Battery Discharge Rates and End-of-Discharge Battery Voltages

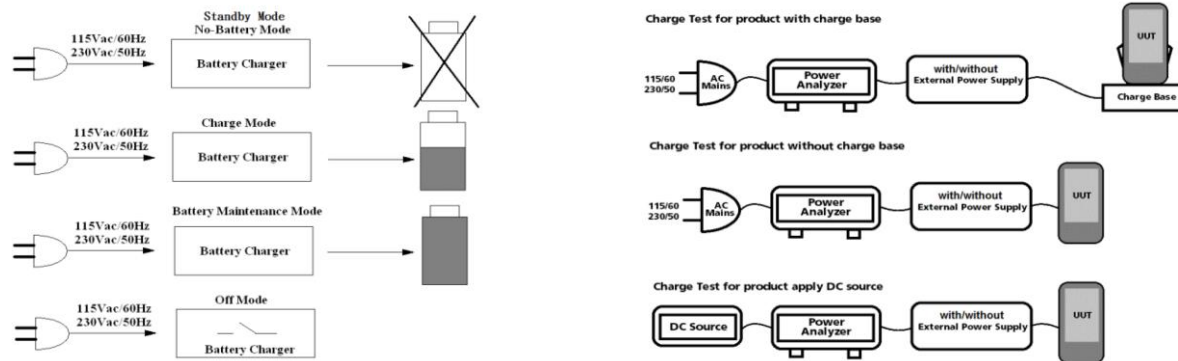
Battery chemistry	Discharge rate (C)	End-of-discharge voltage * (volts per cell)
Valve-Regulated Lead Acid (VRLA)	0.2	1.75
Flooded Lead Acid	0.2	1.70
Nickel Cadmium (NiCd)	0.2	1.0
Nickel Metal Hydride (NiMH)	0.2	1.0
Lithium Ion (Li-Ion)	0.2	2.5
Lithium Polymer	0.2	2.5
Rechargeable Alkaline	0.2	0.9
Nanophosphate Lithium Ion	0.2	2.0
Silver Zinc	0.2	1.2

Table 3.3.3 - Battery Charger Usage Profiles

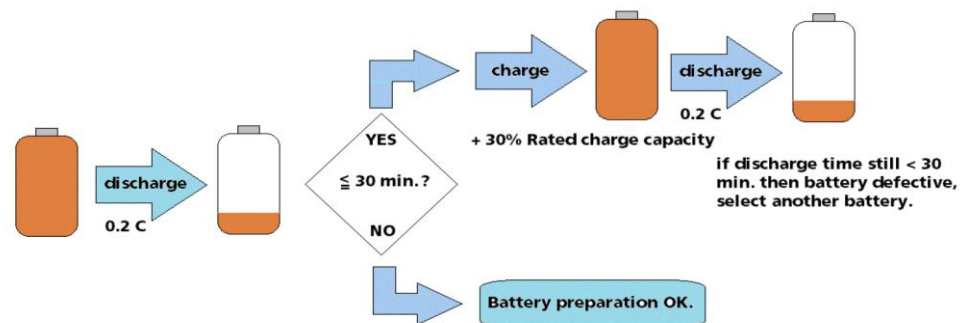
Product class				Hours per day ***			Charges (n)	Threshold charge time *
Number	Description	Rated battery energy (ebatt) **	Special characteristic or battery voltage	Active + maintenance (t _{a&m})	Standby (t _{sb})	Off (t _{off})	Number per day	Hours
1	Low-Energy	≤5 Wh	Inductive Connection ****	20.66	0.10	0.00	0.15	137.73
2	Low-Energy, Low-Voltage	<100 Wh	<4 V	7.82	5.29	0.00	0.54	14.48
3	Low-Energy, Medium-Voltage		4-10 V	6.42	0.30	0.00	0.10	64.20
4	Low-Energy, High-Voltage		>10 V	16.84	0.91	0.00	0.50	33.68
5	Medium-Energy, Low-Voltage	100-3000 Wh	<20 V	6.52	1.16	0.00	0.11	59.27
6	Medium-Energy, High-Voltage		≥20 V	17.15	6.85	0.00	0.34	50.44
7	High-Energy	>3000 Wh		8.14	7.30	0.00	0.32	25.44

Test Configuration Illustration

Test Configuration



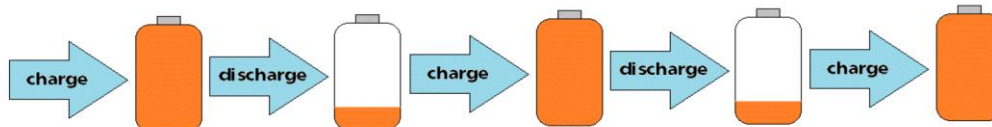
Battery Preparation



Battery Condition

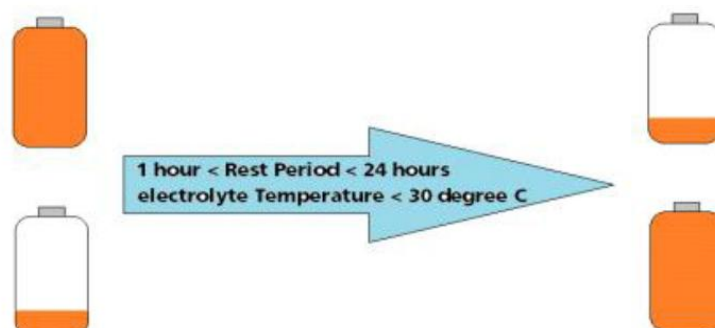
1. no conditioning process for Lead-acid or Lithium batteries.

2. NiCd or NiMH batteries conditioning:



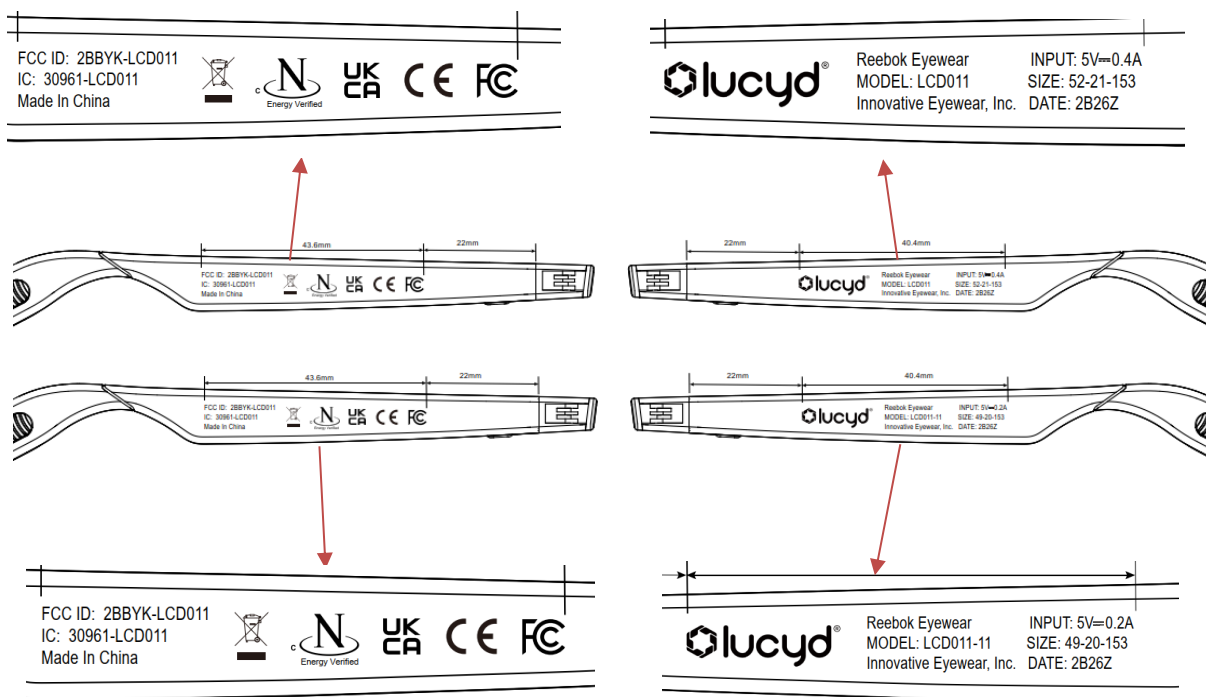
- * Either battery analyzer or UUT may be used for battery conditioning.
- * If battery know to have been through at least two previous full charge/discharge cycles then shall be charged only once.
- * Conditioning procedure apply to erase the memory effect.

Battery Rest Period between Charge/Discharge



Nameplate

UUT label



Battery label



Photos



Photos



---End of Test Report---