

INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY

[A Division of NATRiP Implementation Society (NATIS), Govt. of India]

Non-Transferable

TEST REPORT

ULR No.: TC536020010000038P
Test Report No.: C T 0 B P 5 0 9 9

Date: 09.06.2020

1.0 NAME AND ADDRESS OF THE:
CUSTOMER

M/s. Okaya Power Private Limited
D-8 Udyog Nagar, Rohtak Road,
New Delhi-110041

1.1 NAME AND ADDRESS OF THE:
MANUFACTURER

M/s. Sunoxx International
Vill. Panjhera, Nalagarh-Swarghat Road,
Tehsil Nalagarh, Distt. Solan, Himachal Pradesh -174101
IOCS No. CCTNOKYAPFEEL95699 Dated 17-May-2020

2.0 CUSTOMER LETTER REF :

IOCS No. CCTNOKYAPFEEL95699 Dated 17-May-2020

3.0 DESCRIPTION OF DEVICE UNDER TEST (DUT):

DUT Name	Battery Pack, 12 V
Battery Type	Lead Acid
Battery Capacity(Ah)	90 Ah (Ah in 5 hrs)
Rated Voltage	12 V DC
Id/Model No.	OTER 16006
Quantity	06 Nos. of Battery Pack (ICAT/EEL/95699/01-06)
Trade Name	OKAYA
Drawing No.	DW-1043-00

4.0 DATE OF RECEIPT OF SAMPLE : 19.05.2020

5.0 CONDITION OF SAMPLE: No physical damage observed.

6.0 TEST OBJECTIVE:

To validate the safety requirements of traction battery as per AIS:048 as amended upto date.

7.0 TEST METHOD: Test method referred from AIS:048 as amended upto date.

8.0 ANY DEVIATION OR EXCLUSION FROM TEST METHOD: Not applicable.

9.0 FUNCTIONAL VERIFICATION: Functional verification done and battery was found satisfactory.




10.0 CONCLUSION: The battery pack specified in Sr.No.3.0 of this test report met all the test requirements when tested as per AIS:048 as amended upto date as mentioned in Annexure-I of this report.


11.0 TEST DESCRIPTION: Please refer the Annexure-I of this report.


12.0 DATE OF PERFORMANCE OF TEST: Please refer the Annexure-I of this report.

13.0 TEST RESULTS: Please refer the Test requirements and Results in Annexure-I of this report.

14.0 LOCATION OF TEST: ICAT CENTRE-I.

Prepared By	Checked By	Approved By
		
UDIT KAUL Dy. Manager	MAHENDAR PAL Asst. General Manager	PAMELA TIKKU Sr. General Manager








Page
01 of 07
+
Dwg. (01)
[95699]

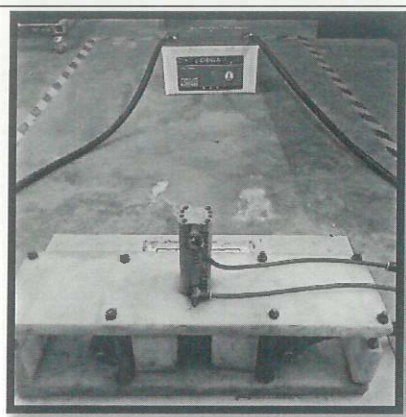
DISCLAIMER

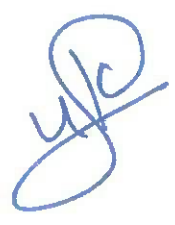


1. ICAT issues Test reports/ Extension reports/ Developmental Reports for vehicles/ parts/ components/ assemblies etc. based on the documents produced and/or prototype / vehicle(s) or sample(s) submitted by the applicant and testing thereof.
2. ICAT issues Test reports/ Extension reports/ Developmental Reports in compliance to Motor Vehicle Act/ Central Motor Vehicle Rules and their provisions as amended from time to time or any other statutory orders under which ICAT is authorized. Other Rules/Acts are outside the purview/scope of the Test reports/Extension reports/ Developmental test reports
3. Test(s) on prototype/ vehicle(s)/ sample(s) is/are carried out on the basis of standard procedures as notified under specific rules/ requested by the applicant. Results of such tests are property of bearer of Test Reports/ Extension Reports / Developmental test reports. These results cannot be disclosed unless specifically so ordered by Government, Court, etc
4. Unless otherwise supported by a separate Certificate, this Test report Extension Reports / Developmental test reports shall not be considered in isolation as valid Type approval for any vehicle
5. ICAT is not responsible for testing each vehicles/ parts/assemblies etc. for which Test Reports/ Extension reports/ Developmental test reports is issued. Further, ICAT is not responsible for ensuring manufacturing quality of the vehicles/ components/ parts/ assemblies etc. for which the Test Reports/ Extension reports/ Developmental test reports is /are issued.
6. ICAT is no way responsible for any misuse or copying any design/type/system in connection with entire vehicle/ components/parts and assemblies covered under the Test Reports/ Extension reports/ Developmental test reports is /are issued
7. Breach of any statutory provisions, of Indian laws or laws of other countries, will be sole responsibility of the customer. ICAT shall not be liable for any claims or damages made by the customer, whatsoever. The customer shall alone be liable for the same and undertakes to indemnify ICAT in this regard
8. Further, ICAT has the right, but not under obligation to initiate cancellation / withdrawal of the Test report/Extension/ Developmental test report is/are issued, in case of any fraud, misrepresentation, when it surfaces and comes in the knowledge of ICAT
9. No extract, abridgment or abstraction from this test report may be published or used to advertise the product without the written consent of the Director, ICAT, who reserves the absolute right to agree or reject all or any of the details of any items of publicity for which consent may be sought The appropriate local court at Gurugram shall have the jurisdiction in respect of any dispute, claim or liability arising out of this report.

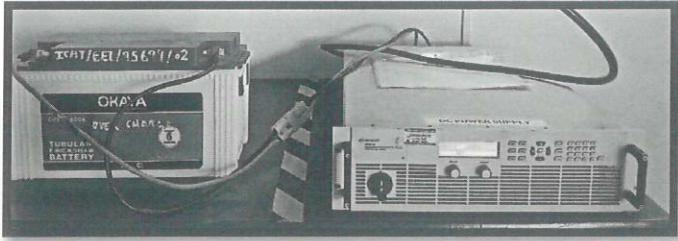
Prepared By		Checked By	Page 02 of 07 + Dwg(01) [95699]
			
UDIT KAUL Dy. Manager		MAHENDAR PAL Asst. General Manager	




Annexure-I

1.0 TEST REQUIREMENTS AND RESULTS:

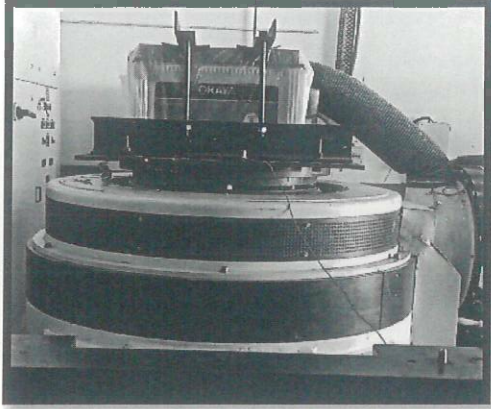
Cl. No.	Test	Test Description	Observations/Results
2.1 Electrical Tests			
2.1.1	<p>Short Circuit test (Test ID:ICAT/ EEL /95699/01) Date of Test : 21.05.2020</p>	 <p>Battery Condition: Fully charged (100% SOC), contained at ambient temperature. Apply a hard short in less than one second to the battery module with a conductor specified in the standard. Test Duration: 10 minutes, or until another condition occurs which prevents completion of test (i.e. component melting, etc.) Lab temperature: Not exceeding 30°C</p> <p>Acceptance Criteria: After 2 hours of observation: At the end of the test, there shall be no: a) Physical damage to the casing or mechanical parts. b) Melting of components. c) Fire or explosion. It is acceptable for the battery to become dry at the end of the test.</p>	<p>Ambient temperature : 27°C</p> <p>Conductor of ≤ 5mΩ was used and short was applied for 10 minutes.</p> <p>No physical damage, explosion or melting observed.</p> <p>Satisfactory.</p>



<p>Prepared By</p>  <p>UDIT KAUL Dy. Manager</p>		<p>Checked By</p>  <p>MAHENDAR PAL Asst. General Manager</p>	<p>Page 03 of 07 + Dwg(01) [95699]</p>
--	---	---	--

2.1.2	<p>Over Charge test (Test ID: ICAT/ EEL /95699/02) Date of Test : 22.05.2020</p>		<p>Battery Condition: Fully charged (100% SOC), contained at ambient temperature at 27±5°C. Duration: 10 hours The battery is to be overcharged at a constant charging current of 0.1 (C₁₀). Acceptance Criteria: At the end of the test, there shall be no: a) Physical damage to the casing or other mechanical parts. b) Melting of components. c) Fire or explosion.</p>	<p>Battery pack was charged with 9 A for 10 hours.</p> <p>No physical damage, melting or explosion observed.</p> <p>Satisfactory.</p>
-------	---	--	---	--

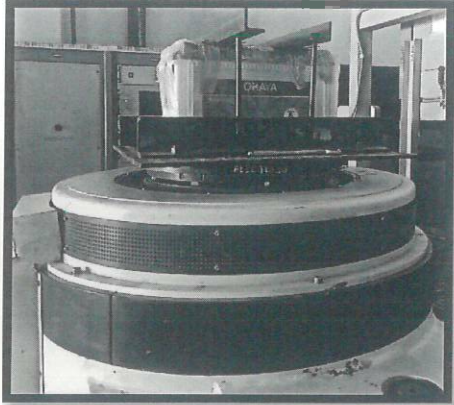
Prepared By	Checked By	
		
UDIT KAUL Dy. Manager		
	MAHENDAR PAL Asst. General Manager	Page 04 of 07 + Dwg(01) [95699]




2.2 Mechanical Tests

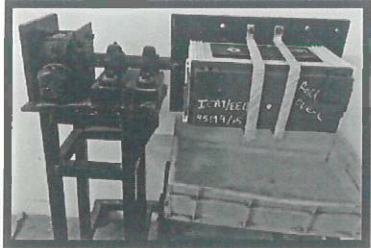
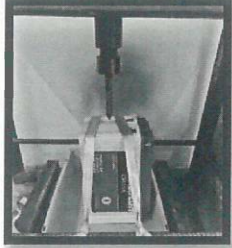
2.2.1	<p>Vibration test (Test ID:ICAT/ EEL /95699/03) Date of test : 28.05.2020</p>	 <p>Battery Condition: Fully charged (100% SOC), contained at ambient temperature, firmly held on the vibration table in vehicle mounting position. Vibration test will be carried out in three-axis viz. in the vertical axis, horizontal axis and battery positioned in longitudinal direction. Acceleration: 3 g (sinusoidal vibration) Frequency: 30-150 Hz Sweep rate: 1 octave per minute Duration: 2 hours in each axis Immediately after the test, discharge the battery at room temperature not exceeding 30°C, at the rate of $I = 0.2 \times \text{Battery capacity}(C_5)$</p> <p>Acceptance Criteria: During test, there shall be no electrolyte loss. The deterioration of battery rated capacity during discharging shall not be more than 10%. At the end of the test, there shall be no: a) Physical damage to the casing or other mechanical parts b) Fire or explosion</p>	<p>No electrolyte loss observed during test. Immediately after the test, battery was discharged at 18 A And deterioration observed was not more than 10%.</p> <p>No physical damage or explosion observed.</p> <p>Satisfactory.</p>
-------	--	---	--




Prepared By	Checked By	
		
<p>UDIT KAUL Dy. Manager</p>	<p>MAHENDAR PAL Asst. General Manager</p>	<p>Page 05 of 07 + Dwg(01) [95699]</p>



2.2.2	<p>Shock test (Test ID: ICAT/ EEL /95699/04) Date of test: 26.05.2020</p>		<p>Immediately after the test, battery was discharged at 18 A and deterioration observed was not more than 10%.</p> <p>No physical damage or explosion observed.</p> <p>Satisfactory.</p>
		<p>Battery Condition: Fully charged (100% SOC), contained at ambient temperature not exceeding 30°C, firmly held on the vibration table in vehicle mounting position.</p> <p>Shock test will be carried out in three-axis viz. in the vertical axis, horizontal axis and battery positioned in longitudinal direction.</p> <p>Acceleration: 30 g (half-sine wave) No. of shocks: 10 in each axis Duration: 15 ms of each shock</p> <p>Immediately after the test, discharge the battery at room temperature, at the rate of $I = 0.2 \times \text{Battery capacity}(C_5)$</p> <p>Acceptance Criteria: The deterioration of battery rated capacity during discharging shall not be more than 10%. At the end of the test, there shall be no:</p> <p>a) Physical damage to the casing or other mechanical parts b) Fire or explosion.</p>	

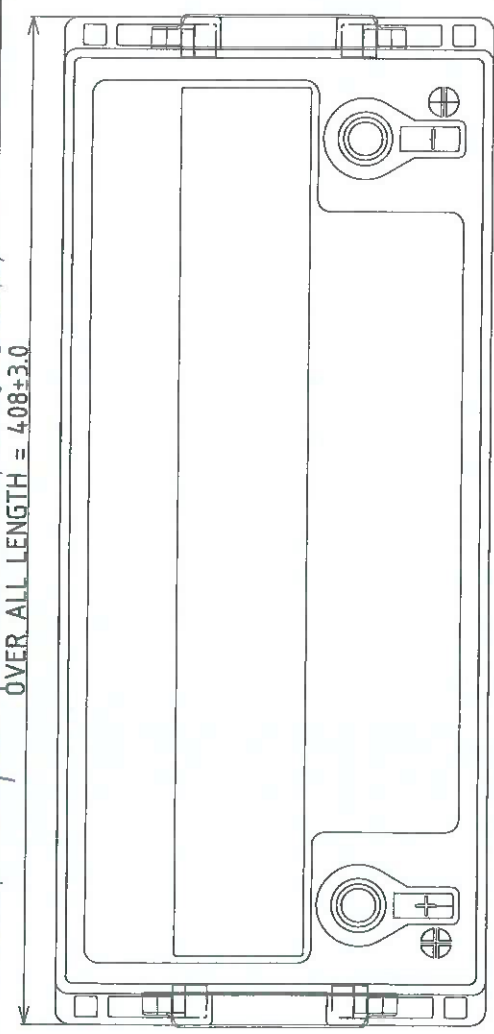
Prepared By		Checked By	
			
UDIT KAUL Dy. Manager		MAHENDAR PAL Asst. General Manager	Page 06 of 07 + Dwg(01) [95699]

<p>2.2.3</p>	<p>Roll-Over Test (Test ID: ICAT/EEL/95699/05) Date of test : 22.05.2020</p>	 <p>Rotate the battery module one complete revolution in one direction, for one minute in a continuous, slow-roll fashion, and observe leakage, if any. Then rotate the battery module in 90° increments in same direction for one full revolution. Hold the battery module for one hour at each position. Acceptance Criteria: The volume of electrolyte spilled in each position shall not be more than 25 ml per module.</p>	<p>Spillage observed was less than 25ml in each position. Satisfactory.</p>
<p>2.2.4</p>	<p>Penetration Test (Test ID: ICAT/ EEL /95699/06) Date of test 01.06.2020</p>	 <p>The battery Cell shall be penetrated with a mild steel (conductive) pointed rod, which will be electrically insulated from the test fixture. The test will be carried out with 100% SOC of the Battery cell/Battery module. Rate of penetration: 8 cm/s. Diameter of Rod: 20mm Orientation of penetration: perpendicular to the electrode plates. Minimum Depth of penetration: Through three cells or 100 mm The battery Cell should be observed, with the rod remaining in place, for a minimum of one hour after the test. Acceptance Criteria: At the end of the test, there shall be no: a) Melting of components. b) Fire or explosion.</p>	<p>After penetration, up to a depth through pack with a pointed mild steel rod of diameter 20mm, electrically insulated from the test fixture, no explosion, no fire and no melting observed. Satisfactory.</p>

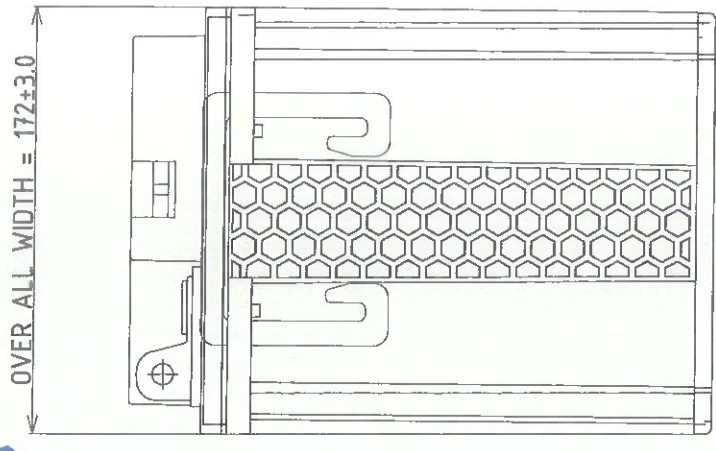
<p>Prepared By</p> 		<p>Checked By</p> 	<p>Page 07 of 07 + Dwg(01) [95699]</p>
<p>UDIT KAUL Dy. Manager</p>		<p>MAHENDAR PAL Asst. General Manager</p>	

Test report No: CT08P5099
 Dated: 09.06.2020

MARK	REV. NO	REVISED BY	DATE
△			



NOTE
 CONTAINER MATERIAL : POLYPROPYLENE
 1. TYPE OF BATTERY : LEAD ACID BATTERY - TUBULAR
 2. NOMINAL VOLTAGE : 12
 3. CAPACITY (Ah) : 90Ah@C5 CORRECTED AT 30°C
 4. TERMINAL POLARITY : RIGHT
 5. SUITABLE APPLICATION : ELECTRIC VEHICLE



DESIGN	DRAWN	CHECKED	APPROVED	DATE	SCALE	PART MATL.	DESCRIPTION	PART WEIGHT
RAJESH	RAJESH	M.SHETTY		20-02-2020	1:1			
				UNSPECIFIED DRAFT ANGLE 15°-30°		SPECIFICATION NO.		REVISION
UNSPECIFIED TOLERANCE				UNSPECIFIED RADIUS 0.2		SP.MIS-1300		
UNDER 4				UNSPECIFIED RADIUS 0.2		PART NAME.		DRG. NO.
OVER 4 UNDER 15				ALL DIMENSIONS ARE IN MM		FINISHED BATTERY FOR OTER 16006		DW-1043-00
OVER 15 UNDER 43				IF IN DOUBT PLEASE ASK				SHEET
OVER 43 UNDER 250				DO NOT SCALE THE DRG.				
OVER 250				±0.5				
Z.PAGE								

OKAYA POWER LTD
 D-7, UDYOG NAGAR, ROHTAK ROAD
 NEW DELHI - 110041

Page 1 of 1