TÜV America Inc.
1866 New Energy Way
Auburn Hills, MI 48326

Phone: (248) 393-6984
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www.tuvsud.com/en-us

CERTIFICATE #2955.03
TESTING LABORATORY

BCIS-21 Vibration Test

TEST REPORT

PREPARED FOR:

Benny Jay

Terra Supreme Battery
1563 E State Road 8
Albion, Indiana 46701
benny.jay@terrasupremebattery.com
-

August 6, 2026
TÜV Job Number: 721023372
PO Number: 004338-00

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REVISION HISTORY

Date:	***Comment:***
06 August, 2026	Original release of test report 721023372.

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TESTING CERTIFICATE
#2955.03

BCIS-21 Vibration Test

Benny Jay
Terra Supreme Battery
1563 E State Road 8
Albion, Indiana 46701

PURCHASE ORDER: 004338-00 **TÜV JOB#: 721023372**

PRODUCTS TESTED:

Table 1: Sample Inventory

Battery Number	Group Number
Sample Number 1	Group 31 AGM

DATES TESTED:

Table 2: Test Dates

Test #	Test Description	Start Date	End Date
1	BCIS-21 Vibration Test	8/3/2026	8/5/2026

TEST PROCEDURE:

Testing was performed per TÜV SÜD quotation Q-000089379 and per BCIS-21 (2020) and information received via e-mail on July 16, 2026

7.0 VIBRATION TEST

7.1 The first test performed should be the Vibration Test.

7.2 49 CFR 173.159 (f)(1) states: "The battery must be rigidly clamped to the platform of a vibration machine, and a simple harmonic motion having an amplitude of 0.8 mm (0.031 inches), with a 1.6 mm (0.063 inches) maximum total excursion must be applied. The frequency must be varied at the rate of 1 Hz/min between the limits of 10 Hz to 55 Hz. The entire range of frequencies and return must be traversed in 95 ±5 minutes for each mounting position (direction of vibrator) of the battery. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for equal time periods"

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TEST PROCEDURE: (continued)

7.3 When mounting the battery (Figure 1), it is important to use nonconductive solid (non-deforming) plates on the top and bottom in order to prevent short circuiting the battery. There should be through holes sufficient to keep the weight from being placed on the terminals. Also, additional through holes must be added where needed to keep any ventilation holes in the battery accessible to the open air. When tightening the apparatus be sure the battery is secure, but the pressure should not be such that the battery becomes deformed or distorted.

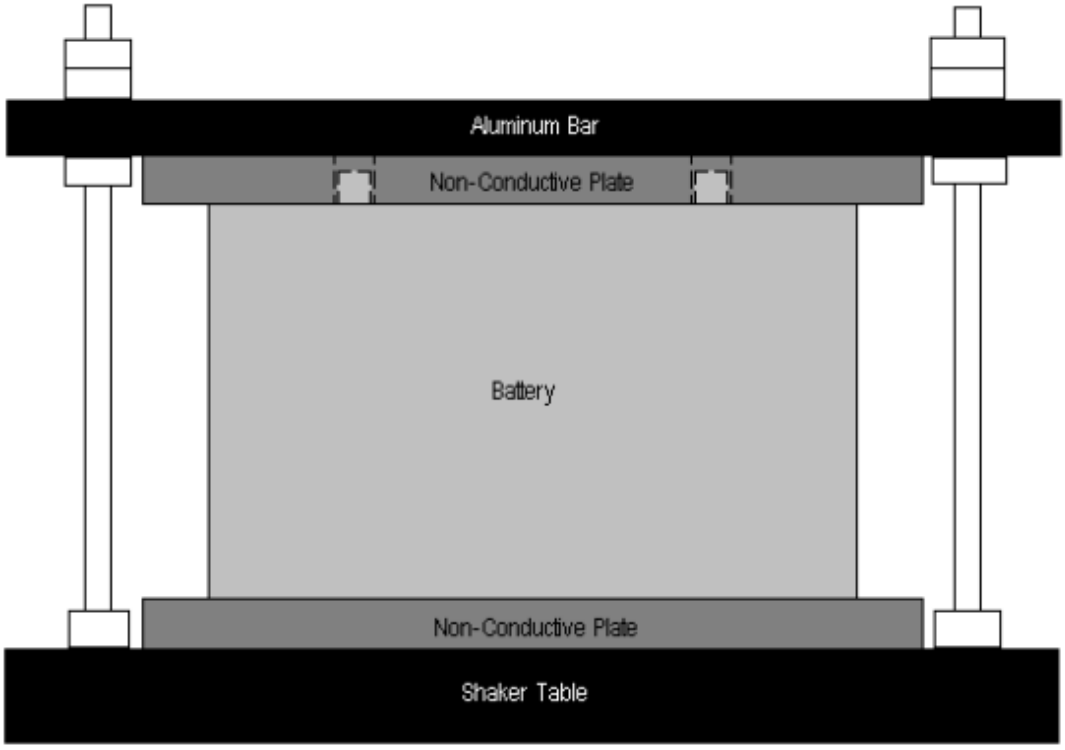

Figure 1

7.4 The first test run will be in the inverted position, the second run will be on the battery's side, and for the final cycle the battery will be clamped in the up on end position. The vibrations will be in the directions of the arrow indicated in the drawings. Vibration Test Orientation drawings 11.1.1, 11.2.1, 11.3.1

7.5 During the course of, and following, each Vibration Test Orientation, inspect the battery for fluid leakage. (See 5.3)

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TEST PROCEDURE: (continued)

11.0 TEST ORIENTATION DRAWINGS – For batteries with 1 x 3 or 1 x 2 cell configurations, contact the battery manufacturer to verify that the 1 x 6 battery orientations are appropriate.

11.1 Test Orientations for 1 x 6 battery.

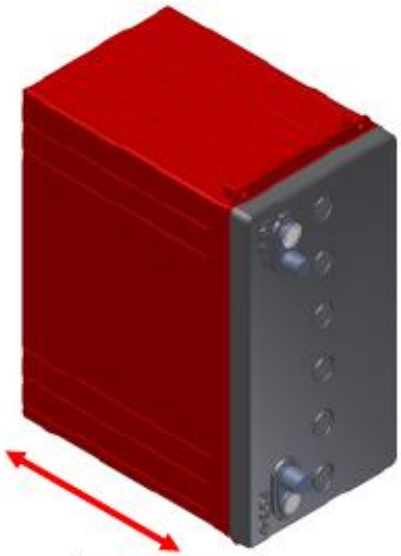
11.1.1 Vibration Test Orientation.

Inverted

Figure 2A

Side

Figure 2B



End

Figure 2C

DATA AND OBSERVATIONS:

The one (1) Battery completed testing as outlined in the Test Procedure above. There was no observed leakage during or at the conclusion of testing in each of the three (3) mounting orientations.

ACCEPTANCE LEVEL:

Battery must endure the Vibration test noted in test procedure and not leak.

TEST RESULTS:

TÜV SÜD America shall make no pass / fail conclusions regarding this test. Any and all such determinations shall be made solely by the customer.

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TEST EQUIPMENT:

Table 3: Test Equipment

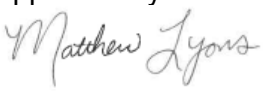
Equipment Identification Number	Description	Model No.	Serial No.	Calibration Due Date
AE-448	Vibration Generator	890-640	436010/3	
AE-515	Accelerometer 10mV	320C18	13064	09/05/2026
AE-670	Vibration Controller	VR9500	9521E137	01/22/2027
AE-1021	Accelerometer	353B04	LW257938	04/20/2027

APPROVAL SIGNATURE:

Tested By:

Kenneth Glaza, 8/6/2026 Date

Approved By:



Matthew Lyons, 8/6/2026 Date

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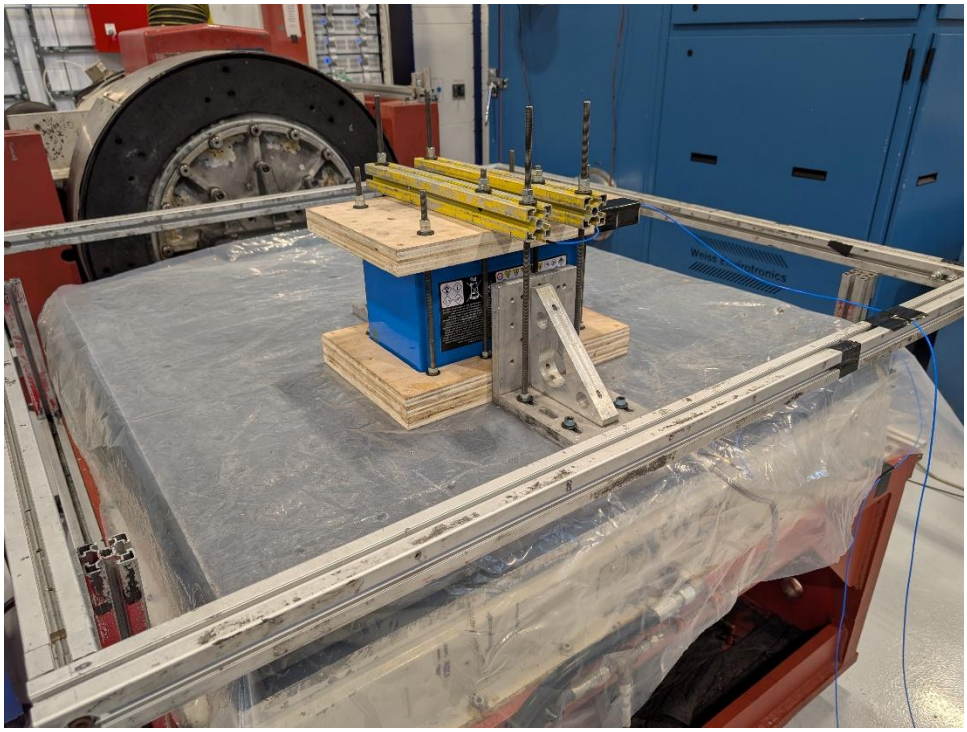
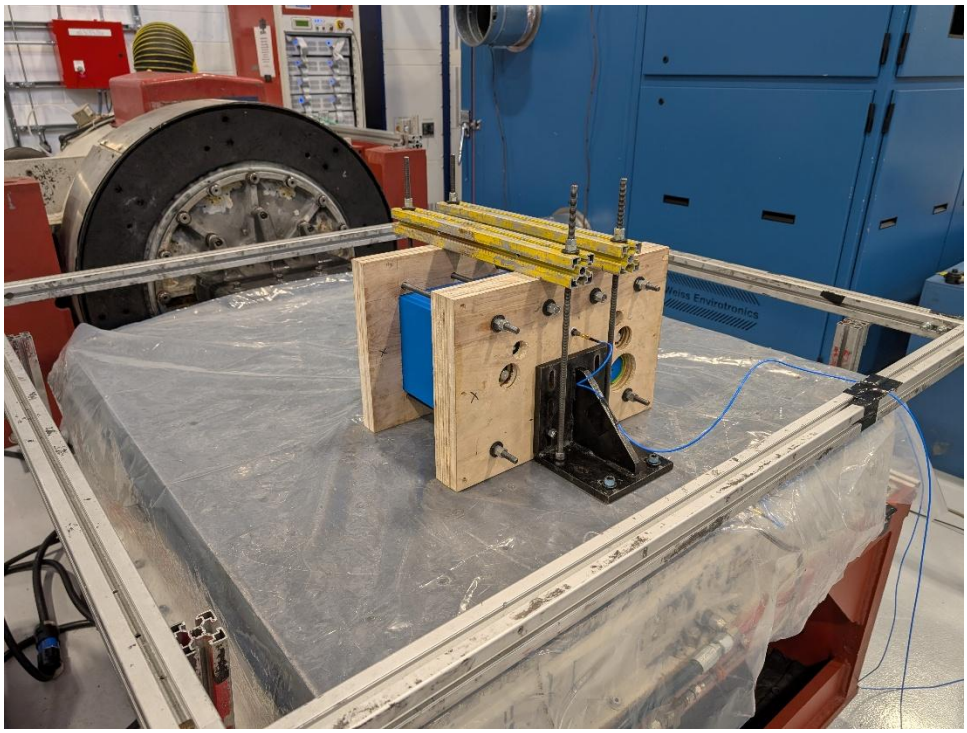
APPENDIX A: TEST PHOTOGRAPH(S)



Inverted Axis Setup



Side Axis Setup

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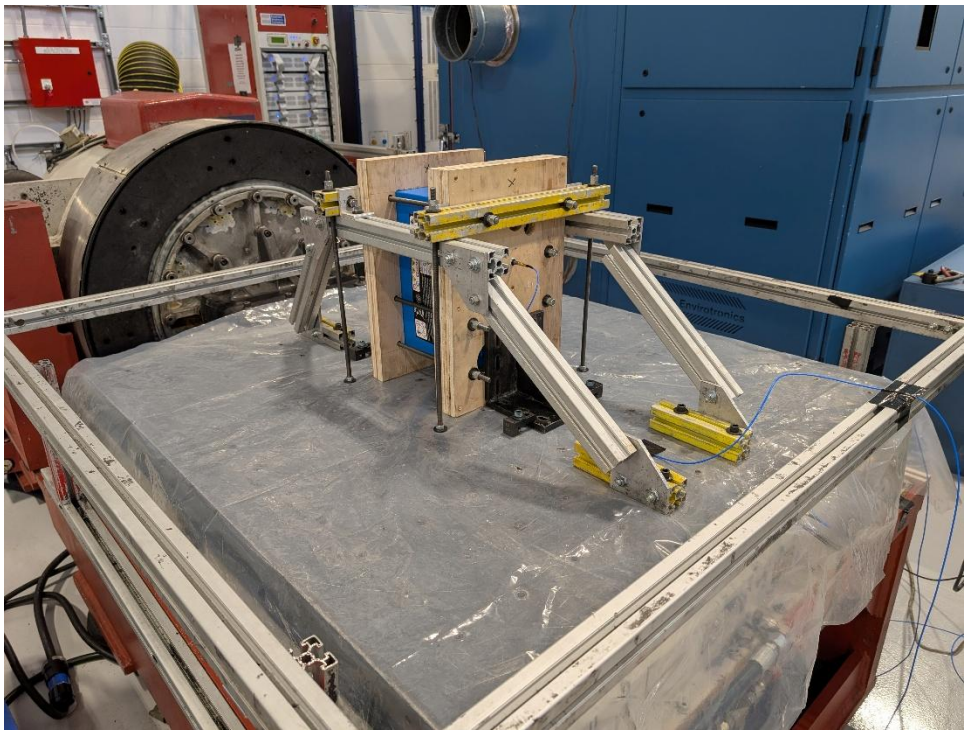
APPENDIX A: TEST PHOTOGRAPH(S)



End Axis Setup

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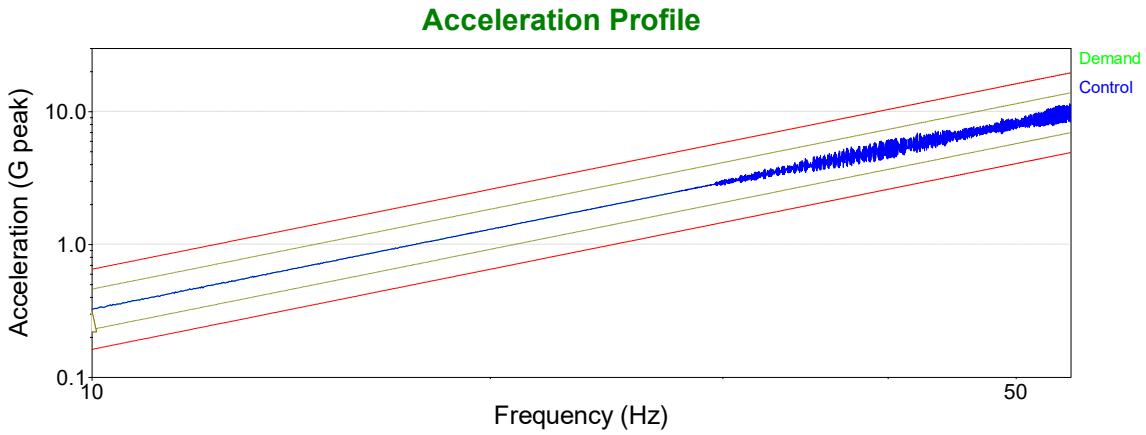
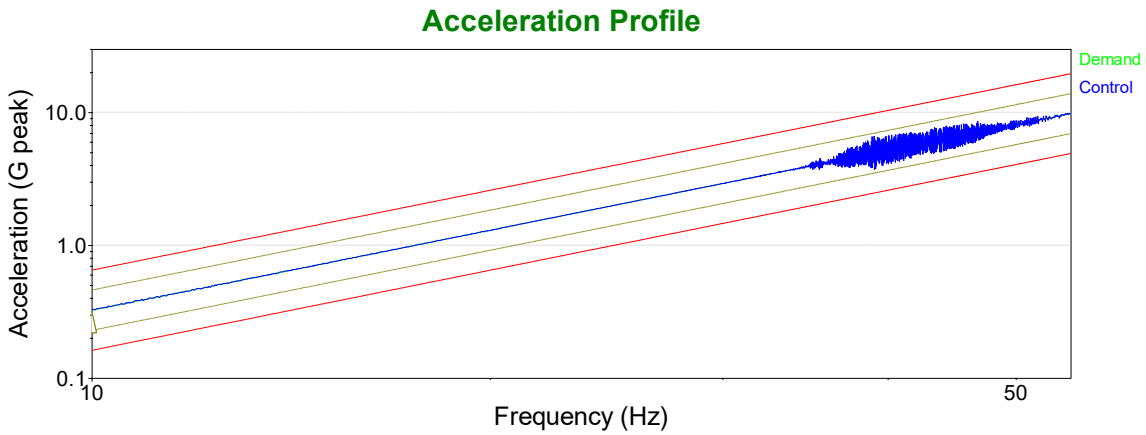
APPENDIX B: VIBRATION PLOT(S)



Aug 03, 2026 16:10:22	Level 1) 100 %	Output: 0.05521 Volts peak	10 55hz sweep
Demand: 0.3221 G	Level Time: 1:30:02	Frequency: 10 Hz	Sample 1 Inverted Axis
Control: 0.323 G	Total Time: 1:31:19	End of Sweep Test	Terra 721023372

Inverted Axis Vibration Plot Representative



Aug 04, 2026 11:18:31	Level 1) 100 %	Output: 0.06274 Volts peak	10 55hz sweep
Demand: 0.3221 G	Level Time: 1:30:01	Frequency: 10 Hz	Sample 1 Side Axis
Control: 0.3218 G	Total Time: 1:30:31	End of Sweep Test	Terra 721023372

Side Axis Vibration Plot Representative

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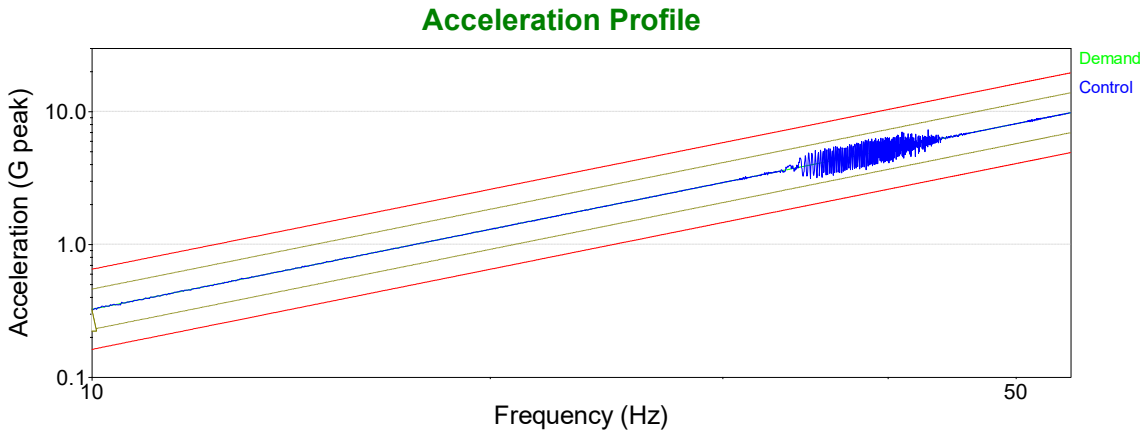
APPENDIX B: VIBRATION PLOT(S)



Aug 04, 2026 16:57:12	Level 1) 100 %	Output: 0.0653 Volts peak	10 55hz sweep
Demand: 0.3221 G	Level Time: 1:30:00	Frequency: 10 Hz	Sample 1 End Axis
Control: 0.3235 G	Total Time: 1:30:31	End of Sweep Test	Terra 721023372

End Axis Vibration Plot Representative

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