

Test Report

Verified Code:091069

Report No.:H202409032802-02EN

Customer: ProTech CO., Ltd

Address: No. 18, Baoying Road, Dawang High-Tech District, Zhaoqing, Guangdong

Sample Name: SINORA HARD SHELL CASE

Sample Model: SIN-04640-19BK-E

Receive
Sample Date: Sep.10th,2024

Test Date: Sep.11th,2024~Oct.12th,2024

Reference
Document: MIL-STD-810H-2019

Test Result: Pass

Prepared by

*Zhang Zesen*Zhang Zesen

Reviewed by

*Wu Shengwei*Wu Shengwei

Approved by

*Zhang Huaming*Zhang Hua Ming

GRG METROLOGY & TEST GROUP CO., LTD.

Issued Date: 2024/10/23

GRG METROLOGY & TEST GROUP CO., LTD.

Address: No.163, Pingyun Road, West of Huangpu Avenue, Guangzhou, Guangdong, China

Tel: (+86) 400-602-0999 FAX: (+86) 020-38698685 Web: <http://www.grgtest.com>

H202409032802-02EN



Statement

1. The report is invalid without "special seal for inspection and testing"; some copies are invalid; The report is invalid if it is altered or missing; The report is invalid without the signature of the person who prepared, reviewed and approved it.
2. The sample information is provided by the client and responsible for its authenticity; The content of the report is only valid for the samples sent this time.
3. When there are reports in both Chinese and English, the Chinese version will prevail when the language problems are inconsistent.
4. If there is any objection concerning the report, please inform us within 15 days from the date of receiving the report.
5. The test report only used for scientific research, teaching, internal quality control and other purposes.

Summary of Test Information

No.	Item Name	Test Standard	Test Result	Page
1	Temperature shock test	According to the requirements of the client	Pass	Page 5
2	Vibration test	According to the requirements of the client	Pass	Page 8
3	Drop test	According to the requirements of the client	Pass	Page 12

—Blank space below this page—

1 Temperature shock test

1.1 Test Condition

According to MIL-STD-810H-2019 method 503.7

1.1.1 Initial detection: Before the experiment, conduct initial testing on the test sample under standard atmospheric conditions

1.1.2 Sample Installation: Place the test sample flat on the rack inside the temperature shock test chamber and keep it within the effective volume of the chamber, allowing air to flow freely inside the chamber.

1.1.3 Experimental operation: The experiment starts from the low temperature range. During the experiment, the high temperature is 80 °C and the low temperature is -30 °C. The holding time for both high and low temperatures is 2 hours, and the transition time between high and low temperatures is no more than 1 minute. A total of 3 cycles are conducted.

1.1.4 Recovery processing:at the end of the experiment, the test chamber returns to indoor temperature, and the chamber door is opened to allow the test sample to recover for 2 hours under the standard atmospheric conditions of the experiment.

1.1.5 Final testing:After the experiment, the final detection of the test sample is carried out under the standard atmospheric conditions of the experiment.

1.2 Sample Information

Sample information is shown in Table 1-1.

Table 1-1 Sample Information

Sample Name	Sample Model	Sample Quantity	Test No
SINORA HARD SHELL CASE	SIN-04640-19BK-E	1 pc	H202409032802-0002

1.3 Test Requirements

According to the requirements of the client

The appearance of the test sample should be free of cracks, debonding, and damage.

1.4 Test Result

The test result is shown in Table 1-2.

Table 1-2 Temperature Shock Test Result

Test No	Detection Result	Conclusion
H202409032802-0002	Appearance no crack no degumming no damage	Pass

1.5 Test Photos



Fig.1-1 Appearance Inspection Before The Experiment



Fig.1-2 Visual Inspection After The Experiment



Fig.1-3 Low Temperature Installation Diagram



Fig.1-4 Low Temperature Test Operation Interface Diagram



Fig.1-5 High Temperature Installation Diagram



Fig.1-6 High Temperature Test Operation Interface Diagram

—Blank space below this page—

2 Vibration Test

2.1 Test Condition

According to MIL-STD-810H-2019 method 514.8.

2.1.1 Initial Detection: Before the experiment, conduct initial testing on the test sample under standard atmospheric conditions.

2.1.2 Sample Installation And positioning: Install the test sample on the fixture, then rigidly fix the fixture on the vibration table, install control sensors on the bottom bracket of the test sample, and use two-point average control method.

2.1.3 Experimental Operation: Conduct a 1-hour vibration test on each axis of the test specimen according to the conditions of Table 2-1 Highway Transportation Vibration Test Scale and Table 2-2 Jet C-5 Vibration Test Scale, with the test sequence being X-axis, Y-axis, and Z-axis.

2.1.4 Final Testing:After the experiment, the final detection of the test sample is carried out under the standard atmospheric conditions of the experiment.

Table 2-1 Highway Transportation - Vibration Test Scale

Z-Axis (Vertical)		X-Axis (Transverse)		Y-Axis (longitudinal)		Test axis and its time
Frequency (Hz)	Acceleration (g) ² /Hz	Frequency (Hz)	Acceleration (g) ² /Hz	Frequency (Hz)	Acceleration (g) ² /Hz	
4	0.015	5	0.00013	5	0.0065	Vibration in horizontal, vertical, and vertical directions for 1 hour each
40	0.015	10	0.00013	20	0.0065	
500	0.00015	20	0.00065	120	0.0002	
/	/	30	0.00065	121	0.003	
/	/	78	0.00002	200	0.003	
/	/	79	0.00019	240	0.0015	
/	/	120	0.00019	340	0.00003	
/	/	500	0.00001	500	0.00015	
Root-Mean-Square Value: 1.08g		Root-Mean-Square Value: 0.21g		Root-Mean-Square Value: 0.76g		

Table 2-2 Vibration Test Scale Of Jet C-5

Frequency (Hz)	Acceleration (g) ² /Hz)	Left Slope (db/Oct)	Right Slope (db/Oct)	Test Axis And Time
15	0.003	0	0	Vibration in horizontal, vertical, and vertical directions for 1 hour each
1000	0.003	0	-6	
2000	0.0007	-6	0	
Root-Mean-Square Value: 2.11g				

2.2 Sample Information

Sample information is shown in Table 2-3.

Table 2-3 Sample Information

Sample Name	Sample Model	Sample Quantity	Test No
SINORA HARD SHELL CASE	SIN-04640-19BK-E	1 pc	H202409032802-0002

2.3 Test Requirements

According to the requirements of the client

The appearance of the test sample should be free of cracks, debonding, and damage.

2.4 Test Result

The test result is shown in Table 2-4.

Table 2-4 Vibration Test Results

Test No	Detection Result	Conclusion
H202409032802-0002	Appearance no crack no degumming no damage	Pass

2.5 Test Photos



Fig.2-1 Appearance Inspection Before The Experiment



Fig.2-2 Visual Inspection After The Experiment



Fig.2-3 Vibration Test Subject Installation Status - X-Axis

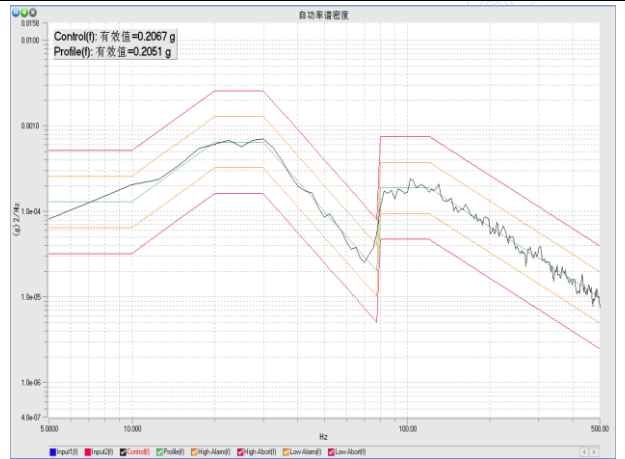


Fig.2-4 Vibration Test Highway Transportation Level Control Spectrum - X-Axis

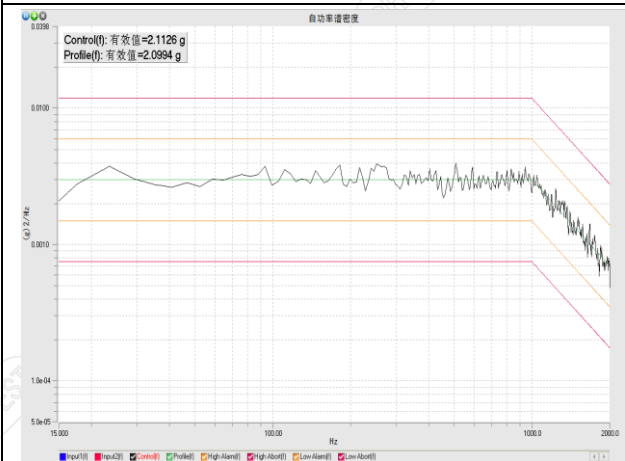


Fig.2-5 Vibration Test Spray Painting C-5 Level Control Spectrum - X-Axis



Fig.2-6 Vibration Test Subject Installation Status - Y-Axis

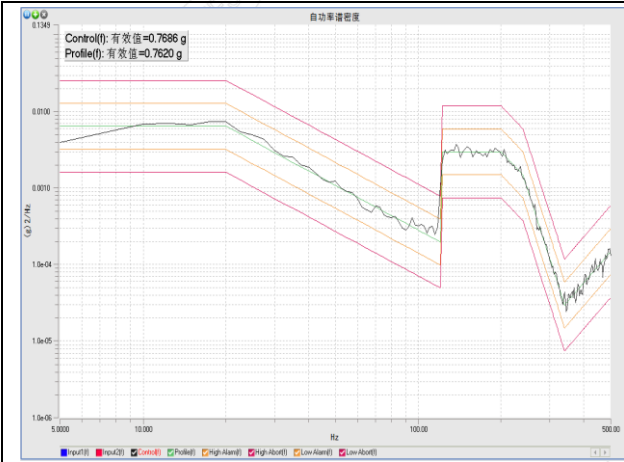


Fig.2-7 Vibration Test Highway Transportation Level Control Spectrum - Y-Axis

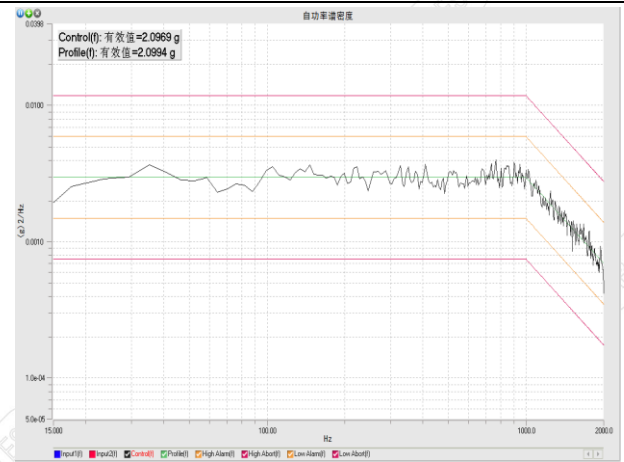


Fig.2-8 Vibration Test Spray Painting C-5 Level Control Spectrum - Y-Axis



Fig.2-9 Vibration Test Subject Installation Status - Z-Axis

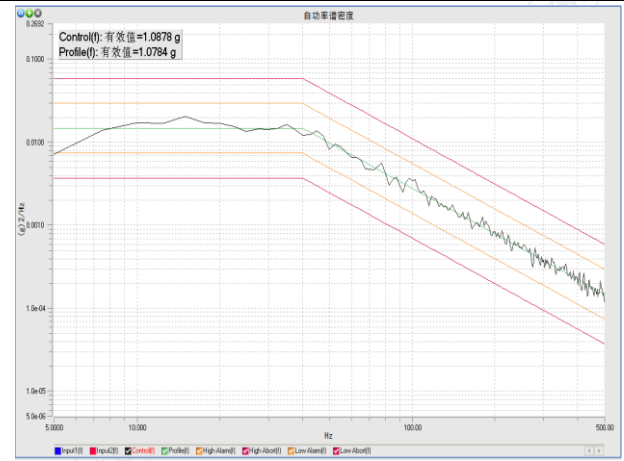


Fig.2-10 Vibration Test Highway Transportation Level Control Spectrum - Z-Axis

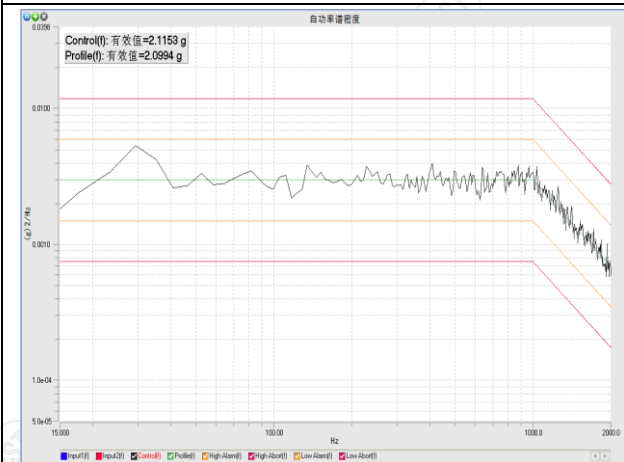
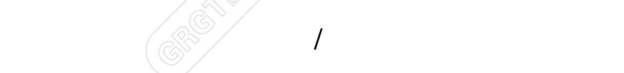
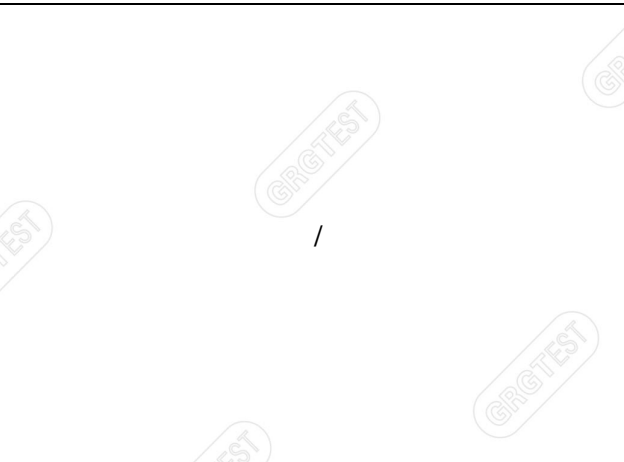


Fig.2-11 Vibration Test Spray Painting C-5 Level Control Spectrum - Z-Axis



3.1 Drop Test

According to MIL-STD-810H-2019 method 516.8.

3.1.1 Initial detection: Before the experiment, conduct initial testing on the test sample under standard atmospheric conditions

3.1.2 Sample Installation And positioning: Install the test sample on the drop testing machine.eep it within the effective volume of the chamber, allowing air to flow freely inside the chamber.

3.1.3 Experimental operation: Perform the drop test according to the conditions in Table 3-1.

Table 3-1 Drop Test Conditions

Falling Surface	Drop Height (cm)	Number Of Drops
12 edges	122	Each edge once, a total of 12 times
8 corners	122	1 time per corner, a total of 8 times
6 faces	122	1 time per face, a total of 6 times

3.2 Sample Information

Sample information is shown in Table 3-2.

Table 3-2 Sample Information

Sample Name	Sample Model	Sample Quantity	Test No
SINORA HARD SHELL CASE	SIN-04640-19BK-E	1 pc	H202409032802-0002

3.3 Test Requirements

According to the requirements of the client

The appearance of the test sample should be free of cracks, debonding, and damage.

3.4 Test Result

The test result is shown in Table 3-3.

Table 3-3 Temperature Shock Test Result

Test No	Detection Result	Conclusion
H202409032802-0002	Appearance no crack no degumming no damage	Pass

3.5 Test Photos



Fig.3-1 Appearance Inspection Before The Experiment



Fig.3-2 Visual Inspection After The Experiment



Fig.3-3 Operation Diagram Of Drop Testing Machine Interface



Fig.3-4 Drop Test Operation - Angle Diagram



Fig.3-5 Drop test Operation - Surface Schematic Diagram



Fig.3-6 Drop Test Operation - Edge Diagram

—Blank space below this page—

4 Testing instruments and equipment

List of Instrument for Testing Equipment					
No.	Testing Item	Instrument/Equipment	Type	Serial No.	Calibration Valid Date
1	Temperature shock test	Walk-in high and low temperature humid heat test chamber	SZ-A-70000D	202404007	2024-04-26~2025-04-25
		Walk-in temperature and humidity test chamber	UC9-50150-R	181419	2024-01-04~2025-01-03
2	Vibration test	Digital vibration test system	DC-10000-100	160913	2024-09-10~2025-09-09
		Sensor	YMC2107CM	20081242	2024-01-24~2025-01-23
		Sensor	YMC2107CM	20081249	2024-01-24~2025-01-23
3	Drop test	Drop tester	GZ-DEZL	NJ167	2023-11-21~2024-11-20

—End of Report—