

IVISTA

China Intelligent Vehicle Index

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Intelligent Safety Index Electrical Safety Rating Protocol

(Version 2023)

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Electrical Safety Rating Protocol

1 Scope

This document specifies the rating method for IVISTA China Intelligent Vehicle Index - Intelligent Safety Index - Electrical Safety.

This document is applicable to new energy vehicles with battery packs arranged at the bottom of the vehicle.

2 Normative References

The following normative documents contain provisions which, through reference in this text, constitute indispensable provisions of this document. For dated references, only the dated edition applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

IVISTA-SM-SPI.ES-TP-A0-2023 Electrical Safety Test Protocol

3 Rating Methods

The electrical safety rating protocol includes bottom crash rating.

3.1 Scoring methods for bottom crash test

The bottom crash rating has a full score of 21 points. The specific scoring rules are shown in Table 1, penalty rules in Table 2 and bonus rules in Table 3.

Table 1 Scoring Rules for Vehicle Safety

Indicator Name		Rating Index	Rating Contents	Score
Vehicle bottom scraping	Front scraping	Special safety requirements	The electrolyte does not leak (the electrolyte leakage shall not exceed 5 L within 30 min after the crash)	3
			The HV harness connector is not broken or disconnected	2
			After the test, there is no failure of the battery pack fixing point*	2
	Rear scraping	Special safety requirements	The electrolyte does not leak (the electrolyte leakage shall not exceed 5 L within 30 min after the crash)	3
			The HV harness connector is not broken or disconnected	2
			After the test, there is no failure of the battery pack fixing point*	2
Vehicle bottoming		Special safety requirements	The electrolyte does not leak (the electrolyte leakage shall not exceed 5 L within 30 min after the crash)	2
			The HV harness connector is not broken or disconnected	1
			After the test, there is no failure of the battery pack fixing point*	1
Vehicle wading		Driving safety requirements	No vehicle fault occurs during the test	1
			No parking and breakdown	2

Note: Fixing point failure includes bolt falling off or fracture.

Table 2 Penalty Rules for Structural Integrity of the Battery Pack

Test Item	Rating Method	Penalty Point
Inspection after test	Measure the deformation point at the bottom of the battery pack after the test. If the vehicle is equipped with a standard battery guard, remove the guard first	--
	Depth (Z direction) deformation rating of the battery pack shell during the bottom scraping test, and measurement of the maximum displacement in the Z direction of the deformation area: When the maximum deformation of all measuring points is ≥ 15 mm, 2 points will be deducted.	2
	Depth (Z direction) deformation rating of the battery pack shell during the bottoming test, and measurement of the maximum displacement in the Z direction of the deformation area: When the maximum deformation of all measuring points is ≥ 15 mm, 3 points will be deducted.	3
	The deformation of the battery pack shell in the bottom scraping test (XY direction) is a monitoring item, and the maximum direct distance of the continuous deformation trajectory is measured*.	--

Note: For scratches with a Z value ≥ 3 mm, start monitoring and record the deformation of the trajectory in the XY direction.

Table 3 Bonus Rules

Indicator Name		Rating Method	Score
Bottom crash	Safety	Designed with flame retardant materials (flame retardant grade)	1
		Battery explosion-proof valve/air pressure balance design	1
		Safe cut-off design (physical HV load outage, etc.)	1

Note: Concerning bonus item scoring, the enterprise shall verify the certification materials.

3.2 Overall rating

The overall rating of electrical safety is divided into four levels: Good (G), Acceptable (A), Marginal (M) and Poor (P), which are classified according to the scoring rate. The scoring rate is obtained by dividing the electrical safety test score by the total score of 21 points and rounding to one decimal place. The specific rating method is shown in Table 4.

In the electrical safety test, if the vehicle insulation resistance does not meet the requirements of GB 31498, or smoke, fire, explosion and other phenomena occur during the test and within 2 h after the test, the overall rating of electrical safety should be directly degraded to poor (P).

Table 4 Overall Rating of Electrical Safety

Rating Method	Scoring rate $\geq 80\%$	$80\% >$ scoring rate $\geq 70\%$	$70\% >$ scoring rate $\geq 60\%$	Scoring rate $< 60\%$
Rating	Good (G)	Acceptable (A)	Marginal (M)	Poor (P)