Regulations for Motor Vehicle Safety Standards

Last amended by MLTM Notification No. 515(08/31/2012)

Caution : This is not a official English version of KMVSS

Chapter 1 General

Article 1(Purpose)

The purpose of the Regulations (called "the Regulation" hereinafter) is to establish the safety standards applicable to the structures and systems of motor vehicles and two-wheeled motor vehicles, and the standards and methods applicable to the safety and the Safety Compliance Test of vehicles, their parts or systems pursuant to Article 29 Clause 2, Article 32 Clause 1 and Article 50 Clause 2 of the Motor Vehicle Control Acts(called "the Law" hereinafter).

Article 2(Definitions)

The definitions of the terms used in this regulation are as follows:

52. "High voltage electric device" means an electric device such as traction motor, power transformation device, traction battery etc. whose operating voltage exceeds 60VDC or 25VACrms.
53. "Traction battery" means an assembly of accumulators constituting the storage of energy used for powering the traction motor(s) of the vehicle.
54. "Traction motor" means a device that can convert electrical energy into rotational mechanical energy to propel the vehicle.
55. "Live parts" means any conductor or conductive part(s) intended to be electrically energized in normal use.

Chapter 2 Safety Standards of Motor Vehicles and Two-wheeled Motor Vehicles

Section 1 Motor Vehicle Safety Standards

Article 18-2 (High voltage electric device)

The high voltage electric device of a vehicle shall meet each of the following requirements:

1. Harnesses containing high voltage shall be visually identified with a permanent orange harness covering material.
2. Wire harness of high voltage electric devices exposed in the passenger compartment or outside of vehicle body shall be protected by enclosures made of metal or plastic.

3. There shall not be any exposed live parts or splices in the wire harness between the high voltage electric devices.
4. Polarity shall be identified by color where necessary in the connection between the high voltage electric devices and wire harnesses, and the identification shall be made hard to erase or remove, except that it is made structurally false-free.
5. Warning against electric shock meeting each of the following requirements shall be identified on high voltage electric devices:
   A. Symbol for indication of a high voltage shall be marked on outer surface of high voltage electric device or protective device.
   B. Symbol for indication of a high voltage shall conform to Table 5.
6. High voltage electric device shall not be opened, disassembled or removed without the use of tools.

Article 18-3 (Traction battery) The traction battery of a vehicle shall meet each of the following requirements:

1. The traction battery shall be of a structure which is isolated from the passenger compartment by a wall or a protection plate.
2. The traction battery shall be protected by properly rated fuses or circuit breakers which may prevent overcharging or over-current beyond the designed specifications.
3. The traction battery shall not catch fire or explode in a physical, chemical, electrical and thermal conditions defined elsewhere by the Minister of MLTM.

Chapter 3 Safety Standards for Safety Compliance Test

Article 91(Fuel System)

(1) The fuel system installed in each passenger car and bus with a gross vehicle weight of 4.5 tons or less which uses flammable liquid for its fuel shall meet Table 10 - Fuel System Integrity.

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(2) Each passenger vehicle and each bus with a GVW not more than 4.5 tons fueled by LPG shall meet Table 11 Fuel system integrity for LPG fueled vehicles.

(3) The fuel system installed in each passenger car and bus with a gross vehicle weight of 4.5 tons or less which uses CNG for its fuel shall meet the crash test standards of the

fuel system specified in Table 11-2.

(4) Passenger cars and buses with GVW 4.5 tons or less among hybrid electric vehicles and electric vehicles shall meet the requirements specified in Table 11-3. Traction battery crash test.

[Table 5]

Symbol for indication of a high voltage on outer surface of high voltage electric device or protective device (Article 18-2 Item 5)

Remark) Black on yellow ground, not to be discolored or erased easily

[Table 11-3]

High voltage electric device crash test [Article 91 Clause (4)]

Test condition	Criteria
1. When the vehicle is impacted perpendicularly into a fixed collision barrier at 48.3km/h	A. It shall not cause fire or explosion. B. Not more than 5 liters of electrolyte from traction batteries shall spill outside the passenger compartment from the time the vehicle ceases motion after a barrier impact test until 30 minutes thereafter, C. and no visible trace of electrolyte shall spill into the passenger compartment. D. No part of any battery system component shall enter the passenger compartment. E. Insulation resistance of high voltage live parts and exposed conductive parts (electrical chassis) shall be not less than 100 Ohm/V[DC] and 500 Ohm/V[AC] respectively.
2. When the vehicle is impacted perpendicularly on the rear by a barrier moving at 48.3km/h	
3. When the vehicle is impacted perpendicularly on the side by a barrier moving at 32.3km/h	
4. When the vehicle is rotated on its longitudinal axis, and on hold for 5 minutes, to each successive increment of 90^{o} after each impact test specified above	

Remark:

In case of low-speed electric vehicles the impact speed in Item 1 shall be 40km/h, and Item 2 and Item 3 are not applied.

Test Procedures for Motor Vehicle Safety Standards

Last amended by MLTM Notification No. 2012-508(08/07/2012)

Caution : This is not a official English version of test procedure for KMVSS

Article 1 (Purpose)

The purpose of this Notification is to specify the detailed criteria and test procedures for the standards pursuant to Article 116 of the Motor Vehicle Safety Standards (KMVSS).

Article 2 (Scope of application)

The detailed criteria and test procedures of motor vehicles or motor vehicle parts necessary to confirm their compliance with the KMVSS shall conform to the requirements set forth in this Notification unless otherwise specified in the Motor Vehicle Control Act (MVCA; "the Law"), Enforcement Ordinance of the MVCA ("the Ordinance"), Enforcement Regulations of the MVCA ("the Regulation"), or KMVSS.

Article 3 (Test procedures)

The following Tables illustrate the safety standards and the test procedures pursuant to Article 116 of the KMVSS and Article 47 of the Regulation:

1. Table 1: the motor vehicle safety standards and the test procedures (or Table 2 if not stated in Table 1)
2. Table 2: the procedures to confirm compliance with KMVSS for in-use vehicles
3. Table 3: the procedures to confirm compliance with KMVSS for two-wheeled motor vehicles.
4. Table 6: the detailed criteria and test procedures of motor vehicle parts

Article 4 (Foreign safety standards recognized)

The foreign safety standards recognized as equivalent to or more stringent than the KMVSS pursuant to Article 114 Clause 7 of the KMVSS are shown in Table 4.

Article 4-2 (Detailed criteria for installation of a fixture for military purpose)

Vehicles subject to installation of a pintle hook and its detailed criteria are specified in Table 5.

Article 4-3 (Safety standards for motor vehicle parts for which manufacture, assembly or import has been discontinued)
The criteria for motor vehicle parts determined and notified by the minister of MLTM pursuant to Article 2 of the Addendum to the KMVSS (MLTM Not. 420 (2011.12.23)) are specified in Table 7.

Article 5 (Due Date of Reevaluation)
The Notification shall be reviewed for discontinuance or revision, if any, by 2015.8.13, in consideration of the changes of the laws or circumstances pursuant to the Regulations for Announcement and Administration of the Notification (Presidential Notification No. 248).

Table 1. Test Procedures for Motor Vehicle Safety Standards

47. Safety Test for High Voltage Electric Devices

47.1. Scope of application
The regulation specifies the test method concerning the high voltage electric devices such as traction battery etc.

47.2. Definitions
1) “Vehicle chassis” means a part nonconductive in normal condition but conductive if there is a failure in the dielectric of an insulation and which is connected to the vehicle chassis electrically.
2) “Electrolyte spillage” means the leakage of electrolyte out of the traction battery which includes electrolyte absorbed by capillary action.

47.3. Documents to be submitted
1) Specifications of the test vehicle, drawings and technical data for composite material
2) Wiring diagram and technical data for traction battery
3) Other drawings or technical data necessary for the test.

47.4. General requirements

1) The color of orange colored on harness between the high voltage electric devices specified in Article 18-2 Item 1 of the KMVSS shall meet any one of the followings:
   a. The range of color shall be between 10R and 10YR, the range of the lightness shall be between 4.5 and 8.5, and the range of the color saturation shall be between 3 and 17 (KS A 0011).
   b. The color shall be 8.75R, the range of the lightness shall be between 5.5 and 6.0, and the range of the color saturation shall be between 11.5 and 13.5 (SAE J1128 Appendix B).
2) The range of color for the warning identified on the high voltage electric devices or protective devices specified in Article 18-2 Item 5 and Table 5 of the KMVSS shall meet the following:
   a. Yellow shall be 2.5Y through 7.5Y with brightness 8.5 through 15, and chroma 8.5 through 13 (KS A 0011, KS A 0062).
   b. Black shall be N0 through N2 (KS A 0011).
3) The high voltage electric devices shall meet the requirement specified in Article 91 Clause 4.

47.5. Test conditions
1) The hybrid vehicles fueled by flammable liquid shall meet each of the following requirements:
   a. The requirements specified in Table 1 Item 3 paragraph 3.5.1) shall be met.
   b. The traction battery shall be charged to the maximum SOC or target SOC as defined by the manufacturer, or charged to at least 95% of the maximum capacity if not as defined by the manufacturer.
2) The hybrid vehicles fueled by natural gas shall meet each of the following requirements:
   a. The requirements specified in Table 1 Item 3 paragraph 3.5.2) shall be met.
   b. The traction battery shall be charged according to paragraph 47.5.1)b.
3) The hybrid vehicles fueled by liquefied petroleum gas shall meet each of the following requirements:
   a. The requirements specified in Table 1 Item 3 paragraph 3.5.3) shall be met.
   b. The traction battery shall be charged according to paragraph 47.5.1)b.
4) The electric vehicles with the test equipment installed shall meet each of the following requirements:

a. The requirements specified in Table 1 Item 3 paragraph 3.5.1)a and c shall be met.

b. The traction battery shall be charged according to paragraph 47.5.1)b.

5) The test dummy shall be seated and restrained according to Table 1 Item 3 paragraph 3.5.4).

6) The parking brake and the gear change lever of the test vehicle shall be controlled according to Table 1 Item 3 paragraph 3.5.5).

7) The fuel pump of the test vehicle shall be controlled according to Table 1 Item 3 paragraph 3.5.6).

47.6. Tests

47.6.1. Frontal impact test

1) The fixed barrier and the test vehicle shall be treated according to Table 1 Item 3 paragraph 3.6.1. 1) and 2).

2) The voltage shall be measured before the frontal impact test as follows:

a. Check and record if the traction battery system is connected to the vehicle propulsion system, and the vehicle ignition is in the 'on' (traction system energized) position.

b. Measure and record the traction battery voltage (V_b) (see Figure 1). Before the vehicle crash test, V_b must be equal to or greater than the nominal operating voltage as defined by the manufacturer, otherwise the traction battery shall immediately be charged. The voltmeter used in this test shall measure DC and AC values, and have an internal resistance of at least 10MOhm.

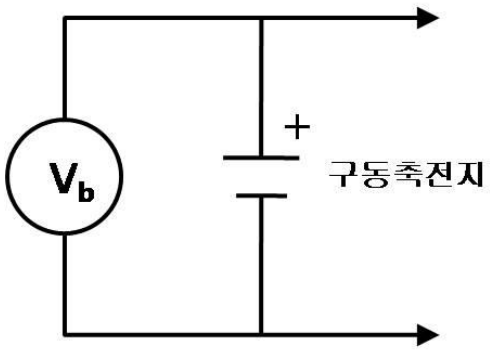

Figure 1. Measurement of traction battery voltage V_b

c. Measure and record the voltage V_1 between the negative side of the traction battery and the vehicle chassis (see Figure 2).

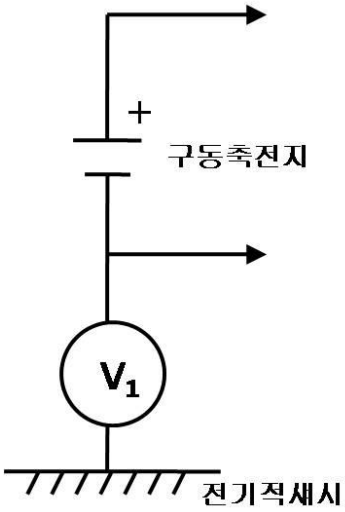

Figure 2. Measure of the voltage between the negative side of the traction battery and the vehicle chassis

d. Measure and record the voltage V_2 between the positive side of the traction battery and the vehicle chassis (see Figure 3).

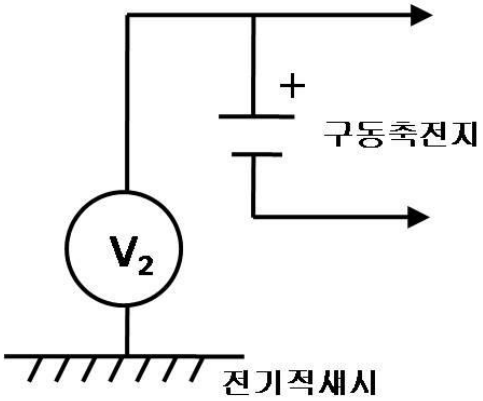

Figure 3. Measure of the voltage between the positive side of the traction battery and the vehicle chassis

e. Insert a standard known resistance (R_0), corresponding to the rated voltage times 500 (AC) or 100 (DC) between the negative side of the traction battery and the vehicle chassis. With R_0 installed, measure the voltage (V_1') between the negative side of the traction battery and the vehicle chassis (see Figure 4). Calculate the electrical isolation (R_{i1}) according to the formula shown.

$$R_{i1} = R_0 (1+V_2/V_1) [(V_1-V_1')/V_1']$$

Where

R_{i1}: the electrical isolation between the negative side of the traction battery and the vehicle chassis

V_1: the voltage between the negative side of the traction battery and the vehicle chassis

V_2: the voltage between the positive side of the traction battery and the vehicle chassis

V_1': the voltage between the negative side of the traction battery and the vehicle chassis with R_0 installed

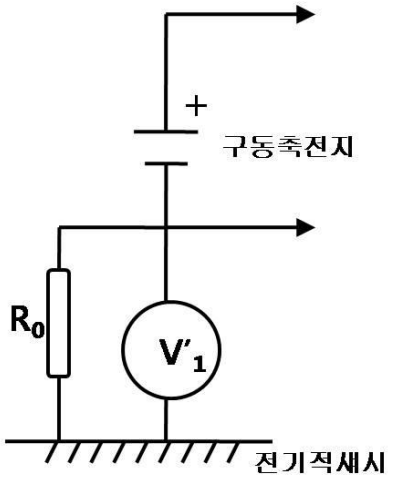

Figure 4. Voltage across resistor between the negative side of traction battery and the vehicle chassis

f. With R_0 installed, measure the voltage (V_2') between the positive side of the traction battery and the vehicle chassis (see Figure 5). Calculate the electrical isolation (R_{i2}) according to the formula shown.

$$R_{i2} = R_0 (1+V_1/V_2) [(V_2-V_2')/V_2']$$

Where

R_{i2}: the electrical isolation between the positive side of the traction battery and the vehicle chassis

V_1: the voltage between the negative side of the traction battery and the vehicle chassis

V_2: the voltage between the positive side of the traction battery and the vehicle chassis

V_2': the voltage between the positive side of the traction battery and the vehicle chassis with R_0 installed

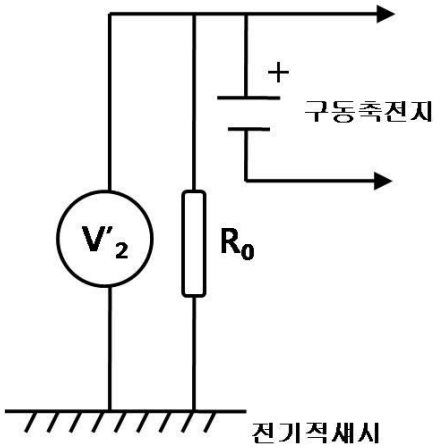

Figure 5. Voltage across resistor between the positive side of traction battery and the vehicle chassis

g. If $R_{i1} < R_{i2}$, calculate R_{i1}/V_b for R_i/V_b, which must be equal to or greater than 100 Ohm/V[DC] or 500 Ohm/V[AC].

h. If $R_{i2} < R_{i1}$, calculate R_{i2}/V_b for R_i/V_b, which must be equal to or greater than 100 Ohm/V[DC] or 500 Ohm/V[AC].

i. In place of the procedures from "c" to "h" above, a mega-ohmmeter may be used to measure the electrical isolation between the positive/negative side of the traction battery and the vehicle chassis by applying a voltage higher than the operating voltage (V_b) of the high voltage electric device, which must be equal to or greater than 100 Ohm/V[DC] or 500 Ohm/V[AC].

3) After the frontal impact inspect the vehicle for electrolyte spillage, and measure the amount of electrolyte spilled; upon impact, after 5 minutes, and after 30 minutes.

4) Measure and record the voltage and electrical isolation after the frontal impact.

a. Measure V_1, V_2, V_1' and V_2' as shown in Figure 2 through Figure 5 after the crash test.

b. Calculate and record the resistance R_{i1} as shown in Figure 4.

c. Calculate and record the resistance R_{i2} as shown in Figure 5.

d. If $R_{i1} < R_{i2}$, calculate R_{i1}/V_b for R_i/V_b, which must be equal to or greater than 100 Ohm/V[DC] or 500 Ohm/V[AC].

e. If $R_{i2} < R_{i1}$, calculate R_{i2}/V_b for R_i/V_b, which must be equal to or greater than 100 Ohm/V[DC] or 500 Ohm/V[AC].

f. In place of the procedures from "a" to "e" above, a mega-ohmmeter may be used to measure the electrical isolation between the positive/negative side of the traction battery and the vehicle chassis by applying a voltage higher than the operating voltage (V_b) of the high voltage electric device, which must be equal to or greater than 100 Ohm/V[DC] or 500 Ohm/V[AC].

5) Inspect visually if electrolyte is spilled into the occupant compartment.

6) Inspect visually if there are any of the battery system components intruded into the occupant compartment.

7) Check if there is any fire or explosion.

8) Proceed to the static rollover test with the test vehicle subjected to the frontal impact test.

47.6.2. Moving barrier rear impact test

1) The rear moving barrier and the impact speed shall be in accordance with Table 1 Item 3 paragraph 3.6.2. 1) through 3).

2) Measure and record the traction battery voltage and electrical isolation according to paragraph 47.6.1. 2).

3) After the rear moving barrier impact inspect the vehicle for electrolyte spillage, and measure the amount of electrolyte spilled; upon impact, after 5 minutes, and after 30 minutes.

4) Measure and record the voltage and electrical isolation after the rear moving barrier impact according to paragraph 47.6.1. 4).

5) Inspect visually if electrolyte is spilled into the occupant compartment.

6) Inspect visually if there are any of the battery system components intruded into the occupant compartment.

7) Check if there is any fire or explosion.

8) Proceed to the static rollover test with the test vehicle subjected to the rear moving barrier impact test.

47.6.3. Moving barrier side impact test

1) The moving barrier for side impact shall conform to the following requirements:

a. The moving barrier for hybrid vehicles fueled by flammable liquid shall conform to the requirements specified in Table 1 Item 1 paragraph 1.8.2. 1).

b. The moving barrier for hybrid vehicles fueled by natural gas or liquefied petroleum gas and for electric vehicles shall conform to the requirements specified in Table 1 Item 3 paragraph 3.6.2. 1).

2) The test dummy seating and the testing area shall conform to the requirements specified in Table 1 Item 1 paragraph 1.8.2. 2) through 4).

3) The impact procedure and impact speed for hybrid vehicles fueled by flammable liquid shall conform to the requirements specified in Table 1 Item 1 paragraph 1.8.2. 4).

4) The impact procedure and impact speed for hybrid vehicles fueled by natural gas or liquefied petroleum gas and for electric vehicles shall conform to the requirements specified in Table 1 Item 3 paragraph 3.7.3. 3).

5) Prior to the moving barrier side impact test measure and record the voltage and electrical isolation according to paragraph 47.6.1. 2).

6) After the moving barrier side impact inspect the vehicle for electrolyte spillage, and measure the amount of electrolyte spilled; upon impact, after 5 minutes, and after 30 minutes.

7) Measure and record the voltage and electrical isolation after the rear moving barrier impact according to paragraph 47.6.1. 4).

8) Inspect visually if electrolyte is spilled into the occupant compartment.

9) Inspect visually if there are any of the battery system components intruded into the occupant compartment.

10) Check if there is any fire or explosion.

11) Proceed to the static rollover test with the test vehicle subjected to the moving barrier side impact test.

12) The moving barrier side impact test for hybrid vehicles fueled by natural gas or liquefied petroleum gas and for electric vehicles may be conducted according to the procedure specified in paragraph 47.6.3. 1) “a” and 47.6.3. 4).

47.6.4. Static rollover test

1) Rotate the test vehicle according to the procedure specified in Table 1 Item 3 paragraph 3.6.3. 1).

2) During the first 5 minutes of each stage, which includes both rotation and part of the stationary period, measure the electrolyte spilled at 1 minute interval. The measurement of the voltage and electrical isolation shall be made available throughout the static rollover test.

3) Measure and record the voltage and electrical isolation for each stage.

a. Install R_0 upon impact test, measure and record V_1, V_2, V_1' and V_2' as shown in Figure 2 through Figure 5.

b. Calculate and record R_{i1} as shown in Figure 4.

c. Calculate and record R_{i2} as shown in Figure 5.

d. If $R_{i1} < R_{i2}$, calculate R_{i1}/V_b for R_i/V_b, which must be equal to or greater than 100 Ohm/V[DC] or 500 Ohm/V[AC].

e. If $R_{i2} < R_{i1}$, calculate R_{i2}/V_b for R_i/V_b, which must be equal to or greater than 100 Ohm/V[DC] or 500 Ohm/V[AC].

f. In place of the procedures from "a" to "e" above, a mega-ohmmeter may be used to measure the electrical isolation between the positive/negative side of the traction battery and the vehicle chassis by applying a voltage higher than the operating voltage (V_b) of the high voltage electric device, which must be equal to or greater than 100 Ohm/V[DC] or 500 Ohm/V[AC].

47.7. Test results

Record the amount of electrolyte spilled out of the traction battery etc. in the Test Report – Prevention of Electrolyte Spillage and Electrical Isolation.

48. Safety Test for Traction battery

48.1. Scope of application

The regulation specifies the test method concerning the traction battery used for motor vehicles (except two-wheeled motor vehicles) to confirm safety in the physical, chemical, electrical and thermal impact conditions.

48.2. Definitions

1) “Ignition” means the state in which the traction battery catches on fire and is burning but some parts are not detached. It does not include momentary sparks where the traction battery does not catch on fire.
2) “Explosion” means the state in which some parts of the traction battery is detached or completely disassembled due to expansion caused by electrochemical reaction.
3) “BMS (Battery Management System)” means a system controlling the function of the traction battery by measuring the current, voltage, and temperature etc. to control the charging/discharging current for efficient usage of the traction battery, and operating the safety device upon abnormal operation.
4) “Safety device” means a device, such as fuse, diode, current breaker etc. which cuts off the current upon abnormal operation of the traction battery.
5) “SOC (State of Charge)” means the charge state of the traction battery, by which SOC 0% means the completely discharged status, and SOC 100% means the fully charged status of the traction battery.
6) “Rated capacity” means the discharge capacity when the battery is fully charged and fully discharged in the current condition specified by the manufacturer.

48.3. Documents to be submitted

1) Specifications, structural characteristics, wiring diagram and technical data
2) Drawing and technical data for BMS and safety device
3) Other drawings or technical data necessary for the test.

48.4. General requirements

The traction battery shall meet the requirements specified in Article 18-3 of the KMVSS.

Test item	Test criteria	Remark
Drop test	There must be no ignition or explosion.	
Immersion test	There must be no ignition or explosion.	
Overcharge test	There must be no ignition or explosion.	
Overdischarge test	There must be no ignition or explosion.	
Short circuit test	There must be no ignition or explosion.	
Heat exposure test	There must be no ignition or explosion.	
Fire resistance test	There must be no explosion.	

48.5. Test conditions

48.5.1. General conditions

1) The test shall, in principle, be done with the BMS and safety devices installed in the vehicle, except that drop test, salt water test, and heat exposure test may be done without the BMM and safety devices installed.
2) The traction battery shall be activated until it reaches the rated capacity through charge/discharge in the method recommended by the manufacturer.
3) The traction battery to be tested shall be soaked in 25+/-5^{o}C at least for 8 hours.
4) The room temperature shall be controlled in 25+/-5^{o}C throughout the test.
5) The drop test, salt water test, heat exposure test, and flammability test may be conducted irrespective of the ambient temperature.

48.5.2. Tolerance of the test equipment

1) The tolerance of the V-A meter shall be within +/-1%.
2) The tolerance of the thermometer shall be within +/-2%.
3) The tolerance of the device measuring the capacity of a traction battery shall be within +/-2%.
4) The tolerance of the ohm meter shall be within +/-1%.

48.6. Tests

48.6.1. Drop test

1) Discharge the traction battery in the ambient temperature, and charge the battery at the rated current up to the target SOC.
2) The target SOC during charging shall be the maximum SOC over the operating range of a vehicle, or SOC 80% if there is no reference SOC.
3) Measure the voltage of the traction battery.
4) Drop the battery (free-fall) at the height of 4.9m on the concrete floor.
5) Check if there is any fire or explosion, and measure the voltage.

48.6.2. Immersion test

1) Fill the tank with salt water of 0.6M so that the traction battery is completely submerged, and stabilize at 25+/-5^{o}C.
2) Completely discharge the traction battery in the ambient temperature, and charge up to the target SOC at the rated current.
3) The target SOC during charging shall be the maximum SOC over the operating range of a vehicle, or SOC 80% if there is no reference SOC.
4) Measure the voltage of the traction battery.
5) Completely submerge the traction battery in the salt water for 1 hour.
6) While the battery is in the salt water check if there is any fire or explosion, take the battery out of the tank and measure the voltage.

48.6.3. Overcharge test

1) Completely discharge the traction battery in the ambient temperature, and charge up to SOC 100% at the rated current
2) Measure the voltage of the traction battery.
3) The charging voltage and current shall be according to the manufacturer's recommendation. If not stated, charge at the constant current of 32A until the voltage reaches 1.5 times the rated voltage, and at the constant voltage after that.
4) Finish charging if SOC 150% is reached. If 150% is not reached due to the characteristics of the battery, finish charging 2.5 hours after full charging.
5) During overcharging, check if there is any fire or explosion, and measure the voltage when the charging is completed.

48.6.4. Overdischarge test

1) Completely discharge the traction battery in the ambient temperature, and maintain SOC 0%.
2) Measure the voltage of the traction battery.
3) Discharge the traction battery at 1C (amount of current which can charge/discharge the whole capacity).
4) Overdischarge the battery for 30 minutes from the start of discharge, and conclude the test.
5) During overdischarging, check if there is any fire or explosion, and measure the voltage when the discharging is completed.

48.6.5. Short circuit test

1) Completely discharge the traction battery in the ambient temperature, and charge up to the target SOC at the rated current.

2) The target SOC during charging shall be the maximum SOC over the operating range of a vehicle, or SOC 80% if there is no reference SOC.
3) Measure the voltage of the traction battery.
4) Short the traction battery with the overall resistance of 50mOhm of the short circuit.
5) Stop electrical short of the traction battery when 1 hour has passed after being short, or no current is flown for 5 minutes.
6) During electrical short, check if there is any fire or explosion, and measure the voltage when the test is concluded.

48.6.6. Heat exposure test

1) Completely discharge the traction battery in the ambient temperature, and charge up to the target SOC at the rated current.
2) The target SOC during charging shall be the maximum SOC over the operating range of a vehicle, or SOC 80% if there is no reference SOC.
3) Measure the voltage of the traction battery.
4) Maintain the temperature of the chamber at 80^{o}C.
5) Place the traction battery in the chamber. When 4 hours have passed, conclude the test.
6) During heat exposure, check if there is any fire or explosion, and measure the voltage when the test is concluded.

48.6.7. Fire resistance test

1) Completely discharge the traction battery in the ambient temperature, and charge up to the target SOC at the rated current.
2) The target SOC during charging shall be the maximum SOC over the operating range of a vehicle, or SOC 80% if there is no reference SOC.
3) Measure the voltage of the traction battery.
4) Place the traction battery as shown in Figure 1 below. Heat the bottom of the traction battery directly.

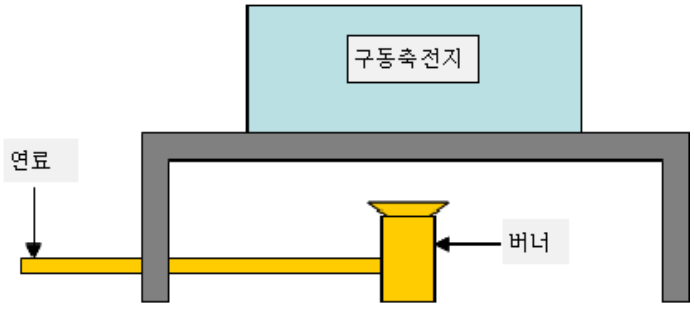

Figure 1. Fire resistance test set-up

5) The battery shall be burned at the temperature of 890°C – 900°C. When 2 minutes have passed, conclude the test.
6) During burning, check if there is any fire or explosion, and measure the voltage when the test is concluded.