



هيئة الإمارات للمواصفات والمقاييس  
Emirates Authority For Standardization & Metrology



## UAE Regulations on Electric Vehicles

## **UAE Regulations on Electric Vehicles**

### **Article 1**

#### **Definitions**

The following definitions shall apply for the implementation of this scheme.

- Country: United Arab Emirates
- Authority: Emirates Authority for Standardization and Metrology (ESMA)
- Council: Board of ESMA
- Director General: Director General (DG) of ESMA
- Concerned Authorities: All those federal and/or local governmental authorities of the country who have been authorized to implement the requirements of this scheme.
- Standard: A standard is a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose.
- Conformity Certificate: A certificate issued by ESMA to the given product ensuring that the product complies with the requirements of this scheme.
- Supplier: Manufacture or Manufacturer's representative to the country or the importer in the absence of a representative of the country.
- ECAS: The system that verifies the fulfillment of the approved standards, either directly or indirectly like inspection, testing, examination, calibration or granting the products conformity certificates, and which is applied by the authority according to the general regulation of Emirates Conformity Assessment Scheme (ECAS) that has been granted by Board Directors of the Authority by decision No. (8) For the year 2009.
- Electrical Motor Vehicle: An electric car is an alternative fuel automobile that uses electric motors and motor controllers for propulsion, in place of more common propulsion methods such as the internal combustion engine (ICE). Electricity can be used as a transportation fuel to power battery electric vehicles (EVs). EVs store electricity in an energy storage device, such as a battery. The electricity powers the vehicle's wheels via an electric motor. EVs have limited energy storage capacity, which must be replenished by plugging into an electrical source.

- "Rechargeable Energy Storage System (REESS)" means the rechargeable energy storage system that provides electric energy for electric propulsion.  
The REESS may include subsystem(s) together with the necessary ancillary systems for physical support, thermal management, electronic control and enclosures.
- "Electric power train" means the electrical circuit which includes the traction motor(s), and may include the REESS, the electric energy conversion system, the electronic converters, the associated wiring harness and connectors, and the coupling system for charging the REESS.
- Electric Vehicle Charging System. A system of components that provide a dc output that is supplied to the vehicle for the purpose of recharging electric vehicle storage batteries.
- Electric Vehicle Connector. A device that, by insertion into an electric vehicle inlet, establishes an electrical connection to the electric vehicle for the purpose of power transfer and information exchange. This device is part of the electric vehicle coupler.
- Electric Vehicle Coupler. A mating electric vehicle inlet and electric vehicle connector set.
- Electric Vehicle Inlet. The device on the electric vehicle into which the electric vehicle connector is inserted for power transfer and information exchange. This device is part of the electric vehicle coupler. For the purposes of this Code, the electric vehicle inlet is considered to be part of the electric vehicle and not part of the electric vehicle supply equipment.
- Electric Vehicle Storage Battery. A battery, comprised of one or more rechargeable electrochemical cells, that has no provision for the release of excessive gas pressure during normal charging and operation, or for the addition of water or electrolyte, or for external measurements of electrolyte specific gravity.
- Electric Vehicle Supply Equipment. The conductors, including the ungrounded, grounded, and equipment grounding conductors and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.
- Electric Vehicle Supply Equipment System. A system of components that provide an ac output that is supplied to the vehicle for the purpose of providing input power to an on-board charger.
- Personnel Protection System. A system of personnel protection devices and constructional features that when used together provide protection against electric shock of personnel.
- Rechargeable Energy Storage System. Any power source that has the capability to be charged and discharged.

## **Article 2**

### **Scope**

This regulation is concerned with the general requirements for electrical motor vehicles; these requirements are applicable to electrical vehicles, with maximum GVW less than 3500Kg.

This regulation includes the requirements for charging station additional to the workstation requirements.

It gives also guideline for dealing with the electrical vehicle after an accident.

The performance of the electrical vehicle is part of this regulation

## **CHAPTER ONE**

### **Electric vehicle requirements**

## **Article 3**

### **Safety Requirements**

These requirements shall reduce deaths and injuries during a crash, during electric shock, which occur because of electrolyte spillage from propulsion batteries, intrusion of propulsion battery system components into the occupant compartment and electric shock.

#### **3-1 General Requirements**

##### **3-1-1 Protection against electrical shock**

- live parts, such as solid insulator, barrier, enclosure, etc ...shall not be able to be opened, disassembled or removed without the use of tools which can be done only by a competent person
- Connectors shall locate under the floor and are provided with a locking mechanism. Or provided with a locking mechanism and other components shall be removed with the use of tools in order to separate the connector.
- The voltage of the live parts becomes equal or below DC 60V or below AC 30V(rms) within 1 second after the connector is separated.

##### **3-1-2 Protection against indirect contact**

- The exposed conductive parts, such as the conductive barrier and enclosure, shall be galvanic ally connected securely to the electrical chassis ,so that no dangerous potentials are produced.
- The resistance between all exposed conductive parts and the electrical chassis shall be less than 0.1ohm when there is current flow of at least 0.2 A .

### 3-1-3 Isolation resistance

- Mechanically robust protections that have sufficient durability over vehicle service life such as motor housings, electronic converter cases or connectors shall be provided.

### 3-1-4 Rechargeable energy storage system (REESS)

- The REESS shall not overheat.
- It shall be equipped with a protective device such as fuses, circuit breakers or main contactors.
- Battery that may produce hydrogen gas shall be provided with a ventilation fan or a ventilation duct to prevent the accumulation of hydrogen gas.

## 3-2 Impact Strength

### 3-2-1 Frontal Impact

This requirement specifies the limit of the rearward displacement of the steering to reduce the likelihood of chest, neck or head injuries. The body injuries are measured by using dummies with electrical impulse connections and measuring instruments. the electrical protection and electrolyte spillage are also measured.

#### 3-2-1-1 mechanical production :

After the frontal impact :

- The part of the steering control surface directed towards the driver shall not present any rough edges likely to increase the danger or severity of injuries to the driver. The steering displacement shall be less than 127mm.
- no rigid component in the passenger compartment shall constitute a risk of serious injury to the occupants.
- The side doors of the vehicle shall not open under the effect of the impact to prevent occupant thrown out during an impact.
- The opening of doors to enable all the passengers to emerge shall be possible without the use of tools.
- The dummy performance criteria shall be complied to indicate that the occupants will not receive any serious injuries.

### 3-2-1-2 Electrical Protection

#### 3-2-1-2-1 Protection against Electrical Shock

As a result of impact one of the four conditions indicated in items below shall be complied to avoid any electric shock:

- The voltages between high voltage buses shall be low as possible. The voltages  $V_b, V_1$  and  $V_2$  of the high voltage buses shall be equal or less than 30VAC or 60 VDC .
- The total energy on the high voltage buses shall be low as possible. The total energy (TE) on the high voltage buses shall be less than 2.0 Joules .

#### 3-2-1-2-2 Physical protection

The resistance between all exposed conductive parts and the electrical chassis shall be low as possible, lower than 0.1ohm when there is a current flow of at least 0.2 A.

For protection against direct contact with high voltage live parts the protection IPXXB shall be provided.

#### 3-2-1-2-3 Isolation resistance

The isolation resistance between the high voltage bus and the electrical chassis shall have a minimum value of 100  $\Omega$ /volt of the working voltage for DC buses, and a minimum value of 500  $\Omega$ /volt of the working voltage for AC buses.

#### 3-2-1-3 Electrolyte spillage

As a result of impact there shall no electrolyte leakage or should be a minimum amount specified (less than 7%) to avoid fire or electric shock and to reduce deaths and injuries. In the period from the impact until 30 minutes after no electrolyte from the REES shall spill into the passenger compartment and no more than 7% of electrolyte shall spill from the REESS except open type traction batteries outside the passenger compartment

#### 3-2-1-4 RESS retention

As a result of impact the REESS (Electrical Power Train) shall not enter the passenger compartment during or after the impact

### 3-2-2 REAR IMPACT

This requirement specifies the limit of the inward displacement of the passenger compartment to reduce the likelihood of death and injuries. Its purpose is to protect passengers from the risk of fire or toxic or any electrical shock as a result of electrolyte spillage inside the passenger compartment during and after motor vehicle crashes.

#### 3-2-2-1 mechanical effect

After the rear impact on the vehicle the following shall be met :

- the longitudinal displacement of the vertical projection of the floor shall not cause any injury to the passengers. The rear displacement should be less than 75mm
- The side doors of the vehicle shall not open under the effect of the impact to prevent occupant thrown out during any impact
- The opening of doors to enable all the passengers to emerge shall be possible without the use of tools.

### 3-2-3 SIDE IMPACT

This requirement is to protect the occupants in side impact crashes. The purpose of this regulation is to reduce the risk of serious and fatal injury to the passenger in case of accidents. It also covers the requirements to avoid electrical shock .

#### 3-2-3-1 Static side Impact

- The side doors shall be reinforced to reduce the impact forces from the side and to reduce the injuries or deaths due to side impact.
- The strength of the body structure and doors shall be such when tested the vehicle in accordance with Gulf standard the vehicle shall meet the following requirement to indicate the structure is strong enough to absorb the forces applied on them:
  - The initial crush resistance be more than 1020 kg.
  - The intermediate crush resistance be more than 1590 kg
  - The peak crush resistance be more than twice the curb weight of the vehicle or 3175 kg whichever is less.

#### 3-2-3-2 Dynamic side Impact

- . After the impact, the side doors should be strong enough that the passengers will not receive any serious injuries in a side impact with other vehicles or rollover accidents. The body injuries are measured by using dummies with electrical impulse connections and measuring instruments.
- At the end of specified impact no rigid component in the passenger compartment shall constitute a risk of serious injury to the passengers.
- The side doors of the vehicle which are not impacted shall not open under the effect of the impact, and the latches shall not separate from the striker to prevent passenger thrown out during an accident.
- After the side impact the conditions indicated in item 3-2-1-2 shall be complied to avoid electric shock.

#### 3-2-3-3 Roof Strength

This requirement establishes strength requirement for the passenger compartment roof to reduce deaths and injuries due to crushing of the roof into the passenger compartment in rollover crashes.

The maximum displacement of any vehicle less than 2722kg after the impact the roof of vehicle shall not exceed 127 mm when tested according to GSO regulation .

## Article 4

### Performance of the electrical vehicles

#### 4.1 Electrical performance

The Technical Service in charge of the tests conducts the measurement of the electric energy consumption according to the method and test cycle described in Annex 7 to this Regulation.

- The Technical Service in charge of the tests conducts the measurement of the electric range of the vehicle according to this Regulation. The electric range measured by this regulation is the only one which may be included in sales promotional material. This value must also be used for the calculations
- The result of the electric energy consumption must be expressed in Watt hours per kilometre (Wh/km) and the range in km, both rounded to the nearest whole number.

If the measured value of electric energy exceeds the manufacturer's declared electric energy value by more than 4 %, then another test is run on the same vehicle.

When the average of the two test results does not exceed the manufacturer's declared value by more than 4 %, then the value declared by the manufacturer is taken as the type approval value.

If the average still exceeds the declared value by more than 4 %, a final test is run on the same vehicle. The average of the three test results is taken as the type approval value.

The electric range value adopted as the type approval value shall be the value declared by the manufacturer if this is no more than the value measured by the Technical Service. The declared value may be lower than the measured value without any limitations.

If the declared range value exceeds the value measured by the Technical Service, then another test is run on the same vehicle. When the manufacturer declared value does not exceed the average of the two test results, then the value declared by the manufacturer is taken as the type approval value.

If the declared value still exceeds the average measured value a final test is run on the same vehicle. The average of the three results is taken as the type approval value.

#### 4.2 Test conditions

##### 4.2.1. Condition of the vehicle

- The vehicle tyres shall be inflated to the pressure specified by the vehicle manufacturer when the tyres are at the ambient temperature.
- The lighting and light-signaling and auxiliary devices shall be off, except those required for testing and usual daytime operation of the vehicle.
- All energy storage systems available for other than traction purposes (electric, hydraulic, pneumatic, etc.) shall be charged up to their maximum level specified by the manufacturer.
- If the batteries are operated above the ambient temperature, the operator shall follow the procedure recommended by the vehicle manufacturer in order to keep the temperature of the battery in the normal operating range.
- The manufacturer's agent shall be in a position to attest that the thermal management system of the battery is neither disabled nor reduced.

- The vehicle must have undergone at least 300 km during the seven days before the test with those batteries that are installed in the test vehicle.

#### **4.3 Test methods**

The electrical range should be test according to ISO 8714 and the same test sequence in annex A shall be used to define energy consumption and range.

#### **4.4 Electric energy consumption, C**

All cars should be equipped with the electrical car performance labile. The performance values must be specified at the standard conditions and at a temperature of 45° C for outdoor test based on a declaration and on the responsibility of the manufacturer.

The energy consumption C is the Energy required to travel X km in standardized conditions, shall be calculated using the formula:

$$C = \frac{E}{D}$$

Expressed in watt-hours per kilometer (Wh/km), rounded to the nearest whole number.

**E:** Energy in Wh

**D :** test is the distance covered during the test (km).

Electric energy consumption ( Wh / Km ) shall be not more than 300 Wh/ Km .

#### **4.5 Total Range :**

The maximum distance an electrified vehicle can travel using battery power over a designated test sequence on a fully charged traction battery, to the end of the test sequence expressed in kilometers (km).

It should be at least 150 KM.

### **Article 5**

#### **Conformity assessment scheme**

- All electrical vehicles should be registered within ECAS program under conformity model (B).
- The electrical cars shall comply with all regulations mention in annex 1, in addition to the requirements in this regulation.
- Manufacture need to fill the declaration form attached in annex 2
- The vehicle should have the performance star label

- All the electrical vehicles should have mechanism for a safety procedure intended to protect persons working on electric vehicles from accidents and from any inadvertent appearance or appearance of voltage on the vehicle.it should disables the traction system from the traction battery to make the vehicle safe.

## **Article 6**

### **Manufacture Responsibility**

- 1-Each manufacturer shall prepare manual with risks and all the warnings for safe use for electrical cars.
- 2- Warning shall be written in case of any accident with following meaning:
  - A damaged 400 V circuit components or cable may cause burns or electrocution so ,Do not touch damaged orange 400 V cables or the 400 V components .
  - If the traction battery is damaged, there may be a delayed risk of fire. In this Case, it is necessary to place the vehicle or the damaged battery under surveillance in a dedicated and secure storage area so as to prevent the start of a fire
- 3- The manufacturers and dealers shall provide proper training to civil defense departments on response and proved them with :
  - a- procedure for a vehicle involved in an impact whilst charging
  - b- Procedure for a vehicle on fire and should include:
    - Hazards and protective equipment to be use.
    - Action procedure to extinguish the vehicle.
  - c- Instructions for avoid high voltage area and Instructions for freeing vehicle occupants
    - Prohibited cutting areas
    - Recommended cutting areas
  - D - Procedure in the event of an electrolyte leak from the traction battery.
- 4 - The manufacturers or his dealer should have at least one workshop with all qualified and trainer persons for regular maintenance and repairing there vehicles.

5 - All cars should be equipped with the electrical car performance labile, It must be non-removable and placed at area can be easily seen.

**Article 7**  
**Publication and Date of Implementation**

This regulation is published in The Gazette and come in to force one year from the date of publication and all the concerned parties shall implement it.

**CHAPTER TOW**

**Electric Vehicle Charging and Supply Equipment Systems**

Scope this chapter cover the electrical conductors and equipment external to an electric vehicle that connect an electric vehicle to a supply of electricity by conductive or inductive means, and the installation of equipment and devices related to electric vehicle charging.

**Article 8**  
**Equipment Construction**

**8-1 Electric Vehicle Coupler :**

The electric vehicle coupler shall comply with:

- The electric vehicle coupler shall have a configuration that is non-interchangeable with wiring devices in other electrical systems. Non-grounding-type electric vehicle couplers shall not be interchangeable with grounding-type electric vehicle couplers.
- The electric vehicle coupler shall be constructed and installed so as to guard against inadvertent contact by persons with parts made live from the electric vehicle supply equipment or the electric vehicle battery.
- The electric vehicle coupler shall be provided with a positive means to prevent unintentional disconnection.
- If a grounding pole is provided, the electric vehicle coupler shall be so designed that the grounding pole connection is the first to make and the last to break contact.

### **8-2 Rating :**

Electric vehicle supply equipment shall have sufficient rating to supply the load served. Electric vehicle charging loads shall be considered to be continuous loads for the purposes of this article. Where an automatic load management system is used, the maximum electric vehicle supply equipment load on a service or feeder shall be the maximum load permitted by the automatic load management system.

### **8-3 Markings :**

- All electric vehicle supply equipment shall be marked by the manufacturer as follows:

“ FOR USE WITH ELECTRIC VEHICLES “

- The electric vehicle supply equipment shall be clearly marked if ventilation not required by the manufacturer as follows:

“ ventilation not required “

- The electric vehicle supply equipment shall be clearly marked by the manufacturer,

“Ventilation Required.”

The marking shall be located so as to be clearly visible after installation.

### **8-3 Cords and Cables :**

The cable for cord-connected equipment shall comply with all of the following :

- The overall useable length shall not exceed 7.5 m unless equipped with a cable management system that is part of a listed the electric vehicle supply equipment or electric vehicle charging system.

(1) Where the electric vehicle supply equipment or charging system is not fixed in place, the cord exposed useable length shall be measured from the face of the attachment plug to the face of the electric vehicle connector.

(2) Where the electric vehicle supply equipment or charging system is fixed in place, the useable length of the output cable shall be measured from the cable exit of the electric vehicle supply equipment or charging system to the face of the electric vehicle connector.

Other cable types and assemblies listed as being suitable for the purpose, including optional hybrid communications, signal, and composite optical fiber cables, shall be permitted.

### **8-4 Interlock.**

Electric vehicle supply equipment shall be provided with an interlock that de-energizes the electric vehicle connector and its cable whenever the electrical connector is uncoupled from the electric vehicle.

#### **8-5 Automatic De-Energization of Cable.**

The electric vehicle supply equipment or the cable-connector combination of the equipment shall be provided with an automatic means to de-energize the cable conductors and electric vehicle connector upon exposure to strain that could result in either cable rupture or separation of the cable from the electric connector and exposure of live parts.

#### **8-6 Personnel Protection System.**

The electric vehicle supply equipment shall have a listed system of protection against electric shock of personnel.

### **Article 9 Installation**

#### **9-1 Branch Circuit Markings.**

When a branch circuit is installed to supply electric vehicle supply equipment (or electric vehicle charging system), a label shall be permanently affixed adjacent to the outlet box and shall contain the following information:

“For use with electric vehicle supply equipment (or ) electric vehicle charging system)”, as appropriate, and the voltage and amperage it is permitted to serve.

#### **9-2 Overcurrent Protection.**

Overcurrent protection for feeders and branch circuits supplying electric vehicle supply equipment shall be sized for continuous duty and shall have a rating of not less than 125 percent.

of the maximum load of the electric vehicle supply equipment. Where non-continuous loads are supplied from the same feeder or branch circuit, the overcurrent device shall have a rating of not less than the sum of the non-continuous loads plus 125 percent of the continuous loads.

### **Article 10 Electric Vehicle Supply Equipment Connection.**

Electric vehicle supply equipment shall be permitted to be cord and plug connected to the premises wiring system in accordance with one of the following:

- 1- Electric vehicle supply equipment that is rated 250 volts maximum and complies with all of the following:
- 2-- It is intended for connection to receptacle outlets rated no more than 50 amperes.
- 3 - It is installed to facilitate any of the following:

- a. Ready removal for interchange
- b. Facilitate maintenance and repair
- c. Repositioning of Portable, movable, or EVSE fastened in place
- 4- Power supply cord length for electric vehicle supply equipment fastened in place is limited to (1.8 m).
- 5- Receptacles are located to avoid physical damage to the flexible cord.

All other electric vehicle supply equipment shall be permanently connected to the premises wiring system. The electric vehicle supply equipment shall have no exposed live parts.

### **Chapter three**

#### **Workstation for EV**

#### **Article 11**

#### **Staff requirements**

##### **11-1 Staff Training**

To identify and prevent electrical hazards during an operation or when using an electrical vehicle the following should be consider :

- Before undertaking any operation on an electrical installation, an electrical risk assessment must be carried out. This assessment must specify how the operation is to be carried out and what measures and precautions need to be taken to ensure safety.
- All staff involved in the operations on or near to an electrical installation must be trained in the safety requirements, safety rules and in-house instructions applicable to the operation.
- Staff must wear clothes appropriate to the workstation and conditions in which they are required to work. This may include the use of snugly fitted clothing or additional personal protective equipment (PPE)
- The goal of the training and education for the staff in the workshop is to:
  - learn about the dangers associated with electricity and be able to identify the hazards.
  - learn about the preventive actions and know how to apply them.
  - Educate Customers on the use and ownership of an Electric Vehicle

##### **11-2 Staff responsibility in the workshop:**

A- We can classify the staff in the workshop to :

**1- Qualified person**

Trained person with relevant knowledge and experience to analyze electrical risks and avoid the hazards electricity could bring about.

He could be Battery Specialist or EV Technician. He can do all type of maintenance and repairing .

**2- Informed person**

Person sufficiently informed so as to avoid the dangers that electricity could bring about, Could be body or Mechanical Technician, Service or bodyshop Manager . He can make all type of maintenance and repairing except electrical and battery repairing.

**3- Ordinary person**

Untrained Person who is neither qualified, nor an informed person. He could be sales executive , or service advisor he cannot do any type of maintenance and repairing.

B- All the workshops for repairing or do a service for electrical vehicles should have at least one qualified person .

**Article 12**

**Safety Equipment for EV Workstation**

- Clear instructor to use the lock out system before working on the High Voltage System and moving Accident Damaged Vehicles.
- Employer is responsible for Providing and maintaining PPE for all staff .
- It is compulsory for the staff to wear individual protection equipment during any operation in the orange zone (Battery removal, Lockout)
- The workstation should have a collective protection equipment (CPE ) for :
- Battery Repair area
- Vehicle Protected Area

- Insulation
- The workstation should have a workspace for high voltage system repairs at it should have a warning Panel the meaning of :

“ Dangers area , high voltage working area “

### **Article 13**

#### **Handling a vehicle involve in an accident :**

- If the Vehicle Condition doesn't have any damage in the structural, Battery or no high voltage wiring damage so, the staff need to Lockout Vehicle before any Repair.
- If the Vehicle after the accident have any damage in the structural, Battery or high voltage wiring damage so, the staff need to Lockout Vehicle and the qualified person should do a safety assessment for :
- Exposed Components
- Leaking Fluids
- Damaged Battery / Wiring
- Vehicle Locked Out

If any of above it should be putting in Isolated area .

### **Article 14**

#### **Requirement for vehicle storage location :**

A dedicated storage with the following specifications:

- One dedicated, uncovered, outdoor parking space
- 5 Meters Clear space around the vehicle
- At least 12 meters away from the nearest building).
- Leave vehicle a minimum of 48 Hours

## Annex 1

## GSO Technical Regulation for Motor Vehicles

<b>No.</b>	<b>GSO</b>	<b>Year</b>	<b>Technical Regulation</b>
1	36	2005	Motor Vehicles - Methods of Test for Impact Strength - Part 1: Frontal Impact
2	37	2012	Motor Vehicles - Methods of Test for Impact Strength - Part 2: Rear Impact
3	38	2005	Motor Vehicles - Methods of Test for Impact Strength - Part 3A: Side Impact
4	39	2005	Motor Vehicles - Methods of Test for Impact Strength - Part 4: Roof Strength
5	40	2011	Motor Vehicles - Impact Strength
6	41	2007	Motor Vehicles: Front and Rear Exterior Protection Devices for Passenger Cars (Bumpers etc) and its Methods of Test
7	42	2015	Motor Vehicles: General Requirements
8	48	1984	Motor Vehicles: Conformity Certificates
9	51	2007	Passenger Car Tyres - Part 1: Nomenclature, Designation, Dimensions, Load Capacities and Inflation Pressures
10	52	2007	Passenger Car Tyres - Part 2: General Requirements
11	53	2007	Passenger Car Tyres - Part 3: Methods of Test
12	96	1988	Motor Vehicles - Methods of Testing of Safety Belt
13	97	1988	Motor Vehicles - Safety Belts
14	98	1988	Motor Vehicles - Flammability of Interior Materials and Testing Methods

15	99	1988	Road Vehicles - Sound Signaling Devices – Technical Specifications
16	279**	2005	Car Upholstery - Testing Methods of Fabric for Car Seats
17	280**	2005	Car Upholstery - Fabric for Car Seats
18	289**	1994	Road Vehicles - Retro Reflective Number Plates and its Methods of Test
19	290	1994	Instruction Manual for Appliances Instruments and Equipment
20	419	1994	Motor Vehicles - Methods of Testing for Door Locks and Door Hinges
21	420	1994	Motor Vehicles - Door Locks and Door Hinges
22	421	2005	Motor Vehicles - Methods of Testing of Rear-view Mirrors
23	422	2005	Motor Vehicles – Rear-view Mirrors
24	581**	2007	Requirements for Storage of Motor Vehicles Tyres
25	645	2005	Multi-Purpose Vehicles, Trucks, Buses and Trailers Tyres - Part 1: Nomenclature, Designation, Dimensions, Load Capacities and Inflation Pressures
26	646	1996	Multi-Purpose Vehicles, Trucks, Buses and Trailers Tyres: Part 2: Method of Test
27	647	1996	Multi-Purpose Vehicles, Trucks, Buses and Trailers Tyres: Part 3: General Requirements
28	674**	1997	Motor Vehicles - Safety Requirements for Maintenance and Repair Workshop
29	963*	1997	Motor Vehicles - General Requirements for Ambulances
30	971**	1997	Motor Vehicles - Periodic Technical Inspection Manual
31	1052 *	2000	Motor Vehicles Tyres - Temporary Use Spare Wheel/Tyres and Their Methods of Test

32	1053	2000	Motor Vehicles - Protection Against Theft
33	1503	2010	Motor Vehicle - Head Lamps Safety Requirements.
34	1598	2002	Motor Vehicles - Head Restraints and Their Methods of Test
35	1625 *	2002	Motor Vehicles - Speed Limiters - Part 2: Technical Requirements
36	1626 *	2002	Motor Vehicles - Speed Limiters - Part 3: Methods of Test
37	1677	2003	Motor Vehicles – Laminated Safety Glass
38	1707	2005	Motor Vehicles - Methods of Test for Impact Strength - Part 3B: Moving Barrier Side Impact (In accordance to US standards)
39	1708	2005	Motor Vehicles - Methods of Test For Impact Strength - Part 3C: Moving Barrier Side Impact (In accordance to European standards)
40	1709 *	2005	Motor Vehicles – Child Restraint Systems
41	1710 *	2005	Motor Vehicles – Methods of Testing of Child Restraint
42	1711 *	2005	Motor vehicles – Speed Limiters - Part 1: General requirements, Equipment Inspection, Certification and type approval
43	1780	2010	Motor Vehicles – Vehicle Identification Number (VIN) - Requirements
44	1781	2006	Motor Vehicles - World Manufacturer Identifier
45	1782	2008	Motor Vehicles – Vehicle Identification Number (VIN) – Location and attachment
46	1783	2006	Passenger Car Tyres - Treadwear, Traction and Temperature-Resistance Grading
47	1784	2006	Passenger Car Tyres - Method of Testing of Tyre Temperature Resistance Grading
48	GSO ISO	2008	Motor Vehicles - Safety Glazing Materials - Mechanical Tests

	3537		
49	GSO ISO 3538	1997	Road Vehicles - Safety Glasses - Test Methods for Optical Properties.
50	GSO ISO 6311* *	2005	Motor Vehicles –Methods of Testing Brake Linings – Part 1: Internal Shear Strength of Lining Material.
51	GSO- ECE- 13H	2012	Motor Vehicles: Braking System of Passenger Cars and Multi Purpose Vehicles
52	GSO- ECE- 13H-1	2012	Motor Vehicles: Methods of Test for Braking System – Part 1: Braking Performance
53	GSO- ECE- 13H-2	2012	Motor Vehicles: Methods of Test for Braking System – Part 2: Determination of Capacity of Energy Storage Devices
54	GSO- ECE- 13H-3	2012	Motor Vehicles: Methods of Test for Braking System – Part 3: Determination of Distribution of Braking among the Axles of Vehicles
55	GSO- ECE- 13H-4	2012	Motor Vehicles: Methods of Test for Braking System – Part 4: Determination of Function of Anti-Lock Systems
56	GSO- ECE- 13H-5	2012	Motor Vehicles: Methods of Test for Braking System – Part 5: Determination of Performance of Brake Lining Using Inertia Dynamometer
57	GSO- ECE- 13H-6	2012	Motor Vehicles: Methods of Test for Braking System – Part 6: Determination of Coefficient of Adhesion
*	<i>Applicable for certification if provided or the vehicle is designed for.</i>		
**	<i>Not applicable for Certification.</i>		

Annex 2

UAE Standards for Electrical Motor Vehicles

ISO	IEC	Technical domain / Standardization corpus
		<b>Electric road vehicle – Vocabulary</b>
ISO 8713:2005		Electric road vehicles – Vocabulary
	IEC 60417	Graphical symbols for use on equipment
	IEC 60446	Basic and safety principles for man-machine interface, marking and identification. Identification of conductors by colours or numerals.
	IEC 60529	Degrees of protection provided by enclosures (IP Code)
		<b>Batteries</b>
ISO 6469-1: 2009 Ed. 2		Electric road vehicles - Safety specifications - Part 1: On-board rechargeable energy storage system (RESS)
ISO/DIS 12405-1 under revision		Electrically propelled road vehicles — Test specification for lithium-ion traction battery packs and systems —  Part 1: High power applications
ISO/WD 12405-2 under development		Electrically propelled road vehicles — Test specification for lithium-ion traction battery packs and systems —  Part 1: High energy applications
	IEC 62619	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for large format secondary lithium cells and batteries for use in industrial applications
	IEC 60050-482	International Electrotechnical Vocabulary (IEV) - Part 482: Primary and secondary cells and batteries
	IEC 60050-486	International Electrotechnical Vocabulary (IEV) - Chapter 486:Secondary cells and batteries
	IEC 60622	Secondary cells and batteries containing alkaline or other non-acid electrolytes Sealed nickel-cadmium prismatic rechargeable single cells

	IEC 60623	Secondary cells and batteries containing alkaline or other non-acid electrolytes Vented nickel-cadmium prismatic rechargeable single cells
	IEC 61434	Secondary cells and batteries containing alkaline or other non-acid electrolytes Guide to the designation of current in alkaline secondary cell and battery standards
	IEC 61982-1 under revision	Secondary batteries (except lithium) for the propulsion of electric road vehicles - Part 1: Performance and endurance tests
	IEC 61982-2	Secondary batteries for the propulsion of electric road vehicles - Part 2: Dynamic discharge performance test and dynamic endurance test
	IEC 61982-3	Secondary batteries for the propulsion of electric road vehicles -Part 3: Performance and life testing (traffic compatible, urban use vehicles)
	IEC 61982-4 IEC 62660-1	Secondary batteries for the propulsion of electric road vehicles – Part 1: Test parameters
	IEC 61982-5 IEC 62660-2	Secondary batteries for the propulsion of electric road vehicles –Part 5: Safety testing for lithium-ion cells and batteries
	IEC 62133	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications
	IEC/TR 62188	Secondary cells and batteries containing alkaline or other non-acid electrolytes – Design and manufacturing recommendations for portable batteries made from sealed secondary cells
	IEC 62281	Safety of primary and secondary lithium cells and batteries during transport

	IEC 62660-1	Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 1: Performance testing
	IEC 62660-2	Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 2: Reliability and abuse testing
	IEC 62485-2	Safety requirements for secondary batteries and battery installations – Part 2: Stationary batteries
	IEC 62485-3	Safety requirements for secondary batteries and battery installations – Part 3: Traction batteries
	IEC/TS 61438	Possible safety and health hazards in the use of alkaline secondary cells and batteries - Guide to equipment manufacturers and users
		Charging systems
	IEC 61439 series	Low-voltage switchgear and control gear assemblies
	IEC 60947-1	Low-voltage switchgear and control gear – Part 1: General rules
	IEC 60947-2	Low-voltage switchgear and control gear – Part 2 : Circuit-breakers
	IEC 60947-3	Low-voltage switchgear and control gear - Part 3: Switches, disconnections, switch- disconnections and fuse-combination units
	IEC 61851-1	Electric vehicle conductive charging system - Part 1: General requirements
	IEC 61851-21	Electric vehicle conductive charging system - Part 21: Electric vehicle requirements for conductive connection to an a.c./d.c. supply
	IEC 61851-22	Electric vehicle conductive charging system - Part 22: AC electric vehicle charging station
	IEC 61851-23	Electric vehicle conductive charging system - Part 23: d.c. electric vehicle charging station
	IEC 62196-1 under revision	Plugs, socket-outlets, vehicle couplers and vehicle inlets - Conductive charging of electric vehicles - Part 1: Charging of electric vehicles up to 250 A a.c. and 400 A d.c.
	IEC 62196-2 under development	Plugs, socket-outlets and vehicle couplers – Conductive charging of electricity vehicles – Part 2: Dimensional interchangeability requirements for a.c. pin and contact-tube accessories

		Wiring, connectors, controllers, rotating machines
ISO 6722		Road vehicles – 60 V and 600 V single-core cables – Dimensions, test methods and requirements
ISO 4141-1		Multi-core connecting cables – Part 1: Test methods and requirements for basic performance sheathed cables
ISO 4141-2		Multi-core connecting cables – Part 2: Test methods and requirements for high performance sheathed cables
ISO 4141-3		Multi-core connecting cables – Part 3: Construction, dimensions and marking of unscreened sheathed low-voltage cables
ISO 4141-4		Multi-core connecting cables – Part 4: Test methods and requirements for coiled cable assemblies
ISO 14572		Road vehicles – Round, unscreened 60 V and 600 V multicore sheathed cables – Test methods and requirements for basic and high performance cables
ISO 10924-1		Road vehicles – Circuit breakers – Part 1: Definitions and general test requirements
ISO 10924-4		Road vehicles – Circuit breakers – Part 4: Medium circuit breakers with tabs (blade type), Form CB15
	IEC 60309	(all parts) Plugs, socket-outlets and couplers for industrial purposes
	IEC 60309-1	Plugs, socket-outlets and couplers for industrial purposes – Part 1: General requirements
	IEC 60309-2	Plugs, socket-outlets and couplers for industrial purposes – Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories
	IEC 60309-4	Plugs, socket-outlets and couplers for industrial purposes – Part 4: Switched socket-outlets and connectors with or without interlock
	IEC/TR 60783	Wiring and connectors for electric road vehicles
	IEC 60664-1	Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests
	IEC/TR 60783	Wiring and connectors for electric road vehicles

	IEC 60811 series	Common test methods for insulating and sheathing materials of electric cables and optical cables
	IEC 60884	Plugs and socket-outlets for household and similar purposes
	IEC/TR 62602	Conductors of insulated cables – Data for AWG and KCMIL sizes
	IEC 60481	Coupling devices for power line carrier systems
	IEC 61850 series	Communication networks and systems in substations
	IEC/PAS 62559	Intelligrid methodology for developing requirements for energy systems
		Vehicle safety & personnel protection
ISO 6469-1: 2009		Electrically propelled road vehicles -- Safety specifications -- Part 1: On-board rechargeable energy storage system (RESS)
ISO 6469-2: 2009		Electric road vehicles - Safety specifications - Part 2: Vehicle operational safety means and protection against failures
ISO 6469-3: 2001		Electric road vehicles - Safety specifications - Part 3: Protection of persons against electric hazards
ISO 6469-3* ed. 2 under development		Electric road vehicles - Safety specifications - Part 3: Protection of persons against electric hazards
ISO 8820-1: 2008		Road vehicles - Fuse-links - Part 1: Definitions and general test requirements
ISO 8820-6:		Road vehicles - Fuse-links - Part 6: Single- bolt fuse-links
	IEC 61140	Protection against electrical shock – Common aspects for installation and equipment
	IEC/TS 60479 series	Effects of current on human beings and livestock
	IEC 60269-1	Low-voltage fuses – Part 1 : General requirements
	IEC 62335	Circuit breakers – Switched protective earth portable residual current devices for class I and battery powered vehicle applications
	IEC 60755	General requirements for residual current operated protective devices

		EMC (Electro-magnetic compatibility)
	IEC 61000-3-2	Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for armonic current emissions (equipment input current < 16 A per phase)
	IEC 61000-3-3	Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage systems for equipment with rated current ≤ 16 A per phase and not subjected to conditional connection
	IEC 61000-3-12	Electromagnetic compatibility (EMC)--Part 3-4 Limits – Limitation of mission of harmonic currents in low-voltage power supply systems for equipment with rated current > 16 A
	IEC 61000-3-11	Electromagnetic Compatibility (EMC) – Part 3-11 – Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage systems - Equipment with rated current ≤ 75 A per phase and subjected to conditional connection
	IEC 61000-3-12	Electromagnetic Compatibility (EMC) – Part 3-12 – Limits for harmonic current emissions produced by equipment connected to public low-voltage systems with input current > 16 A and ≤ 75 A per phase
	IEC 61000-4-1	Electromagnetic compatibility (EMC) – Part 4-1 – Testing and measurement techniques – Overview of IEC 61000-4 series
	IEC 61000-4-2	Electromagnetic compatibility (EMC) – Part 4-2 – Testing and measurement techniques – Electrostatic discharge immunity test
	IEC 61000-4-3	Electromagnetic compatibility (EMC) – Part 4-3 – Testing and measurement techniques – Radiated, radio-frequency, electromagnetic filed immunity test
	IEC 61000-4-4	Electromagnetic Compatibility (EMC) – Part 4-4 – Testing and measurement techniques – Electrical fast transients/burst immunity test
	IEC 61000-4-5	Electromagnetic Compatibility (EMC) – Part 4-5 – Testing and measurement techniques – Surge immunity test
	IEC 61000-4-6	Electromagnetic Compatibility (EMC) – Part 4-6 – Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields
	IEC 61000-4-7	Testing and measurement techniques – General guide on harmonics and interharmonics measurements and instrumentation, for power supply systems and equipment connected thereto

	IEC 61000-4-8	Electromagnetic Compatibility (EMC) – Part 4-8 – Testing and measurement techniques – Power frequency magnetic field immunity test
	IEC 61000-4-11	Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests
	IEC 61000-4-13	Electromagnetic compatibility (EMC) - Part 4-13: Testing and measurement techniques - Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests
	IEC 61000-4-15	Electromagnetic compatibility (EMC) - Part 4-15: Testing and measurement techniques – Flickermeter – Functional and design specifications
	IEC 61000-4-21	Electromagnetic compatibility (EMC) – Part 4-21: Testing and measurement techniques – Reverberation chamber test methods
	IEC 61000-6-1:2005	Electromagnetic Compatibility (EMC) – Part 6-1 – Generic standards Immunity for residential, commercial and light-industrial environments
	IEC 61000-6-2	Electromagnetic Compatibility (EMC) – Part 6-2 – Generic standards Immunity for industrial environments
	IEC 61000-6-3:2006	Electromagnetic Compatibility (EMC) – Part 6-3 – Generic standards Emission standard for residential, commercial and light-industrial environments
	IEC 61000-6-4:2006	Electromagnetic Compatibility (EMC) – Part 6-4 – Generic standards Emission standard for industrial environments
	CISPR 22	Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement.
	CISPR 11	Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement.
	CISPR 16-X-X	Specification for radio disturbance and immunity measuring apparatus and methods
	CISPR 12	Vehicles, boats and internal combustion engine driven devices - Radio disturbance characteristics - Limits and methods of measurement for the protection of receivers except those installed in the vehicle/boat/device itself or in adjacent vehicles/boats/devices.
	CISPR 25	Radio disturbance characteristics for the protection of receivers used on board vehicles, boats, and on devices - Limits and methods of measurement

	IEC 61204-3	Low-Voltage Power Supplies, D.C. Output – Part 3: Electromagnetic Compatibility (EMC)
	IEC 62040-2	Uninterruptible power systems (UPS) – Part 2: Electromagnetic compatibility (EMC)
	IEC 60050 (161)	International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility
	IEC 60870-2-1	Telecontrol equipment and systems – Part 2: Operating conditions – Section 1: Power supply and electromagnetic compatibility
		Measurements of electrical vehicle performance
ISO 8715:2001		Electric road vehicles - Road operating characteristics
ISO 8714:2002		Electric road vehicles - Reference energy consumption and range - Test procedures for passenger cars and light commercial vehicles
ISO 8715		Electrically propelled road vehicles - Measurement of road operating ability - Part 1: Pure electric vehicles
ISO 8714		Electrically propelled road vehicles - Measurement of energy performances - Part 1: Pure electric vehicles

#### Additional standards

<b>UNECE Regulation 100</b>	<b>the approval of vehicles with regard to specific requirements for the electric power train</b>
<b>UNECE Regulation 12</b>	<b>the approval of vehicles with regard to the protection of the driver against the steering mechanism in the event of impact</b>
<b>UNECE Regulation 121</b>	<b>the approval of vehicles with regard to the location and identification of hand controls, tell-tales and indicators</b>
<b>UNECE Regulation 94</b>	<b>the approval of vehicles with regard to the protection of the occupants in the event of a frontal collision</b>
<b>UNECE Regulation 95</b>	<b>the approval of vehicles with regard to the protection of the occupants in the event of a lateral collision</b>
<b>UNECE Regulation 32</b>	<b>THE APPROVAL OF VEHICLES WITH REGARD TO THE BEHAVIOUR OF THE STRUCTURE OF THE IMPACTED VEHICLE IN A REAR-END COLLISION</b>