MC-250905

هيئة التقييس الخليجية
GCC Standardization Organization

GSO Technical Regulation for Electric Vehicle

Note:

Only the Arabic version of this Regulation is authentic in

law and is applicable where there are differences with this translation

Content

Introduction

1. Based on the objectives of the Gulf Cooperation Council (GCC) which aim to achieve integration and unity among member states in all fields reaching to their unity, in alignment with the goals of the new unified economic agreement between GCC states which laid the foundations for the GCC common market and outlined the steps of economic integration between GCC states, and marked the steps of economic integration starting with the free trade zone, followed by the customs union, and customs union, and then completion of GCC common market requirements, and ultimately the monetary and economic union as well as unification of commercial, industrial and customs legislations applicable across the member states.

2. In realization of the GCC's goals in establishing the GCC Standardization Organization (GSO), supporting the progress of economic integration, and aligning with the requirements of the customs union, including the unification of standards and metrology among member states, the GSO aim to ensure the safety and quality of the goods entering GCC markets for the benefit of its citizens. It also works on consolidation, follow up, implementation and unifying various standardization activities to contribute to the development of production and services sectors, enhance intra-GCC trade, protect consumers, the environment and public health, promote GCC industries and agricultural products to strengthen the GCC economy and preserve the achievements of member states, and reduce of technical barriers to trade (TBT) in line with the goals of customs union and GCC's commitments under World Trade Organization (WTO) agreements.

3. In implementation of the resolution of the GCC Financial Economic and Cooperation Committee in its 72nd session (4-5 November 2006) "urging GSO to complete its efforts in establishing unified procedures for applying GSO standards in GCC countries, to be implemented uniformly at inter-state entry ports, in support of timely implementation of the customs union requirements and to facilitate the smooth flow of goods".

4. In implementation of the resolution of GSO Board of Directors in its 6th session (5 June 2007), which approved the commencement of implementing the recommendations of the project of develop conformity verification in GCC states and Regional Conformity Assessment Scheme (RCAS), including the adoption of the concept that legislative obligation should be based on the essential requirements of products (safety, health and environment) as the foundation for establishing the new GCC legislative approach.

5. In implementation of the resolution of GSO Board of directors in its 11th session (Doha, 22 November 2009) by announcing the official accession of the republic of Yemen to GCC Standardization Organization (GSO) starting from 01 January 2010, pursuant to the decision of the GCC Supreme Council in its 29th session (Muscat, 30 December 2008) to approve this accession.

6. Whereas the laws and regulations and control procedures applicable in the Member states with regard to electric vehicles characteristics vary in scope and content leading to barriers to trade and difference in tender conditions in the desired GCC common market, without tangible return of this difference on customer protection against the hazards that may arise from these products.

7. Where as barriers to the desired GCC common market should be lifted to allow the sale of safe products that meet adequate safety requirements.

8. Whereas consistency and adaptation should be achieved through specifying the essential requirements and the unified rules between the GCC Member states regarding consumer health and safety required in all vehicles to allow placing it on the market and free movement in the customs union territory.

9. Whereas vehicles placed on the desired common market should not cause harm to the direct user or the surrounding environment.

10. Whereas safety standards of vehicles should be determined by reference to the intended use, it should allow higher limits to cover any unseen conditions.

11. Whereas safety standards of vehicles should be considered when placed on the market taking into account the requirement to abide thereby during the specified normal period of use for vehicles.

12.Where as GSO is entrusted with developing, approval, updating and publishing of GSO technical regulations and standards together with procedures of GCC compliance verification for commodities, products, measurement and calibration instruments, definitions, technical symbols and terminology, and requirements of sampling, inspection, testing and calibration in accordance with the executive bylaws issued thereof.

13. In implementation of the resolution of the technical council in its meeting no (59) (Doha, 14-15 October 2024), which stipulated the following:

Referring draft technical regulation for "technical requirements for electric vehicles" to GSO committee of conformity assessment to complete study of draft regulation according to applicable practices in some member states to approve it at the next meeting of the technical council.

This GSO technical regulation related to electric vehicles has been issued after studying it according to applicable practices in some member states, which states the essential requirements to be met in vehicles manufactured locally or imported to any of GCC states. Any of these products shall be allowed to be freely distributed in GCC Member states markets without impediment in custom ports, since they are complying with the requirements of this technical regulation.

Term "electric vehicles" is abbreviated in this regulation as "vehicles" and includes all of them unless the text requires otherwise.

Term "technical regulation" is abbreviated in this regulation as "regulation" Wherever it is mentioned.

Note: This introduction and all annexes are integral part of this regulation.

Article (1): Terms and definitions

For the purposes of this technical regulation, the following terms and definitions shall apply:

1. Cooperation Council: Cooperation Council for the Arab States of the Gulf.

2. Organization: Standardization Organization for the Cooperation Council for the Arab States of the Gulf (GSO).

3. Member States: Member States of the Standardization Organization for the Cooperation Council for the Arab States of the Gulf (United Arab Emirates, Kingdom of Bahrain, Kingdom of Saudi Arabia, Sultanate of Oman, State of Qatar, State of Kuwait and Republic of Yemen).

4. Ministerial Committee: The ministerial committee for Standardization Affairs of cooperation council (formerly "board of directors of organization ").

5. Technical Council: Council consists of directors of national standardization Bodies of GCC countries.

6. GSO Committee of Conformity Assessment: The committee overseeing the process of issuing the GSO technical regulations, and its membership includes representatives from national Standardization Bodies of Member States, which are specialists in conformity assessment or Standards application fields.

7. General Committee for Standards: The committee supervising the process of issuing standards and the activities of technical committees of standards in the organization, and has in its membership directors of national standards departments of national standardization bodies.

8. Normal Operation: The circumstances under which vehicles is operated for ordinary use.

9. Supply Chain: All the stages of vehicles after the production and right up to the final consumer.

10. Withdrawal: Means any measure aimed at preventing products in the market and in the supply chain.

11. Recall: Means any measure aimed at achieving the return of presented products that has already been made available to the end user according to recall regulation in the member states.

12. GSO Conformity Certification System: A system through which Standardization Organization for the Cooperation Council for the Arab States of the Gulf (GSO) carries out the procedures for authenticating GSO conformity certificates that indicate product's conformity to the relevant GSO and national technical regulations and standards. It is currently applied to new imported vehicles, bicycles and tires, and may include other products in the future, such as tire rims, and the obligation to apply them to clear them for member states.

13. Product: Vehicle that operates with an electric motor instead of traditional methods of propulsion that depend on internal combustion engines.

14. Manufacturer: Establishment that bears technical responsibility for manufacturing the electric vehicle and its spare parts.

15 Economic Operators: means the following:
15.1 Product manufacturer, if he resides in one of the Member States, or any person who presents his identity as product manufacturer by naming the product by his name or any relevant commercial description, as well as any person who renews the product.
15.2 Manufacturer's agent in one of the Member States if the manufacturer resides outside the Member States, or the importer in the event that there is no agent for the manufacturer in one of the Member States.
15.3 Any person in the supply chain whose activity may have an impact on the product characteristics.

16. Official Representative: Any natural or legal person who has a license or authorization according to the procedures followed in the Member States and is established within one of the Member States and has received a written mandate from manufacturer certified by

the relevant authorities in the Member States to represent him in performing specific tasks.

17. Distributor: Means any natural or legal person in the supply chain, other than the Manufacturer or the Importer, who has a license or authorization according to the procedures followed in the Member States for the product's activity on the market.

18. Conformity: It is fulfilling the requirements. Means that specified requirements relating to a product, service, process, system, person or body are fulfilled. These requirements may be technical legislations, GSO technical regulations or standards, contractual clauses, customer requirement, or other related requirements.

19. Conformity Assessment: Means the process demonstrating whether specified requirements relating to product, process, system, person or body have been fulfilled.

20. Type Examination: Is the part of a conformity assessment procedure in which a notified body examines the technical design of a product and verifies and attests that the technical design of the product meets the requirements of the GSO technical regulations that apply to it.

21. Type Examination Certificate: Is a certificate issued by a notified body after examining the technical design of a product and verifying that the technical design of the type under examination meets the requirements of the applicable GSO technical regulations that apply to it.

22. Conformity Assessment Bodies: Means bodies that perform conformity assessment activities, including calibration, testing, certification and inspection.

23. Notified Body: Conformity Assessment Body notified by GSO as a notified conformity assessment body in a specific field according to the applicable GSO technical regulations.

24. GSO Conformity Certificate: The certificate approved by GSO, which confirms that the product meets the requirements of this technical regulation.

25. GSO procedures of Conformity Assessment: A document approved by the ministerial committee, which describes the procedures used directly, or indirectly for conformity assessment.

26. National Regulations: A mandatory document issued by the competent authorities in the Member States sets out the essential requirements for a product or for a specific category of products.

27. Accreditation: Shall mean an attestation by a third party, which formally prove that a particular notified conformity assessment body is competent to carry out a specific conformity assessment activities.

28. GSO Conformity Tracking System: Electronic system for tracking products conformity which subject to GSO technical regulations.

29. Quick Response Code (QR Code): A code issued by GSO consisting of black units arranged in a square grid on a white background, containing information that can be read by a device that reads this type of code.

30. GSO Standard: A document approved by the ministerial committee that provides for regular and frequent use - the rules and instructions or characteristics of the products or relevant processes and production methods, Which the compliance is not mandatory, and include in particular terminology and definitions, packaging and labeling requirements or labels that apply to the products or services, processes or production methods.

31. GSO Technical Regulation: A document approved by the ministerial committee that provides the characteristics of the products, the related processes and their production methods, and includes the administrative provisions in force, with which the compliance is mandatory. It could include in particular terminology and definitions, packaging and labeling requirements or labels that apply to the products or services, processes or production methods.

32. Essential Requirements: Requirements for products, which may affect the safety, health and the environment, and that, must be respected.

33. Market Surveillance: Means the activities carried out and measures taken by the Market Surveillance Authorities to ensure that the products comply with the applicable requirements set out in

the relevant GSO technical regulations and do not endanger health, safety and environment or any other aspect of public interest protection.

34. Competent National Authorities: the bodies concerned with implementing some or all of the provisions of this regulation in the member states.

35. Market Surveillance Authority: Shall mean the body determined by each Member States as a qualified body responsible for carrying out market surveillance on its territory. Member States may designate more than one body for this purpose.

36. Hazard (s): Means a potential source of harm.

37. Risk (s): Means the probable rate of occurrence of a hazard causing harm and the degree of severity of the harm.

38. Battery Electric Vehicle (BEV): Electric vehicle operates by a battery (BEV), electric vehicle operates by a battery only, complete electric vehicle, or completely electric vehicle is a type of electric vehicle (EV) that uses chemical energy stored in rechargeable battery packs. Battery Electric Vehicles use electric motors and motor controllers instead of internal combustion engines (ICEs) for propulsion.

39. Plug-in Hybrid Electric Vehicle (PHEV): It is a hybrid vehicle that contains an internal combustion engine in addition to an electric motor that can be recharged by connecting it to an external source of electrical energy as well as by its internal engine. The extended-range electric vehicle (EREV) is a subcategory of (PHEV) vehicles where electric motor is used for propulsion and the internal combustion engine is used to provide electrical energy when needed.

40. Rechargeable Energy Storage System (REESS): The system responsible for supplying the vehicle with electric energy.

The REESS may include subsystems, ancillary systems, thermal management system and electronic control systems.

41. Electric propulsion System: 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.

42. Electric Vehicle Charging System. A system of components that is supplied to the vehicle for the purpose of recharging electric vehicle storage batteries.

43. Electric Vehicle Connector. A device intended for the purpose of power transfer and information exchange with electric vehicle.

44. Electric Vehicle Coupler. A mating electric vehicle inlet and electric vehicle connector set.

45. Electric Vehicle Inlet. The device on the electric vehicle into which the electric vehicle connector is inserted for power transfer and information exchange, electric vehicle inlet is part of the electric vehicle and not part of the electric vehicle supply equipment.

46. Electric Vehicle 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.

47. Electric Vehicle Supply Equipment (EVSE). 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 to electric vehicle.

48. Electric Vehicle Supply Equipment System. A system of components for providing input power to an on-board charger.

49. Personnel Protection System. A system of personnel protection devices provide protection against electric shock of personnel.

50. Direct Contact. Contact of personnel with high voltage live parts.

51. External Electric Power Supply. It means an electric power source that operates on alternating current (AC) or direct current (DC) off-board the vehicle.

52. 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.

53. Indirect Contact. Contact of personnel with exposed conductive parts

54. High Voltage. Voltage that indicates classification of electric component or electric circuit when its operating voltage is greater than 60 volt and up to 1500 volt direct current or greater than 30 volt and up to 1000 volts alternating current (root mean square).

55. Category M. Motor vehicles with at least four wheels, designed and manufactured for the carriage of occupants.

56. Category N. Motor vehicles with at least four wheels, designed and manufactured for transport of goods.

Article (2): Application scope

This regulation applies to all electric vehicles used on roads and operating on batteries (EREV, BEV and PHEV) of categories M and N with a speed of more than 25 km/h, which are placed and made available on markets of Member States, whether manufactured within one of the member states or imported from abroad, in accordance with the relevant definitions and terms mentioned in article (1), taking into consideration compliance with requirements of the relevant GSO standards and technical regulations. The regulation includes performance requirements for electric vehicles.

Article (3): Objectives

This technical regulation aims to determine the essential requirements for electric vehicles covered within scope of this regulation, and conformity assessment procedures that shall be followed by economic operator, to ensure preservation of environment, health and safety of consumer, and facilitating market surveillance procedures.

Article (4): Obligations of Manufacturer and Economic Operator

The manufacturer and economic operator shall comply with the following requirements:

1. The technical requirements to achieve requirements of this regulation, as follows:

A) Electric vehicles supplied by manufacturer and economic operator shall meet the technical requirements specified in standards indicated in annex (1) of this regulation, and in the event that GSO standards are not available, United Nations Economic Commission for Europe standards (UNECE) or the corresponding Federal Vehicle Safety Standards (FMVSS) shall be met.

(b) Electric vehicles supplied by manufacturer and economic operator shall pass conformity assessment procedures indicated in this regulation, and shall be accompanied by a technical file containing all the documents and information proving the product's conformity with requirements of this regulation.

(c) Factory shall have an effective quality management system (i.e. factory has obtained management system certificate according to IATF 16949 "Special requirements for application of ISO 9001 in the field of vehicle and related spare parts production" – or equivalent – meets requirements of this clause.

(d) Electric vehicle shall be accompanied by a chemical materials safety data sheet (MSDS) specific to the battery.

2. Essential requirements: essential requirements for electric vehicles are set out in annex (2) of this regulation.

3. Electric vehicles shall comply with connectors of electric charging systems according to national requirements of each Member State.

4. Metrological (Standard) requirements: The SI Units, their multiples or parts shall be used during design, manufacturing or handling.

5. Administrative requirements: Electric vehicles shall comply with provisions of the applicable traffic system of the Member States.

Article (5): Conformity assessment procedures

1. Manufacturer responsible for electric vehicles shall submit GSO conformity certificate to GSO for approval for each type in accordance with technical regulation GSO 48 and the relevant issued GSO procedures and guides.

2. The application shall be accompanied by technical file that includes the following:

a) The manufacturer declaration of conformity according to the form attached to annex (5).

b) The risk assessment document.

c) The designs and drawings that prove the product conformity to the requirements of this regulation.

d) The necessary warnings and cautions, manuals and use of product for safe and proper operation.

Article (6): Responsibilities of regulatory bodies

National regulatory bodies in the member states as part of their competencies and responsibilities shall implement the following:

1. Verify that electric vehicles subject to this regulation meet specified conformity assessment procedures and the availability of technical documents attached to consignments.

2. Regulatory bodies have the right to withdraw samples randomly of electric vehicles subject to this regulation, and send them immediately to the competent laboratories to verify the extent of their compliance with requirements contained in this regulation.

3. Regulatory bodies have the right to charge economic operators with costs of conducting tests and related matters.

4. In case of product non-conformity, regulatory body has the right to withdraw products concerned from warehouses, and take necessary legal actions.

5. Traffic departments verify registration documents of electric vehicle and verify the private driver's licenses while driving on public roads, according to the applicable traffic regulations and procedures.

Article (7): Responsibilities of market surveillance authorities

Market surveillance authorities as part of their competencies and responsibilities, shall implement the following:

1. Applying market surveillance procedures to products placed and made available in the market and products stored in traders warehouses and manufacturers in order to verify products safety and the extent of its compliance with essential requirements stipulated in this regulation and relevant standards.

2. Withdraw samples of the product, whether from the market or warehouses of economic operators, in order to conduct the necessary tests and ensure the extent of its compliance with requirements stipulated in this regulation.

3. In the case that product placed or stored does not conform to requirements of this regulation, market surveillance authority shall take all applicable administrative actions for product in question, and procedures and penalties referred to in article (8) shall be applied after taking necessary actions.

Article (8): Violations and Penalties

1. It is prohibited to manufacture, import, place, make available, or even advertise products that does not comply with provisions of this regulation.

2. Failure to meet requirements of this regulation is sufficient reason for market surveillance authorities and regulatory bodies to consider product is non-compliant, which may pose a risk to health and safety of consumer and environment, in the following cases:

a. Failure to issue GSO certificate of conformity where manufacturer acknowledge conformity or issue incorrectly GSO certificate of conformity.

b. Lack or incompleteness of technical documents according to issued GSO guides and procedures, or containing incomplete or incorrect information.

c. Lack or incompleteness of markings or instructions for use (if possible).

3. In case of a violation of provisions of this regulation, market surveillance authorities shall take all necessary actions, as appropriate to remove this violation and its effects from market, to realize this purpose, market surveillance authorities shall:

a. Assign violating party responsible for placing and making available violating product to withdraw it from warehouses or market with aim of correcting violation, if possible, or exporting it within time period specified by market surveillance authorities.

b. Withdraw or restrict products, or take any other necessary action to recall these products from markets, and according to the case, market surveillance authorities may announce withdrawal of product from the markets, and violating party shall charge all associated expenses.

c. Deal with violating products included in this regulation according to applicable laws and regulations by regulatory bodies and market surveillance authorities.

4. When a violation is detected in electric vehicles by the member states, GSO shall take necessary actions against these products that violate requirements of this regulation, including cancelling relevant certificate of conformity.

5. Anyone who violates provisions of this regulation shall be subject to applicable penalties and fines in the member states.

Article (9): General Provisions

1. Manufacturer and economic operator shall bear completely legal responsibility for implementing requirements of this technical regulation, and shall be subject to penalties according to applicable procedures in the member states , in case of any violation of its articles being proven.

2. This technical regulation does not prevent manufacturer and economic operator from complying with all other applicable laws/regulations in the member states related to handling, carriage and storage of electric vehicles, as well as laws/regulations related to environment, security, health and safety.

3. Manufacturer and economic operator of electric vehicles subject to provisions of this regulation are obligated to provide inspectors of regulatory bodies and market surveillance authorities with all necessary information and facilities required to carry out tasks assigned to them.

4. If any case arises that cannot be treated under provisions of this technical regulation, this case will be dealt with according to applicable regulations in the member states and through GSO.

5. Manufacturer may submit a new application after removing reasons for rejecting first application related to obtain GSO conformity certificate, and after making necessary corrections for reasons which lead to rejecting, and manufacturer shall charge any additional expenses determined by GSO.

6. GSO shall study complaints received by it regarding products that have obtained GSO conformity certificate, verify validity of these complaints, and take necessary required actions in case that any violations are proven.

7. Member States have the right to coordinate with GSO to review GSO conformity certificate, if manufacturer and economic operator violates provisions of this regulation, and take necessary actions to guarantee GSO and member States rights.

8. In case that any modifications are made to previous type, new application shall be submitted to new type, manufacturer shall notify GSO.

9. GSO only has right to interpret provisions of this regulation, and all beneficiaries of application of this regulation shall abide by interpretations issued by GSO.

Article (10): Transformation of regulation into national legislations in the Member States

Member States, whose legal systems require transformation of GSO regulations into national legislations before their entry into force will enact such national legislations prior to the effective date of this regulation, and will forthwith inform GSO to that effect.

Article (11): First version of the regulation

This document is the first version of GSO technical regulation for electric vehicles. It supersedes any GSO or national technical regulation related to electric vehicles listed in the same field, starting from the effective date of this regulation.

Article (12): Effective date

This regulation shall enter into force starting from the date determined by the ministerial committee for standardization affairs. GSO and the member states shall complete the necessary procedures for application.

Annex (1)

List of standards for electric vehicles

No.	GSO Standard	Arabic Title	English Title
1	GSO 36	السيارات – طرق اختبار تحمل الصدمات – الجزء الأول : الصدمة الأمامية	motor vehicles – methods of test for impact strength - Part 1 : frontal impact
2	GSO 37	السيارات – طرق تحمل الصدمات – الجزء الثاني : الصدمة الخلفية بالصادم المتحرك	Motor vehicles –methods of test for impact strength - Part 2 : moving barrier rear impact
3	GSO 2112	السيارات - حواجز الحماية الأمامية للشاحنات	Motor vehicles – Front under run protective devices for trucks
4	GSO 2113	السيارات - حواجز الحماية الجانبية للشاحنات والمقطورات وطرق اختبارها	Motor vehicles – Lateral under run protective devices for trucks and trailers and its methods of test
5	GSO 2114	السيارات - حواجز الحماية الخلفية للشاحنات والمقطورات وطرق اختبارها	Motor vehicles – Rear under run protective devices for trucks and trailers and its methods of test
6	GSO 38	السيارات - طرق اختبار تحمل الصدمات - الجزء الثالث 3 أ : الصدمة الجانبية	Motor vehicles -methods of test for impact strength - Part 3 a : side impact
7	GSO 39	السيارات - طرق اختبار تحمل الصدمات - الجزء الرابع : متانة السقف	Motor vehicles -methods of test for impact strength - Part 4 :roof strength
8	GSO 40	السيارات .تحمل الصدمات	Motor vehicles -impact strength
9	GSO 41	السيارات - أداة الوقاية الخارجية الأمامية والخلفية لسيارات الركوب (الصدامات وغيرها) وطرق اختبارها.	Motor Vehicles: front and rear exterior protection devices for passenger's cars (BumPers etc.) and its methods of test.
10	GSO 42	السيارات - المتطلبات العامة	Motor vehicles - General requirements
11	GSO 51	الجزء الأول : المسميات والتمييز إطارات سيارات الركوب - والبيانات الإيضاحية والأبعاد والأحمال وضغوط النفخ.	Passenger car tyres - Part 1: Nomenclature, designation, marking, dimensions, load capacities and inflation pressure
12	GSO 52	إطارات سيارات الركوب - الجزء الثاني : المتطلبات العامة	Passenger car tyres - part 2: general requirement
13	GSO 53	الجزء الثالث : طرق الاختبار إطارات سيارات الركوب -	Passenger car tyres - part 3: methods of test
14	GSO 96	السيارات - طرق اختبار أحزمة الأمان	Motor vehicles - Methods of testing safety belts.
15	GSO 97	السيارات - أحزمة الأمان	Motor vehicles - safety belts
16	GSO 98	السيارات - قابلية الأجزاء الداخلية للاشتعال وطرق اختبارها.	Motor vehicles-flammability of interior materials and testing methods
17	GSO 99	مركبات الطرق - المنبهات الصوتية - المواصفات الفنية	Road vehicles - Sound signaling devices - Technical specification
18	GSO 159	السيارات – الأبعاد والأوزان	Motor Vehicles – Dimensions and weights
19	GSO 279	طرق اختبار فرش السيارات – قماش تنجيد مقاعد السيارة	Car Upholstery – Testing Methods of Fabric for Car Seats
20	GSO 280	قماش تنجيد مقاعد السيارة فرش السيارات –	Car Upholstery – Fabric for Car Seats
21	GSO 289	مركبات الطرق – لوحات الأرقام ذات الخلفية العاكسة وطرق اختبارها	Road vehicles retro - reflective number plates and its methods of test

No.	GSO Standard	Arabic Title	English Title
22	GSO 290	كتيب إرشادات الأجهزة والمعدات	Instruction Manual for Appliances and Equipment
23	GSO 419	السيارات - طرق اختبار أقفال الأبواب ومفصلاتها	Motor vehicles - methods of test for door locks and door hinges
24	GSO 420	السيارات - أقفال الأبواب ومفصلاتها	Motor vehicles - door locks and door hinges
25	GSO 421	السيارات - طرق اختبار مرايا الرؤية الخلفية	Motor vehicles - Methods of testing of rear view mirrors.
26	GSO 422	السيارات - مرايا الرؤية الخلفية.	Motor Vehicles: Rearview mirrors
27	GSO 581	اشتراطات تخزين إطارات السيارات	Requirements for storage of motor vehicle tyres
28	GSO 645	إطارات السيارات متعددة الأغراض والشاحنات والحافلات والمقطورات - الجزء الأول: المسميات والتمييز والبيانات الإيضاحية والأبعاد والأحمال وضغوط النفخ.	Multi-Purpose Vehicles, Trucks, Buses and Trailers Tyres - Truck and Bus - Part 1: Nomenclature, Designation Marking, Dimensions, Load Capacities and Inflation Pressures
29	GSO 647	إطارات السيارات متعددة الأغراض والشاحنات والحافلات والمقطورات - الجزء الثالث: المتطلبات العامة	Multi-Purpose Vehicles, Trucks, Buses and Trailers Tyres - Part 3: General Requirements
30	GSO 963	السيارات - المتطلبات العامة لسيارات الإسعاف	Motor vehicles -General requirements for ambulance.
31	GSO 1052	إطارات السيارات - العجلات والإطارات الاحتياطية المؤقتة وطرق اختبارها.	Motor vehicles tyers - temporary use spare wheels /tyers and there methods test
32	GSO 1053	السيارات. الحماية من السرقة	Motor Vehicles - Protection against theft
33	GSO 1503	أنوار المصابيح الأمامية للسيارات - متطلبات الأمان.	Motor Vehicle - Head Lamps Safety Requirements.
34	GSO 1598	- مساند الرأس وطرق اختبارها. السيارات	Motor Vehicles - Head restraints and method of testing.
35	GSO 1625	السيارات - محددات السرعة - الجزء الثاني : المتطلبات الفنية	Motor vehicles – Speed limiters – Part 2: Technical requirements.
36	GSO 1626	السيارات - محددات السرعة - الجزء الثالث : طرق الاختبار	Motor vehicles – speed limiters – Part 3: Methods of test.
37	GSO 1677	السيارات - زجاج الأمان متعدد الطبقات	Motor vehicles – laminated safety glass
38	GSO 1707	الجزء الثالث – طرق اختبار تحمل الصدمات – السيارات ب : الصدمة الجانبية بالصادم المتحرك	motor vehicles – methods of test for impact strength – Part 3b -moving barrier side impact
39	GSO 1708	الجزء الثالث – طرق اختبار تحمل الصدمات –السيارات ج : الصدمة الجانبية بالصادم المتحرك	motor vehicles – methods of test for impact strength – part 3c : moving barrier side impact
40	GSO 1709	وسائل تثبيت الطفل– السيارات	Motor vehicles – child restraint system
41	GSO 1710	السيارات - طرق اختبار وسائل الطفل	Motor vehicles methods of testing of child restraint system
42	GSO 1711	السيارات محددات السرعة - الجزء الاول : المتطلبات العامة المطابقة، اعتماد الطراز ، فحص الجهاز ، شهادات .	Motor vehicles – Speed limits – Part 1 : General requirements , Equipment inspection , Certification and type approval
43	GSO 1780	المتطلبات – الرقم المميز للمركبة –السيارات	Motor Vehicle – Identification Number (Vin) Requirements
44	GSO 1781	الرمز العالمي لصانع المركبة– السيارات	Motor Vehicles – World manufacturer identifier code
45	GSO 1782	وضعة وتثبيته– الرقم المميز للمركبة –السيارات	Motor Vehicles – VIN-Location and attachement
46	GSO 1783	إطارات سيارات الركوب درجة مقامة تآكل الموطىء والسحب والحرارة.	Motor Vehicles Tyres – Treadwear, Traction and Temperature Resistance Grading

No.	GSO Standard	Arabic Title	English Title
47	GSO 1784	طرق اختبار درجة مقاومة الإطار –إطارات سيارات الركوب للحرارة.	Motor Vehicles Tyres – Method of Testing of Tire Temperature Resistance Grading.
48	GSO ISO 3537	السيارات - مواد زجاج الأمان - طرق الاختبارات الميكانيكية	Road vehicles - Safety glazing materials - Mechanical tests
49	GSO ISO 3538	السيارات - مواد زجاج الأمان - طرق اختبار الخصائص البصرية	Road Vehicles - Safety glazing materials - Test Methods for Optical Properties
50	GSO ISO 6311	السيارات – طرق اختبار بطانات المكابح – الجزء الأول – إجهاد القص الداخلي لمادة البطانة	Motor vehicles – methods of testing for broke lining – part 1: internal shear strength of lining material.
51	GSO ECE 13H	السيارات - نظام مكابح سيارات الركوب والسيارات متعددة الاغراض	Motor Vehicles - Braking system of Passenger Car and Multi-Purpose Vehicles
52	GSO ECE 13H-1	السيارات - طرق الاختبار لنظامِ المكابح - الجزء الأول : أداء المكابح	Motor Vehicles: Methods of Test for Braking System -- Part 1: Braking Performance
53	GSO ECE 13H-2	السيارات - طرق الاختبار لنظامِ المكابح - الجزء الثاني : تعيين الطاقة سعة أجهزة خزنِ	Motor Vehicles: Methods of Test for Braking System -- Part 2: Determination of Capacity of Energy Storage Devices
54	GSO ECE 13H-3	السيارات - طرق الاختبار لنظامِ المكابح - الجزء الثالث : بين محاور المركبات تعيين توزيع المكابح	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	السيارات - طرق الاختبار لنظامِ المكابح - الجزء الرابع : تعيين القفلَ وظيفة الأنظمة ضد	Motor Vehicles: Methods of Test for Braking System -- Part 4: Determination of Function of Anti-Lock Systems
56	GSO ECE 13H-5	الجزء الخامس : --السيارات -- طرق الاختبار لنظامِ المكابح الكبحِ باستخدام ديناموميتر القصور الذاتي تعيين أداءِ بطانةِ	Motor Vehicles: Methods of Test for Braking System -- Part 5: Determination of Performance of Brake Lining Using Inertia Dynamometer
57	GSO ECE 13H-6	الجزء السادس : --السيارات -- طرق الاختبار لمكابح النظام الالتصاق تعيين معامل	Motor Vehicles: Methods of Test for Braking System -- Part 6: Determination of Coefficient of Adhesion
58	GSO ISO 3917	مركبات الطرق - مواد الزجاج الآمن - طرق اختبار مقاومة الإشعاع وارتفاع درجة الحرارة والرطوبة والحريق ومحاكاة العوامل الجوية	Road vehicles - Safety glazing materials ,Test methods for resistance to radiation high temperature, humidity, fire and simulated weathering
59	GSO ISO 6310	السيارات – بطانات المكابح (الفرامل) –طريقة اختبار انفعال الانضغاط	road vehicle - brake linings - compressive strain test method
60	GSO ISO 6312	مركبات الطرق -- بطانات المكابح (الفرامل) – اجراء اختبار القص للمكابح القرصية والاسطوانية	Road vehicles - Brake linings - Shear test procedure for disc brake pad and drum brake shoe assemblies
61	GSO ISO 6313	السيارات – بطانات المكابح (الفرامل) –تاثير الحرارة على ابعاد وشكل لقم المكابح القرصية- طريقة الاختبار	Road vehicles - brake linings - effects of heat - on dimensions and form of disc brake pads test procedure
62	GSO ISO 4000-2	إطارات وجنوط سيارة الركوب - الجزء الثانى : الجنوط	Passenger car tyres and rims - Part 2: rims.

No.	GSO Standard	Arabic Title	English Title
63	SASO GSO ISO 3894	السيارات – عجلات واطواق المركبات التجارية – طرق الاختبار	Road vehicles - Wheels/rims for commercial vehicles - Test methods
64	GSO ISO 4209-2	اطارات وأطواق الشاحنات والحافلات - (التسلسل المتري) - الجزء الثاني : الأطواق	Truck and bus tyres and rims (metric series) Part 2: Rims
65	GSO ISO 7141	المركبات – العجلات المصنوعة من السبائك الخفيفة - اختبار التصادم	Road vehicles - Light alloy wheels - Impact test
66	GSO 2501	السيارات – اشتراطات السلامة في الحافلات المدرسية	School buses - General requirements
67	GSO ISO 3006	المركبات - عجلات سيارة الركاب لاستعمال الطريقِ - طرق الاختبار	Road vehicles - Passenger car wheels for road use - Test methods
68	GSO ECE 100	بالموافقة على المركبات فيما يتعلق المتعلقة الموحدة الأحكام بالمتطلبات المحدده لمجموعة نقل الحركة الكهربائية	Uniform provisions concerning the approval of vehicles with regard to specific requirements for the electric powertrain
69	GSO ECE 101	بالموافقة الموافقة على سيارات المتعلقة الموحدة الأحكام الركاب التي تعمل بمحرك احتراق داخلي فقط، أو تعمل بمحرك كهربائي هجين فيما يتعلق بقياس انبعاثات ثاني أكسيد الكربون و استهلاك الوقود و / أو قياس استهلاك الطاقة الكهربائية والمدى الكهربائى ، ومركبات الفئتين M1 و N1 التي تعمل بمحرك كهربائي فقط فيما يتعلق قياس استهلاك الطاقة الكهربائية والمدى الكهربائى	Uniform provisions concerning the approval of passenger cars powered by an internal combustion engine only, or powered by a hybrid electric power train with regard to the measurement of the emission of carbon dioxide and fuel consumption and/or the measurement of electric energy consumption and electric range, and of categories M1 and N1 vehicles powered by an electric power train only with regard to the measurement of electric energy consumption and electric range
70	GSO ECE R12	باعتماد المركبات فيما يتعلق المتعلقة الموحدة الأحكام بحماية السائق من آليه التوجيه فى حالة الاصطدام	Uniform provisions concerning the approval of vehicles with regard to the protection of the driver against the steering mechanism in the event of impact
71	GSO ECE 95	بالموافقة على المركبات فيما يتعلق المتعلقة الموحدة الأحكام بحماية ركابها فى حالة الاصطدام الجانبى	Uniform provisions concerning the approval of vehicles with regard to the protection of the occupants in the event of a lateral collision
72	GSO IEC 61000-3-12	الجزء (3– 12): التوافق الكهرومغناطيسي (EMC): الحدود –حدود التيارات التوافقية التي تنتج من معدة موصلة أمبير <16بأنظمة جهد منخفض للأغراض العامة وتيار دخل أمبير لكل طور ≤75و	Electromagnetic compatibility (EMC) – Part :3-12 Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤ 75 A per phase
73	GSO IEC 61000-4-7	الجزء (4 – 7): تقنيات (EMC) التوافق الكهرومغناطيسي الاختبار والقياس - الإرشاد العام على التوافقات وقياسات	Electromagnetic compatibility (EMC) – Part 4-7 - Testing and measurement techniques : General guide on harmonics and inter harmonics

No.	GSO Standard	Arabic Title	English Title
		التوافقات المتداخلة وأجهزة القياس لأنظمة مصـادر القدرة وعلى المعدات الموصلة لها	measurements and instrumentation, for power supply systems and equipment connected thereto
74	GSO IEC 61000-2-2	الجزء (2 – 2): البيئة – (EMC) التوافق الكهرومغناطيسي مسـتويات التوافق للتوصـيلات المضـطربة منخفضـة التردد والاشـارات فى نظم القـدرة الكهربـائيـة منخفضـة القـدرة للاغراض العامة	Electromagnetic compatibility (EMC)- Part:2-2 Environment - Compatibility levels for low frequency conducted disturbances and signaling in public low-voltage power supply systems
75	GSO IEC 61000-3-2	الجزء (3 – 2): حدود (EMC) التوافق الكهرومغناطيسـي الانبعاثات الحالية التوافقية (دخل معدات التيار≥ 16 امبير لكل مرحلة)	Electromagnetic compatibility (EMC) - Part:3-2 Limits - Limits for harmonic current emissions (equipment input current ≤16 A (per phase)
76	GSO IEC/TR 61000-3-6	الجزء (3): الحـدود – (EMC) التوافق الكهرومغنـاطيسـي القسـم (6) : تقييم حدود انبعاث الاحمال المشـوهة فى انظمة الاصـدار الرئيسـى للتـوافـق HV و MVالـقـدرة - الكهرومغناطيسي (EMC)	Electromagnetic compatibility (EMC) - Part:3 Limits - Section 6: Assessment of emission limits for distorting loads in MV and HV power systems - Basic EMC publication
77	GSO IEC 61000-4-2	الجزء (4 – 2): تقنيات (EMC) التوافق الكهرومغناطيسـي الاختبار والقياس – اختبار مناعة التفريغ الكهربائى الساكن	Electromagnetic compatibility (EMC) - Part:4-2 - Testing and measurement techniques Electrostatic discharge immunity test
78	GSO IEC 61000-4-3	الجزء (4 – 3): تقنيات (EMC) التوافق الكهرومغناطيسـي الاختبار والقياس – اختبار مناعة الاشـعال ومجال التردد الراديوى والكهرومغناطيسى	Electromagnetic compatibility (EMC) - Part:4-3 - Testing and measurement techniques Radiated, radio-frequency, electromagnetic field immunity test
79	GSO IEC 61000-4-4	الجزء (4 – 4): تقنيات (EMC) التوافق الكهرومغناطيسـي مناعة السـريعة- إختبار العابرة الاختبار والقياس – التيارات الانفجار	Electromagnetic compatibility (EMC) – Part:4-4 – Testing and measurement techniques Electrical fast transient/burst immunity test
80	GSO IEC 61000-4-5	الجزء (4 – 5): تقنيات (EMC) التوافق الكهرومغناطيسـي مناعة السـريعة- إختبار العابرة الاختبار والقياس – التيارات التدفق الكهربائى (التموج)	Electromagnetic compatibility (EMC) - Part: 4-5 - Testing and measurement techniques Surge immunity test
81	GSO IEC 61000-4-6	الجزء (4 – 6): تقنيات (EMC) التوافق الكهرومغناطيسـي الموصلة- المتسببة للاضـطرابات الاختبار والقياس – المناعة راديوية ترددات مجالات بواسطة	Electromagnetic compatibility (EMC) - Part: 4-6 - Testing and measurement techniques ,Immunity to conducted disturbances induced by radio-frequency fields
82	GSO IEC 61000-4-7	الجزء (4 – 7): تقنيات (EMC) التوافق الكهرومغناطيسـي وقياسـات العام على التوافقات الاختبار والقياس – الإرشـاد القدرة مصادر لأنظمة القياس المتداخلة وأجهزة التوافقات لها الموصلة على المعدات	Electromagnetic Compatibility (EMC)- Part: (4- 7) - Test and Measurement Techniques - General guidance on compatibility, cross harmonic measurements and measuring devices for power source systems and on the equipment connected to them

No.	GSO Standard	Arabic Title	English Title
83	GSO IEC 61000-4-8	الجزء (4 – 8): تقنيات (EMC) التوافق الكهرومغناطيسي لقدرة المجال المناعة الاختبار والقياس – إختبار المعناطيسى المتردد	Electromagnetic compatibility (EMC) – Part: 4-8 – Testing and measurement techniques- Power frequency magnetic field immunity test
84	GSO IEC 61000-4-11	الجزء (4 – 11): (EMC) التوافق الكهرومغناطيسي انخفاضات الجهد والانقطاعات القصيرة والاختلافات فى الجهد	Electromagnetic compatibility (EMC) - Part : 4-11- Testing and measurement techniques- Voltage dips, short interruptions and voltage variations immunity tests
85	GSO IEC 62196-1	القوابس ، منافذ المقابس، موصلات المركبات ومداخل المركبات – موصل الشحن للمركبات الكهربائية – الجزء1: المتطلبات العامة	Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles - Part 1: General requirements
86	GSO IEC 62196-2	القابسات والمقابس ووصلات المركبة ومداخل المركبة - الشحن التوصيلي للمركبات الكهربائية - الجزء 2: توافق الأبعاد ومتطلبات قابلية التبادل لمسمار التيار المتردد وملحقات صمام التلامس	Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles - Part 2: Dimensional compatibility and interchangeability requirements for a.c. pin and contact-tube accessories
87	GSO IEC 62196-3	القوابس والمخارج ووصلات المركبات ومداخلها - الشحن التوصيلي للمركبات الكهربائية - الجزء 3: متطلبات توافق الأبعاد وقابلية التبادل للقارنات المسمارية وقارنات أنبوب التلامس في التيار المستمر والتيار المتردد / التيار المستمر في المركبات	Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles - Part 3: Dimensional compatibility and interchangeability requirements for d.c. and a.c./d.c. pin and contact-tube vehicle couplers
88	GSO IEC 60309-1	القابسات ، المقابس والقارنات للأغراض الصناعية – الجزء الأول : المتطلبات العامة	Plugs, socket-outlets and couplers for industrial purposes – Part 1: General requirements
89	GSO IEC 61851-1	نظام الشحن الكهربائي الموصل للمركبة- الجزء 1: متطلبات عامة	Electric vehicle conductive charging system Part 1: General requirements
90	GSO IEC61851-23	نظام توصيل الشحن للسيارات الكهربائية - الجزء 23: محطات الشحن الكهربائي للسيارات بالتيار المستمر DC	Electric vehicle conductive charging system Part 23: DC electric vehicle charging station
91	GSO IEC 61851-24	نظام الشحن الكهربائي الموصل للمركبة- الجزء 24: التوصيل الرقمي بين محطة شحن المركبة الكهربائية بتيار مستمر ونظام التحكم في شحن المركبة الكهربائية بتار مستمر	Electric vehicle conductive charging system Part 24: Digital communication between a d.c. EV charging station and an electric vehicle for control of d.c. charging
92	GSO IEC 61851-21-1	نظام الشحن الموصّل للمركبة الكهربائية - الجزء 21-1 متطلبات التوافق الكهرومغنطيسي لشاحن السيارة الكهربائي على متن السيارة للتوصيل الموصل بمصدر التيار المتردد / التيار المستمر	Electric vehicle conductive charging system Part 21-1 Electric vehicle on-board charger EMC requirements for conductive connection to AC/DC supply

No.	GSO Standard	Arabic Title	English Title
93	GSO IEC 61851-21-2	نظام شحن الموصلات الكهربائية للمركبات الكهربائية - الجزء 21-2: متطلبات المركبة الكهربائية للتوصيل الموصّل بمصدر AC / DC - متطلبات التوافق الكهرومغناطيسي لأنظمة الشحن الخارجية للمركبات الكهربائية	Electric vehicle conductive charging system Part 21-2: Electric vehicle requirements for - conductive connection to an AC/DC supply EMC requirements for off board electric vehicle charging systems
94	GSO IEC 62752	وسيلة التحكم والحماية داخل الكابل للشحن نمط 2 لمركبات الطرق الكهربائية	In-cable control and protection device (IC CPD) for mode 2 charging of electric road vehicles
95	GSO IEC 60146-1-1	المغيرات شبه الموصلة - المتطلبات العامة ومغيرات تبادل الخط - الجزء 1-1: مواصفات المتطلبات الأساسية	Semiconductor converters - General requirements and line commutated converters - Part 1-1: Specification of basic requirements
96	GSO IEC TR 60146-1-2	محولات أشباه الموصلات - المتطلبات العامة ومحولات تبديل الخط - الجزء 1-2: دليل التطبيق	Semiconductor converters - General requirements and line commutated converters - Part 1-2: Application guide
97	GSO IEC 60146-2	المغيرات شبه الموصلة - الجزء 2: مغيرات التبديل الذاتي شبه الموصلة التي تشتمل على مغيرات تعمل بالتيار المستمر	Semiconductor converters - Part 2: Self commutated semiconductor converters including direct d.c. converters
98	GSO IEC 60146-1-1	المغيرات شبه الموصلة - المتطلبات العامة ومغيرات تبادل الخط - الجزء 1-1: مواصفات المتطلبات الأساسية	Semiconductor converters - General requirements and line commutated converters - Part 1-1: Specification of basic requirements
99	GSO IEC/TS 60479-1	تأثيرات التيار على الجنس البشرى والحيوانات - الجزء الأول: سمات عامة	Effects of current on human beings and livestock - Part 1: General aspects
100	GSO IEC 61140	الحماية ضد الصدمة الكهربائية – الجوانب الشائعة للتركيب والمعدات	Protection against electric shock - Common aspects for installation and equipment
101	GSO IEC 60664-1	تنسيق العزل للمعدات داخل أنظمة الإمداد ذات الجهد المنخفض - الجزء 1: المبادئ والمتطلبات والاختبارات	Insulation coordination for equipment :within low-voltage systems - Part 1 Principles, requirements and tests
102	GSO IEC 60364-4-43	التركيبات الكهربائية منخفضة الجهد- الجزء رقم 4-43 : الحماية من أجل السلامة والحماية ضد التيار الزائد	Low-voltage electrical installations - Part 4-43: Protection for safety - Protection against overcurrent.
103	GSO IEC 60364-5-53	التركيبات الكهربائية للمبانى الجزء رقم 5-53: اختيار وتركيب المعدات الكهربائية والعزل والتحويل والتحكم	Electrical installations of buildings - Part 5:53- Selection and erection of electrical equipment - Isolation, switching and control
104	GSO IEC 60364-5-54	التركيبات الكهربائية ذات الجهد المنخفض الجزء رقم 5-54: اختيار وتثبيت المعدات الكهربائية – ترتيبات التأريض ، موصلات الحماية، وموصلات الحماية المساعدة	Low-voltage electrical installations - Part 5:54- Selection and erection of electrical equipment - Earthing arrangements and protective conductors

No.	GSO Standard	Arabic Title	English Title
105	GSO IEC 60068-2-1	الاختبار البيئي – الجزء 2-1: الاختبارات – الاختبار أ: بارد	Environmental testing - Part 2-1: Tests - Test A: Cold
106	GSO IEC 60068-2-14	N: الاختبار البيئي- الجزء 2- 14: الاختبارات- الاختبار تغير درجة الحرارة	Environmental testing - Part 2-14: Tests Test N: Change of temperature
107	GSO IEC 60228	موصلات الكابلات المعزولة	Conductors of insulated cables
108	GSO IEC 60269-1	مصاهر الجهد المنخفض – الجزء 1: متطلبات عامة	Low-voltage fuses - Part 1: General requirements
109	GSO IEC 60269-2	مصاهر الجهد المنخفض – الجزء 2 : متطلبات اضافية للمصاهر للاستخدام بواسطة أشخاص مصرح لهم (المصاهر المعدة للتطبيقات الصناعية) – أمثلة لتوحيد الانظمة للمصاهر من A الى K	Low-voltage fuses - Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) Examples of standardized systems of fuses A to K
110	GSO IEC 61643-12	أجهزة الوقاية من الاندفاع الكهربائي المتصلة بنظم توزيع القدرة ذات الجهد-المنخفض - الجزء 12: مبادىء الاختيار والتطبيق	Low-Voltage Surge Protective Devices - Part 12: Surge Protective Devices Connected To Low-Voltage Power Distribution Systems - Selection And Application Principles
111	GSO IEC 62893-1	كابلات شحن السيارات الكهربائية للجهد المقنن حتى 1/0.6 كيلو فولت - الجزء الأول: المتطلبات العامة	Charging cables for electric vehicles for rated voltages up to and including 0,6/1 kV – Part :1 General requirements
112	GSO IEC 62893-2	كابلات شحن المركبات الكهربائية للجهود المقننة حتى 1 / 0,6 كيلو فولت الجزء 2: طرق الاختبار	Charging cables for electric vehicles for rated voltages up to and including 0,6/1 kV - Part Test methods :2
113	GSO IEC 62893-3	كابلات شحن السيارات الكهربائية للجهود المقننة حتى 1/0.6 كيلو فولت الجزء 3 - كابلات الشحن بالتيار المتردد وفقاً للأوضاع 1 و 2 و 3 من المواصفة القياسية IEC 61851-1 لجهود مقننة حتى 750/450 فولت	Charging cables for electric vehicles for rated voltages up to and including 0,6/1 kV - Part Cables for AC charging according to :3 modes 1, 2 and 3 of IEC 61851-1 of rated voltages up to and including 450/750 V
114	GSO IEC 62893-4-1	كابلات الشحن للمركبات الكهربائية ذات الجهد المقنن حتى 1 / 0،6 كيلو فولت الجزء 4-1: الكابلات للشحن بالتيار الشحن IEC 61851-1 المستمر وفقًا للنمط 4 من بالتيار المستمر دون استخدام نظام إدارة حراري	Charging cables for electric vehicles with rated voltages up to 0.6/1 kV - Part 4-1: DC charging cables according to Mode 4 of IEC 61851-1 DC charging without the use of a thermal management system
115	GSO ISO 11898-1	مركبات الطرق - شبكة منطقة جهاز التحكم - الجزء 1: طبقة ربط البيانات والإشارات الفيزيائية	Road vehicles -- Controller area network (CAN) -- Part 1: Data link layer and physical signalling
116	GSO ISO 11898-2	مركبات الطرق - شبكة منطقة جهاز التحكم - الجزء 2: وحدة دخول الوسط عالي-السرعة	Road vehicles — Controller area network (CAN) Part 2: High-speed medium access unit

No.	GSO Standard	Arabic Title	English Title
117	GSO IEC 62660-1	خلايا أيون- الليثيوم الثانوية لدفع مركبات الطرق الكهربائية -- الجزء 1 : اختبار الأداء	Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 1: Performance testing
118	GSO IEC 62660-2	خلايا أيون - الليثيوم الثنائية لدفع مركبات الطرق الكهربائية -- الجزء 2 : اختبار الدقة والاستعمال الخاطئ	Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 2: Reliability and abuse testing
119	GSO IEC 62660-3	خلايا أيون - الليثيوم الثنائية لدفع مركبات الطرق الكهربائية -- الجزء 3 : متطلبات السلامة	Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 3: Safety requirements
120	GSO IEC 62660-4	خلايا أيون-الليثيوم الثانوية المستخدمة لدفع مركبات الطرق الكهربائية - الجزء 4: طرائق الاختبار البديلة المرشحة لاختبار دارة القصر الداخلية المبين بالمواصفة القياسية IEC 62660-3	Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 4: Candidate alternative test methods for the internal short circuit test of IEC 62660-3
121	GSO IEC 61982	البطاريات الثانوية (ما عدا الليثيوم) لدفع مركبات الطرق الكهربائية - اختبارات الأداء والتحمل	Secondary batteries (except lithium) for the - propulsion of electric road vehicles Performance and endurance tests
122	GSO IEC 61982-4	البطاريات الثانوية (باستثناء بطاريات الليثيوم) لدفع مركبات الطرق الكهربائية – الجزء 4 : متطلبات السلامة لخلايا البطاريات ووحدات خلايا البطاريات المصنعة من هيدريد معدن النيكل المعدني	Secondary batteries (except lithium) for the :propulsion of electric road vehicles - Part 4: Safety requirements of nickel-metal hydride cells and modules
123	GSO IEC TS 62840-1	مبادلة بطارية المركبة الكهربائية – الجزء 1 : عام نظام واسترشادى	Electric vehicle battery swap system - Part 1: General and guidance
124	GSO IEC 62840-2	مبادلة بطارية المركبة الكهربائية – الجزء 2 : نظام متطلبات السلامة	Electric vehicle battery swap system - Part 2: Safety requirements
125	GSO IEC 62196-1	القوابس ، منافذ المقابس، موصلات المركبات ومداخل المركبات – موصل الشحن للمركبات الكهربائية – الجزء1: المتطلبات العامة	Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles - Part 1: General requirements
126	GSO IEC 62196-2	القابسات والمقابس ووصلات المركبة ومداخل المركبة - الشحن التوصيلي للمركبات الكهربائية - الجزء 2: توافق الأبعاد ومتطلبات قابلية التبادل لمسمار التيار المتردد وملحقات صمام التلامس	Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles - Part 2: Dimensional compatibility and interchangeability requirements for a.c. pin and contact-tube accessories
127	GSO IEC 62196-3	القوابس والمخارج ووصلات المركبات ومداخلها - الشحن التوصيلي للمركبات الكهربائية - الجزء 3: متطلبات توافق الأبعاد وقابلية التبادل للقارنات المسمارية وقارنات أنبوب التلامس في التيار المستمر والتيار المتردد / التيار المستمر في المركبات	Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles - Part 3: Dimensional compatibility and interchangeability requirements for d.c. and a.c./d.c. pin and contact-tube vehicle couplers
128	GSO ISO 8820-1	مركبات الطرق-أسلاك المصاهر – الجزء الأول : تعاريف ومتطلبات اختبار عامة	Road vehicles -- Fuse-links -- Part 1 Definitions and general test requirements

No.	GSO Standard	Arabic Title	English Title
129	GSO ISO 8820-6	مركبات الطرق- أسلاك المصاهر – الجزء رقم 6 : أسلاك مصاهر بمسمار مفرد	Road vehicles -- Fuse-links -- Part 6: Singlebolt fuse-links
130	GSO IEC 60269-1	مصاهر الجهد المنخفض – الجزء 1: متطلبات عامة	Low-voltage fuses - Part 1: General requirements
131	GSO IEC 62335	قواطع الدوائر الكهربائية – أدوات التأريض الواقية المحمولة القابلة للوصل والفصل العاملة بالتيار المتبقي من واستخدامات المركبات العاملة بالبطارية I الفئة	Circuit breakers - Switched protective earth portable residual current devices for class I and battery powered vehicle applications
132	GSO ISO 6722-1	مركبات الطرق -- الكابلات الأحادية القلب ذات جهد 60 فولت و 600 فولت - الجزء 1: الأبعاد وطرق الاختبار والمتطلبات الخاصة بكابلات النحاس الموصلة	Road vehicles -- 60 V and 600 V single-core cables -- Part 1: Dimensions, test methods and requirements for copper conductor cables
133	GSO ISO 6722-2	مركبات الطرق - الكابلات الأحادية القلب ذات جهد 60 فولت و 600 فولت - الجزء 2: أبعاد كابلات الألومنيوم الموصلة وطرق اختبارها ومتطلباتها	Road vehicles -- 60 V and 600 V single-core cables -- Part 2: Dimensions, test methods and requirements for aluminum conductor cables
134	GSO IEC/TR 60783	تمديدات سلكية وتوصيلات لمركبات الطرق الكهربائية	Wiring and connectors for electric road vehicles
135	GSO ISO 4141-1	مركبات الطرق - كابلات التوصيل متعددة القلوب -- جزء 1: طرق اختبار ومتطلبات الأداء الأساسي للكابلات المغلفة	Road vehicles -- Multi-core connecting cables Part 1: Test methods and requirements for basic performance sheathed cables
136	GSO ISO 4141-2	مركبات الطرق - كابلات التوصيل متعددة القلوب - جزء 2: طرق اختبار ومتطلبات الأداء العالي للكابلات المغلفة	Road vehicles -- Multi-core connecting cables Part 2: Test methods and requirements for high performance sheathed cables
137	GSO ISO 4141-3	مركبات الطرق - كابلات التوصيل متعددة القلوب - جزء 3: التركيب والأبعاد ووسم الكابلات للجهد المنخفض المغلفة وغير محجبة	Road vehicles -- Multi-core connecting cables Part 3: Construction, dimensions and marking of unscreened sheathed lowvoltage cables
138	GSO ISO 4141-4	مركبات الطرق - كابلات التوصيل متعددة القلوب – جزء 4: طريقة اختبار المفاصل ومتطلبات تجميعات الكابلات	Road vehicles -- Multi-core connecting cables -- Part 4: Test methods and requirements for coiled cable assemblies
139	ISO 14572	المغلفة الاحاديه او المستديرة مركبات الطرق - الكابلات الاقطاب المحجبة وغيرالمحجبة لجهود 60 فولت المتعددة أداء الكابلات و600 فولت – طرق الاختبار ومتطلبات الأساسى والعالى	Road vehicles — Round, sheathed, 60 V and 600 V screened and unscreened single- or multi-core cables — Test methods and requirements for basic- and high-performance cables
140	GSO IEC/TR 62602	موصلات الكابلات المعزولة – بيانات مقاسات)KCMIL و AWG(	Conductors of insulated cables - Data for AWG and KCMIL sizes

No.	GSO Standard	Arabic Title	English Title
141	GSO IEC/TS 60479-1	تأثيرات التيار على الجنس البشـــرى والحيوانات - الجزء الأول: سمات عامة	Effects of current on human beings and livestock - Part 1: General aspects
142	GSO IEC 60479-2	تأثيرات التيار المار خلال الجسم البشري - الجزء رقم (2) السمات الخاصة	Effects of current on human beings and livestock - Part 2: Special aspects
143	GSO IEC 60755	المتطلبات العامة لأجهزة الحماية العاملة بالتيار المتبقي	General requirements for residual current operated protective devices
144	GSO IEC 62335	قواطع الـدوائر الكهربـائيـة – أدوات التـأريض الواقيـة المحمولة القابلة للوصـل والفصـل العاملة بالتيار المتبقي من واستخدامات المركبات العاملة بالبطارية I الفئة	Circuit breakers - portable, detachable residual current grounded protective devices Class I, battery-powered vehicle - applications
145	GSO ISO 6469-1	مركبات الطرق المدفوعة كهربائيًا - مواصـفات السـلامة - الجزء 1: نظام تخزين الطاقة الداخلي القابل لإعادة الشحن	Electrically propelled road vehicles - Safety specifications -- Part 1: On-board rechargeable energy storage system (RESS)
146	GSO ISO 6469-2	مركبات الطرق المدفوعة كهربائيًا - مواصـفات السـلامة - الجزء 2: وســائل ســلامة تشــغيل المركبات والحماية من الأعطال	Electrically propelled road vehicles - Safety specifications -- Part 2: Vehicle operational safety means and protection against failures
147	GSO ISO 6469-3	مركبات الطرق المدفوعة كهربائيًا - مواصـفات السـلامة - الجزء 3: حماية الأشخاص من الصدمة الكهربائية	Electrically propelled road vehicles - Safety specifications -- Part 3: Protection of persons against electric shock
148	GSO IEC 60445	تمييز أطراف توصيل المعدات ونهايات الموصلات الخاصة ، شاملاً الأسس العامة لنظام رقمي حرفي	IDENTIFICATION OF EQUIPMENT TERMINALS AND OF TERMINATIONS OF CERTAIN DESIGNATED CONDUCTORS, INCLUDING GENERAL RULES FOR AN ALPHANUMERIC SYSTEM
149	GSO IEC 60529	درجـات الحمـايـة التي توفرهـا الأغلفـة الخـارجيـة (النظـام الرمزي IP)	Degrees of protection provided by enclosures (IP Code)
150	GSO ISO 8715	مركبات الطرق الكهربائية - خصـــائص التشـــغيل على الطريق	Electric road vehicles -- Road operating characteristics
151	GSO IEC 61980-1	أنظمة نقل القدرة اللاسلكية (WPT) للسيارات الكهربائية - الجزء 1: المتطلبات العامة	Electric vehicle wireless power transfer (WPT) systems - Part 1: General requirements
152	GSO ISO/TR 8713	مركبات الطرق الكهربائية - التعاريف	Electrically propelled road vehicles Vocabulary
153	GSO IEC 60050-482	المفردات الـدوليـة الكهروتقنيـة - الجزء 482 : الخلايـا الأولية والثانوية والبطاريات	International Electro technical Vocabulary Part 482: Primary and secondary cells and batteries
154	GSO ISO 15118-1	مركبات الطرق - واجهة الاتصـــال الشـــبكي - الجزء1: المعلومات العامة وتعريف حالة الاستخدام	Road vehicles - Vehicle to grid communication interface - Part 1: General information and use-case definition

No.	GSO Standard	Arabic Title	English Title
155	GSO ISO 15118-2	مركبات الطرق - واجهة الاتصـــال الشـــبكى- الجزء 2: متطلبات بروتوكول التطبيق والشبكة	Road vehicles - Vehicle-to-Grid Communication Interface - Part 2: Network and application protocol requirements
156	GSO ISO 15118-3	مركبات الطرق - واجهة اتصـال المركبة بالشـبكة - الجزء 3: متطلبات الطبقة المادية وطبقة ارتباط البيانات	Road vehicles - Vehicle to grid communication interface - Part 3: Physical and data link layer requirements
157	*UNECE Regulation 10	بالتوافق الكهرومغناطيسى يتعلق فيما المركبات اعتماد	The approval of vehicles with regard to electromagnetic compatibility
158	* UNECE Regulation 121	وتحديد أجهزة الموقع حيث من الموافقة على المركبات والمؤشرات اليدوية والكاشفات التحكم	the approval of vehicles with regard to the ,location and identification of hand controls tell-tales and indicators
159	* UNECE Regulation 94	بحمـاية ركـابها فى حـالـة يتعلق فيما المركبات اعتماد الأمامي الاصطدام	the approval of vehicles with regard to the protection of the occupants in the event of a frontal collision
160	* UNECE Regulation 135	التى تتعلق بأداء الصدمات الجانبية الموافقة على المركبات على القطب(PSI)	the approval of vehicles with regard to their Pole Side Impact performance (PSI)
161	* UNECE Regulation 153	بسـلامة نظام الوقود وسـلامة يتعلق فيما المركبات اعتماد مجموعة الحركة الكهربائية فى حالة الاصطدام الخلفى	The approval of vehicles with regard to fuel system integrity and safety of electric power train in the event of a rear-end collision
162	*UNECE Regulation 44	أحكام موحدة بشـــأن الموافقة على أجهزة تقييد الأطفال لركـاب المـركبـات الآليـة (نظـام تقييـدالأطفـال) من)MY2026(	Uniform provisions concerning the approval of restraining devices for child occupants of power-driven vehicles (Child Restraint System) (from MY2026)
163	* UNECE Regulation 129	أحكام موحدة بشـــأن الموافقة على أجهزة تقييد الأطفال المســـتخدمة على متن المركبات (ECRS)المحســـنة من) الآليةMY2026(	Uniform provisions concerning the approval of Enhanced Child Restraint Systems (ECRS) used on board of motor vehicles (from MY2026)
164	* UNECE Regulation 145	أحكام موحدة تتعلق بالموافقة على المركبات فيما يتعلق مثبتـات الحبـل العلوى ISOFIXبـأنظمـة التثبيـت ISOFIXومواضع الجلوس iSize من) MY2026(	Uniform provisions concerning the approval of vehicles with regard to ISOFIX anchorage systems ISOFIX top tether anchorages and iSize seating positions(from MY2026)
165	*UNECE Regulation 14	أحكام موحدة بشـــأن بالموافقة على المركبات فيما يتعلق بمثبتات أحزمة الأمان (ابتداء من 2026)	Uniform provisions concerning the approval of vehicles with regard to safety-belt anchorages (from MY2026)
166	*FMVSS 305	المركبات التى تعمل بالطاقة الكهربائية : انســـكاب المنحل بالكهرباء والحماية من الصدمات الكهربائية	Electric-Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection
167	*FMVSS 208	حماية الركاب من الاصطدام	Occupant Crash Protection

No.	GSO Standard	Arabic Title	English Title
168	*FMVSS 301	الوقود نظام سلامة	Fuel System Integrity
169	*FMVSS 214	الصدمات الجانبية من حماية	Side Impact Protection
170	* FMVSS 216a	السقف تحطم مقاومة	Roof Crush Resistance

* will be adopted as GSO standard

Note: List of standards mentioned in this annex is subject to review, and manufacturer and economic operator are responsible for ensuring that they use the latest standards, based on the transitional provisions provided in the referred document.

GSO will work on establishing an electronic link for GSO standards that are compatible with GSO technical regulation for electric vehicles and linking their updates to GSO electronic standards store.

Annex (2)

Essential requirements for electric vehicles

1. Electric vehicle safety requirements

Electric vehicles manufacturers can apply for a GSO conformity certificate for their products whether they are compliant with to the relevant United Nations Economic Commission for Europe (UNECE) standards or Federal Motor Vehicle Safety Standards (FMVSS) and American Environmental Protection Agency (EPA) standards.

It is necessary to comply with the technical requirements contained in this regulation.

1.1 General requirements on protection against electrical shock

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.

These electrical safety requirements apply to high voltage buses of electric power train and electrical components which are galvanically connected to the high voltage bus of electric power train under conditions where they are not connected to external high voltage power supplies.

1.1.1 Protection against direct contact

- For high voltage live parts inside the passenger compartment or luggage compartment, the protection degree IPXXD shall be provided.

- For high voltage live parts in areas other than the passenger compartment or luggage compartment, the protection degree IPXXB shall be provided.

- Electrically protected barriers and enclosures, etc. …shall not be able to be opened, disassembled, or removed without use of tools.

- Connectors and vehicles inlet can be separate without use of tools if it is comply with one at least from the following:

• Comply with the above requirements.

•They are located under the floor and equipped with a locking mechanism.

•They are equipped with a locking mechanism and other components, shall be removed with use of tools in order to separate the connector.

• Voltage of the live parts becomes equal or below DC 60V or below AC 30V (r.m.s) within 1 second after the connector is separated.

1.1.2 Protection against indirect contact:

- Exposed conductive parts, such as the conductive barrier and enclosure, shall be securely galvanically connected to the electrical chassis.

- Resistance between all exposed conductive parts and electrical chassis shall be less than 0.1 Ω when there is current flow of at least 0.2 A.

- For vehicles which are intended to be connected to the earthed external electric power supply through the conductive connection between vehicle inlet and vehicle connector, a device to enable the galvanically connection shall be provided. The device shall enable connection to the earth before exterior voltage is applied to the vehicle and retain the connection until after the exterior voltage is removed from the vehicle.

1.1.3 Isolation resistance

1.1.3.1 Electric power train consisting of separate Direct Current- or Alternating Current-buses

If AC high voltage buses and DC high voltage buses are galvanically isolated from each other, isolation resistance between the high voltage bus and the electrical chassis shall have a minimum value of 100 Ω /volt of the working voltage for DC buses, and a minimum value of 500 Ω /volt of the working voltage for AC buses.

1.1.3.2 Electric power train consisting of combined DC- and AC-buses

If AC high voltage buses and DC high voltage buses are galvanically connected, isolation resistance between high voltage bus and the electrical chassis shall have a minimum value of 500 Ω/volt of the working voltage.

1.1.4 Rechargeable energy storage system (REESS)

REESS shall comply with requirements of FMVSS 305/ UNECE 100, or at least, it shall comply with the following:

- REESS or vehicle system shall provide a signal to activate the warning in the event of operational failure of the vehicle controls (e.g. input and output signals to the management system of REESS, sensors within REESS, etc.) that manage the safe operation of REESS.

- REESS or vehicle system shall provide a signal to activate the warning in the case of a thermal event in REESS (as specified by the manufacturer).

- If REESS can be externally charged, vehicle movement by its own propulsion system shall impossible as long as the vehicle connector is physically connected to the vehicle inlet.

- A warning to the driver in the event of low REESS state of charge shall be provided. The manufacturer shall determine the necessary level of REESS energy remaining.

- Battery that may produce hydrogen gas shall be provided with a ventilation fan or a ventilation duct to prevent the accumulation of hydrogen gas.

- During a normal charge procedure, hydrogen emissions shall be below 125 g during 5 h, or below 25 x t2 g during t2 (in h).

1.1.5 Protection against water effects. (Implementation for this clause will be starting from 1st Jan 2026)

Vehicles shall maintain isolation resistance after water exposure (e.g. washing, driving through standing water). This paragraph shall not apply to electrical circuits that are galvanically connected to each other, where the DC part of these circuits is connected to the electrical chassis.

Vehicle manufacturer can choose to comply one the following requirements in clauses (1.1.5.1, 1.1.5.2 or 1.1.5.3):

1.1.5.1 Vehicle manufacturers shall provide evidence and/or documents on how the electrical design, or the components of the vehicle located outside the passenger compartment or externally attached, after water exposure remain safe and comply with the requirements described in Annex 4. If the evidence and/or documents provided are not satisfactory, the manufacturer shall perform a physical component test based on the requirements described in Annex 4.

1.1.5.2 The following two tests shall be applied:

1.1.5.2 .1 Washing.

This test is intended to simulate normal washing of vehicles, but not specific cleaning using high water pressure or underbody washing.

Vehicle areas related to this test are border lines, i.e. a seal of two parts such as flaps, glass seals, outline of opening parts, outline of front grille and seals of lamps.

All border lines shall be exposed and followed in all directions with the water stream using a hose nozzle and conditions in accordance with IPX5 as specified in Annex 3.

1.1.5.2 .2 Driving through standing water.

The vehicle shall be driven in a wade pool, with 10 cm water depth, over 500 m at a speed of 20 ±2 km/h, in a time of approximately 1.5 min.

If the wade pool used is less than 500 m in length, then the vehicle shall be driven through it several times. The total time, including the periods outside the wade pool, shall be less than 10 min.

1.1.5.3 If an isolation resistance monitoring system is provided, and the isolation resistance less than the requirements given in clause 1.1.3. is detected, a warning shall be indicated to the driver. The function of the on-board isolation resistance monitoring system shall be confirmed by the manufacturer documents.

1.1.6 Vibration test.

The test shall be conducted in accordance the below procedures:

During the test, there shall be no evidence of electrolyte leakage, rupture (applicable to high voltage REESS only), venting (for REESS other than open-type traction battery), fire or explosion. The evidence of electrolyte leakage shall be verified by visual inspection. For a high voltage REESS, the isolation resistance measured after the test shall not be less than100 Ω/V.

1.1.6 .1 Purpose.

The purpose of this test is to verify the safety performance of the REESS under a vibration environment which the REESS will likely experience during the normal operation of the vehicle.

1.1.6 .2 Installations.

This test shall be conducted either with the complete REESS or with REESS subsystem(s). If manufacturer chooses to test with subsystem(s), the manufacturer shall demonstrate that the test result can reasonably represent the performance of the complete REESS with respect to its safety performance under the same conditions. If the electronic management unit for the REESS is not integrated in the casing enclosing the cells, then the electronic management unit may be omitted from installation on the tested device if requested by manufacturer.

1.1.6 .3 Procedure for conducting a standard cycle.

Procedure for conducting a standard cycle for a complete REESS, REESS subsystem(s), or complete vehicle.

1.1.6 .3 .1 Standard discharge:

- Discharge rate: The discharge procedure including termination criteria shall be defined by the manufacturer. If not specified, then it shall be a discharge with C1 current for a complete REESS and REESS subsystems.

- Discharge limit (end voltage): Specified by the manufacturer.

-For a complete vehicle, discharge procedure using a dynamometer shall be defined by the manufacturer. Discharge termination will be according to vehicle controls.

- Rest period after discharge: minimum 15 min.

1.1.6 .3 .2 Standard charge:

The charge procedure shall be defined by the manufacturer. If not specified, then it shall be a charge with C/3 current. Charging continues until normally terminated.

For a complete vehicle that can be charged by an external source, charge procedure using an external electric power supply shall be defined by the manufacturer. For a complete vehicle that can be charged by on-board energy sources, a charge procedure using a dynamometer shall be defined by the manufacturer. Charge termination will be according to vehicle controls.

1.1.6 .4 Test procedure:

The tested device shall be subjected to a vibration having a sinusoidal waveform with a logarithmic increase between 7 Hz and 50 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours in the vertical direction of the mounting orientation of the REESS as specified by the manufacturer.

The correlation between frequency and acceleration shall be as shown in following table:

Frequency (Hz)	Acceleration (m/s2)
7 - 18	10
18 - 30	gradually reduced from 10 to 2
30 - 50	2

- At the request of manufacturer, a higher acceleration level as well as a higher maximum frequency may be used.

- At the choice of manufacturer, a vibration test profile determined by vehicle manufacturer verified for the vehicle application may be used as a substitute for the frequency - acceleration correlation of above table.

- REESS certified according to this condition shall be limited to the installation for a specific vehicle type.

- After completing the vibration, a standard cycle as described in clause 1.1.6.3. Shall be conducted.

- Test shall end with an observation period of 1 hour at the ambient temperature conditions.

- The test temperature shall be according to ECE R 100 or UN GTR 20 regulation.

- As an alternative to the tests mentioned in clauses 1.1.5 and 1.1.6 of the vehicle wash test and vibration test, the corresponding tests according to regulation no. ECE R 100 can be accepted.

1.2 Electrical protection

The following conditions shall be complied to avoid any electric shock:

1.2 .1 Protection against electrical shock

To avoid electric shock, one of the following conditions must be fulfilled:

1.2 .1 .1 Absence of high voltage

- Voltages between high voltage buses shall be low as possible, so that its value is between the voltages Vb,V1 and V2 shall be equal to or less than 30VAC or 60 VDC.

- Voltage measurement shall be performed after at least 10 seconds, but not more than 60 seconds, after the impact.

1.2.1.2 Electrical energy reduction

The total energy on the high voltage buses shall be low as possible and shall be less than 2.0 Joules.

1.2.1.3 Physical protection

- Resistance between all exposed conductive parts and electrical vehicle chassis shall be less 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, all conductive parts shall be provided with the protection IPXXB.

1.2.1.4 Isolation resistance

Isolation resistance between high voltage bus and electrical chassis shall have a minimum value of 100 Ω/volt for DC voltages, and a minimum value of 500 Ω/volt for AC voltages.

1.2.2 Electrolyte spillage (Electrolyte)

After impact, there shall be no electrolyte spillage or it shall be less than 7% of the total charging system capacity, with a maximum of 5.0 liters, to avoid fire or electric shock and to reduce deaths and injuries. Electrolyte leakage shall not be occurred inside the driver's compartment, and the percentage of leakage from the charge storage system, if it occurs, shall not exceed 7%, with a maximum of 5.0 liters, during the impact and up to 30 minutes after the impact. This excludes open traction batteries located outside the passenger compartment.

1.2.3 REESS retention

As a result of impact, any part of the REESS shall not enter the passenger compartment during or after the impact.

For more details on the electrical safety requirements refer to UNECE 100.

2. Performance requirements of electrical vehicles

2.1 Electrical performance requirements

- Measurement of electric energy consumption is according to methods and test cycles described in ECER 101.

- Electrical range measured according to this regulation is indicated only in sales promotional materials. This value shall also be used for calculations.

- Electrical energy consumption shall be expressed in Watt hours per kilometer (Wh/km) and range in km, both rounded to the nearest whole number.

- If the measured value of electrical energy exceeds the manufacturer's declared value by 4 %, another test is conducted on the same vehicle. When the average of two tests results does not exceed the manufacturer's declared value by more than 4 %, the value declared by the manufacturer is taken as approved value for production of the type.

- The average of the three test results is taken as approved value for type approval, if the average of values exceeds the declared value by more than 4 %, final tests is conducted on the same vehicle.

- If the declared electrical range value exceeds the measured value, another test is conducted on the same vehicle. When the manufacturer declared value does not exceed average of two tests results, range value declared by the manufacturer is taken as approved value for type approval.

- If the declared range value exceeds average of measured value, a final test is conducted on the same vehicle. The average of the three tests results is taken as approved value for type approval.

2.2 Test conditions

Vehicle condition

- Vehicle tyres shall be inflated to the pressure specified by the vehicle manufacturer at ambient temperature.

- Lighting and light-signaling and auxiliary devices shall be off, except those required for testing and usual daytime operation of vehicle.

- All energy storage systems available for traction purposes (electric, hydraulic, pneumatic, etc.) shall be charged up to their maximum level specified by manufacturer.

- If batteries are operated above ambient temperature, operator shall follow procedures recommended by vehicle manufacturer in order to keep battery temperature in normal operating range.

- Manufacturer shall acknowledge that the thermal system of battery is neither disabled nor reduced.

- Vehicle shall have undergone at least 300 km during seven days before test with those batteries that are installed.

2.3 Test methods

Electrical range and electrical energy consumption shall be tested according to ECE R101 or ECE R154. Results are accepted, if the electric vehicle complies with the latest version of GSO ISO 8714 as an alternative to define energy consumption and range.

2.4 Electric energy consumption(C)

All electric vehicles shall be equipped with label (as approved in conformity department at GSO) that defines the electrical vehicle performance at the standard conditions according to test results declared by the manufacturer and on its responsibility.

Energy consumption C is energy required to travel D km, shall be calculated using the following formula:

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

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

E: Energy in Wh

D: Distance covered during the test (km).

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

2.5 Total range

The maximum distance that electric vehicle can travel using battery on a fully charged, from beginning to end of the test shall not less than 200 KM .Total range shall be specified and declared from manufacture by official declaration.

3. Manufacturer and economic operator responsibility

Manufacturer and economic operator shall carry out the following:

3.1 Carry out tests for all requirements and provisions of this regulation.

3.2 Prepare appropriate manual for electric vehicle operation so that it includes all the risks, warnings and alerts necessary for

safe use, including places where high voltage is disconnected from the vehicle.

3.3 Warnings shall be written to avoid possible accidents as follow:

- Do not touch orange 400 V cable or any of components that may cause burns or electric shocks.

- If the battery is damaged, there may be a fire hazard. In this case, it is necessary to place vehicle or damaged battery under surveillance in a dedicated and secure storage area so as to prevent start of a fire.

3.4 Manufacturers and economic operator shall provide proper training to civil defense departments in order to respond and take initiative in accident situations, providing them with the following:

a- Procedures to be followed in the event of an impact during charging.

b- Procedures to be followed in the event of a fire in an electric vehicle and the following are included:

• Hazards and protective equipment to be used.

• Type of extinguishers used to extinguish fire.

c- Instructions for avoiding high voltage area and instructions for evacuating passengers from electric vehicle which includes Prohibited areas.

d - Procedures to be followed in the event of an electrolyte leakage from the traction battery.

3.5 Manufacturers and economic operator shall provide technical workshop with all qualified and trained people for regular maintenance and repairing electric vehicles.

3.6 All vehicles shall be equipped with electric vehicle performance label; the label shall be displayed on the inner side of vehicle on to the rear left hand side window by vehicle manufacturer. In case it cannot be installed in the rear left-hand window, the label shall be displayed on the front left-hand side window.

3.7 Training the vehicle owner on the correct and safe way to use electric vehicle, how to maintain it and how to charge its batteries, etc.

3.8 Economic operator in the member states is responsible for disposing or recycling expired batteries for their vehicles.

3.9 Economic operator shall provide vehicle with a mechanism that allows vehicle doors to be opened from inside in the event of an emergency and when the engine turns off.

4. Electric Vehicle Charging and Power Supply Systems

4.1 Accessories installation

4.1.1 Electric Vehicle Coupler:

Electric vehicle coupler shall comply with the following instructions and requirements:

a. Electric vehicle coupler shall be non-interchangeable with wiring devices in other electrical systems. Earthed electric vehicle coupler shall not be interchangeable with non-earthed electric coupler.

b. Electric vehicle coupler shall be installed to be protected against inadvertent contact with conductive parts from electric vehicle supply equipment or battery.

c. Electric vehicle coupler shall be provided with proper means to prevent unintentional disconnection.

d. If electric vehicle is provided with earthing, in this case, electric vehicle coupler shall be so designed that when connecting the coupler to charging outlet, the earthing pole shall be the first connection point and the last disconnection point.

4.1.2 Power rating

Electric vehicle supply equipment shall have sufficient rating to supply the load served .Where an automatic load management system is used, the maximum electric vehicle supply equipment load or feeder shall be the maximum load permitted by automatic load management system.

4.1.3 Markings

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

“**For Use with Electric Vehicles** “

Electric vehicle supply equipment shall be clearly marked by manufacturer if ventilation not required as follows:

“**Ventilation not required** “

Electric vehicle supply equipment shall be clearly marked by manufacturer as follows:

"**Ventilation required**."

The markings shall be securely affixed and positioned in locations where they are clearly visible to the eye.

4.1.4 Cords and cables:

Cables related to connectors of connected devices shall comply with the following requirements:

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

b. Where electric vehicle supply equipment or charging system is not fixed in place, the length of the cable used shall be measured from the face of the plug to the face of electric vehicle connector.

c. Where the electric vehicle supply equipment or charging system is fixed in place, the cable length shall be measured from the outlet of electric vehicle's power supply equipment to the front of electric vehicle's connector. Other types of cables suitable for this purpose are permitted, including communications, signal, and optical fiber cables.

4.1.5 Interlock equipments.

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

4.1.6 Automatic power disconnect cable

Electric vehicle supply equipment or connector cables to equipments shall be provided with an automatic means to de-energize cables when they are subjected to strain that could result in either cable cutting, separation or rupture from electric connector.

4.1.7 Personnel Protection System

Electric vehicle supply equipment shall be provided with protection systems against electric shock in order to protect users and employees.

4.2 Electrical Installations

4.2.1 Branch Circuit Markings.

A label shall be permanently affixed adjacent to socket box containing the data shown below when installing branch circuit with equipment:

“For use with electric vehicle supply equipment or electric vehicle charging system)”, in addition to indicate the appropriate voltage and current data for use.

4.2.2 Overcurrent Protection.

The test shall be conducted in accordance with FMVSS305/UNECE 100 requirements.

1 - During the test there shall be no evidence of electrolyte leakage, fire, explosion or rupture (applicable to high voltage REESS(s) only); Venting (for REESS other than open-type traction battery).

(The evidence of electrolyte leakage and venting shall be verified by visual inspection without disassembling any part of the tested device).

2- Overcurrent protection control of the REESS shall terminate charging or temperature measured on the casing of the REESS shall be stabilized, such that the temperature gradient varies by less than 4 °C through 2 hours after the maximum overcurrent charging level is reached.

3- For a high voltage REESS, isolation resistance measured after the test shall not be less than 100 Ω/V.

4.2.3 Electric Vehicle Supply Equipment Connectors.

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

4.2.3.1 Electric vehicle supply equipment that is rated 250 volts maximum and complies with the following:

a. It is intended for connection to receptacle outlets rated no more than 50 amperes.

b. It is installed to facilitate any of the following:

- Facilitate maintenance and repair.

- Repositioning and moving portable equipment, or install electric vehicle supply equipment (EVES) in place.

c. Length of power supply cord is limited to 1.8 m.

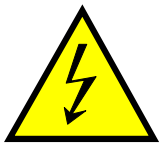
d. Receptacles are located in specific places to avoid physical damage to flexible cords.

e. Electric vehicle supply equipment shall be permanently connected to the premises wiring system.

5. Marking

- REESS having high voltage capability shall be identified with the symbol shown in Figure 1. Symbol background shall be yellow, the bordering and the arrow shall be black.

Marking of High Voltage Equipment



- High voltage cables which are not located within enclosures shall be identified by an orange outer sheath.

6. Spare Tire

Electric vehicles equipped with a repair kit are exempt from the requirement to provide vehicle with a spare tire, which is mentioned in the GSO technical regulation no. GSO 42. Under the following conditions:

- Puncture repair kit, as a replacement of spare wheel, is mandatory for vehicles.

- Manufacturer and economic operator shall provide detailed brochure explaining the use of puncture repair kit.

- Manufacturer and economic operator shall obtain the consumer's consent and acceptance of such feature as an alternative to use instead of spare wheel.

- Manufacturer and economic operator shall ensure quick response service /road assistance support at 24 hours a day, 7 days a week for these vehicles subject to the mentioned agreement for 3 years at least.

* Electric vehicle shall be provided with spare tire for KSA market.

Annex (3)

Workshops and repair centers for electric vehicles

Manufacturer and economic operator for electric vehicle shall comply with the following requirements or according to applicable procedures in the member states.

1. General requirements for Workshops

1.1 Protection against electrical hazards

Before undertaking any operation on an electrical installation, an electrical risk assessment shall be carried out to protect against possible electrical hazards which may be occurred during operation and using an electric vehicle.

This assessment shall specify how the operation is to be carried out and precautions need to be taken to ensure safety.

1.2 Specific requirements for technicians

a. All employees involved in or in close proximity to electrical installation operations shall be trained in electrical safety requirements, and knowledge of safety rules related to operations they are assigned to perform.

Training and education of employees aims to:

• Learn about the possible dangers associated with electricity.

• Learn about preventive actions and know how to apply them.

• Educate customers about owning electric vehicles and how to use them.

b. Technicians shall wear clothes appropriate to workstation. This may include using comfortably fitted clothing or personal protective equipment.

Responsibility of electric vehicle maintenance and service personnel

1.3 Responsibility of electric vehicle maintenance and service personnel:

Workshops personnel can be classified into:

1.3.1 Qualified persons with sufficient experience

Trained persons with relevant knowledge and experience related to electric vehicles enables them to analyze the relevant electrical risks and how to avoid them. They may be a battery specialist or in general, electric vehicles technicians. They can do all different maintenance and repair operations.

1.3.2 Qualified persons with specific specializations

They are those persons who have sufficient knowledge to avoid electrical risks that may be occurred, they can carry out all different maintenance and repair operations except electrical and battery repairing.

1.3.3 Persons with limited experience

They are those Persons who are not trained or qualified enough to carry out maintenance and repair operations. They can be responsible for sales or providing the necessary services only, but not for repair and maintenance.

All workshops providing maintenance and repair services for electric vehicles shall have at least one qualified person.

2. Safety equipment for electric vehicle centers and workshops

a. Clear instructions on how to use lock out system before starting work on high voltage systems and moving vehicles after an accident shall be provided.

b. Employer shall provide personal protective equipment to all employees.

c. It is compulsory for technicians to wear individual personal protective equipment before working in the orange zone (Battery removal, Lockout).

d. The station shall have collective protection equipment (CPE) for:

• Battery repair protected area

• Vehicle protected area

• Isolated spaces

e. The station shall have working area for repairing high voltage system with a warning sign that includes the following phrases:

“Dangers area, high voltage working area”

3. Handling a vehicle involve in an accident

Vehicle shall be locked out prior to any repair, with an open space for parking electric vehicle and 5 meters of empty spaces around electric vehicle. In the event of structure, battery, or any high voltage wires damage, a qualified person shall assess the integrity of the following components:

a. Exposed and conductive components

b. Fluids leakage.

c. Battery and wirings damage.

d. Electric vehicle locked out.

If any of the above mentioned components, it shall be placed in an isolated area.

Annex (4)

Verification method for testing compliance of isolation resistance based on vehicle electrical design documents after water exposure

This annex describes the applicable requirements when certifying manufacturer's high voltage equipment or system components against adverse water effects rather than a physical test. Vehicle manufacturers shall provide information to laboratory to identify, as a reference point, mounting location for each high voltage component in/on vehicle.

1. Documents shall contain the following information:

a. How manufacturer tested isolation resistance compliance of electrical design of vehicle by using fresh water.

b. How high voltage component or system was inspected for water ingress, after testing, and how each high voltage component/system met the appropriate degree of protection against water, depending on its installation location.

2. Testing authority verifies and confirms the eligibility of documented conditions which have been taken into account, and should have been adhered to, during certification process by manufacturer:

2.1. Partial condensation of moisture within enclosure is permitted during testing. Dew that may be deposited is not considered as water ingress. For testing purposes, surface area of the tested high voltage component or system is calculated with an accuracy of 10 percent. If possible, the tested high voltage component or system being tested is energized. If the tested high voltage component or system is energized, adequate safety precautions are taken.

2.2. For electrical components, attached externally (e.g. in engine compartment), open from the bottom, whether in exposed or protected locations, testing authority shall verify, in order to confirm compliance, whether the test is conducted by spraying high voltage component or system from all practicable directions with a stream of water from a standard test nozzle as shown in figure 1. The following parameters are observed during the test in particular:

a. Nozzle internal diameter: 6.3 mm

b. Flow rate: 11.9 – 13.2 l/min

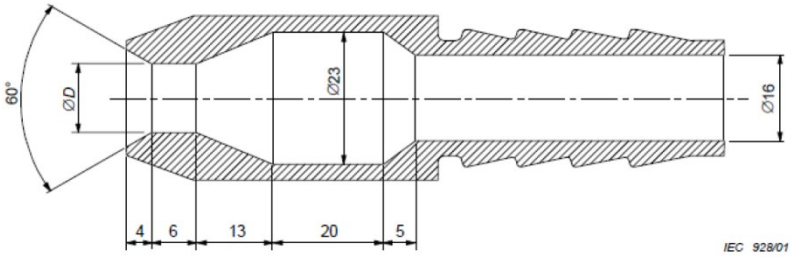
c. Water pressure at nozzle: approximately 30 kPa (0.3 bar)

d. Test duration per m^2 of surface area of the tested high voltage component or system: 1 min

e. Minimum test duration: 3 min

f. Distance from nozzle to tested high voltage component or system surface: approximately 3 m (this distance may be reduced, if necessary to ensure proper wetting when spraying upwards).

Figure 1- Standard nozzle for test



2.3. For electrical components, attached externally (e.g. in engine compartment), covered from the bottom, testing authority shall verify, in order to confirm compliance, from the following:

a. Cover protects component against direct water spray from below and is invisible.

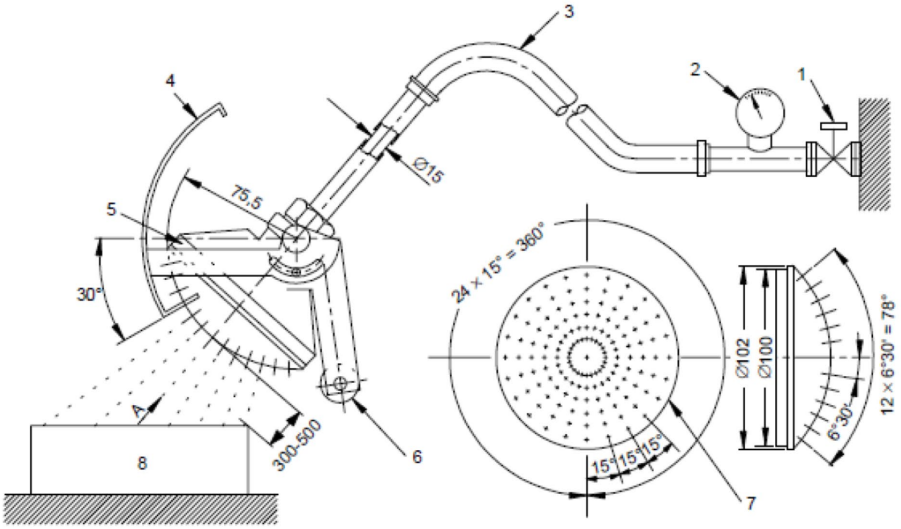
b. Test is conducted by using splashing test nozzle as shown in figure 2.

c. Moving shield is removed from spray nozzle and machine is sprayed from all practicable directions.

d. Water pressure is adjusted to give a delivery rate of (10 ± 0.5) l/min (pressure approximately 80 kPa to 100 kPa (0.8 bar to 1.0 bar)).

e. Test duration is 1 min/m2 of calculated surface area of machine (excluding any mounting surface and cooling fin) with a minimum duration of 5 min.

Figure 2 - Splashing test nozzle



Dimensions in millimetres

Viewed according to arrow A (with shield removed)

IEC 927

Note:

1. Cock
2. Pressure gauge
3. Hose
4. Moving shield – aluminium
5. Spray nozzle
6. Counter weight
7. Spray nozzle – brass with 121 holes ∅ 0,5:
   1 hole in centre
   2 inner circles of 12 holes at 30° pitch
   4 outer circles of 24 holes at 15° pitch
8. Machine under test

3. The entire high voltage system or each component is checked to comply with isolation resistance requirements with the following conditions:

a. Electric chassis shall be simulated by an electric connector, e.g. a metal plate, components are attached with their standard mounting devices.

b. Cables, where provided, shall be connected to component.

4. Parts designed not to be wet during operation shall not be allowed to become wet and water which could reach them shall not be allowed to accumulate inside high voltage component or system.

Annex (5)

Manufacturer declaration of conformity

Authentication request for certificate of conformity by GSO

We, company (**manufacturer name**), which manufactures (product name), would like to submit the following certificates of conformity (model year) for certification by GSO.

We acknowledge that the products covered by certificates of conformity are in compliance with GSO and national technical regulations and requirements, as well as international technical regulations and requirements approved by GSO, In case of non-availability of relevant technical regulations and requirements.

We (**manufacturer name**) will provide further supporting documents if necessary and guarantee the following:

- In case of any technical error in the design or production of our products, which will affect the safe operation, durability and safety of product users in GCC countries, the appropriate action will be taken, and GSO will be informed immediately with full details of the product defects.

- In case of any recall of vehicles in GCC market, the appropriate action will be taken, and GSO will be informed immediately with full details of recall.

- Provide appropriate training to civil defense departments and/or relevant bodies that deal with vehicle accidents.

- Establish sufficient workshops in GCC countries with qualified and trained personnel for periodic maintenance and repair of our vehicles, especially if vehicle after an accident has any damage to chassis, battery, or high voltage wiring, qualified personnel shall conduct the required safety assessment.

- Guarantee battery's independence or vehicle fuel economy performance of at least 70% for 5 years or 100,000 km and take responsibility for handling, recovering, charging, recycling and disposing of vehicle batteries.

- Vehicle warranty agreement covers all GCC countries.

We acknowledge that all the above mentioned warranties and instructions and all information provided are correct.

Name and position of responsible person