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Fuel cell electric vehicles - Terminology

燃料电池电动汽车 术语

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Foreword

This Standard was proposed by China National Development and Reform Commission.

This Standard shall be under the jurisdiction of China National Automotive Standardization Technical Committee.

The drafting organizations of this Standard: Shanghai Automotive Group Co., Ltd., China Automotive Technology and Research Center, Tongji University.

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Fuel cell electric vehicles - Terminology

1 Scope

This Standard specified the relevant terms and definitions of fuel cell electric vehicles.

This Standard applies to electric vehicles and components which use gaseous hydrogen fuel cell

2 Normative references

The following standards contain the provisions which, through reference in this Standard, constitute the provisions of this Standard. For dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard. However, the parties who enter into agreement based on this Standard are encouraged to investigate whether the latest versions of these documents are applicable. For undated reference documents, the latest versions apply to this Standard.

GB/T 19596 *Terminology of electric vehicles*

GB/T 20042.1 *Proton exchange membrane fuel cell - Terminology*

3 Terms and definitions

3.1 General

3.1.1 fuel cell

power generation device which directly converts external supplied fuel and chemical energy in oxidant to electricity, heat and other reaction products via electrochemical reaction

3.1.2 fuel cell electric vehicle; FCEV

vehicle which takes fuel cell system as power source or primary power source

3.1.3 cold start

start at standard ambient temperature after sufficient vehicle-soaking

NOTE: for a test program, the soaking time usually recommended shall be 12 h to 36 h; during

3.1.13 hydrogen permeation

hydrogen releasing when hydrogen goes through structural material

3.1.14 poisoning

fuel cell components, for example, fuel cell membrane electrode is polluted, which causes catalyst performance degradation to weaken fuel cell performance

3.1.15 recycle

the process of active ingredient recycling by collection, separation and processing, etc.

3.1.16 stack rated pressure

air pressure at air inlet of fuel cell stack, at rated power

NOTE: Absolute pressure is recommended. If the measured pressure is used, it shall be specified.

3.1.17 open circuit voltage

voltage when fuel cell stack is disconnected with external circuit

3.1.18 rated voltage

end voltage of stack at rated power under specific working conditions

3.1.19 rated current

current of stack at rated power under specific working conditions

3.1.20 output characteristics

characteristics of the relation between fuel cell voltage and current

NOTE: In many situations, current refers to current density of fuel cell. The curve of the relation between fuel cell voltage and current is also called polarization curve.

3.1.21 rated power

the power of which the fuel cell stack can continue to work under certain operating conditions specified by manufacturer

3.1.22 mass specific power

rated power of per unit of mass

the system which is used to maintain thermal balance of fuel cell system, to recycle excess heat and perform auxiliary heating at the start of fuel cell system

3.2.2.5 ventilation system

the system in fuel cell system which discharges the gas in shell with help of mechanical methods

3.2.2.6 water treatment system

the system used for water treatment of fuel cell system, recovery and purification of produced water

3.3 vehicle hydrogen supply system

3.3.1 high pressure hydrogen storage cylinder

the device to store high pressure hydrogen

3.3.2 hydrogen fueling receptacle

connection device of hydrogen fuel filling at vehicle side

3.3.3 rated refueling pressure

normal working pressure under designed refueling and standard conditions

3.3.4 max. refueling pressure

the maximum refueling pressure within a safe operating range (usually 1.25 times rated refueling pressure)

3.4 Fuel cell electric vehicle system

3.4.1 complete fuel cell vehicle diagram

the diagram which indicates each component of fuel vehicle, as shown in Figure 1

3.5 Performance and test methods

3.5.1 Fuel cell safety and performance requirements

3.5.1.1 gas leakage

gas leakage phenomenon in gas supply system and fuel cell system, in addition to normal exhaust and emptying

3.5.1.2 lower flammability limit; LFL

the minimum volume concentration of flammable gas burning in air

NOTE: hydrogen: 4%; carbon monoxide: 12.5%; methane: 5%; N- pentane: 1.5%; acetylene: 2.5%; ammonia: 15%

3.5.1.3 maximum allowable working pressure, MAWP

the maximum gage pressure at which system or part certified by relevant regulations or instructions can work

NOTE: Pressure relief protection is set under this numerical value (or less than this numerical value).

3.5.1.4 maximum operating pressure

the maximum working pressure of internal fuel and oxidant at which fuel cell specified by manufacture can continuously work safely

3.5.1.5 allowable differential working pressure

the maximum pressure difference between each fluid specified by manufacturer, of which the fuel cell module can withstand and not damage or permanently lose functions or characteristics

3.5.1.6 maximum power

the maximum power value which the system or component can output

3.5.1.7 maximum operating temperature; MOT

the maximum transient or steady-state temperature of which the system or component can perform non-failure work

3.5.2 Test methods for performance of fuel cell system

3.5.2.1 standby state

the state of which fuel cell system is well prepared for start and can start any

time under start order

3.5.2.2 cold state

at ambient temperature, the internal temperature of fuel cell system is same with the external environment temperature; fuel cell system is at off state

3.5.2.3 idle state

the state of which fuel cell system is at working; all its output power are used to maintain the consumption of its auxiliary system; net output power is zero

3.5.2.4 response time to rated power

the time of fuel cell system from idle state to rated power under normal working state

3.5.2.5 dynamic response time

the time of fuel cell system from one state to another state under normal working state

3.5.2.6 start response time to rated power

the time required by fuel cell system from standby state to rated power state, including rated power cold start and rated power hot start

3.5.2.7 start response time to idle state

the time of fuel cell system from standby state to idle state, including idle cold start and idle hot start; it can operate stably after it reaches to idle state

[Translator: **3.5.2.8** is not existed in Chinese version]

3.5.2.9 heat recovery efficiency (of a fuel cell power system)

the ratio between fuel cell system recovery heat and fed fuel heating value (low heat value) of fuel cell system

3.5.2.10 fuel cell engine net output power

the power left after fuel cell stack output power minus the power consumed by auxiliary system

3.5.2.11 fuel cell engine rated power

net output power of which fuel cell system specified by manufacture can continuously work under specific working conditions

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