SAE FUEL CELL STANDARDS

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Fuel cells standards

	SAE Std	Standard Title	Objective
1	J1766	Recommended Practice for Electric, Fuel Cell and Hybrid Electric Vehicle Crash Integrity Testing	Electric, Fuel Cell and Hybrid vehicles may contain many types of high voltage systems. Adequate barriers between occupants and the high voltage systems are necessary to provide protection from potentially harmful electric current and materials within the high voltage system that can cause injury to occupants of the vehicle during and after a crash. This SAE Recommended Practice is applicable to Electric, Fuel Cell and Hybrid vehicle designs that are comprised of at least one vehicle propulsion voltage bus with a nominal operating voltage greater than 60 and less than 1,500 VDC, or greater than 30 and less than 1,000 VAC. This Recommended Practice addresses post-crash electrical safety, retention of electrical propulsion components and electrolyte spillage.
2	J2572	Recommended Practice for Measuring Fuel Consumption and Range of Fuel Cell and Hybrid Fuel Cell Vehicles Fuelled by Compressed Gaseous Hydrogen	Etablishes uniform procedures for testing fuel cell and hybrid fuel cell electric vehicles. This practice provides standard tests that will allow for determination of fuel consumption and range based on the US Federal Emission Test Procedures.
3	J2574 (Stbl)	Fuel Cell Vehicle Terminology	Contains definitions for hydrogen fuel cell powered vehicle terminology.
4	J2578	Recommended Practice for General Fuel Cell Vehicle Safety	Identifies and defines the preferred technical guidelines relating to the safe integration of fuel cell system, fuel storage, and electrical systems into the overall Fuel Cell Vehicle.
5	J2579	Technical Information Report for Fuel Systems in Fuel Cell and Other Hydrogen Vehicles	Defines design, construction, operational, and maintenance requirements for hydrogen storage and handling systems in on-road vehicles.
6	J2594	Recommended Practice to Design for Recycling Proton Exchange Membrane (PEM) Fuel Cell Systems	Provides a tool that helps the FC system designers and engineers incorporate recyclability into the PEM FC design process.
7	J2600	Compressed Hydrogen Surface Vehicle Fueling Connection Devices	Specifies design, safety and operation verification of Compressed Hydrogen Surface Vehicle (CHSV) refuelling connection devices.
8	J2601	Fueling Protocols for Light Duty and Medium Duty Gaseous Hydrogen Surface Vehicles	Establishes safety limits and performance requirements for gaseous hydrogen fuel dispensers.
9	J2601/2	Fueling Protocol for Gaseous Hydrogen Powered Heavy Duty Vehicles	Establish the safety limits and performance requirements for 35 MPa gaseous hydrogen fuel dispensers for heavy duty vehicle fueling (with tank system storage capacity >10kg).
10	J2601/3	Fueling Protocol for Gaseous Hydrogen Powered Industrial Trucks	Establishes performance requirements for fueling vehicles including a pressure test method to check for leaks, pressure limits for the vehicle fueling system and target pressure compensation limits to manage the effects of vehicle tank temperature rise during the fueling process.
11	J2615 (Stbl)	Testing Performance of Fuel Cell Systems for Automotive Applications	Provide a framework for performance testing of fuel cell systems (FCS) designed for automotive applications with direct current (DC) output.
12	J2616 (Stbl)	Testing Performance of the Fuel Processor Subsystem of An Automotive Fuel Cell System	Serves as a design verification procedure to verify design specifications or vendor claims.
13	J2617 (Stbl)	Recommended Practice for Testing Performance of PEM Fuel Cell Stack Sub-system for Automotive Applications	Serves as a procedure to verify the design specifications or vender claims of any PEM (Proton Exchange Membrane) type fuel cell stack sub-system for automotive applications.
14	J2719	Hydrogen Fuel Quality for Fuel Cell Vehicles	Serves as the basis of a proposed standard for commercial hydrogen fuel Purity for H powered vehicles, possibly including ICE's.
15	J2719/1	Application Guideline for Use of Hydrogen Quality Specification	The purpose of this TIR is to provide guidance for minimizing test requirements based on SAE J2719 while still ensuring fuel quality at hydrogen fueling stations for PEM fuel cell vehicles (FCVs) and ICEVs (to the extent that has been determined).
16	J2760 (Stbl)	Pressure Terminology Used in Fuel Cells and Other Hydrogen Vehicle Applications	SAE J2579 is being developed by the SAE Fuel Cell Vehicle (FCV) Safety Working Group (SWG) to provide recommended practices for Fuel Systems in Fuel Cell and Other Hydrogen Vehicles. As part of this work, definitions for pressurized systems and containers were developed. The purpose of this TIR is to desiminate these definitions prior to the release of SAE J2579 such that other technical groups are aware of the information.
17	J2799	Pressure Terminology Used in Fuel Cells and Other Hydrogen Vehicle Applications Hydrogen Surface Vehicle to Station Communications Hardware and Software	This document is intended to be used by both industry and regulators for routine (or periodic) monitoring of filling station performance.

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18	J2990/1	Gaseous Hydrogen and Fuel Cell Vehicle First and Second Responder Recommended Practice	Electric and alternative fueled vehicles present different hazards for first and second responders than conventional gasoline internal combustion engines. Hydrogen vehicles including Fuel Cell Vehicles (FCVs) involved in incidents may present unique hazards associated with the fuel storage and high voltage systems. The electrical hazards associated with the high voltage systems of hybrid-electric vehicles and FCVs are already addressed in the parent document, SAE J2990. This Recommended Practice therefore addresses electric issues by reference to J2990 and supplements J2990, to address the potential consequences associated with hydrogen vehicle incidents and suggest common procedures to help protect emergency responders, tow and/or recovery, storage, repair, and salvage personnel after an incident has occurred. Industry design standards and tools were studied and where appropriate, suggested for responsible organizations to implement
19	J3089	Characterization of On-board Vehicular Hydrogen Sensors	This SAE Technical Information Report (TIR) provides test methods for evaluating hydrogen sensors when the hydrogen system integrator and/or vehicle manufacturer elect to use such devices on board their hydrogen or fuel cell vehicles. The test methods are performance-based using environmental and operating conditions defined in SAE J2578. Since the use of the on-board hydrogen sensors is not standardized or regulated, the implementation of these sensors can vary greatly from vehicle to vehicle. In general, the test methods considered the widest reasonable range of operating conditions based on different possible sensor implementations within the vehicle. For example, the on-board sensor could be located in relatively dry environments like the passenger compartment or in “damp” environments such as the process exhaust from the fuel cell system. For this reason, the system integrator and/or vehicle manufacturer need to determine which test methods and associated test conditions are applicable for their implementation(s) and define specific test acceptance criteria based on the achieving the required performance of their process control and protective systems within the vehicle.
20	J3219	Hydrogen Fuel Quality Screening Test of Chemicals for Fuel Cell Vehicle	The purpose of this Technical Information Report (TIR) is to establish Proton Exchange Membrane (PEM) testing methods and characterization of chemicals used in Hydrogen Refueling Stations (HRS), during operation and maintenance that can influence the performance of commercial proton exchange membrane (PEM) fuel cell vehicles. Hydrogen quality standards such as SAE J2719 provide list of contaminants with maximum impurity levels that ensure safe operation of fuel cell vehicles. These contaminants are primarily from the hydrogen production. Less attention in these quality standards were given to the contaminants generated from the operation and maintenance of HRS. Common chemicals used during HRS operation are refrigerants, lubricants, etc.., and during HRS maintenance are solvents cleaning agents, lubricants etc... Some of these chemicals are found to have adverse impacts on PEM fuel cells. The development of testing methods and characterization of chemicals in this report are based on similar methods used in SAE J2719 although the approach in this TIR is a direct evaluation of the chemical rather than specifying the contaminant level. These methods consider fuel cell performance characteristics for each chemical tested and the impacts of functional groups on PEM fuel cells. Adverse impact of contaminants on fuel cells are associated with performance drop after exposure to the chemical.