

# PGE EXPO / HYDROGEN EXPO 2023

## NORME E PUBBLICAZIONI SULL'IDROGENO E LE CELLE A COMBUSTIBILE

### NFPA

NFPA 2 "Hydrogen Technologies Code"

NFPA 55 "Compressed Gases and Cryogenic Fluids Code" (incorpora NFPA 50A "Standard for Gaseous Hydrogen Systems at Consumer Sites" e NFPA 50B "Standard for Liquefied Hydrogen Systems at Consumer Sites")

### ASME

Boiler and Pressure Vessels Code Section VIII-3 "Rules for Construction of Pressure Vessels, Division 3, Alternate Rules High Pressure Vessels", al cui interno si trova:

KD-10 Article "Special Requirements for Vessels in High Pressure Gaseous Hydrogen Transport and Storage Service"

B31.12 "Hydrogen Piping & Pipelines"

STP-PT-003 "Hydrogen Standardization Interim Report for Tanks, Piping, and Pipelines"

STP-PT-005 "Hydrogen, High Pressure Composite Tanks, Design Factor Guidelines"

STP-PT-006 "Design Guidelines for Hydrogen Piping and Pipelines"

STP-PT-014 "Data Supporting Composite Tank Standards Development for Hydrogen Infrastructure Applications."

STP-PT-017 "Hydrogen, Service, Properties for Composite Materials"

STP-PT-021 "Nondestructive Testing and Evaluation Methods for Composite Hydrogen Tanks"

STP-PT-064 "Evaluation of Fracture Properties Test Methods for Hydrogen Service"

PVP2005-71031 "Codes and Standards for Gaseous Hydrogen Vessels" Conference Proceedings del ASME 2005 Pressure Vessels and Piping Conference

### ASTM

D7606-17 "Standard Practice for Sampling of High Pressure Hydrogen and Related Fuel Cell Feed Gases"

D7634-10(2017) "Standard Test Method for Visualizing Particulate Sizes and Morphology of Particles Contained in Hydrogen Fuel by Microscopy"

D7649-19 "Standard Test Method for Determination of Trace Carbon Dioxide, Argon, Nitrogen, Oxygen and Water in Hydrogen Fuel by Jet Pulse Injection and Gas Chromatography/Mass Spectrometer Analysis"

D7650-21 "Standard Practice for Sampling of Particulate Matter in High Pressure Gaseous Fuels with an In-Stream Filter"

D7651-17 "Standard Test Method for Gravimetric Measurement of Particulate Concentration of Hydrogen Fuel"

D7653-18 "Standard Test Method for Determination of Trace Gaseous Contaminants in Hydrogen Fuel by Fourier Transform Infrared (FTIR) Spectroscopy"

D7675-15 "Standard Test Method for Determination of Total Hydrocarbons in Hydrogen by FID-Based Total Hydrocarbon (THC) Analyzer"

D7676-18 "Standard Practice for Screening Organic Halides Contained in Hydrogen or Other Gaseous Fuels"

D7892-15 "Standard Test Method for Determination of Total Organic Halides, Total Non-Methane Hydrocarbons, and Formaldehyde in Hydrogen Fuel by Gas Chromatography/Mass Spectrometry"

D7941/D7941M-14 "Standard Test Method for Hydrogen Purity Analysis Using a Continuous Wave Cavity Ring-Down Spectroscopy Analyzer"

STP543-EB "Hydrogen Embrittlement Testing"

STP962-EB "Hydrogen Embrittlement: Prevention and Control"

## SAE

J1766 Recommended Practice for Electric, Fuel Cell and Hybrid Electric Vehicle Crash Integrity Testing

J2572 Recommended Practice for Measuring Fuel Consumption and Range of Fuel Cell and Hybrid Fuel Cell Vehicles Fuelled by Compressed Gaseous Hydrogen

J2574 Fuel Cell Vehicle Terminology

J2578 Recommended Practice for General Fuel Cell Vehicle

J2579 Technical Information Report for Fuel Systems in Fuel Cell and Other Hydrogen Vehicles

J2594 Recommended Practice to Design for Recycling Proton Exchange Membrane (PEM) Fuel Cell Systems

J2600 Compressed Hydrogen Surface Vehicle Refueling Connection Devices

J2601 Fueling Protocols for Light Duty and Medium Duty Gaseous Hydrogen Surface Vehicles

J2601/2 Fueling Protocol for Gaseous Hydrogen Powered Heavy Duty Vehicles

J2601/3 Fueling Protocol for Gaseous Hydrogen Powered Industrial

J2601/4 Ambient Temperature Fixed Orifice Fueling

J2615 Testing Performance of Fuel Cell Systems for Automotive Applications  
J2616 Testing Performance of the Fuel Processor Subsystem of An Automotive Fuel Cell System  
J2617 Recommended Practice for Testing Performance of PEM Fuel Cell Stack Sub-system for Automotive Applications  
J2719 Hydrogen Fuel Quality for Fuel Cell Vehicles  
J2719/1 Application Guideline for Use of Hydrogen Quality Specification  
J2760 Pressure Terminology Used in Fuel Cells and Other Hydrogen Vehicle Applications  
J2799 Hydrogen Surface Vehicle to Station Communications Hardware and Software  
J2990/1 Gaseous Hydrogen and Fuel Cell Vehicle First and Second Responder Recommended Practice  
J3089 Characterization of On-board Vehicular Hydrogen Sensors  
J3219 Hydrogen Fuel Quality Screening Test of Chemicals for Fuel Cell Vehicle

## SAE BOOKS – FUEL CELLS

R-494 Advanced Hybrid Powertrains for Commercial Vehicles, 2E  
TU-003 Advances in Electric Propulsion  
B-HON-020 Honda R&D Technical Review October 2016  
TU-001 Impacting Commercialization of Rapid Hydrogen Fuel Cell Electric Vehicles (FCEV)  
B-HON-017 Honda R& D Technical Review April 2015  
MR-ID-020 Range Extenders for Electric Vehicles Land, Water & Air 2015-2025  
R-409 Fuel/Engine Interactions  
T-128 Future Automotive Fuels and Energy  
R-396 Advanced Hybrid Powertrains for Commercial Vehicles  
T-127 Automotive 2030--North America  
B-925 Toyota R&D Technical Review 2011  
B-HON-009 Honda R&D Technical Review: April 2011  
T-125 Hybrid-Powered Vehicles, Second Edition  
PT-143/5 Electric and Hybrid-Electric Vehicles - Fuel Cell Hybrid EVs  
B-ART-026 Energy Harvesting for Autonomous Systems  
B-HON-001 Honda R&D Technical Review: October 2009  
B-HON-007 Honda R&D Technical Review: April 2009  
PT-96 Fuel Cell Technology for Vehicles 2002-2004

T-119 Hybrid Powered Vehicles  
T-114 Fuel Cell Powered Vehicles  
R-347 Direct Injection Systems  
T-100 Alternative Fuels  
RR-010 Fuel Cell Vehicles  
RR-013 Fuel Cell Powered Vehicles  
R-263 The Automotive Industry and the Global Environment  
R-187 History of the Electric Automobile  
R-180 Alternative Fuels Guidebook

## SAE EDGE REPORTS

Economics of Fuel Cells and Electric Ground Vehicles  
Use of Fuel Cells in Electric Ground Vehicles

## ISO/TC 197 “HYDROGEN TECHNOLOGIES”

ISO 13984:1999 Liquid hydrogen — Land vehicle fuelling system interface  
ISO 13985:2006 Liquid hydrogen — Land vehicle fuel tanks  
ISO 14687:2019 Hydrogen fuel quality — Product specification  
ISO/TR 15916:2015 Basic considerations for the safety of hydrogen systems  
ISO 16110-1:2007 Hydrogen generators using fuel processing technologies — Part 1: Safety  
ISO 16110-2:2010 Hydrogen generators using fuel processing technologies — Part 2: Test methods for performance  
ISO 16111:2018 Transportable gas storage devices — Hydrogen absorbed in reversible metal hydride  
ISO 17268:2020 Gaseous hydrogen land vehicle refuelling connection devices  
ISO 19880-1:2020 Gaseous hydrogen — Fuelling stations — Part 1: General requirements  
ISO 19880-3:2018 Gaseous hydrogen — Fuelling stations — Part 3: Valves  
ISO 19880-5:2019 Gaseous hydrogen — Fuelling stations — Part 5: Dispenser hoses and hose assemblies  
ISO 19880-8:2019 Gaseous hydrogen — Fuelling stations — Part 8: Fuel quality control  
ISO 19880-8:2019/Amd 1:2021 Gaseous hydrogen — Fuelling stations — Part 8: Fuel quality control — Amendment 1: Alignment with Grade D of ISO 14687  
ISO 19881:2018 Gaseous hydrogen — Land vehicle fuel containers

ISO 19882:2018 Gaseous hydrogen — Thermally activated pressure relief devices for compressed hydrogen vehicle fuel containers

ISO/TS 19883:2017 Safety of pressure swing adsorption systems for hydrogen separation and purification

ISO 22734:2019 Hydrogen generators using water electrolysis — Industrial, commercial, and residential applications

ISO 26142:2010 Hydrogen detection apparatus — Stationary applications

## IEC TC 105 “FUEL CELL TECHNOLOGIES”

IEC 62282-2-100:2020 Fuel cell technologies - Part 2-100: Fuel cell modules - Safety

IEC 62282-3-100:2019 RLV Fuel cell technologies - Part 3-100: Stationary fuel cell power systems - Safety

IEC 62282-3-100:2019 Fuel cell technologies - Part 3-100: Stationary fuel cell power systems - Safety

IEC 62282-3-200:2015 Fuel cell technologies - Part 3-200: Stationary fuel cell power systems - Performance test methods

IEC 62282-3-201:2017+AMD1:2022 CSV Fuel cell technologies - Part 3-201: Stationary fuel cell power systems - Performance test methods for small fuel cell power systems

IEC 62282-3-201:2017 Fuel cell technologies - Part 3-201: Stationary fuel cell power systems - Performance test methods for small fuel cell power systems

IEC 62282-3-201:2017/AMD1:2022 Amendment 1 - Fuel cell technologies - Part 3-201: Stationary fuel cell

IEC 62282-3-300:2012 Fuel cell technologies - Part 3-300: Stationary fuel cell power systems - Installation

IEC 62282-3-400:2016 Fuel cell technologies - Part 3-400: Stationary fuel cell power systems - Small

IEC 62282-4-101:2022 Fuel cell technologies - Part 4-101: Fuel cell power systems for propulsion other than road vehicles and auxiliary power units (APU) - Safety of electrically powered industrial trucks

IEC 62282-4-102:2022 Fuel cell technologies - Part 4-102: Fuel cell power systems for industrial electric trucks - Performance test methods

IEC 62282-4-600:2022 Fuel cell technologies - Part 4-600: Fuel cell power systems for propulsion other than road vehicles and auxiliary power units (APU) - Fuel cell/battery hybrid systems performance test methods for excavators

IEC 62282-5-100:2018 Fuel cell technologies - Part 5-100: Portable fuel cell power systems - Safety

IEC 62282-6-100:2010+AMD1:2012 CSV Fuel cell technologies - Part 6-100: Micro fuel cell power systems – Safety

IEC 62282-6-100:2010 Fuel cell technologies - Part 6-100: Micro fuel cell power systems - Safety

IEC 62282-6-100:2010/COR1: Corrigendum 1 - Fuel cell technologies - Part 6-100: Micro fuel cell power systems - Safety

IEC 62282-6-100:2010/AMD1:2012 Amendment 1 - Fuel cell technologies - Part 6-100: Micro fuel cell power systems - Safety

IEC PAS 62282-6-150:2011 Fuel cell technologies - Part 6-150: Micro fuel cell power systems - Safety - Water reactive (UN Devison 4.3) compounds in indirect PEM fuel cells

IEC 62282-6-200:2016 Fuel cell technologies - Part 6-200: Micro fuel cell power systems - Performance test methods

IEC 62282-6-300:2012 Fuel cell technologies - Part 6-300: Micro fuel cell power systems - Fuel cartridge interchangeability

IEC 62282-6-400:2019 Fuel cell technologies - Part 6-400: Micro fuel cell power systems - Power and data interchangeability

IEC TS 62282-7-1:2017 Fuel cell technologies - Part 7-1: Test methods - Single cell performance tests for polymer electrolyte fuel cells (PEFC)

IEC 62282-7-2:2021 Fuel cell technologies - Part 7-2: Test methods - Single cell and stack performance tests for solid oxide fuel cells (SOFCs)

IEC 62282-8-101:2020 Fuel cell technologies - Part 8-101: Energy storage systems using fuel cell modules in reverse mode - Test procedures for the performance of solid oxide single cells and stacks, including reversible operation

IEC 62282-8-102:2019 Fuel cell technologies - Part 8-102: Energy storage systems using fuel cell modules in reverse mode - Test procedures for the performance of single cells and stacks with proton exchange membrane, including reversible operation

IEC 62282-8-201:2020 Fuel cell technologies - Part 8-201: Energy storage systems using fuel cell modules in reverse mode - Test procedures for the performance of power-to-power systems

IEC TS 62282-9-101:2020 Fuel cell technologies - Part 9-101: Evaluation methodology for the environmental performance of fuel cell power systems based on life cycle thinking - Streamlined life-cycle considered environmental performance characterization of stationary fuel cell combined heat and power systems for residential applications

IEC TS 62282-9-102:2021 Fuel cell technologies - Part 9-102: Evaluation methodology for the environmental performance of fuel cell power systems based on life cycle thinking - Product category rules for environmental product declarations of stationary fuel cell power systems and alternative systems for residential applications

Per ordinare, contattare:

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