

Appendix A2 – Useful regulations, codes and standards

- 1 Standards are under continuous update and review. For the latest status of the hydrogen and fuel cell standards the user is referred to:
<http://www.fuelcellstandards.com>.

Application/topic	Applicable regulations, codes and standards	Applicable countries
Hydrogen system specifications	IEC 62282-3-1: 2007 - Stationary Fuel Cell Power Systems-Safety	International
	ISO 16110-1 - Hydrogen generators using fuel processing technologies. Part 1 : Safety	
	2006/42/EC - Machinery Directive	EU
	90/396/EEC - Gas appliances directive	
	EN 50465: 2008 - Gas appliances-Fuel cell gas heating appliance	
	EN 13611: 2007 - Safety and control devices for gas burners and gas-burning appliances - general requirements	
	EN 161:2001 - Automatic shut-off valves for gas burners and gas appliances	
	EN 298:2003 - Automatic gas burner control systems for gas burners and gas burning appliances with or without fans	
	EN 437:2003 - Test gases. Test pressures. Appliance categories	
	EN483:1999 - Gas-fired central heating boilers. Type C boilers of nominal heat input not exceeding 70 kW	
	EN 677:1998 Gas-fired central heating boilers. Specific requirements for condensing boilers with a nominal heat input not exceeding 70 kW	
	EN ISO 12100-1:2003 Safety of machinery. Basic concepts, general principles for design. Basic terminology, methodology	
	EN ISO 12100-2:2003 - Safety of machinery. Basic concepts, general principles for design. Technical principles	
	EN 50165:1997- Electrical equipment of non-electric appliances for household and similar purposes. Safety requirements	

	EN 60079-14:2003 - Electrical apparatus for explosive gas atmospheres. Electrical installations in hazardous areas (other than mines)	
	EN 60079-17:2003 - Electrical apparatus for explosive gas atmospheres. Inspection and maintenance of electrical installations in hazardous areas (other than mines)	
	EN 60079-19:2007 - Explosive atmospheres. Equipment repair, overhaul and reclamation	
	EN 60204-1:2006 - Safety of machinery. Electrical equipment of machines. General requirements	
	EN 60335-1:1994 - Specification for safety of household and similar electrical appliances. General requirements	
	EN 60529:1992 - Specification for degrees of protection provided by enclosures	
	EN 60730 series - Automatic electrical controls for household and similar use	
	EN 60950-1:2006 Information technology equipment. Safety. General requirements	
	EN 61000-6-2:2005 - Electromagnetic compatibility (EMC). Generic Standards. Immunity for industrial environments	
	EN 61000-6-4:2001 Electromagnetic compatibility (EMC). Generic standards. Emission standard for industrial environments	
	DVGW-VP 119: 2000 - Preliminary basic rules for testing fuel cell appliances - 70 kW	DE
	NASA - NSS 1740.16 - Safety standard for hydrogen and hydrogen systems - Guidelines for Hydrogen System Design, Materials Selection, Operations, Storage, and Transportation	US
Fire safety design	DM 117: 2007 - Fire safety engineering	Italy
Hydrogen systems installation	IEC 61779-1 to 5 - Electrical Apparatus for the Detection and Measurement of Flammable Gases - Part 1. Gen Requirements. & Test Methods	International
	IEC 60079-29-1 & 2 - Electrical Apparatus for Explosive Gas Atmospheres Part 1 Electrical apparatus for the detection and measurement of flammable gases-General Requirements & Test Methods - Part 2 Electrical apparatus for the detection and measurement of flammable gases-Guide for the selection, installation, use and maintenance	
	IEC 62282-3-3: 2007 - Stationary fuel cell power systems – Installation	
	EN 60079-10 - Electrical apparatus for explosive gas atmosphere - part 10 classification of hazardous area	EU
	HSE - HSG243 Fuel cells – Understand the hazards, control the risks	UK

	Draft - Installation Guide for Hydrogen Fuel Cells and Associated Equipment	UK
	US DOE Regulators' Guide to Permitting Hydrogen Technologies – Overview Module 1 – Permitting Stationary Fuel Cell Installations	US
	CGA G-5.4 - Standard for Hydrogen Piping Systems at Consumer Sites	
	CGA G-5.5 - Hydrogen Vent Systems	
	NFPA 853: 2007 - Standard for the Installation of Stationary Fuel Cell Power Plants	
	ASME B31 - Hydrogen Piping and Pipeline Project Team	
Hydrogen storage	EN ISO 11114-1:1997 Transportable gas cylinders – Compatibility of cylinder and cylinder valve with gas contents – Part 1: Metallic materials	International
	EN ISO 11114-4:2005 Transportable gas cylinders – Compatibility of cylinder and cylinder valve with gas contents – Part 4: Test methods for selecting metallic materials resistant to hydrogen	
	NFPA 55 - Standard for the Storage, Use and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, cylinders, Equipment and Tanks	US
	CGA C-10 - Recommended procedures for changes of gas service of compressed gas cylinder	
	IGC Doc 100/03/E - Hydrogen cylinders and transport vessels	
	CGA PS-20 CGA - Position Statement on the Direct Burial of Gaseous Hydrogen Storage Tanks	
	CGA PS-21 - Position Statement on Adjacent Storage of Compressed Hydrogen And Other Flammable Gases	
	CGA Doc 02-50 - Hydrogen Storage in Metal Hydrides	
General hydrogen safety	Biennial report on hydrogen safety - HYSAFE	International
	Guidance for using hydrogen in confined spaces, INSHYHE results - HYSAFE	
	ISO TR 15916 – Basic Considerations for the Safety of Hydrogen Systems	
	1999/92/EC - Safety and health protection of workers potentially at risk from explosive atmospheres	EU
	AIGA G-095 (2004) - Guide to Safety of Hydrogen and Hydrogen Systems	US
	CGA P-6 - Standard Density Data, Atmospheric Gases and Hydrogen	
	NFPA 50A - Standard for gaseous hydrogen system at consumer sites	

	IGC Doc. 75/01/rev - Determination of Safety Distances	
	(NFPA) Requirements for Hydrogen Supplies in non combustibile enclosure	
Safety distances	IGC 15/06/E, Gaseous Hydrogen Stations	EU
	IGC 75/01/E/rev Determination of Safety Distances	EU
	ISO TR 15916 – Basic Considerations for the Safety of Hydrogen Systems	International
	NFPA 52, 50A, 50B and 55	US
Fuel cells - general	IEC 62282-3-1 Fuel cell technologies - Stationary fuel cell power systems - Safety	
	IEC 62282-3-2 Fuel cell technologies – Stationary fuel cell power plants - Performance test methods	
	IEC 62282-3-3 Fuel cell technologies – Stationary fuel cell power systems – Installation	
Hydrogen fuel	ISO 14687:1999 Hydrogen fuel. Product specification.	International
	ISO/TS 14687-2:2008 - Hydrogen fuel. Product specification. Part 2: Proton exchange membrane (PEM) fuel cell applications for road vehicles.	
Sensors – Performance requirements	IEC 61779-1 to 5 ed 1.0: 1998 - Electrical apparatus for the detection and measurement of flammable gases	International
	EN 50054 to 50058:1998	EU
	FM 6310, 6320:2001 - Approval Standard for combustibile gas detectors	USA
	UL 2075:2004 - Standard for Gas and Vapour Detectors and Sensors	USA
	CSA C22.2 No. 152-M1984 - Combustibile gas detection instruments	Canada
	GOST 13320:1981- Automatic instruments of continuous action used for gas analysis. General requirements	Russia
	GB 15322 Parts 1 to 6:2003 - Combustibile gas detectors	China
	JIS M 7626:1994 - Stational type combustibile gas alarm	Japan
	JIS M 7653:1996 - Portable type combustibile gas detector	Japan
	ISO / DIS 26142 - Hydrogen Detection Apparatus	International
Sensors – Recommended practises	IEC 61779-6 ed 1.0 - Guide for the selection, installation, use and maintenance of apparatus for the detection and measurement of flammable gases	International

	EN 50073:1999 - Guide for selection, installation, use and maintenance of apparatus for the detection and measurement of combustible gases or oxygen	EU
Sensors – In house manuals and safety guidelines	NASA NSS 1740.16 - Safety Standard for Hydrogen and Hydrogen Systems	USA
	IEC 62282-3-3 / IEC 60079-29-1 & 2, ISO/TR 15916. 2004	
Explosion venting	BRHS – Chapter 5 “Hydrogen safety barriers and safety measures	EU/International
	NFPA 68 - Guide for Venting of Deflagrations	USA
	EN 14994:2007 - Gas Explosion Venting Protective Systems	EU
Barriers and walls	NFPA 68 - Guide for Venting of Deflagrations	
Electrolysers	ISO 22734-1 Hydrogen generators using water electrolysis process – Part 1: Industrial and commercial applications	International
	ISO 22734-2 Hydrogen generators using water electrolysis process -- Part 2: Residential applications. Under development scheduled publication 2010-05	International
Reformers	ISO 16110-1 - Hydrogen generators using fuel processing technologies. Part 1 : Safety	International