NREL
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Stationary and Portable Fuel Cell Systems Codes and Standards Citations

This document lists codes and standards typically used for Stationary and Portable Fuel Cell Systems projects. To determine which codes and standards apply to a specific project, you need to identify the codes and standards currently in effect within the jurisdiction where the project will be located. Some jurisdictions also have unique applicable ordinances or regulations.

Learn about codes and standards basics at www.afdc.energy.gov/afdc/codes_standards_basics.html.

Find Stationary and Portable Fuel Cell Systems codes and standards in these categories:

Balance of Plant

ANSI/CSA America FC 1-2004, Stationary Fuel Cell Power Systems (American National Standards Institute and Canadian Standards Association 2004)

- 1.8.1 Metallic Piping
- 1.9 Drain, Venting and Ventilation Exhaust Systems
- 1.12.1 Manual Valves
- 1.12.2 Automatic Valves
- 1.12.3 Pressure Regulators

International Fire Code (International Code Council 2009)

- 2703.2.2 Piping, Tubing, Valves, and Fittings
- 2703.3 Release of Hazardous Materials
- 3003.3 Pressure Relief Devices
- 3003.4.3 Piping Systems
- 3003.6 Valve Protection

- 3005.3 Piping Systems
- 3005.4 Valves
- 3005.5 Venting

International Fuel Gas Code (International Code Council 2009)

- 703.3 Pressure Relief Devices
- 704 Piping, Use and Handling

International Mechanical Code (International Code Council 2009)

- 305 Piping Support
- 401 General
- 501 Exhaust Systems
- 502 Required Systems
- 510 Hazardous Exhaust Systems

NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2010)

- 7.3.1.3 Piping Systems
- 7.3.1.4 Valves
- 10.2.1 Pressure Relief Devices
- 10.2.1.1 Venting Requirements

NFPA 853, Standard for the Installation of Stationary Fuel Cell Power Systems (National Fire Protection Association 2007)

- 6.4.1 Gaseous Hydrogen Storage
- 6.4.1 Ventilation Air
- 6.4.3 Hydrogen Piping
- 7.1.1 General
- 7.2.2 When Natural Ventilation Permitted
- 7.3 Exhaust Systems

Compressed Hydrogen Gas Storage

International Building Code (International Code Council 2009)

- 414.4 Hazardous Materials Systems

International Fire Code (International Code Council 2009)

- 2703.2 Systems, Equipment, and Processes
- 2703.2.1 Design and Construction of Containers, Cylinders, and Tanks
- 2703.2.4 Installation of Tanks

- 2703.2.5 Empty Containers and Tanks
- 2703.4 Material Safety Data Sheets
- 2703.9.2 Security
- 2703.9.3 Protection from Vehicles
- 2703.9.9 Shelf Storage
- 2704 Storage
- 3003.1 Containers, Cylinders, and Tanks
- 3003.2 Design and Construction
- 3003.4.1 Stationary Compressed Gas Containers, Cylinders, and Tanks
- 3003.4.2 Portable Containers, Cylinders, and Tanks
- 3003.5 Security
- 3003.6.1 Compressed Gas Container, Cylinder, or Tank Protective Caps or Collars
- 3003.10 Unauthorized Use
- 3003.12 Leaks, Damage, or Corrosion
- 3003.13 Surface of Unprotected Storage or Use Areas
- 3003.14 Overhead Cover
- 3004 Storage of Compressed Gases
- 3005.1 Compressed Gas Systems
- 3503.1.2 Storage Containers
- 3503.1.3 Emergency Shutoff
- 3503.1.4 Ignition Source Control

International Fuel Gas Code (International Code Council 2009)

- 303 Appliance Location
- 409 Shutoff Valves
- 703.2 Containers, Cylinders, and Tanks
- 703.5 Security

International Mechanical Code (International Code Council 2009)

- 303 Equipment & Appliance Location

NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2010)

- 7.1.3 Listed and Approved Hydrogen Equipment
- 7.1.7.3 Containers, Cylinders and Tanks

- 10.3 Location of Gaseous Hydrogen Systems

NFPA 853, Standard for the Installation of Stationary Fuel Cell Power Systems (National Fire Protection Association 2007)

- 6.4.1 Gaseous Hydrogen Storage
- 6.4.3.2 Hydrogen Piping
- 6.4.3.5 Hydrogen Piping
- 6.4.3.7 Hydrogen Piping
- 6.4.3 Hydrogen Piping
- 6.4.3.1 Hydrogen Piping

Design

ANSI/CSA America FC 1-2004, Stationary Fuel Cell Power Systems (American National Standards Institute and Canadian Standards Association 2004)

- 1.2 Power Systems Design
- 1.3 General Design Requirements
- 1.4 Materials
- 1.6 Enclosures and Associated Construction

International Building Code (International Code Council 2009)

- 307.1.1 Maximum Allowable Quantities
- 414.1 General
- 414.2 Control Areas
- 1609 Wind Loads
- 1612 Flood Loads
- 1805 Footings and Foundation

International Fire Code (International Code Council 2009)

- 2703.1.1 Maximum Allowable Quantities per Control Area
- 2703.1.3 Quantities Not Exceeding the Maximum Allowable Quantity per Control Area
- 2703.1.4 Quantities Exceeding the Maximum Allowable Quantity per Control Area
- 2703.2.8 Seismic Protection
- 2703.8 Construction Requirements
- 2703.8.1 Buildings
- 2703.8.2 Required Detached Buildings
- 2703.8.3 Control Areas

- 2703.8.4 Gas Rooms
- 2703.8.5 Exhausted Enclosures
- 2703.8.6 Gas Cabinets
- 2703.8.7 Hazardous Materials Storage Cabinets
- 2703.9.6 Protection from Light
- 2703.9.7 Shock Padding
- 3003.15 Lighting
- 3503.1 Quantities Not Exceeding the Maximum Allowable Quantity per Control Area
- 3503.2 Quantities Exceeding the Maximum Allowable Quantity per Control Area
- 3504.2 Outdoor Storage

International Fuel Gas Code (International Code Council 2009)

- 301 General
- 302 Structural Safety
- 633 Stationary Fuel Cell Power Systems
- 635 Gaseous Hydrogen Systems

International Mechanical Code (International Code Council 2009)

- 301 General
- 302 Protection of Structure
- 924 Stationary Fuel Cell Power Systems
- 926 Gaseous Hydrogen Systems

NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association, 2010)

- 7.1.1 Listed and Approved Hydrogen Equipment
- 7.1.4.3 Physical Protection
- 10.2 Design of Gaseous Hydrogen Systems
- 10.2 Design of Gaseous Hydrogen Systems

NFPA 853, Standard for the Installation of Stationary Fuel Cell Power Systems (National Fire Protection Association 2007)

- 4.2 Prepackaged, Self-Contained Fuel Cell Power Systems
- 4.3 Pre-Engineered Fuel Cell Power Systems
- 4.4 Engineered and Field-Constructed Fuel Cell Power Systems
- 5.1.1 (2) General Siting
- 6.4.1 Gaseous Hydrogen Storage

Electrical Equipment

ANSI/CSA America FC 1-2004, Stationary Fuel Cell Power Systems (American National Standards Institute and Canadian Standards Association 2004)

- 1.15 Electrical Equipment and Wiring

International Fire Code (International Code Council, 2009)

- 2703.9.4 Electrical Wiring and Equipment
- 2703.9.5 Static Accumulation
- 3003.8 Wiring and Equipment
- 3503.1.5 Electrical

International Fuel Gas Code (International Code Council 2009)

- 703.4 Venting
- 703.6 Electrical Wiring and Equipment

NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2010)

- 10.4.1.2 Electrical Equipment Location

NFPA 853, Standard for the Installation of Stationary Fuel Cell Power Systems (National Fire Protection Association 2007)

- 8.1.3 Electrical Equipment and Components

Equipment Safety

ANSI/CSA America FC 1-2004, Stationary Fuel Cell Power Systems (American National Standards Institute and Canadian Standards Association 2004)

- 1.3.2 Protection from Environmental Conditions
- 1.3.3 Electrical Safety
- 1.3.5 Steam Backflow
- 1.3.6 FC System Purging
- 1.3.7 Safe Handling During Moving
- 1.3.8 Shock and Vibration Protection
- 1.3.9 Requirements for Not-Listed Equipment
- 1.3.11 Temperature Limits

International Building Code (International Code Council 2009)

- 414.6 Outdoor Storage, Dispensing, and Use

International Fire Code (International Code Council 2009)

- 2703.1 Hazardous Materials

- 2703.2.3 Equipment, Machinery, and Alarms
- 2703.2.9 Testing
- 2703.9 General Safety Precautions
- 2703.9.1 Personnel Training and Written Procedures
- 2703.9.8 Separations of Incompatible Materials
- 2703.12 Outdoor Control Areas
- 2705 Use, Dispensing, and Handling
- 3003.7 Separations from Hazards
- 3005 Use and Handling of Compressed Gases
- 3005.2 Controls
- 3005.6 Upright Use
- 3005.7 Transfer
- 3005.9 Material-Specific Regulations
- 3005.10 Handling
- 3504.2.1 Distance Limitation to Exposures
- 3505 General Use

International Fuel Gas Code (International Code Council 2009)

- 705 Testing of Hydrogen Piping Systems
- 706 Location of Gaseous Hydrogen Systems

NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2010)

- 7.1.10 Separation from Hazardous Conditions
- 7.6 Flammable Gases

NFPA 853, Standard for the Installation of Stationary Fuel Cell Power Systems (National Fire Protection Association 2007)

- 5.1.1 General Siting
- 5.1.2 General Siting
- 5.2 Outdoor Installations
- 9.2 Outdoor Installations

Fire Safety

ANSI/CSA America FC 1-2004, Stationary Fuel Cell Power Systems (American National Standards Institute and Canadian Standards Association 2004)

- 1.5 General Construction and Assembly
- 1.6 Enclosures and Associated Construction
- 1.19.1 Materials for Markings
- 1.19.2 FC Labeling Requirements
- 1.19.4 - 1.19.7 Electrical Diagrams

International Building Code (International Code Council 2009)

- 907 Fire Alarms and Detection Systems

International Fire Code (International Code Council 2009)

- 401 General Emergency Planning and Preparedness
- 406 Employee Training and Response Procedures
- 2703.9.1.1 Fire Department Liaison
- 3003.4 Gas Marking
- 3003.11 Exposure to Fire
- 3003.16.13 Accessway
- 3203.4 Liquid Marking

International Fuel Gas Code (International Code Council 2009)

- 305 Installation

International Mechanical Code (International Code Council 2009)

- 304 Installation

NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2010)

- 7.1.7.3.1 Labeling Requirements
- 10.2.5 Marking
- 10.6 Fire Protection

NFPA 853, Standard for the Installation of Stationary Fuel Cell Power Systems (National Fire Protection Association 2007)

- 5.1.3 General Siting
- 5.2 Outdoor Installations
- 6.1.2 General
- 8.1.2 Fuel Cell Fire Protection and Detection
- 9.2 Outdoor Installations

- 9.5 Fire Protection

Fuel Lines

ANSI/CSA America FC 1-2004, Stationary Fuel Cell Power Systems (American National Standards Institute and Canadian Standards Association 2004)

- 1.8.1 Metallic Piping

NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2010)

- 7.3.1.3 Piping Systems

NFPA 853, Standard for the Installation of Stationary Fuel Cell Power Systems (National Fire Protection Association 2007)

- 6.4.1 Gaseous Hydrogen Storage
- 6.4.3 Hydrogen Piping

Operation Approvals

ANSI/CSA America FC 1-2004, Stationary Fuel Cell Power Systems (American National Standards Institute and Canadian Standards Association, 2004)

- 1.19.1 Materials for Markings
- 1.19.2 FC Labeling Requirements
- 1.19.4 - 1.19.7 Electrical Diagrams

CGA P-1, Safe Handling of Compressed Gases in Containers (Compressed Gas Association 2006)

- 4.4 Regulating Authorities of Employee Safety and Health

International Fire Code (International Code Council 2009)

- 105.6.8 Compressed Gases
- 404.3.2 Fire Safety Plans
- 406 Employee Training and Response Procedures
- 2703.5 Hazard Identification Signs
- 2703.6 Signs

NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2010)

- 4.7 Personnel Training
- 4.8 Fire Department Liaison
- 7.1.7.3.1 Labeling Requirements
- 10.2.5 Marking

- 10.3 Location of Gaseous Hydrogen Systems
- 10.6 Fire Protection

NFPA 853, Standard for the Installation of Stationary Fuel Cell Power Systems (National Fire Protection Association 2007)

- 6.1.2 General
- 6.4.1 Gaseous Hydrogen Storage
- 6.4.3 Hydrogen Piping
- 8.2 Fire Prevention and Emergency Planning

Periodic Inspections

ANSI/CSA America FC 1-2004, Stationary Fuel Cell Power Systems (American National Standards Institute and Canadian Standards Association 2004)

- 1.18.2 Maintenance Manual

International Fire Code (International Code Council 2009)

- 2703.2.6 Maintenance
- 3003.9 Service and Repair

International Fuel Gas Code (International Code Council 2009)

- 707 Operation and Maintenance of Gaseous Hydrogen Systems

Setbacks and Footprints

International Fire Code (International Code Council 2009)

- 2703.9.8 Separations of Incompatible Materials
- 3003.7 Separations from Hazards
- 3004 Storage of Compressed Gases
- 3504.2.1 Distance Limitation to Exposures

International Fuel Gas Code (International Code Council 2009)

- 706 Location of Gaseous Hydrogen Systems

NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2010)

- 10.3.2 Specific Requirements

NFPA 853, Standard for the Installation of Stationary Fuel Cell Power Systems (National Fire Protection Association 2007)

- 6.4.1 Gaseous Hydrogen Storage

Transportation

CGA P-1, Safe Handling of Compressed Gases in Containers (Compressed Gas Association 2006)

- 4.1 Transportation Regulating Authorities
- 4.2 Container Regulations
- 4.3 Container Filling Regulations
- 6.2 Flammable Gases

International Fire Code (International Code Council 2009)

- 105.6.8 Compressed Gases
- 404.3.2 Fire Safety Plans
- 2705 Use, Dispensing, and Handling
- 3005.7 Transfer
- 3505 General Use

NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2010)

- 7.3 Use and Handling
- 8.3.5 Overfilling
- 10.3 Location of Gaseous Hydrogen Systems

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