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**
  - 1.8.2 Metallic Piping
  - 1.8.3 Flue Gas Venting Systems
  - 1.11.2.1 Shut-off Valves
  - 1.11.2.2 Supply Fuel Valves

- **Compressed Hydrogen Gas Storage**
- **Design**
- **Electrical Equipment**
- **Equipment Safety**
- **Fire Safety**
- **Fuel Lines**
- **Operation Approvals**
- **Periodic Inspections**
- **Setbacks and Footprints**
- **Transportation**

**Balance of Plant**


- 1.8.2 Metallic Piping
- 1.8.3 Flue Gas Venting Systems
- 1.11.2.1 Shut-off Valves
- 1.11.2.2 Supply Fuel Valves


- 5003.2.2 Piping, Tubing, Valves, and Fittings
- 5003.3 Release of Hazardous Materials
- 5303.3 Pressure Relief Devices
- 5303.4.3 Piping Systems
- 5303.6 Valve Protection
- 5305.3 Piping Systems
- 5305.4 Valves
- 5305.5 Venting

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

**International Mechanical Code (International Code Council 2012)**
- 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 2013)**
- 7.3.1.3 Piping Systems
- 7.3.1.4 Valves
- 10.2.3 Hydrogen-Venting Systems
- 10.2.3.1 Venting Requirements

- 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

- 414.4 Hazardous Materials Systems

- 5003.2 Systems, Equipment, and Processes
- 5003.2.1 Design and Construction of Containers, Cylinders, and Tanks
- 5003.2.4 Installation of Tanks
- 5003.2.5 Empty Containers and Tanks
• 5003.4 Material Safety Data Sheets
• 5003.9.2 Security
• 5003.9.3 Protection from Vehicles
• 5003.9.9 Shelf Storage
• 5004 Storage
• 5303.1 Containers, Cylinders, and Tanks
• 5303.2 Design and Construction
• 5303.4.1 Stationary Compressed Gas Containers, Cylinders, and Tanks
• 5303.4.2 Portable Containers, Cylinders, and Tanks
• 5303.5 Security
• 5303.6.1 Compressed Gas Container, Cylinder, or Tank Protective Caps or Collars
• 5303.10 Unauthorized Use
• 5303.12 Leaks, Damage, or Corrosion
• 5303.13 Surface of Unprotected Storage or Use Areas
• 5303.14 Overhead Cover
• 5304 Storage of Compressed Gases
• 5305.1 Compressed Gas Systems
• 5803.1.2 Storage Containers
• 5803.1.3 Emergency Shutoff
• 5803.1.4 Ignition Source Control

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

**International Mechanical Code (International Code Council 2012)**
• 303 Equipment & Appliance Location

**NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2010)**
• 7.1.4 Listed and Approved Hydrogen Equipment
• 7.1.6 Containers, Cylinders and Tanks
• 10.3.2 Location of Gaseous Hydrogen Systems
NFPA 853, Standard for the Installation of Stationary Fuel Cell Power Systems
(National Fire Protection Association 2010)

- 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 Physical Environment and Operating Conditions
- 1.4 Selection of Materials
- 1.6 Cabinets


- 307.1.1 Maximum Allowable Quantities
- 414.1 General
- 414.2 Control Areas
- 1609 Wind Loads
- 1612 Flood Loads
- 1808 Foundations


- 5003.1.1 Maximum Allowable Quantities per Control Area
- 5003.1.3 Quantities Not Exceeding the Maximum Allowable Quantity per Control Area
- 5003.1.4 Quantities Exceeding the Maximum Allowable Quantity per Control Area
- 5003.2.8 Seismic Protection
- 5003.8 Construction Requirements
- 5003.8.1 Buildings
- 5003.8.2 Required Detached Buildings
- 5003.8.3 Control Areas
- 5003.8.4 Gas Rooms
- 5003.8.5 Exhausted Enclosures
- 5003.8.6 Gas Cabinets
- 5003.8.7 Hazardous Materials Storage Cabinets
- 5003.1 Quantities Not Exceeding the Maximum Allowable Quantity per Control Area
- 5003.2 Quantities Exceeding the Maximum Allowable Quantity per Control Area
- 5004.2 Outdoor Storage

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

**International Mechanical Code (International Code Council 2012)**
- 301 General
- 302 Protection of Structure
- 924 Stationary Fuel Cell Power Systems
- 926 Gaseous Hydrogen Systems

- 7.1.4 Listed and Approved Hydrogen Equipment
- 10.2.2 Piping Systems

- 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**

- 1.12 Electrical Safety

- 5003.9.4 Electrical Wiring and Equipment
• 5003.9.5 Static Accumulation
• 5303.8 Wiring and Equipment
• 5803.1.5 Electrical

• 703.4 Venting
• 703.6 Electrical Wiring and Equipment

• 8.1.3 Electrical Equipment and Components

**Equipment Safety**

• 1.3.3 Physical Environmental
• 1.3.6 System Purging
• 1.3.7 Vibration, Shock and Bump
• 1.3.8 Handling, Transportation, and Storage
• 1.3.9 Protection against Fire and Explosion Hazards

• 414.6 Outdoor Storage, Dispensing, and Use

• 5003.1 Hazardous Materials
• 5003.2.3 Equipment, Machinery, and Alarms
• 5003.2.9 Testing
• 5003.9 General Safety Precautions
• 5003.9.1 Personnel Training and Written Procedures
• 5003.9.8 Separations of Incompatible Materials
• 5003.12 Outdoor Control Areas
• 5005 Use, Dispensing, and Handling
• 5303.7 Separations from Hazards
• 5305 Use and Handling of Compressed Gases
• 5305.2 Controls
• 5305.6 Upright Use
• 5305.7 Transfer
• 5305.9 Material-Specific Regulations
• 5305.10 Handling
• 5805 General Use

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

**NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2013)**
• 7.1.11 Separation from Hazardous Conditions
• 7.6 Flammable Gases

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

**Fire Safety**

• 1.5 General Requirements
• 1.6 Cabinets
• 1.16 Marking, Labeling, and Packaging
• 1.16.2 FC Power System Marking
• 1.19.4.2 Installation Manual

• 907 Fire Alarms and Detection Systems

• 401 General Emergency Planning and Preparedness
• 406 Employee Training and Response Procedures
• 5003.9.1.1 Fire Department Liaison
• 5303.4 Gas Marking
• 5303.11 Exposure to Fire
• 5303.16.13 Accessway
• 5503.4 Liquid Marking

• 305 Installation

International Mechanical Code (International Code Council 2012)
• 304 Installation

NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2010)
• 7.1.8 Labeling Requirements
• 10.2.1 Marking
• 10.6.1.2 Fire Protection

• 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

• 1.8.1 Metallic Piping

NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2013)
• 7.3.1.3 Piping Systems

• 6.4.1 Gaseous Hydrogen Storage
• 6.4.3 Hydrogen Piping
Operation Approvals


- 1.16.1 Marking, Labeling and Packaging
- 1.16.2 FC Power System Marking
- 1.16.4.2 Installation Manual

CGA P-1, Safe Handling of Compressed Gases in Containers (Compressed Gas Association 2008)

- 4.4 Regulating Authorities of Employee Safety and Health


- 105.6.8 Compressed Gases
- 404.3.2 Fire Safety Plans
- 406 Employee Training and Response Procedures
- 5003.5 Hazard Identification Signs
- 5003.6 Signs

NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2013)

- 4.7 Personnel Training
- 4.8 Fire Department Liaison
- 7.1.8 Labeling Requirements
- 10.2.1 Marking
- 10.3.2 Location of Gaseous Hydrogen Systems
- 10.6.1.2 Fire Protection


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

Periodic Inspections


- 1.16.4.5 Maintenance Manual

- 5003.2.6 Maintenance
- 5303.9 Service and Repair


- 707 Operation and Maintenance of Gaseous Hydrogen Systems

Setbacks and Footprints


- 5003.9.8 Separations of Incompatible Materials
- 5003.7 Separations from Hazards
- 5004 Storage of Compressed Gases


- 706 Location of Gaseous Hydrogen Systems

NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2013)

- 10.3.2 Locations


- 6.4.1 Gaseous Hydrogen Storage

Transportation

CGA P-1, Safe Handling of Compressed Gases in Containers (Compressed Gas Association 2008)

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


- 105.6.8 Compressed Gases
- 404.3.2 Fire Safety Plans
- 5005 Use, Dispensing, and Handling
- 5305.7 Transfer
- 5805 General Use
NFPA 55, Compressed Gases and Cryogenic Fluids Code (National Fire Protection Association 2013)

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