CSA Group Standards for Hydrogen Ecosystem

Hydrogen, a carbon-free energy carrier, can play a critical role in Canada's net-zero future. As a leader in research and standards development, CSA Group is engaged in multiple initiatives supporting the development of standards to facilitate broader hydrogen use.

CSA standards and research publications address the entire hydrogen ecosystem, from production, distribution, and storage to end-use, providing requirements, best practices, and guidelines to help ensure safety, efficiency, and reliability.



CSA Group Standards and research publications

Energy sources

1 **CSA C22.2 No. 272,** *Wind turbine electrical systems*

2 **CSA 61400** suite of standards for wind energy generation systems

3 **CSA C22.2 No. 61730,** suite of standards for photovoltaic (PV) module safety qualifications

4 **CSA/ANSI B149.6,** *Code for digester gas, landfill gas, and biogas generation and utilization*

5 Suite of 40+ CSA/ISO standards for solid biofuels

6 Suite of 60+ CSA standards covering entire life cycle of a nuclear facility

7 Suite of 20+ CSA standards covering systems, components, and management of the production, delivery, and storage of petroleum and natural gas products

Hydrogen production

8 **CSA/ANSI B22734,** *Hydrogen generators using water electrolysis – Industrial, commercial, and residential applications*

9 **CSA/ANSI FC 5,** *Hydrogen generators using fuel processing technologies – Part 1: Safety*

10 **CSA Z741,** *Geological storage of carbon dioxide*

11 **CSA TS-226,** *Geological storage of carbon dioxide – Measurement, monitoring, and verification plans*

12 **CSA/ANSI R124/BNQ 1789-200,** *A harmonized methodology for reporting the production pathway and carbon intensity of hydrogen*

13 Advanced Classification of Hydrogen: Life Cycle Assessment and Beyond (research report)

14 Hydrogen Production Using Nuclear Energy (research report)

15 Integration of Hydrogen Production with Nuclear Power Plants: Probabilistic Safety Assessment Considerations (research report)

16 Hydrogen Production from Fossil Fuels (research report)

17 Carbon Capture and Geological Storage Technologies in Hydrogen Production (research report)

Hydrogen storage

18 **CSA B51, Parts 1-3,** *Boiler, pressure vessel, and pressure piping code*

19 **CSA Z341 Series,** *Storage of hydrocarbons in underground formations, including Supplement No. 1 on application to hydrogen and hydrogen blends*

20 **CSA Z625,** *Well design for petroleum and natural gas industry systems*

Hydrogen delivery

21 **CSA Z662,** *Oil and gas pipeline systems*

22 Suite of CSA standards for transportation of dangerous goods

23 Assessment of Natural Gas Pipeline Materials for Hydrogen Service (research report)

24 Coatings and Liners for Hydrogen Service Pipelines (research report)

25 Assessment of Natural Gas Pipeline Components and Equipment for Hydrogen Service (research report)

26 Assessment of Hydrogen Leak Detection and Monitoring Frameworks for Pipeline Systems (research report)

27 Hydrogen Storage and Transportation Beyond Pipeline: Regulations and Standardization (research report)

Transportation

28 **CSA/ANSI HGV 2,** *Compressed hydrogen gas vehicle fuel containers*

29 **CSA/ANSI HGV 3.1,** *Fuel system components for compressed hydrogen gas powered vehicles*

30 **CSA/ANSI HGV 4,** suite of eight standards for hydrogen fueling stations and their components

31 **CSA HGV 5.1,** *Residential fueling appliance for hydrogen vehicle fueling* (in progress)

32 **CSA HGV 5.2,** *Compact hydrogen fuelling system*

33 **CSA B401.3,** *Hydrogen vehicle and trailer maintenance facilities code*

34 **CSA/ANSI HPRD 1,** *Thermally activated pressure relief devices for compressed hydrogen vehicle fuel containers*

35 **CSA SPE 2.1 (series),** Best practices for defueling, decommissioning, and disposal of compressed hydrogen, compressed natural gas, and liquid natural gas vehicle fuel containers (in progress)

36 **CSA TS 5.3,** *Transportable hydrogen refueling units* (in progress)

37 **CSA TS 4.3.5,** *Test methods for high-flow hydrogen fueling parameter evaluation* (in progress)

38 **CSA TS-601,** *Hydrogen fuel cell power systems for rolling stock*

39 **ANSI/CSA CHMC 1,** *Test methods for evaluating material compatibility in compressed hydrogen applications – Metals*

40 **CSA/ANSI CHMC 2,** *Test methods for evaluating material compatibility in compressed hydrogen applications – Polymers*

41 Hydrogen and Compressed Natural Gas (CNG) Standards: Comparison of Pressure Terminology and Validation Pressure Test Levels (research report)

42 Hydrogen Blending with Transportation Fuel (research report)

43 Advancing the Use of Hydrogen and Electrification in the Rail Industry (research report)

44 Alternative fuels and energy systems for the marine sector (research report)

45 Hydrogen Leak Rates for Common Piping Connections (research report, in progress)

46 Hydrogen for the Maritime Sector – Regulation, Codes and Standards (research report, in progress)

Residential appliances

47 **CSA Z21 suite** of 60+ standards for appliances and controls for residential heating, cooking, HVAC, drying, and hearth products

48 **CSA B149.1,** *Natural gas and propane installation code*

49 **CSA P.17,** *Performance testing of hydrogen-enriched appliances (in progress)* + a suite of eleven standards for energy efficiency of various fuel appliances

50 Appliance and equipment performance with hydrogen-enriched natural gases (research report)

Commercial/industrial applications

51 **CSA HPIT 1,** *Compressed hydrogen powered industrial truck on-board fuel storage and handling components*

52 **CSA HPIT 2,** *Dispensing systems and components for fueling hydrogen powered industrial trucks*

53 **CSA B335,** *Safety standard for lift trucks*

54 **CSA Z83 suite** of nine standards for gas-fired commercial/industrial products and controls

55 **CSA B149.3,** *Code for the field approval of fuel-burning appliances and equipment*

56 **CSA/ANSI FC 1,** *Fuel cell technologies – Stationary fuel cell power systems – Safety*

53 **CSA/ANSI FC 3,** *Portable fuel cell power systems*

58 **CSA/ANSI FC 6,** *Fuel cell modules*

59 **CSA B107,** *Enclosed hydrogen equipment*

60 **CSA M424.5,** *Hydrogen fuel cell-powered machines for use in underground mines* (in progress)

61 Hydrogen-Powered Forklifts Standardization (research report)

Worker safety

62 Competency and Training for Emergency Responders Addressing Incidents Involving Hydrogen (research report, in progress)

Get more information

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