

ICS 27.010
CCS F 19



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 44399-2024

**Reversible metal hydride hydrogen storage system for
transportable application**

移动式金属氢化物可逆储放氢系统

(English Translation)

Issued on: August 23, 2024

Implemented on: August 23, 2024

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Preface
1 Scope
2 Normative references
3 Terms and Definitions
4 Composition and model
4.1 Composition
4.2 Model
5 Conditions of use
5.1 Pressure
5.2 Temperature range
5.3 Hydrogen Quality
6 Design requirements
6.1 General requirements
6.2 Material Requirements
6.3 Metal hydride reversible hydrogen storage and release unit
6.4 Design load
6.5 Overpressure and fire protection
6.6 Charging of Hydrogen Storage Materials
6.7 Heat exchange structure of metal hydride reversible hydrogen storage and release module
6.8 Particle prevention
6.9 Service life
7 Test requirements
7.1 Test items and test requirements
7.2 Factory Inspection
7.3 Type test
7.4 Regular inspection cycle
8 Marking and labeling
8.1 Identification
8.2 Tags
9 Product Documentation
9.1 Material Safety Data Sheet

9.2 Product Certificate

9.3 Batch Inspection Quality Certificate

Appendix A (Informative) Hydrogen Storage Materials

A.1 Class I Dangerous Goods

A.2 Commonly used hydrogen storage materials

Appendix B (Informative) Pressure Level Relationship

Appendix C (Normative) Determination method of measured maximum strain growth trend

Appendix D (Informative) Hydrogen Charging and Discharging Test Procedure

D.1 Hydrogen charging test process

D.2 Hydrogen release test process

References

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting is required.

1 Scope

This document specifies the composition and model, use conditions, design requirements, test requirements, Marking and labelling, product documentation.

This document applies to metal hydride reversible hydrogen storage and release systems for road motor vehicles and on-site motor vehicles with hydrogen as the storage medium.

The hull water volume used shall not exceed 150 L, the maximum temperature rise pressure shall not exceed 25 MPa, and the operating ambient temperature shall be -40 °C to 65 °C.

This document can be used as a reference for metal hydride reversible hydrogen storage and release systems used in trams, construction machinery, power generation equipment, etc.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version

(including all amendments) applies.

in this document.

GB/T 191 Pictorial markings for packaging, storage and transportation GB/T 3634.1
Hydrogen Part 1: Industrial Hydrogen GB/T 12241 General requirements for safety valves
GB/T 13310 Electric vibration table GB/T 16804 Gas Cylinder Warning Label GB/T 16918
Bursting disc safety devices for gas cylinders GB/T 24499 Terminology of hydrogen, energy
and hydrogen energy systems GB/T 26990 Fuel cell electric vehicles - Technical
requirements for onboard hydrogen systems GB/T 29729 Basic requirements for hydrogen
system safety GB/T 33292 Metal hydride hydrogen storage system for fuel cell backup
power supply GB/T 34542.1 Hydrogen storage and delivery systems Part 1: General
requirements GB/T 34542.2 Hydrogen storage and transportation systems Part 2: Test
methods for compatibility of metallic materials with hydrogen environments GB/T 34544
Safety test methods for low-pressure hydrogen storage devices for small fuel cell vehicles
GB/T 42612 Compressed hydrogen gas cylinder with plastic liner and fully wrapped carbon
fiber for vehicle use

3 Terms and definitions

The terms and definitions defined in GB/T 24499 and the following apply to this document.

Metal hydride

A metal combined with hydrogen gas to form a solid material that can absorb and release hydrogen.

Hydrogen storage bed it is composed of metal hydride, heat conductor, anti-expansion agent, gas conductor, etc., placed in a metal shell, and has the functions of reversible hydrogen charging and discharging,