

ICS 71.100.20

CCS G86



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

GB 4962-2008

Replacing GB 4962-1985

Technical safety regulation for gaseous hydrogen use

氢气使用安全技术规程

Issued on: December 11, 2008

Implemented on: October 1, 2009

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China;
Standardization Administration of China**

Table of Contents

1 Scope	
1.6 MPa and less than	
2 Normative References	
3 Terms and Definitions	
4 Basic Requirements	
4.1 Buildings and site selection	
4.2 Operating personnel	
4.3 Hydrogen system	
5 Replacement	
6 Storage	
6.3 Hydrogen Cylinder (Cylinder Bundle)	
6.5 Hydrogen Holder	
7 Compression and Filling	
7.1 Compression	
7.2 Filling	
8 Discharge	
9 Fire Fighting and Emergence Handling	
10.0 MPa (high pressure), greater than or equal to	

Foreword

Chapters 4, 5, 6, 7, 8 and 9 of this Standard are mandatory and the rest are recommendatory. This Standard replaces "Technical Safety Regulation for Gaseous Hydrogen Use" (GB 4962-1985) from the implementation date hereof. Compared with "Technical Safety Regulation for Gaseous Hydrogen Use" (GB 4962-1985), this Standard has the following major changes. -- Application scope, terms and definitions (Chapter 1 of the original edition) were modified, and normative references were added; -- Fire separation for hydrogen filling station plane layout was modified (

2.2 of original edition); -- 2.3, 2.4, 3.2.1, 3.3.3,

5.4 of the original edition were deleted; -- Two chapters (Chapters 5 and 7 of this edition) and one appendix were added; -- Hydrogen filling arrangement and hydrogen cylinder application were modified (Chapters 3 and 5 of original edition; Chapter 6 of this edition); -- Empty pipe was modified (

3.5 of original edition; Chapter 8 of this edition); -- Firefighting was modified (Chapter 6 of original edition; Chapter 9 of this edition). Appendix A of this Standard is informative. This Standard was proposed by the State Administration of Work Safety. This Standard is under the jurisdiction of the Technical Subcommittee on chemicals safety standardization of the National Technical Committee on Safety Production of Standardization Administration of China (SAC/TC 288/SC 3). Drafting organization of this Standard. Shanghai Institute of Work Safety Science Participating drafting organizations of this Standard. Shanghai Hualin Industrial Gases Co., Ltd., Linde Group (Suzhou, Ningbo, Xiamen) Chief drafting staff of this Standard. Liu Guiling, Li Jie, Jiang Yanfeng, Tang Gengmei, Long Xianmiao, She Weihong, Fu Jiajia. This Standard was issued in 1985 for the first time and is revised for the first time. Technical Safety Regulation for Gaseous Hydrogen Use

1 Scope

GB 4962-2008 is the Chinese national standard on technical safety regulation for gaseous hydrogen use, in the field of chemical technology. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 11 December 2008 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 October 2009. Classification: ICS 71.100.20, CCS G86. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Standard specifies the safety specifications of gaseous hydrogen on such aspects as application, replacement, storage, compression and filling, discharging process, firefighting and emergency treatment, as well as safety protection. This Standard is applicable to the various workplaces on the ground where gaseous hydrogen is produced, and it is not applicable to the locations for liquid hydrogen, overwater gaseous hydrogen and hydrogen used in aviation as well as on-board hydrogen supply system. Corresponding procedures during hydrogen production may be implemented by reference.

2 Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. For dated reference, subsequent amendments to (excluding correction to), or revisions of, any of these publications do not apply. However, the parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards. For undated references, the latest edition of the normative document referred to applies. GB 2893 Safety Colors

GB 2894 Safety Signs and Guideline for the Use

GB 3836.1 Electrical Apparatus for Explosive Gas Atmospheres - Part

3 Terms and Definitions

For the purposes of this Standard, the following terms and definitions apply.

3.1 Hydrogen filling station General term of such sites as buildings and structures for supplying hydrogen through bottles and/or pipelines, excluding hydrogen generation equipment

3.2 Gaseous hydrogen receiver General term of vessels with constant pressure and variable volume (dish gas holder) and with variable pressure and constant volume for storing hydrogen, excluding gas cylinder

3.3 Gaseous hydrogen filling station General term of such sites as buildings and structures equipped with hydrogen compression facilities, filling facilities and necessary auxiliary facilities for filling hydrogen

3.4 Explosive hazard zone The zone where the gas, steam or fog, dust or fibrous combustible substances contacting air under atmospheric conditions to form explosive mixtures that, in the presence of ignition source, will burn or explode over the entire unfired mixture

3.5 Hot work The construction operation that may make open fire (e.g. flame or spark) and form red-hot surface

3.6 Low/middle/high-pressure gaseous hydrogen compressor Gaseous hydrogen compressor that the output pressure is greater than or equal to

4.1 Buildings and site selection

4.1.1 Fire separation for hydrogen filling station plane layout is detailed in Table 1.

4.1.2 The fire separation between gaseous hydrogen receivers or receiver zones shall meet the requirements of GB 50177-2005, with more details as follows:

4.1.6 Top plane of the building shall be even, so as to prevent hydrogen from accumulating in the dents.

4.1.7 Where the hydrogen may accumulate or hydrogen concentration may increase, stationary flammable gas detecting alarm should be arranged above the monitoring point (source of release) or on the top of the workshop building, of which the installation height should be 0.5m~2m higher than the source of release and the surrounding should be reserved with clearance not less than 0.3m for the convenience of monitoring the hydrogen concentration. Effective covering level plane radius of flammable gas detecting alarm

should be 7.5m indoor and 15m outdoor.

4.1.8 There shall be no open fire at least 10m around the gaseous hydrogen filling station, hydrogen filling station, full cylinder room and empty cylinder room.

4.1.9 Hydrogen in the hydrogen system must not be released inside the building.

4.1.15 Filling station, manifolds room, empty cylinder and full cylinder shall be arranged according to the following requirements.

4.2 Operating personnel

4.2.1 The operating personnel shall receive the on-the-job training and may only take the post with a certificate after passing the exams. Special operating personnel shall receive professional training, hold the special operation certificate, and take the post with certificate within the validity period.

4.3 Hydrogen system

4.3.1 Hydrogen mass in the hydrogen system shall meet its safety requirements.

4.3.4 Oxygen volume fraction of hydrogen in the hydrogen system shall not exceed 0.5%, and the hydrogen system shall be equipped with replacement and purging facilities with inert gas of oxygen content less than 3%.

4.3.5 Hydrogen system equipment must not be knocked, maintained under pressure, fastened, or overpressure during operation. Hydrogen system equipment must not be under a negative pressure state.

5 Replacement

5.1 The equipment and piping to be replaced in the hydrogen system shall be isolated reliably from the system.

5.2 The replacement method with inert gas shall meet the following requirements.

5.3 The evacuating by water injection shall meet the following requirements.

5.4 The bundle of seamless steel cylinders may be replaced by the methods below.

5.5 If gas inlet (outlet) pipe is arranged on the bottom of the reservoir vessel and the replacement starts from the bottom, the gases are mixed up for 2h~3h each time after a certain amount of inert gas is filled; the procedure is repeated till the analyses are eligible.

5.6 The gas for replacement blowing shall be exhausted by vent pipe.

6 Storage

6.1 Gaseous hydrogen reservoir vessel shall meet the requirements of "Regulation of