

ICS 77.140.75

CCS H 48



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

GB/T 46599-2025

**Steel pipe for gaseous hydrogen storage and transportation
pipelines**

氢气储输管道用钢管

Issued on: October 31, 2025

Implemented on: May 1, 2026

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

1.Scope	1
2 Normative References	1
5.Brand Naming Method	3
6.Order details	4
7 Manufacturing process	4
8 Technical Requirements	6
9.Test Methods	22
10 Inspection Rule	31
46 References	49

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed by the China Iron and Steel Association. This document is under the jurisdiction of the National Steel Standardization Technical Committee (SAC/TC183). This document was drafted by: Bohai Petroleum Equipment Manufacturing Co., Ltd., China National Petroleum Corporation; Metallurgical Industry Information and Standardization Research Institute; China National Petroleum Corporation. Engineering Construction Co., Ltd. North China Branch, Hengyang Valin Steel Pipe Co., Ltd., Zhejiang Jinzhou Pipeline Industry Co., Ltd., and Iron & Steel Research Institute have Limited Liability Company, Shougang Group Co., Ltd., Steel Research Institute Nake Testing Technology Co., Ltd., Jingjiang Special Steel Co., Ltd., Baoshan Iron & Steel Co., Ltd. The company, Southwest Branch of China Petroleum Engineering & Construction Corporation, China Petroleum Gemstone Pipeline Co., Ltd., and China Petroleum Pipeline. Scientific Research Institute Co., Ltd., National Pipeline Group Engineering Technology Innovation Co., Ltd., Sinopec Petroleum Engineering Design Co., Ltd., China National Petroleum Corporation Group Engineering Materials Research Institute Co., Ltd., Inner Mongolia Baogang Steel Union Co., Ltd., Tianjin Steel Pipe Manufacturing Co., Ltd., Shanxi Taigang Stainless Steel Steel Pipe Co., Ltd., ZTE Energy Equipment Co., Ltd., Tianjin Lianzhong Steel Pipe Co., Ltd., Taizhou Huadi Materials Technology Co., Ltd., Chengde Jianlong Special Steel Co., Ltd., Dalipu Petroleum Special Pipe Co., Ltd., Anke Engineering Technology Research Institute (Beijing)

Co., Ltd., Dongfang Electric Group Tuan Dongfang Boiler Co., Ltd., Panzhihua Iron & Steel Group Xichang Steel & Vanadium Co., Ltd., Panyu Zhujiang Steel Pipe (Zhuhai) Co., Ltd., Julong Steel Pipe Co., Ltd. The company, Nanjing Julong Steel Pipe Co., Ltd., State Power Investment Corporation Science and Technology Research Institute Co., Ltd., Zhejiang Taifu Seamless Steel Pipe Co., Ltd. Zhangjiagang Shagang Jinzhou Pipeline Co., Ltd., Xi'an Xiangyang Aerospace Materials Co., Ltd., Tianjin Yuantai Derun Steel Pipe Manufacturing Group Co., Ltd. Company, Jiangsu Yinhan Precision Steel Pipe Co., Ltd., Xi'an Special Equipment Inspection and Testing Institute, Ningbo Zhonggang Technology Co., Ltd., Dexin Steel Pipe (China) Co., Ltd. Limited Liability Company, Jiangsu Tianhuai Steel Pipe Co., Ltd., Linzhou Fengbao Pipe Industry Co., Ltd., Hebei Haiqianwei Steel Pipe Co., Ltd., Hebei Shangheng Pipeline Manufacturing Co., Ltd. Limited Liability Company, Hebei Hengtong Pipe Fittings Group Co., Ltd., and Hebei Hongyuan Special Steel Pipe Industry Group Co., Ltd. The main drafters of this document are. Chen Xiaowei, Wang Songtao, Wang Lei, Wang Qiang, Li Qi, Fu Xianqiao, He Hang, Yang Weifang, Wang Bing, Tian Peng, and Luo Jing. Yao Yong, Zhang Chuanguo, Wang Yaxi, Mao Nongzhao, Yang Die, Zhang Xiaoqiang, Wang Yingwei, Chi Qiang, Yu Zejin, Sun Yu, Cheng Yiming, Qiu Yunlong, Zhou Wenjun Wang Raoyang, Zhang Jun, Wang Kui, Wang Xiuyun, Nie Li, Huang Chu, Su Zhangzhuo, Zhao Zhiwei, Cao Huayong, Li Xin, Zhang Guozhong, Wang Xing, Li Huajun, Liu Kaisong Zhuang Zhuojun, Yang Xu, Tang Ping, Dong Xiyue, Li Fei, Li Jingmin, Li Guiliang, Liu Tao, Li Ye, Yang Baoqi, Chen Wenhao, Jia Shujun, Li Shaopo, Feng Yan Zhang Zhiyuan, Qu Xianrong, Yang Hanqing, Liu Bin, Yan Chen, Liu Zhitian, Song Weichen, Feng Hui, Zhang Xinggang, Li Yan, Kang Xitang, Zhu Weifei, Xu Longqing Wang Jueguang, Yang Zhiwen, Xie Xiaoyuan, Ren Shoubin, Huang Kejian, Zhang Lei, Zhang Zhiming, Sun Chen, Zhang Bing, Xiao Lin, Hua Yangkang, Li Debiao, Zhou Shihang Long Jinhua, Li Jianyi, Zuo Guofeng, Shi Li, Jiang Qingmei, Wang Zenghai, Chen Yan, Guo Bicheng, Li Tao, Huang Li, Zhao Bo, Wang Bin, Sun Shaoqing, Chen Jianqiu Ji Yanqing and Jia Qifeng.

Steel pipes for hydrogen storage and transportation pipelines

1 Scope

GB/T 46599-2025 is the Chinese national standard covering the pipe for a hydrogen pipeline - the composition and cleanliness that limit hydrogen embrittlement, the hardness ceiling at the weld and its heat affected zone, the fracture and fatigue behaviour in a hydrogen atmosphere, and the testing that demonstrates it. At 26,500 words. Hydrogen makes steel behave differently from natural gas service, and this is the standard behind China's hydrogen pipeline programme. First edition, in force from 1 May 2026. Issued on 31 October 2025, it has been in force since 1 May 2026.

This document specifies the naming method, ordering details, manufacturing process, technical requirements, testing methods, and inspection procedures for steel pipes used in hydrogen storage and transportation pipelines. Inspection rules, packaging, marking, coating, quality certificate and loading. This document applies to straight seam submerged

arc welding of hydrogen for onshore storage and transportation pipelines with purity conforming to GB/T 3634.1 or GB/T 3634.2. (SAWL) steel pipes, spiral submerged arc welded (SAWH) steel pipes, high frequency welded (HFW) steel pipes, and seamless (SMLS) steel pipes (hereinafter referred to as "steel pipes") Tube").

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 223.5 Determination of Acid-Soluble Silicon and Total Silicon Content in Iron and Steel - Reduced Molybdate Spectrophotometric Method

GB/T 223.9 Determination of Aluminum Content in Iron and Steel and Alloys - Chromium Blue S Spectrophotometric Method

GB/T 223.11 Determination of Chromium Content in Iron and Steel and Alloys - Visual Titration or Potentiometric Titration

GB/T 223.14 Chemical Analysis Methods for Iron and Steel Alloys - Determination of Vanadium Content by Tantalum Reagent Extraction Spectrophotometry

GB/T 223.19 Chemical Analysis Methods for Iron and Steel Alloys - Determination of Copper Content by Neo-Copper-Chloroform Extraction Spectrophotometric Method

GB/T 223.23 Determination of Nickel Content in Iron and Steel and Alloys - Dimethylglyoxime Spectrophotometric Method

GB/T 223.26 Determination of molybdenum content in iron and steel and their alloys - Thiocyanate spectrophotometric method

GB/T 223.37 Determination of Nitrogen Content in Iron and Steel and Alloys - Distillation Separation of Indophenol Blue Spectrophotometric Method

GB/T 223.40 Determination of Niobium Content in Iron and Steel and Alloys - Chlorsulfonylphenol S Spectrophotometric Method

GB/T 223.59 Determination of phosphorus content in iron and steel and their alloys - Bismuth-phosphomolybdenum blue spectrophotometric method and antimony-phosphomolybdenum blue spectrophotometric method

GB/T 223.63 Determination of Manganese Content in Iron and Steel and Alloys - Sodium (Potassium) Periodate Spectrophotometric Method

GB/T 223.77 Chemical Analysis Methods for Iron and Steel Alloys - Determination of

Calcium Content by Flame Atomic Absorption Spectrometry

GB/T 223.78 Chemical Analysis Methods for Iron and Steel Alloys - Determination of Boron Content by Direct Spectrophotometry Using Curcumin

chinastandards.org - PREVIEW