

ICS 91.060.20

CCS Q 73



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

GB/T 44534-2024

**Technical requirement for spherical node of space grid
structures**

空间网格结构球型节点技术要求

Issued on: September 29, 2024

Implemented on: April 1, 2025

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

Table of Contents

1 Scope	1
2 Normative references	1
3 Terms and Definitions	2
4 Classification, marking and specifications	3
5 General requirements	5
6 Requirements	6
7 Test methods	17
8 Inspection Rules	21
41 References	44

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. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by the Ministry of Housing and Urban-Rural Development of the People's Republic of China. This document is under the jurisdiction of the National Technical Committee for Standardization of Building Components (SAC/TC454). This document was drafted by: China Architecture Standard Design Institute Co., Ltd., Zhejiang Southeast Grid Co., Ltd., Beijing University of Technology, Zhejiang University, Xuzhou Inspection and Testing Center, Tsinghua University, Shandong Jianzhu University, Beijing University of Civil Engineering and Architecture, China Architecture Design & Research Institute Co., Ltd. Co., Ltd., Tsinghua University Architectural Design and Research Institute Co., Ltd., China Aviation Planning and Design Research Institute Co., Ltd., Xuzhou Feihong Grid Construction Technology Co., Ltd., Shanxi Fenyang Grid Construction Co., Ltd., Suzhou Suwang Construction Engineering Co., Ltd., Jiangsu Zhongmin Steel Structure Co., Ltd., Jiangsu Ba Fang Steel Structure Group Co., Ltd., Anhui Jiuhuan Industrial Co., Ltd., Jiangsu Lanhua Construction Co., Ltd., Xuzhou Jiuding Steel Structure Co., Ltd., Xuzhou Sanjiugu Fastener Manufacturing Co., Ltd., Xuzhou Kyoto Construction Engineering Co., Ltd., Xuzhou Litai Steel Structure Co., Ltd., Jiangsu Xinpengjia Construction Technology Co., Ltd., Jiangsu Oumei Steel Structure Curtain Wall Technology Co., Ltd., Henan Tianyuan Equipment Engineering Co., Ltd., Beijing Machinery Engineering Co., Ltd. Group Co., Ltd., Beijing Shougang Construction Group Co., Ltd., Shanghai Baoye Group Co., Ltd.,

Xinjiang Weitai Development and Construction (Group) Co., Ltd. Co., Ltd., Shandong Huayi Steel Machinery Co., Ltd., China 22nd Metallurgical Group Co., Ltd., Hunan Jinwei New Materials Technology Co., Ltd., Jiangsu Tianchu New Materials Technology Co., Ltd., CITIC Construction Co., Ltd. The main drafters of this document are. Yu Yinquan, Wang Zhe, Zhou Guangen, Wu Jinzhi, Luo Yaozhi, Wang Hao, Zhong Xianhua, Xue Suduo, Chen Weigang, Li Jingyuan, Hu Hongzhi, Ruan Xinwei, Hu Tianbing, Sun Guojun, Li Mingrong, Yang Dabin, Shi Gang, Sun Hailin, Zhen Wei, Zhu Lei, Zhang Yizhou, Zhang Guojun, Zhang Meng, Zhang Zhong, Tang Bingchuan, Liu Zhijian, Yuan Gaoyang, Zhang Zongjun, Zhang Jiancheng, Wu Weimin, Liu Quanyi, Huang Huawei, Zhang Guangsheng, Wang Hui, Wu Xiaojun, Wang Jun, Huang Xianghuai, Xu Lei, Li Xiongyan, Hu Yao, Wang Xiong, Yin Weimin, Xie Binqun, Wang Jun, Li Qiang, Ma Qi. Technical requirements for spherical nodes of space grid structures

1 Scope

GB/T 44534-2024 sets the technical requirements for the spherical nodes of space grid structures, the components on which every Chinese space frame roof depends. A space grid is a structure of slender members that carries load only because the joints hold their geometry exactly; the two Chinese node systems, the bolted spherical node with its sleeve, set screw, sealing plate and cone head, and the welded hollow sphere, are made in enormous quantities by a fragmented supply chain, and this standard is the quality control document for them. It gives the classification, designation and specifications, then the general requirements and eleven pages of requirements proper, covering materials, dimensions and permissible deviations, mechanical properties, welding, threads, surface condition and corrosion protection, followed by the test methods, the inspection rules and the marking, packaging, transport and storage. Six normative annexes carry the dimensional tables that the trade actually works from: the principal specifications of the bolted spherical nodes, the dimensions and deviations of the sleeves and set screws, of the sealing plates and of the cone heads over eleven pages, and the specifications and diagrams of the welded hollow spheres. It applies to the quality control of both node types.

This document provides the classification, marking and specifications of spherical nodes of space grid structures, and stipulates the requirements, inspection rules, marking, packaging, transportation and storage, and the corresponding test methods are described. This document is applicable to the quality control of bolted sphere nodes and welded hollow sphere nodes of spatial grid structures.

2 Normative references

The contents of the following documents constitute 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 to This document.

GB/T 196 Basic dimensions of common threads

GB/T 197 General thread tolerances

GB/T 223.5 Determination of acid-soluble silicon and total silicon content of iron and steel - Reduced molybdenum silico-silicic acid spectrophotometric method

GB/T 223.11 Determination of chromium content in steel and alloys Visual titration or potentiometric titration method

GB/T 223.19 Methods for chemical analysis of iron, steel and alloys - Determination of copper content by the new cuproline-chloroform extraction spectrophotometric method

GB/T 223.23 Determination of nickel content in steel and alloys - Dimethylglyoxime spectrophotometric method

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

GB/T 223.63 Determination of manganese content in iron, steel and alloys - Sodium (potassium) periodate spectrophotometric method

GB/T 223.79 Determination of multi-element content of steel - X-ray fluorescence spectrometry (conventional method)

GB/T 223.81 Determination of total aluminum and total boron content of steel and alloys - Microwave digestion-inductively coupled plasma mass spectrometry

GB/T 223.85 Determination of sulfur content in iron, steel and alloys - Infrared absorption method after combustion in an induction furnace

GB/T 223.86 Determination of total carbon content of steel and alloys - Infrared absorption method after combustion in an induction furnace

GB/T 228.1 Tensile test of metallic materials Part