

ICS 23.020.10
CCS J 74



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

GB 12337-2014

Replacing GB 12337-1998

Steel spherical tanks

钢制球形储罐

(English Translation)

Issued on: September 3, 2014

Implemented on: February 1, 2015

Issued by: Standardization Administration of China

Table of Contents

Introduction

Introduction

1 Scope

2 Normative references

3 General

4 Materials

5 Structure

6 Calculation

7 Manufacturing

8 Welding, inspection and acceptance

Appendix A (normative) standard declaration of conformity and Amendment

Appendix B (normative) safety accessories and ancillary facilities

Annex C (normative) risk assessment report

Annex D (normative) stress analysis and design 66 tank

Appendix E (normative) low temperature spherical tank

Annex F (informative) spherical shell butt weld groove type and size

Annex G (normative) site classification

Foreword

Appendix F of this standard are recommended, the rest of the technical content is mandatory.

This standard was drafted in accordance with GB/T 1.1-2009 given rules.

This standard replaces GB 12337-1998 "steel spherical tanks", compared with GB 12337-1998 standard, the main technical changes are as follows.

--- According TSGR0004 "Stationary Pressure Vessel Safety Technology Supervision", GB 150.1 ~ 150.4 "pressure vessel" to amend the relevant content.

Scope --- design pressure from 4.0MPa up to 6.4MPa.

--- Increasing the spherical shell steel plate thickness of not greater than a predetermined 50mm, the corresponding amendments to the scope of application of the steel sheet thickness.

- Spherical shell material to 14 kinds of new material. Q370R, 15MnNiDR, 15MnNiNbDR, 09MnNiDR, 07MnMoVR, 07MnNiVDR, 07MnNiMoDR, S30408, S30403, S31608, S31603.
- Support to Shell connection type to cancel the U-shaped column structure and flange structure, increasing the oblong structure.
- Increasing the degree of toxicity requirements containing extreme or highly hazardous medium tank, the import and export should be on the very opening.
- Canceled tank manhole, flange sealing surface should be used to take over the uneven surface requirements.
- Calculated according to GB 50011 "Seismic Design of Buildings" revised seismic loads.
- Calculated according to GB 50009 "Building structure Load Code" Amendment wind loads.
- Increasing the content of external pressure calculated spherical shell.
- Product welding specimen from the 3 to 2, respectively, vertical welding, flat welding plus overhead welding.
- Increasing the time of flight diffraction method and ultrasonic detection method for carbon steel and low alloy steel using the time of flight diffraction method priority ultrasonic testing Claim.
- Increasing the tank inner side should adopt fluorescent magnetic particle testing requirements.
- Should not be used to increase the gamma-ray panorama exposure radiation detection.
- Added Appendix A standard declaration of conformity and amendments.
- Added Appendix B Safety accessories and ancillary facilities.
- Added Appendix C risk assessment report.
- Added Appendix D stress analysis and design sphere.

This standard by the National Standardization Technical Committee of the boiler pressure vessel (SAC/TC262) and focal points.

This standard was drafted. High-tech Gansu Lanke Petrochemical Equipment Co., Ltd., China Special Equipment Inspection and Research Institute, Hefei General Machinery Research Institute, China Petrochemical Engineering Construction Co., Ltd., China Tianchen Engineering Co., Ltd., Sinopec Ningbo Engineering Company Limited, Shanghai Installation Engineering Cheng Co., Ltd., Anshan Steel Pressure Vessel Co., Ltd., Shenyang Industrial Installation Engineering Co., Ltd., China Petroleum First Construction the company, Dalian Boiler and Pressure Vessel Inspection and Research Institute, China Petrochemical Group Fujian Petrochemical Company.

Drafters of this standard. Liu Fu recorded, Yangguo Yi, Zhu Baoguo, Lu Ling Duan, Li Jingcheng, Luhuan Jun, Xiao Xiurong, Zhang Xiao Hu, Zhao Lei Jiang, Fengzhen You, Zhang Lianyou, Wu Tong Zhu, Zhang Zhigang.

This standard replaces the standards previously issued as follows.

--- GB 12337-1990, GB 12337-1998.

Introduction

This standard is the boiler pressure vessel Standardization Technical Committee (hereinafter referred to as "the Committee") is responsible for developing and centralized spherical tanks (Hereinafter referred to as tank) standards to govern constructed or used in China spherical tank design, manufacturing, welding, inspection and acceptance. This standard is Design calculations including a spherical shell, pillar, rod, etc., selection of materials requirements to the structural elements, as well as tank manufacture, welding, inspection Inspection and acceptance of comprehensive national standards.

The standard technical provisions include spherical tank construction process (referring to the design, fabrication, welding, inspection and acceptance) should be mandatory to follow Requirements, special regulations and recommend disabling provisions, the terms of which are not recommended to be performed part. Over the past decade, along with metallurgy, machinery processing Advances in engineering, welding and non-destructive testing technology, especially with the rapid development of computer technology as the representative of information technology, spherical tanks Technology has also made corresponding progress. Economic globalization and fierce competition makes the world must consider the safety and spherical tank Coordination of economic unity. The EU and the United States as the representative of the developed countries has introduced a new pressure vessel standards, greatly enhance the international competition of the Competition. In comparison, our existing GB 12337-1998 "steel spherical tanks" After ten years of technological progress, both from the design concept from the technical indicators are still to be improved. For this reason, the international standards and the same standards of spherical tanks integrated steel Comparison based on the full use of our scientific and technological achievements in recent years, after investigation analysis and experimental verification, combined with the successful experience in the use of steel Spherical tank system standards to enrich and improve and improve. Tank design, manufacturing, welding, inspection and acceptance in addition to compliance with this standard, but also shall comply with GB 150.1 ~ 150.4, the relevant provisions of JB4732. Since this standard is not necessary, it is impossible to include within the scope of the construction sphere Made all the technical details, therefore, to meet the basic safety requirements and regulations under the premise of this standard should not be prohibited is not particularly Technical content mentioned. This standard is not as specific technical manual tank construction, also not a substitute for training and experience in engineering

and project evaluation.

Project evaluation is defined by the knowledgeable and skilled in Xian specification applications made for the technical evaluation of specific products. But project evaluation should Compliance with relevant technical requirements of this standard, shall not violate the mandatory requirements of this standard and disable rules.

This standard does not limit the actual engineering design and construction using advanced technology and methods, but engineers using advanced technology and methods should be able to make reliable judgments, to ensure that it meets this standard, in particular the mandatory provisions concerning the design (such as strength or stability design Formulas, etc.).

This standard includes both a design rule method, but also contains the analysis and design methods. When using a computer program to design, in addition shall meet the standard requirements should be confirmed.

- 1) The program assumes that the reasonableness of the use of technology;
- 2) The program design using adaptive content;
- 3) The program input and output parameters for the correctness of the use of engineering design.

Steel spherical tanks

1 Scope

1.1

standard specifies steel spherical tanks (hereinafter referred to as "tank") design (including the design and analysis of design rules, the same below), manufacturing, group Welding, inspection and acceptance requirements.

1.2

This standard applies to the design pressure is less than 6.4MPa, the design temperature range allows the use of the steel according to the temperature of the orange segment or hybrid to Tank support strut.

1.3

This standard does not apply to tank.

- a) nuclear devices tank;
- b) subjected to a relative movement (such as a car or ship) of the tank;
- c) the nominal volume of the tank is less than 50m³;
- d) tank-layer structure.