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

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**Periodic inspection methods for stationary pressure vessels**

压力容器定期检验方法

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## Foreword

The following symbols apply to this document. A

--- The semi-length of the major axis of the circumscribed rectangle after the pit is normalized into a semi-ellipsoid, in millimeters (mm). B

--- The half-width of the minor axis of the circumscribed rectangle after the pit is normalized into a semi-ellipsoid, in millimeters (mm). C

--- The depth of the circumscribed rectangle after the pit is normalized into a semi-ellipsoid, in millimeters (mm). G0

---Dimensionless parameter. H

--- The dimension of a non-circular defect in the thickness direction of the plate, also known as the defect height, in millimeters (mm). L

- Length of non-circular defects, in millimeters (mm). R
- Average radius of the pressure vessel, in millimeters (mm). T
- The wall thickness of the pressure vessel at the location of the pit (the actual measured wall thickness minus the corrosion amount up to the next inspection period), in millimeters (mm). t
- The thickness of the steel at the weld joint, in millimeters (mm).

## 5 General Requirements

5.1 Special equipment inspection agencies (hereinafter referred to as "inspection agencies") shall conduct periodic inspections of pressure vessels within their approved inspection scope. Inspection and testing personnel (hereinafter referred to as "inspection personnel") shall obtain the corresponding special equipment inspection and testing personnel certificate and conduct inspections in accordance with regulations. register.

5.2 The periodic inspection cycle, inspection conclusions and report formats for pressure vessels shall be implemented in accordance with the relevant provisions of TSG21.

5.3 The equipment, instruments and measuring tools used in the inspection process shall be within their valid verification or calibration period.

5.4 When new materials, technologies, or methods are used in periodic inspections, they shall be carried out in accordance with relevant laws and TSG documents.

5.5 During periodic inspections, the relevant health, safety, and environmental protection requirements of the user and the inspection agency shall be followed.

5.6 In addition to complying with this document, periodic inspections of stationary pressure vessels shall also comply with relevant special equipment safety technical specifications and national standards. Regulation.

5.7 The general procedure for periodic inspection work includes data collection, inspection plan development, on-site preparation before inspection, implementation of periodic inspection, and defect identification and handling. Problem handling, summarizing test results, and issuing test reports, etc.

5.8 Periodic inspections of pressure vessels in small refrigeration units shall comply with the requirements of Appendix A.

5.9 Periodic inspections of pressure vessels that have reached their design service life shall be carried out in accordance with the provisions of TSG21.

## 6 Data Collection

6.1 Before inspection, inspectors generally collect the following data, of which items

d) are collected during the first periodic inspection after the pressure vessel is put into service. Collection will be conducted as needed for future inspections (e.g., in the event of relocation, modification, or major repairs).

a) Design documents, including the design firm's qualification certificate, design, installation, and user manuals, design drawings, strength calculation sheets, etc.;

b) Manufacturing (including on-site welding) documentation, including manufacturer qualification certificates, product certificates of conformity, quality certification documents, as-built drawings, etc. Inspection certificate, safety performance supervision and inspection report for imported pressure vessels;

c) Pressure vessel installation completion data;

d) Renovation or major repair documentation, including construction plans and completion documents, as well as renovation and major repair inspection certificates;

e) Management data, including usage registration certificates and usage registration forms, as well as operation records, start-up and shutdown records, and information on changes in usage conditions. And records of any abnormal situations that occur during use;

f) Inspection and testing data, including annual inspection reports within the periodic inspection cycle and the previous periodic inspection report.

6.2 If any of the following situations are discovered during the data collection process, the testing agency shall report to the registration authority.

a) No registration certificate;

b) Pressure vessels were not subject to manufacturing supervision and inspection as required;

c) Imported pressure vessels were not subject to safety performance supervision and inspection;

d) Pressure vessels were not subject to supervision and inspection as required for modification or major repairs;

e) The user failed to conduct the annual inspection of the pressure vessel as required;

## 7 Development of Inspection Plan

7.1 Before inspection, the inspection agency shall, based on the basic parameters and usage of the pressure vessel, and in conjunction with its damage mode and failure mode, follow the procedures outlined in this document. Inspection plans should be developed based on the requirements of the components. Damage modes and failure modes should be identified in accordance with GB/T 30579, GB/T 150.1 and GB/T 4732.1.

7.2 The inspection plan shall be prepared by a pressure vessel inspector or a senior

pressure-bearing inspector whose work includes pressure vessels, and the technical head of the inspection organization or... Authorized technical personnel shall review and approve the inspection plan. Inspection personnel shall conduct inspections in accordance with the approved inspection plan; any changes to the plan shall be handled by the inspection agency. The structure shall be executed in accordance with the requirements of the quality system.

7.3 The test plan shall include at least the following.

- a) Basic information about the project;
- b) Verification basis;
- c) Technical parameters;
- d) Preparatory work before inspection;
- e) Safety requirements for inspection work;
- f) Testing instruments and equipment;
- g) Test items and methods;
- h) Recording and reporting requirements.

7.4 For pressure vessels with catalysts or packing materials, insulation layers, or those that cannot be opened, the inspection plan should be developed by the inspection agency and... The decision will be determined through consultation between the user units.

## 8.1 Site Conditions

8.1.1 The user unit shall prepare for and assist in the inspection, including the following.

- a) For pressure vessels operating under high or low temperature conditions, slowly cool down or heat up according to the operating procedures until they reach a temperature suitable for inspection. The degree of work;
- b) Pressure vessels that can rotate or have movable parts should have their switches locked and be securely fixed during inspection;
- c) Disconnect the power supply to the pressure vessel and set up clear safety warning signs;
- d) Clean or remove any auxiliary parts or other objects that may affect the inspection, in accordance with the inspection requirements;
- e) Erect scaffolding, lightweight ladders, and other facilities that meet the inspection requirements;
- f) The surfaces to be inspected should be thoroughly cleaned, especially corroded areas