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NB

**ENERGY INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

NB/T 47057-2017

Replacing JB/T 4781-2005

Tank containers for liquefied gases

液化气体罐式集装箱

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Foreword

This document was issued on 28 March 2017 by the National Energy Administration of the PRC and takes effect on 1 August 2017.

It is a NB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

It is classified under ICS 23.020.01, Chinese classification J74.

It replaces JB/T 4781-2005, which is superseded.

This standard was drafted in accordance with the rules given in GB/T 1.1-2009 Directives for standardization-Part 1: Structure and drafting of standards.

This standard supersedes JB/T 4781-2005 Tank containers for liquefied gases. Compared with JB/T 4781-2005, the main technical changes are as follows.

a) Scope: the requirement on design temperature was deleted, and the delimitation of tanks

with a tank volume of not less than 1 cubic metre was added.

b) Terms and definitions: 7 terms such as working pressure and design pressure were deleted, and 4 terms such as liquefied gas were added.

c) Qualification and responsibilities: the former clause 'General' was renamed 'Qualification and responsibilities'; the responsibilities of the user or design client were added, and the requirements on the qualification and responsibilities of the design unit and the manufacturing unit were modified.

d) Materials: the requirements for steel plates, steel forgings, steel pipes and fittings, bulk insulating materials and welding materials for the tank were modified, and a low-temperature impact requirement at minus 20 degrees C for frame materials was added.

e) Design: the requirements on maximum permissible filling mass and minimum design metal temperature were modified; the design-by-analysis method, four media such as dimethyl ether, and leak test requirements were added.

f) Safety accessories, instruments and loading/unloading accessories: the requirements for safety accessories, instruments and loading/unloading accessories were modified.

g) Manufacture: the requirements on welded joints, material re-inspection, cold and hot forming, assembly, welding, non-destructive testing and heat treatment were modified, and Category E welded joints were added.

h) Test methods: ammonia leak detection, halogen leak detection and helium leak detection test methods were added.

i) Inspection rules: the requirement for batch inspection was deleted, and the conditions for exemption from the type test were added.

j) Annexes: two annexes, 'Declaration of conformity to the standard and revisions' and 'Risk assessment report', were added; the two former annexes 'Format and content of the product quality certificate' and 'Format of the test report' were deleted; the former annex 'Design calculation of pressure relief devices' was changed to 'Calculation of the tank safety relief capacity and the discharge capacity of pressure relief devices', and the requirements on the tank safety relief capacity and the discharge capacity of pressure relief devices were modified.

This standard was proposed by and is under the jurisdiction of the National Technical Committee on Boilers and Pressure Vessels of Standardization Administration of China (SAC/TC 262).

The drafting of this standard was organized by the Subcommittee on Transportable Pressure Vessels of the National Technical Committee on Boilers and Pressure Vessels of Standardization Administration of China (SAC/TC 262/SC4).

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The previous edition of the standard superseded by this standard is JB/T 4781-2005.

This standard was approved and issued by the National Energy Administration by Announcement No. 6 of 2017, dated 28 March 2017, together with 158 other industry standards (34 NB energy standards, 39 DL electric power standards and 86 SY petroleum standards); boiler and pressure vessel standards are published and distributed by Xinhua Publishing House.

1 Scope

NB/T 47057-2017 governs steel tank containers for liquefied gases, replacing JB/T 4781-2005. These are the ISO-framed pressure tanks that carry propane, butane, ammonia, chlorine, LPG mixtures and similar gases liquefied under pressure at ambient temperature, moved by road, rail and sea. The standard applies to tanks with a design pressure of at least 0.1 MPa and a volume of at least one cubic metre; it excludes tanks in non-ferrous or non-metallic materials, vacuum-insulated tanks, and military use. It sets the scope, some fifty-seven normative references and the defined terms, then the qualification and responsibilities of the designer, the manufacturer and the inspection body. Materials are specified for the shell, heads, frame and fittings - carbon, low-temperature and austenitic stainless plates by grade - with the impact energy required at the design temperature. Design covers the shell under internal pressure and under the dynamic load cases of intermodal transport, the heads, openings and reinforcement, the frame and its connection to the tank, the filling ratio for each gas, and the sizing of the service equipment: valves, emergency shut-off, pressure relief devices, level and pressure gauges. Fabrication, welding and heat treatment, non-destructive examination, the hydraulic and leak tests, the frame tests for lifting, stacking and impact, marking, delivery documentation and storage complete the standard. It applies to tank containers built in China.

1.1 This standard specifies the requirements for the materials, design, manufacture, test methods, inspection rules, marking, delivery documents, and storage and transportation of tank containers for liquefied gases (hereinafter referred to as tank containers).

1.2 This standard is applicable to steel tank containers with a design pressure of not less

than 0.1 MPa and a tank volume of not less than 1 cubic metre.

1.3 This standard is not applicable to the following tank containers: those whose tank material is a non-ferrous metal or a non-metal; those whose tank is of vacuum-insulated construction; and those with special requirements, such as national defence and military equipment.

1.4.1 The tank container covered by this standard includes the tank, piping, safety accessories, instruments, loading and unloading accessories, as well as the frame, supports and the like.

1.4.2 The boundaries of the tank are as follows: a) the groove face of the first circumferential joint where the tank is connected to piping by welding; b) the end face of the first threaded joint where the tank is connected to piping or safety accessories by threads, or the first flange sealing face where connected by flanges; c) the end caps, plugs and their fasteners of openings in the tank; d) the welds connecting the tank to non-pressure parts.

1.4.3 The main pressure parts include the shell, the heads, and pressure-bearing nozzles with a nominal diameter of not less than 50 mm, bosses, flanges, flange covers and the like.

1.4.4 The piping includes all pipes and fittings connected to the tank.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the edition cited applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 150.1 Pressure vessels-Part 1: General requirements

GB/T 150.2 Pressure vessels-Part 2: Materials

GB/T 150.3 Pressure vessels-Part 3: Design

GB/T 150.4-2011 Pressure vessels-Part 4: Fabrication, inspection and testing, and acceptance

GB/T 196 General purpose metric screw threads-Basic dimensions

GB/T 197 General purpose metric screw threads-Tolerances

GB/T 567.1 Bursting disc safety devices-Part 1: Basic requirements

GB/T 567.2 Bursting disc safety devices-Part 2: Application, selection and installation

GB/T 567.3 Bursting disc safety devices-Part 3: Classification and installation dimensions

GB/T 713 Steel plates for boilers and pressure vessels