ICS 23.020.01
CCS J 74

NB

ENERGY INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

NB/T 47059-2017

Replacing JB/T 4784-2007

Tank containers for refrigerated liquefied gas

冷冻液化气体罐式集装箱

Issued on: November 15, 2017 **Implemented on: March 1, 2018**

Issued by: National Energy Administration of the PRC

Table of Contents

Foreword

This document was issued on 15 November 2017 by the National Energy Administration of the PRC and takes effect on 1 March 2018.

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 J 74.

It replaces JB/T 4784-2007, which is superseded.

This standard has been 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 replaces JB/T 4784-2007, Tank containers for cryogenic liquid. Compared with JB/T 4784-2007, the main technical changes are as follows.

a) Title of the standard: the former title Tank containers for cryogenic liquid has been changed to Tank containers for refrigerated liquefied gas.

b) Scope: the range of non-application, the delimitation of the boundaries of the tank container and of the tank, and the delimitation of the main pressure-bearing components have been added.

c) Terms and definitions: sixteen terms and definitions, such as cryogenic liquid and insulation layer, have been deleted, while ten terms and definitions, such as high vacuum multilayer insulation and refrigerated liquefied gas, have been revised or added.

d) Qualification and responsibilities: the former clause Responsibilities has been changed to Qualification and responsibilities; the responsibilities of the user or of the party commissioning the design have been added, and the content of the requirements on the responsibilities of the design and manufacturing organizations has been revised and completed.

e) Materials: the requirements for steel plates, steel forgings, steel pipes and pipe fittings, welding consumables, insulating materials, adsorbent materials and interspace support materials used for the tank have been revised, and requirements for sealing gasket materials have been added.

f) Design: the design requirements for loads, design temperature, design pressure, frame, piping and so on have been revised, and requirements for the design by analysis method, the minimum design metal temperature, the minimum thickness of the tank and the maximum permissible filling quantity have been added.

g) Safety accessories, instruments and loading and unloading accessories: the types of safety accessories, instruments and loading and unloading accessories have been listed explicitly, and the related technical requirements have been revised.

h) Fabrication: the requirements for the classification of welded joints, re-inspection of materials, cold and hot forming, assembly, welding and non-destructive testing have been revised, and requirements for class E welded joints and for the coating of the tank have been added.

i) Test methods: the ammonia leak test, the halogen leak test and the helium leak test methods have been added.

j) Inspection rules: the requirements of the inspection rules have been revised, and a table of inspection items and technical requirements has been added.

k) Marks and markings: the specific requirements for marks and markings have been revised.

l) Annexes: the two annexes Statement of compliance with the standard and its revisions and Risk assessment report have been added; the three former annexes Test method for

holding time, Format and content of the product quality certificate and Physical property parameters of common cryogenic liquids have been deleted; the former Annex A, Design calculation of the safety relief device, has been changed into Annex C, Calculation of the safety relief quantity of the tank and of the discharge capacity of the overpressure relief devices, and the content of the calculation of the safety relief quantity of the tank and of the discharge capacity of the overpressure relief devices has been revised.

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).

Attention is drawn to the possibility that some elements of this document may be the subject of patent rights. The issuing body of this document shall not be held responsible for identifying such patent rights.

This standard was organized and drafted 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).

Drafting organizations of this standard: Nantong CIMC Energy Equipment Co., Ltd.; Shanghai Gas Industry Association; China Special Equipment Inspection and Research Institute; Shanghai Huayi Group Equipment Engineering Co., Ltd.; Zhangjiagang Branch of the Jiangsu Province Special Equipment Safety Supervision and Inspection Institute; Jiangxi Oxygen Plant Co., Ltd.; China Classification Society; Zhangjiagang CIMC Sanctum Cryogenic Equipment Co., Ltd.; Shanghai Special Equipment Supervision and Inspection Technical Institute; Shijiazhuang Enric Gas Equipment Co., Ltd.; Ningbo Mingxin Chemical Machinery Co., Ltd.; Zhangjiagang Hanzhong Deep Cooling Technology Co., Ltd.; Tieling Huanghai Special Purpose Vehicle Manufacturing Co., Ltd.

Main drafters of this standard: Yang Yang, Zhou Weiming, Luo Yongxin, Teng Junhua, Chen Zhaohui, Wang Fei, He Hua, Chen Yanshan, Lai Yongcai, Liu Gencang, Tang Xiaoying, Wang Hongxia, Wen Qing, Qin Feng and Chen Liyan.

The previous editions of the standard replaced by this standard are as follows: JB/T 4784-2007.

1 Scope

NB/T 47059-2017 covers tank containers for refrigerated liquefied gas, replacing JB/T 4784-2007. These are the ISO-framed vacuum-insulated tanks that move LNG, liquid oxygen, nitrogen, argon and ethylene by road, rail and sea: an inner vessel at cryogenic temperature, an outer jacket, and the vacuum and multilayer insulation between them, all inside a container frame that has to meet the handling and stacking loads of intermodal transport. The standard fixes the qualification and responsibilities of the designer, manufacturer and inspection body, then the materials permitted for the inner vessel, the

outer jacket and the frame, with the low-temperature toughness required and the allowable stresses at service temperature. Design follows: the inner vessel for internal pressure and for the external pressure of the vacuum, the outer jacket for collapse, the supports that carry the inner vessel while conducting as little heat as possible, the frame for the transport load cases, and the sizing of the piping, valves, pressure relief and instrumentation. The insulation system, the vacuum and its measurement, and the evaporation rate that proves the insulation works are all specified. Fabrication and welding, non-destructive examination, pressure and leak testing, the thermal performance test, marking and the documentation delivered with the unit complete the standard. It applies to tank containers built in China for refrigerated liquefied gas service.

1.1 This standard specifies the requirements for the materials, design, fabrication, test methods, inspection rules, marks and markings, documents delivered with the product, storage and transport of tank containers for refrigerated liquefied gas (hereinafter referred to as tank containers).

1.2 This standard applies to tank containers in which the design pressure of the inner vessel of the tank is not less than 0.1 MPa, the geometric volume is not less than 1 cubic metre, a vacuum powder insulation structure or a high vacuum multilayer insulation structure is adopted, and the tank is permanently connected to the frame.

1.3 This standard does not apply to tank containers falling within the following ranges.

1.3 a) Tank containers whose tank material is a non-ferrous metal or a non-metallic material.

1.3 b) Tank containers filled with a refrigerated liquefied gas medium whose standard boiling point is lower than minus 196 degrees Celsius.

1.3 c) Tank containers filled with toxic media.

1.3 d) Tank containers with special requirements, such as those for national defence and military equipment.

1.4 Delimitation of the boundaries.

1.4.1 The tank containers covered by this standard include, within their boundaries, the tank, the piping, the safety accessories, the instruments, the loading and unloading accessories, the self-pressurizer, the frame, the supports and the operating box.

1.4.2 The boundaries of the tank are delimited as follows.

1.4.2 a) The bevelled end face of the first circumferential joint where the tank is welded to the external piping.

1.4.2 b) The end face of the first threaded joint where the tank is connected by threads to the external piping or to the safety accessories, and the first flange sealing face where the connection is flanged.