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

GB/T 4732-1984

**Pressure vessels design by analysis - Part 1: General
requirements
(English Translation)**

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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.

This document is Part 1 of GB/T 4732 "Analysis and Design of Pressure Vessels". GB/T 4732 has been published in the following parts.

- Part 1: General requirements;
- Part 2: Materials;
- Part 3: Formula method;
- Part 4: Stress classification method;
- Part 5: Elastic-plastic analysis methods;
- Part 6: Manufacturing, inspection and acceptance.

Introduction

GB/T 4732 "Analysis and Design of Pressure Vessels" provides the requirements for the construction of pressure vessels according to the analysis and design method. GB/T 150 is based on the rule design concept puts forward the requirements for the construction of pressure vessels. Pressure vessel design and manufacturing units can choose two construction methods according to the specific design conditions.

One of the standards implements the construction of pressure vessels.

GB/T 4732 consists of 6 parts.

--- Part 1: General requirements. The purpose is to provide general requirements for pressure vessels built according to analysis and design, including relevant management requirements.

Requirements, common terms and definitions, and basic requirements shared by other parts of GB/T 4732.

--- Part 2: Materials. The purpose is to give the relevant requirements and material properties of steel materials in pressure vessels built according to analysis and design.

Energy data, etc.

--- Part 3: Formula method. The purpose is to give typical pressure components and structural design requirements of pressure vessels built according to analytical design.

The thickness calculation formulas for commonly used container parts designed by the formula method are specifically given. GB/T 4732.3 can be used as the design basis of GB/T 4732.4 and GB/T 4732.5 can also be simplified and completed according to GB/T 4732.3.

Analysis design.

--- Part 4: Stress classification method. The purpose is to give the stress classification method used in pressure vessels built according to analysis and design.

Design related regulations.

--- Part 5: Elastic-plastic analysis method. The purpose is to give the elastic-plastic analysis method used in pressure vessels built according to analytical design.

Relevant provisions for design in accordance with the law.

--- Part 6: Manufacturing, inspection and acceptance. The purpose is to give the structural types of pressure vessels built according to analysis and design.

Manufacturing, inspection and acceptance requirements for devices.

GB/T 4732 includes the pressure vessel construction process based on the analysis and design method (i.e. materials, design, manufacturing, inspection, testing and verification).

GB/T 4732 does not need to and cannot cover all the technical requirements and special prohibition regulations that need to be followed in the collection work.

All technical details of the pressure vessel construction, therefore, under the premise of meeting the basic safety requirements specified in the safety technical specifications, there is no restriction. There is no special mention of technical content in GB/T 4732. GB/T 4732 cannot be used as a technical manual for the construction of specific pressure vessels, nor can it be used as a technical manual for the construction of specific pressure vessels.

Alternative training, engineering experience and engineering evaluation. An engineering evaluation is a review of a specific Technical evaluation of products. Engineering evaluation needs to comply with the relevant technical requirements of GB/T 4732.

GB/T 4732 does not restrict the use of other advanced technical methods in actual engineering construction, but engineering and technical personnel use advanced technical methods.

Reliable judgment is needed when applying the law to ensure that it meets the requirements of GB/T 4732.

GB/T 4732 neither requires nor restricts designers to use computer programs to analyze and design pressure vessels, but the use of computers is when analyzing and designing the program, in addition to meeting the requirements of GB/T 4732, it is also necessary to confirm.

- Reasonableness of the technical assumptions in the adopted procedures;
- The applicability of the adopted procedures to the design content;
- The correctness of the program input parameters and output results used for engineering design.

When performing stress analysis and design calculations, you can choose or not to use GB/T 4732.3 as the design basis, and then use GB/T 4732.4 or GB/T 4732.5 to conduct specific design calculations to determine whether the design calculation requirements for preventing structural failure are met.

Component thickness or local structural dimensions. When GB/T 4732.4 or GB/T 4732.5 is used independently as the design basis, there is no need to satisfy.

Pressure vessel analysis and design Part 1: General requirements

1 Scope

1.1

GB/T 4732 specifies the construction requirements for steel pressure vessels (hereinafter referred to as "vessels") designed using the analytical design method, and provides Design method based on failure mode based on elastic stress analysis or elastoplastic stress analysis.

General requirements for materials, design, manufacture, inspection and acceptance of vessels designed in accordance with this law.

1.2

GB/T 4732 Applicable design pressure.

- a) Containers with a pressure greater than or equal to 0.1 MPa and less than 100 MPa;
- b) Containers with a vacuum degree greater than or equal to 0.02MPa.

1.3

The applicable design temperature range of GB/T 4732 is determined according to the applicable temperature range of each part.

1.4

The following containers are not within the scope of application of GB/T 4732.

- a) Containers with a design pressure less than 0.1 MPa and a vacuum degree less than 0.02 MPa;
- b) Pressure chambers that are integral or part of rotating or reciprocating mechanical equipment (e.g. pump casings, compressor casings, turbine housings, etc.) housing, hydraulic cylinder, etc.);
- c) Containers in nuclear power plants that are at risk of failure due to neutron radiation damage;
- d) direct flame heated vessels;
- e) Inner diameter (for non-circular cross-sections, it refers to the maximum geometric dimension of the inner boundary of the cross-section. For example, for a rectangle, it is the diagonal line; for an ellipse, it is the major axis) for 150mm container.

1.5 Container Structure Defining Scope

1.5.1

Connection between container and external pipeline.

- a) The first circumferential joint groove end face of the welded connection;
- b) The first threaded joint end face of the threaded connection;
- c) The first flange sealing surface of the flange connection;
- d) The first sealing surface of a special connector or pipe connection.

1.5.2

Pressure-bearing heads, flat covers and their fasteners for connecting pipes, manholes, handholes, etc.

1.5.3

Connecting welds between non-pressure components and pressure components.