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National Standard of the People's Republic of China

GB 150—1998

Steel Pressure Vessels

Issued on 1998-03-20 Enforced on 1998-10-01

Issued by China State Bureau of Technical Supervision

CONTENTS

FOREWORD

This Standard is the revised edition of GB150-89.

The content variations of this Standard, based upon the practical experiences since the implementation of GB150-89 in conjunction with the applicable provisions of recent International Codes by reference, are prescribed as follows:

(1) Partial contents of GB150-89 such as Chapter 8 "Horizontal Vessels", Chapter 9 "Vertical Vessels", Annex E "U-Shaped Expansion Joint", Annex F "High-Order Vibration Modes of Vertical Vessels", Annex H "Liquid Penetrate Examination in Steel Pressure Vessels", and Annex L "Calculation Examples" are deleted in this Edition, all of those except Annex L are covered in other National Standards or Industrial Standards;

(2) Some new contents such as "FOREWORD", "Normative Standards" and Annex H are added in this Edition;

(3) Contents in 1.1 of GB150-89 are reedited in Chapter 1 "Scope" of this Edition; those in 1.2 of GB150-89 are deleted. All the rest of Chapter 1 of GB150-89 are covered by Chapter 3 "General Requirements" of this Edition;

(4) In Chapter 3 of this Edition, the variations relative to the corresponding Chapter 1 of GB150-89 are such that: "Calculating Pressure" is defined; the definitions of "Minimum Thickness" and "Calculated Thickness" are revised; the selection of corrosion allowance is definitely determined; the explanations of selecting "Allowable Stress" are consistent with that in JB4732 *Steel Pressure Vessels – Design by Analysis*; the restriction of $(p+0.1)$ on static pressure test is deleted and the requirements of static pressure test for large vessels are determined;

(5) In Chapter 4 of this Edition, the variations relative to the corresponding Chapter 2 of GB150-89 are based upon those of Material Standards, so that some steel designations are added or deleted. In addition, the technical requirements for stainless steel clad plate are added; the provisions for ultrasonic examination on steel plate is strictly defined as per piece;

(6) In Chapter 5 of this Edition, the contents of "Calculations for combined stresses in cylindrical and spherical shells" in the corresponding Chapter 3 of GB150-89 are deleted;

(7) In Chapter 6 of this Edition, the variations relative to the corresponding Chapter 4 of GB150-89 dealing with the conditions for the calculation of cylindrical shell and tube subjected to external pressure are such that: the values of $D_o/\delta_e \geq 10$ and $D_o/\delta_e < 10$ shall be changed to $D_o/\delta_e \geq 20$ and $D_o/\delta_e < 20$ respectively;

(8) In Chapter 7 of this Edition, a new Paragraph of 7.2.5.2 "Calculations for conical section subjected to external pressure" relative to the corresponding Chapter 5 of GB150-89 is added;

(9) In Chapter 8 of this Edition, the variations relative to the corresponding Chapter 6 of GB150-89 are such that: the provisions for opening diameter requiring no reinforcement are revised; and the Paragraph "An alternate method for the design of opening reinforcement" is deleted;

(10) In Chapter 10 of this Edition, the contents dealing with the requirements of forged-welded pressure vessels and that of postweld heat treatment procedure are added;

(11) In Annex C, the provisions for low temperature vessels of austenitic stainless steel is added;

(12) In Annex H, some materials are transferred to this Informative Annex from Annex A.

This Standard shall be used in lieu of GB150-89 beginning with the date of implementation.

The Annex A, B, C, D and E are the Normative Annex.

The Annex F, G, H and J are the Informative Annex.

This Standard is prepared and directed by the China National Standardization Committee on Pressure Vessels (CNSCPV).

The China National Standardization Committee on Pressure Vessels (CNSCPV) Secretariat has the authority to organize and formulate this Standard. The participating members and corresponding Units for formulating are listed as follows:

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This Standard was firstly issued in February 1989 and reedited as the first revised edition in February 1998.

The China National Standardization Committee on Pressure Vessels (CNSCPV) has the authority to provide official interpretations of this Standard.

National Standard of the People's Republic of China

GB 150—1998
Replace GB150—89

Steel Pressure Vessels

1 SCOPE

This Standard specifies all applicable requirements for design, fabrication, testing and inspection, and acceptance of steel pressure vessels.

1.1 This Standard is applicable to vessels designed for pressure not exceeding 35 MPa.

1.2 This Standard is applicable to vessels with the design temperature range identical to the allowable service temperature of steel selected.

1.3 The following classes of vessels are exempted from the scope of this Standard:

(a) fired process vessels;
(b) vessels subject to nuclear radiation;
(c) pressure containers which are integral parts or components of rotating or reciprocating mechanical devices, such as pumps, compressors, turbines and hydraulic cylinders etc.;
(d) vessels frequently transported;
(e) vessels having design pressure not exceeding 0.1 MPa;
(f) vessels having vacuum less than 0.02 MPa;
(g) vessels having an inside diameter, width, height or cross section diagonal not exceeding 150 mm;
(h) vessels requiring fatigue analysis;
(i) vessels covered in other Industrial Standards, such as specific vessels and enamel vessels used in industries of refrigeration, sugar making, pulp and paper making, beverage etc..

1.4 When the construction dimensions of pressure parts can not be determined by this Standard, at least one of the following design procedures, which shall be evaluated and approved by the China National Standardization Committee on Pressure Vessels, is permitted:

—stress analysis including the finite element method;
—experimental analysis for verification such as experimental stress analysis, hydraulic test for verification;
—empirical design compared with the practical constructions.

Approved by China State Bureau of Technical Supervision on 1998-03-20

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