

ICS 19.100
CCS J 04



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

GB/T 18182-2025

Replacing GB/T 18182-2012

**Acoustic emission examination and evaluation of metallic
pressure vessels**

金属压力容器声发射检测及结果评价方法

Issued on: October 31, 2025

Implemented on: October 31, 2025

**Issued by: State Administration for Market Regulation;
Standardization Administration of China**

Table of Contents

1.Scope	1
2 Normative References	1
3.Terms and Definitions	1
4.Methodology Summary	2
5.Personnel Qualifications	2
6.Equipment and Materials	2
7.Testing Procedures	3
11 Appendix B (Normative) Sensitivity Evaluation Method for Acoustic Emission Systems	13

Foreword

This document conforms to GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting is scheduled. This document replaces GB/T 18182-2012 "Methods for Testing and Evaluating Acoustic Emission of Metal Pressure Vessels", and is consistent with GB/T 18182- Compared to.2012, aside from structural adjustments and editorial changes, the main technical changes are as follows:

a) Increased requirements for the channel coverage and detection sensitivity of the acoustic emission detection system [see

b) Added requirements for acoustic emission detection digital pressure gauges and pressure monitoring (see 6.2);

c) The sensor selection requirements in the technical preparation before the start of the test have been changed, and the diameter and hardness of the lead-core acoustic emission simulation source have been modified. The requirements were also specified, and the amplitude range of the model source was limited (see 7.2,.2012 edition 7.2).

d) Added requirements for the "sensitivity factor (Kcats)" of acoustic emission instruments in positioning calibration and reporting [see

7.5.3 and 10.2]. k)], added a method for evaluating the sensitivity of acoustic emission systems (see Appendix B);

e) Increased quantitative requirements for processing changes in acoustic emission signal amplitude and energy with test pressure during the detection process (see 7.6.2.2);

- f) An additional requirement has been added that on-site verification is required when more than 10 acoustic emission events occur in the acoustic emission location source area during the detection process. (See 7.7.3);
- g) The quantitative requirements for improving the activity level have been changed (see 8.2,.2012 edition of 8.2).
- h) Added a calculation method when the number of acoustic emission signals in the source region is less than 5 when calculating the intensity of the acoustic emission localization source (see 8.3).
- i) A reference strength classification for metallic materials with yield strengths differing from Q345R by $\pm 10\%$ has been added (see 8.3).
- j) The method for re-inspecting Class III or IV acoustic emission locators has been changed (see 9.3, 9.1 in the.2012 edition).

1 Scope

GB/T 18182-2025 is the Chinese national standard on acoustic emission examination and evaluation of metallic pressure vessels, in the field of testing. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 31 October 2025 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 31 October 2025. Classification: ICS 19.100, CCS J 04. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document describes the acoustic emission detection and result evaluation method for metal pressure vessels under load. This document applies to acoustic emission testing of active defects in metal pressure vessels under construction and in use. It also applies to boilers, pressure piping, and other metal components. The acoustic emission testing shall be performed in accordance with the reference procedure.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are listed below. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 9445 Qualification and Certification of Nondestructive Testing Personnel

GB/T 12604.4 Nondestructive Testing Terminology. Acoustic Emission Testing

GB/T 19800 Primary Calibration of Acoustic Emission Testing Transducers for Nondestructive Testing

GB/T 19801 Nondestructive testing - Acoustic emission detection - Secondary calibration of acoustic emission sensors

GB/T 20737 General Terms and Definitions for Nondestructive Testing

GB/T 35013 Evaluation of the suitability of pressure equipment for use NB/T 47013.2 Non-destructive testing of pressure equipment - Part

2. Radiographic testing NB/T 47013.3 Non-destructive testing of pressure equipment - Part

3. Ultrasonic testing NB/T 47013.4 Non-destructive testing of pressure equipment - Part

4. Magnetic particle testing NB/T 47013.5 Non-destructive testing of pressure equipment - Part

5. Penetrant testing NB/T 47013.6 Non-destructive testing of pressure equipment - Part

6. Eddy current testing NB/T 47013.7 Non-destructive testing of pressure equipment - Part

7. Visual inspection NB/T 47013.10 Non-destructive testing of pressure equipment - Part

10. Ultrasonic testing by time-of-flight diffraction method NB/T 47013.15 Non-destructive testing of pressure equipment - Part

3 Terms and Definitions

The terms and definitions defined in GB/T 12604.4 and GB/T 20737, as well as the following terms and definitions, apply to this document.

3.1 acoustic emission source The physical source or location of transient elastic waves generated by the rapid release of energy in a material.

3.2 Acoustic emission location source The location of the acoustic emission source on the inspected part is determined by analyzing the acoustic emission data.

Note. Commonly used source localization methods include area localization, computational localization, and continuous signal localization.

3.3 active activity The degree to which the number of events of an acoustic emission source changes with the loading process or time.