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

GB/T 45878-2025

**Metallic materials - Fatigue testing - Axial plane bending
method**

金属材料 疲劳试验 轴向平面弯曲方法

(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 modified to adopt ISO 22407:2021 "Metallic materials - Fatigue testing - Axial plane bending method".

The technical differences between this document and ISO 22407:2021 and their reasons are as follows.

--- Adjust the fatigue test requirements for controlled atmospheric conditions from the scope to the test plan, and add normative Appendix B, citing international standards The relevant content of 2.1 in ISO 554:1976 is presented in table form to facilitate the use of the standard (see Chapter 6, Appendix B).

- ISO 7500-1 is replaced by the normative reference GB/T 16825.1 to adapt to my country's technical conditions (see 8.1.2);
- Added reference to JJG556 to adapt to my country's technical conditions (see 8.1.2);
- Deleted ASTM E2309/E2309M and added reference to JJG 475 to adapt to my country's technical conditions (see 8.1.3).
- When specimen fracture is used as the failure criterion, the fracture position of the specimen is clearly defined to facilitate standard use (see 11.6.1). The following editorial changes have been made to this document.
- Added informative references to GB/T 3505 and GB/T 10610 (see 7.3.2.1);
- Added informative reference GB/T 24176 (see Chapter 12);
- Move Figures 1 to 7 of the international standard forward to the main text (see 3.2, 3.6, 3.9, 3.15, 10.1, 11.1), and adjust the order of the content of Figure 5 Adjust to make it more consistent with the context logic.

1 Scope

This document specifies the axial force or displacement of metal material specimens (without intentional introduction of stress concentration) at room temperature (between 10°C and 35°C) Control conditions for plane bending fatigue tests.

This document is applicable to axial plane bending fatigue tests on rectangular and oblique cross-section specimens, product components and other special shape specimens. Testing is not included.

This document does not apply to reverse or partial loading tests. The purpose of the test is to provide relevant results, such as the stress ratio, given material conditions, The relationship between applied stress and number of cycles to failure under the condition of the components (such as hardness and microstructure).

Therefore, this document is not suitable for fatigue testing of notched specimens. However, the fatigue test procedures described in this document can be applied to Appendix A. Fatigue test on notched specimens.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 16825.1 Inspection and calibration of static uniaxial testing machines for metallic materials Part 1: Tension and/or compression testing machines Inspection and calibration of force measurement systems (GB/T 16825.1-2022, ISO 7500-1:2018, IDT)

JJG475 Verification Procedure for Electronic Universal Testing Machines

JJG556 Verification Procedure for Axial Force Fatigue Testing Machine

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1

The thickness of a specimen with a rectangular cross section or the thickness of a specimen with an oblique cross section.

Note: See Figures 1 and 2.

3.2 Test cross-section width

The width of a specimen with a rectangular cross section or the width of a specimen with an oblique cross section.

Note: See Figures 1 and 2.