

WES

**WELDING
ENGINEERING
STANDARD**

Translated by

Method for ultrasonic fatigue testing in metallic

materials Committee

The Japan Welding Engineering Society

WES 1112: 2022

**Method for ultrasonic fatigue testing in
metallic material**

WES 1112 (Method for ultrasonic fatigue testing in metallic materials (English Version))

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Published : March 1, 2017

Revised : March 1, 2022

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Foreword

The Japan Welding Engineering Society standard (hereinafter called **WES**) has been established through a consensus standards development process in accordance with statute and rules of the Japan Welding Engineering Society. Draft **WES** is discussed at the Standard committee after the public hearing. Publication as a **WES** requires approval by the council of the Japan Welding Engineering Society. With this, **WES 1112:2017** is revised and replaced by this standard.

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WES 1112: 2022

Welding Engineering Standard

Method for ultrasonic fatigue testing in metallic materials

Introduction

The Atomic Energy Research Committee of the Japan Welding Engineering Society established the subcommittees for “Research on High Cycle Fatigue Strength of Nuclear Component Materials (GCF),” “Research on High Cycle Fatigue Strength of Power Plant Component Materials (GCF2),” and “Study on Evaluation of Giga-cycle Fatigue (GCF) [Phase I] (GCF3)” between 2000 and 2011. In these subcommittees, high cycle fatigue testing was conducted on austenitic stainless steel, carbon steel and low-alloy steel, which are the primary materials used in power plants. Based on technologies developed in these subcommittees, this standard was first established in 2017 to contribute to the widespread adoption of ultrasonic fatigue testing methods. It was editorially revised in 2022, mainly owing to a withdrawal of normative reference.

1 Scope

This standard applies to two methods of ultrasonic fatigue testing—i.e., axial loading by longitudinal oscillation and torsional loading by torsional oscillation—for metallic materials with a fatigue life of 10^7 or more at room temperature.

Note: Ultrasonic fatigue testing is a technique to measure the fatigue life of materials by applying ultrasonic oscillations at a frequency to resonate the specimen for cyclic loadings.

2 Normative references

The following documents, in whole or part, are referenced in this document, and are indispensable to its application. For dated references, only the edition cited applies. For undated references, the latest edition of each referenced document (including any amendments) applies:

JIS B 7721 Tension/compression testing machines—verification and calibration of the force-measuring system

JIS C 1602 Thermocouples

JIS C 1612 Test methods for radiation thermometers

JIS Z 2273:1978 General rules for fatigue testing of metals

3 Terms and definitions

For the purposes of this document, the terms and definitions given in **JIS Z 2273:1978** and the following