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**JIS Z 3147** : 2017

**High-speed rotating bar bending  
fatigue testing of aluminium alloys  
and magnesium alloys**

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## Foreword

This Japanese Industrial Standard has been established by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law.

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It should be noted that being in conformance with this Standard may come under the use of the patent rights held by the following:

- Title of invention: Fatigue testing device
- Patent application number: 2016-033359
- Name: Yamamoto Metal Technos Co., Ltd.
- Address: 2-4-7, Setoguchi, Hirano-ku, Osaka-shi, Osaka, Japan

The relevant holders of the above-mentioned patent rights have indicated an intention of granting license to anyone under the nondiscriminatory and reasonable conditions, except to the other relevant holders of the patent rights related to this Standard who will not grant their licenses under the same conditions.

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The “patent rights” as mentioned here include patent right, application for a patent after opening to the public or utility model right.

# High-speed rotating bar bending fatigue testing of aluminium alloys and magnesium alloys

## 1 Scope

This Japanese Industrial Standard specifies the method of high-speed rotating bar bending fatigue testing at room temperature and at a frequency of over 5 000 cycles/min up to and including 8 000 cycles/min (hereafter referred to as high-speed test) for obtaining the fatigue life in the high cycle range, in which the number of cycles is over  $10^7$  up to and including  $10^9$ , for the base material and junction of structural aluminium alloys and structural magnesium alloys used for rolling stock, marine vessels, automobiles, etc.

The high-speed test method specified in this Standard is applicable to the tests in which the number of cycles is  $10^7$  or under.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. For standards with the year indication, only the editions of the indicated year shall be applied and the revisions (including amendments) made thereafter shall not be applied. For those without the indication of the year, the most recent edition (including amendments) shall be applied.

JIS H 4000 *Aluminium and aluminium alloy sheets, strips and plates*

JIS H 4100 *Aluminium and aluminium alloy extruded profiles*

JIS H 4140 *Aluminium and aluminium alloy forgings*

JIS H 4201 *Magnesium alloy sheets, plates and strips*

JIS H 4204 *Magnesium alloy extruded shapes*

JIS H 4205 *Magnesium alloy forgings*

JIS H 5202 *Aluminium alloy castings*

JIS H 5203 *Magnesium alloy castings*

JIS H 5302 *Aluminium alloy die castings*

JIS H 5303 *Magnesium alloy die castings*

JIS R 6010 *Coated abrasive grain sizes*

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

JIS Z 2274:1978 *Method of rotating bending fatigue testing of metals*

## 3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS Z 2273:1978**, and the following apply.

### 3.1 standard test piece

test piece for the high-speed test classified as Class I