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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 6398-2017

Metallic materials -- Fatigue testing -- Fatigue crack growth method

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Table of Contents

Foreword

This standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GB/T 6398-2000 "Test method for fatigue crack growth rate of metallic materials", compared with GB/T 6398-2000

The main technical changes are as follows.

- modified the scope of application of the standard (see Chapter 1);

- modified normative reference documents (see Chapter 2);

- modify the symbols, define them, divide them into terms and definitions, symbols and instructions (see Chapter 3, Chapter 4,.2000, Chapter 3);

--- modified the type of specimen (see Chapter 5,.2000, Chapter 4);

--- modified test equipment requirements (see Chapter 6,.2000, Chapter 5);

- the requirements of the test procedure have been modified. This standard uses the test procedure in Chapter 7 and the length of the crack in Chapter 8 to describe the

Claim;

- modified the processing and calculation of the test results (see Chapter 9,.2000, Chapter 7, Chapter 8);

- the criteria for the validity of the test data were deleted; the criteria for the validity of the test data for the high strain hardening material were removed;

The contents of the stress intensity factor calculation part;

- delete the original standard Appendix A content; the original standard Appendix D as Appendix A (informative); the original standard Appendix E

As Appendix D of this standard (informative appendix); Appendix F of the original standard as Appendix E of this standard (informative appendix);

Standard appendix C (informative) Requirements for test procedures for fatigue crack

propagation rate testing in aqueous media.

This standard uses the re-drafting method to modify ISO 12108..2012 "Fatigue Test Fatigue Crack Growth Method for Metallic Materials".

The main structure is consistent with international standards. This standard has been modified and supplemented to ISO 12108..2012, and in the text they are

The blanks of the terms involved are identified by vertical lines.

--- on the normative reference documents, this standard has made a technical differences in the adjustment to meet China's technical conditions, adjust the situation

The situation is reflected in Chapter 2, "Normative references", as follows.

Replace GB 4965.1 (see 6.1.1) with GB/T 25917 with international standard modification;

* Added references to GB/T 10623 (see Chapter 3);

* Added reference to GB/T 16825.1 (see 6.1.3);

* The increase refers to ISO 23788 (see 6.1.2).

- the terms and definitions of increasing the length of the pre-crack (see 3.20);

--- correct ISO 12108..2012 error, ISO 12108..2012 "deltaKth is defined as the crack propagation rate equal to

10-8 mm/cycle corresponding to the deltaK value ", modified to" deltaKth is defined as the crack propagation rate is equal to 10-7mm/cycle

Corresponding deltaK value "(see 9.3);

--- In order to be consistent with the requirements of the new International Standard ISO 23788 "Coaxial Calibration of Metallic Materials Fatigue Testing Machine", the test

(See 6.1.2, ISO 12108..20125.1.2);

- In accordance with ISO 23788 on the calculation of the coaxial degree of the formula, the calculation of the international standard bending strain is removed (see 6.1.2,

ISO 12108..20125.4.5).

This standard has also made the following editorial changes.

- Adjust the order of the ISO 12108..2012 chapter 5 "Test equipment" and Chapter 6 "Sample" before and after;

--- Increased information Appendix B. Crack length non-visual measurement - Flexibility method;

- Supplementary information Appendix C. Particular requirements for the determination of fatigue crack propagation in aqueous media;

- Increased data Appendix D. Fatigue small crack propagation assay method;

- Increased information Appendix E. Determination of fatigue crack opening force;

--- All the formulas in the standard are numbered.

This standard is proposed by China Iron and Steel Industry Association.

This standard is under the jurisdiction of the National Steel Standardization Technical Committee (SAC/TC183).

The drafting of this standard unit. Iron and Steel Research Institute, Beijing Institute of Aeronautical Materials, Metallurgical Industry Information Standards Institute.

The drafters of this standard. Zhang Hailong, Gao Yifei, Liu Tao, Guo Guangping, Ma Shaoyun, Dong Li, Hou Jie.

This standard replaced the previous version of the standard release.

GB/T 6398-1986, GB/T 6398-2000.

Fatigue Test Fatigue Crack Propagation Method for Metallic Materials

1 Scope

This standard specifies the stress intensity factor range from the fatigue crack growth threshold deltaKth to the fatigue crack before the start of rapid instability cracking

The method of determining the rate of expansion.

This standard applies to the measurement of isotropic metal materials in the linear elastic stress-based, and only perpendicular to the crack surface of the force (I type

Force conditions) and the fixed stress ratio R under the conditions of the crack growth rate.

2 normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article

Pieces. For undated references, the latest edition (including all modifications) applies to this document.

GB/T 10623 Mechanical properties test for metallic materials (GB/T 10623-2008, ISO 23718..2007, MOD)

GB/T 16825.1 Tests for static uniaxial testing machines - Part 1. Tests for force measurement systems of tension and/or pressure testing machines

Calibration (GB/T 16825.1-2008, ISO 7500-1..2004, IDT)

GB/T 25917 Axial afterburner fatigue testing machine Dynamic force calibration (GB/T 25917-2010, ISO 4965. 1979, MOD)

ISO 23788 Metal material fatigue testing machine Coaxial degree calibration (Metalicmaterials-Verificationofthealignment

offatiguetestingmachines

3 terms and definitions

The following definitions and definitions as defined in GB/T 10623 apply to this document.

3.1

Crack length cracklength

A linear measure of the principal plane dimension from the reference plane to the crack tip.

Note. also known as crack size.

3.2

Cycle cycle

The repetition of the force, stress and other minimum period of time.

Note. The terms "fatigue cycle", "force cycle" and "stress cycle" can be used instead of each other, and the letter N is used to represent the number of cycles of force experienced.

3.3

Fatigue crack propagation rate fatiguecrackgrowthrate

da/dN

The amount of expansion of the fatigue crack corresponding to the unit cycle.

3.4

Maximum force

Fmax

Force in the cycle of the largest algebraic value, pull the load is positive, pressure to the load is negative.