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

GB/T 14999.3-2012

Replacing GB/T 14999.3-1994; GB/T 14999.5-1994

**Test methods for superalloys -- Part 3: Verification of
longitudinal fracture of bars**

高温合金试验方法 第3部分：棒材纵向断口检验

(English Translation)

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Foreword

GB/T 14999 "Test Method for High Temperature Alloy" is divided into six parts.

- Part 1. Portrait of macrostructure and defect acid leaching test;
- Part 2. horizontal macrostructure and defect acid leaching test;
- Part 3. longitudinal fracture test bars;
- Part 4. Rolling superalloy strips the grain structure and a carbide distribution measurement;
- Part 6. Wrought superalloys double the grain structure and a carbide distribution measurement method;
- Part 7. high-temperature alloy castings grain size, dendrite arm spacing and a loose microscopic measurement method.

This is Part 3 GB/T 14999 in.

Rules in this section in accordance with GB/T 1.1-2009 given draft.

This Part replaces GB/T 14999.3-1994 "superalloy bars of longitudinal fracture test" and GB/T 14999.5-1994 "high temperature Alloy low magnification, high power rating organization Standard Atlas "in Chapter 2," superalloy bars longitudinal fracture rating map. " this section compared with GB/T 14999.3-1994, the main changes are as follows.

--- Increasing the "Introduction", "range", "Terms and Definitions", "measurement methods and results indicate", "inspection report" and other technical content (see para.

Chapter 1, Chapter 2, Chapter 4, Chapter 5);

--- Increase the relevant technical requirements limit eligibility image method (see 4.1.1.2

and 4.1.2.2);

--- The "high-temperature alloy rods rating longitudinal fracture map" was changed to "longitudinal fracture loose standards diagrams" and "vertical fracture stratified Review Level map "(see Appendix A and Appendix B, Chapter 2 GB/T 14999.5-1994's).

This part is proposed by the China Iron and Steel Association.

This part of the National Steel Standardization Technical Committee (SAC/TC183) centralized.

This part mainly drafted by. Dongbei Special Steel Group Co., Ltd., Steel Research Institute, Metallurgical Industry Information Standards Institute.

Introduction

This section provides a picture basically the original geometry based on real photos, do not involve specific technical conditions of the alloy.

This section as a recommended test method applies only to three-dimensional longitudinal fracture test, is not suitable for two-dimensional plane (cross section) longitudinal fracture Test. It can not be determined subject superalloys lateral macrostructure and defect whether to accept or use the appropriate range.

Superalloys Test methods - Part 3.

Bar longitudinal fracture test

1 Scope

This section GB/T 14999 requirements using comparative law, law on eligibility limit pictures fracture porosity and fracture assessment stratified method.

This section applies to not less than 16mm diameter hot rolled bars wrought superalloy layered fracture porosity and fracture testing, other types of Bar fracture test may refer to execution.

2 Terms and definitions

The following terms and definitions apply to this document.

Loose shrinkage

Since the organization is not sufficient feeding liquid alloy formed less dense defects. Longitudinal stripes organization presented on the fracture, wherein the strip Grain or strip remains obvious metallic luster with a granular structure, and does not destroy the continuity of defect Alloy.

Hierarchical stratification Presented on the fracture gray, yellow or brown-black strip, the strip without a metallic sheen and granular structure and undermine continuous Alloy of defects.

Stratified into three common.

- a) by a secondary reduction of external and slag caused stratified;
- b) by a stratified porosity and subcutaneous injection ingot during cold caused by random distribution, but always from one side of the defect to the surface gradually Heart extension;
- c) Small stratified by the secondary oxidation of small linear inclusions caused by the fracture surface material located.

3.1 Cut

Interception location and number of samples 3.1.1 shall be specified in the relevant product standard or technical conditions.

3.1.2

should be cut using a sample taken does not change the material structure of the method, the subject should be noted that the removal of surface processing methods (such as thermal cutting, punching or Saw impact crushed, hammering cut off, etc.). Allow the sample size on the surface quality or substandard products from.

3.1.3

Sample thickness longitudinal fracture is.

- a) when the diameter not less than 16mm ~ 32mm, a thickness of 10mm $\pm$ 2mm;
- B) When a diameter greater than 32mm, a thickness of 14mm $\pm$ 2mm.

3.2 Preparation

3.2.1

Sample according to the corresponding technical requirements specified in the heat treatment process after treatment grooved.