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

GB/T 14999.4-2012

Replacing GB/T 14999.4-1994; GB/T 14999.5-1994

**Test methods for superalloys -- Part 4: Determination of
characterizing banding grains and primary carbides distribution
of super alloy rolling**

高温合金试验方法 第4部分：轧制高温合金条带晶粒组织和一次碳化物分布测定
(English Translation)

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Foreword

GB/T 14999 "superalloys test methods" 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 section GB/T Part of 414,999.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This Part replaces GB/T 14999.4-1994 "superalloy microstructure test method" and GB/T 14999.5-1994 "superalloys Low magnification, high power rating organization Standard Atlas "in Chapter 3," superalloy purity rating map "and Chapter 4," banded grain size grading atlas. " this section compared with the GB/T 14999.4-1994, the main changes are as follows.

- Standard name changed to "hot rolled strip alloy grain structure and a carbide distribution measurement method";
- Increasing the "Introduction", "range", "normative references", "Terms and Definitions", "The results are shown" and "test" and other technical Content (see Chapter 1, Chapter 2,

Section 3, Chapter 6 and Chapter 7);

--- Added two bar sample recommended etchant (see Table 2, 1994 edition of the Table 2);

--- Abolition of the "Evaluation of grain size" (see 1994 version 3.2);

--- The "fine-grained concentrate grading atlas ribbon" to "strip grains rating standard map" and adds the result shows an example (See Appendix A, GB/T 14999.5-1994 4.1);

--- Remove the "scatter band grain grading atlas" (see GB/T 14999.5-1994 4.2);

--- The "superalloys purity rating map" changed to "rolling superalloy primary carbides standards diagrams" (see Appendix B, GB/T 14999.5-1994 of Chapter 3).

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 is basically the original geometry based on real photos, so regardless of the alloy itself. If the alloy strip grain group Organizations and a carbide distribution and this section provides a rating consistent picture can be assessed using this section provides comparative law. Crystal strip Granulated tissue can also be quantitatively assessed by the method specified in this part.

As part of this recommended measurement method applies only to two-dimensional plane (cross section) with grains and determination of a strip of carbide distribution, but can not determine the subject of high-temperature alloy rolled strips the grain structure and a carbide distribution is received or suitable range for use.

Superalloys Test methods - Part 4.

Rolled strip superalloy grain structure and a Carbide distribution measurement

1 Scope

This section GB/T 14999 specifies the superalloy microstructure measurement terms and definitions, sample preparation and cut, and test methods Measuring method, the results indicated that inspection reports.

This section applies to rolling temperature alloy strips the grain structure and a carbide distribution of inspection and assessment.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 6394 Determination of average grain size of metal GB/T 24177 double grain size characterization and determination

3 Terms and Definitions

GB/T 6394 defined by the following terms and definitions apply to this document.

Dual grains duplexgrainsizes Two distinctly different sizes, different distributions of crystal grains at least, and the grain size differential is not less than three.

Strip grain bandinggrains Grain size distribution of a large difference in the machine direction (differential of not less than three) of alternating regions, the alloy is not uniform organization.

Focus strip grain concentratebandinggrains Rows of grain strips organization.

A carbide distribution primarycarbidesdistribution Longitudinal cross-section of the sample along the rolling direction of the strip once zonal distribution of carbide particles.

4.1 Cut

4.1.1

specimens cut direction, location and number shall be specified in the product standard or the appropriate technical conditions. Not specified, the general should be parallel to the rolling direction of the product (longitudinal) sampling. Sample diameter or side grow up to 32mm, the longitudinal sample cut 1/2 of its test surface Centerline axis through the center should be (the deviation of $\pm 0.5\text{mm}$); sample diameter or length was longer than 32mm, the longitudinal direction of the cut sample