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YS

**NONFERROUS METALS INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

YS/T 335-2009

Replacing YS/T 335-1994

**Metallographic determination methods of oxygen content in
oxygen-free copper**

无氧铜含氧量金相检验方法

(English Translation)

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Foreword

Instead of the standard YS/T 335-1994 "power vacuum devices with oxygen free copper metallurgical test method." Compared with this standard YS/T 335-1994, individual provisions of the original standard was appropriate to supplement and improve, while increasing the "Fan Wai ", " terms ", " equipment ", " test report "and other sections.

Appendix A of this standard is a normative appendix.

This standard by the National Standardization Technical Committee of non-ferrous metals and centralized.

This standard was drafted. aluminum Shenyang Nonferrous Metals Processing Co., Ltd.

1 Scope

This standard specifies the metallographic examination of the principle of free copper oxygen, equipment, and preparation of test samples, test procedures and test requirements and report.

This standard applies to the oxygen content of the oxygen-rank test.

2 Principle of the method

The prepared samples in an atmosphere containing hydrogen is heated and cooled under the conditions of the sample is not in contact with the air, based on copper oxide copper Reductive reaction of hydrogen with the grain boundary cracks or cracking characteristics, observed by optical microscope, depending on the cracks or crack the case to determine its oxygen content grade.

3 Equipment

3.1

electrolytic polishing equipment and mechanical polishing equipment.

3.2

hydrogen annealing apparatus.

3.3

drying equipment.

3.4

microscope.

4 Sample and sample preparation

4.1

the number of samples specified in the relevant product technical standards.

Size 4.2 test specimen surface is generally 10mm x (10mm ~ 15mm), or flexible sample depending on the circumstances.

4.3

pairs fine wire, oxygen-free copper block can be used to make brackets around it.

Preparation of electrolytic polishing or mechanical polishing may be 4.4 sample. If doubt vary, subject to electrolytic polishing.

Fast electrolytic polishing Recommended.

--- Electrolyte. phosphoric acid (3 + 4).

--- Voltage (no load). 25V.

--- Current density. about 4A/cm² (a little contact with the sample surface with the electrolyte).

--- Polishing time. 10s ~ 25s.

--- Cathode material. copper plate.

5 Test methods and requirements

5.1

The sample was rough, polished after fine grinding, to bright surface without trace.

After drying the sample water after polishing 5.2 full flush, the drying process of the sample

temperature should be below 50 °C.

After drying the sample 5.3 containing at least 10% hydrogen (by volume) atmosphere heated to 820 °C ~ 850 °C insulation 20min, samples Under cooling conditions are not in contact with air.

5.4

samples cooled to room temperature, remove the inspection directly under a microscope at 200X magnification bright field.

5.5

Atlas oxygen in accordance with Appendix A 1 ~ 5 standard, determined oxygen levels. Oxygen permeability of the edge cases, by both parties Association Suppliers for processing.

6 Test report

The test report shall include the following.