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OF CHINA**

**中华人民共和国国家标准**

**GB/T 3246.1-2012**

**Replace GB/T 3246.1-2000**

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**Inspection method for structure of wrought  
aluminum and aluminum alloy products - Part 1:**

**Inspection method for microstructure**

**变形铝及铝合金制品组织检验方法**

**第 1 部分：显微组织检验方法**

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China**

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## Foreword

GB/T3246 *Inspection method for structure of wrought aluminum and aluminum alloy products* is divided into two parts:

- Part 1: Inspection method for microstructure;
- Part 2: Inspection method for macrostructure.

This is part 1 of GB/T3246.

This part was drafted in accordance with the rules of GB/T1.1-2009.

This part takes place of GB/T3246.1 — 2000 *Wrought aluminum and aluminum alloys products inspection method for structure*.

Compared with GB/T3246.1 — 2000, the main technical changes in this part are as follows:

- Increased etchant 8;
- Added requirements for the testing surface of samples;
- modified a part content of “rough machining of samples”, “mechanical polishing” and “electrolytic polishing”;
- Added 8 ××× alloys in the application of etchant;
- Described how to discriminate burnt structure of aluminum alloy;
- Added the part of test report;
- Complemented figures of 6063 alloy ingot structure and normal structure and burnt structure of 1235 alloy cast-rolling zone.

This part was compiled by using redrafted law and referring to ASTM E112-1996 (2010) *Standard Test Method for Determination of Average Particle Size*, ASTM E3-2011 *Preparation Procedures for Metallographic Specimen*, ASTM E1558—1999(2004) *Electrolytic Polishing Guide for Metallographic Specimen* and ASTM E407—2007 *Standard Test Method for Micro-etched Metal and Alloys*” and it is non-equivalent with ASTM E112-1996 (2010), ASTM E3-2011, ASTM E1558-1999 (2004) and ASTM E407—2007 in the consistency degree.

This part is under the jurisdiction of National Standardization Technical Committee of Nonferrous Metals (SAC/TC243).

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Previous versions that this part replace are as follows:

——GB/T3246.1—2000;

——GB/T3246—1982.

# Inspection Method for Structure of Wrought Aluminum and Aluminum Alloy Products

## Part 1: Inspection Method for Microstructure

### 1 Scope

This part of GB / T3246 specifies the measurement and test reports of the test solution, specimen preparation, erosion, anodized film, tissue testing and grain size used for microstructure inspection of aluminum and Al alloy ingots (or ingot blank), wrought aluminum and aluminum alloy sheet, strip, foil, tubes, rods, wire, forgings (hereinafter referred to as processed products).

This part applies to microstructure inspection of aluminum, Al alloy ingots (or ingot blank) and processed products.

### 2 Test solution

2.1 Salpeter solution (1+4)

2.2 Perchloric acid ethanol (1 + 9)

2.3 Salpeter solution (1 + 2.5)~ Salpeter solution (1+1).

2.4 Etchant 1: Hydrofluoric acid solution (1+200)

2.5 Etchant 2: Hydrofluoric acid solution (1+1).

2.6 Etchant 3: Phosphoric acid solution (1+9).

2.7 Etchant 4: Sulfuric acid solution (1+9)~ Sulfuric acid solution (2+8).

2.8 Etchant 5: Salpeter solution (1+3).

2.9 Etchant 6: mix volumes of hydrofluoric acid ( $\rho$ 1.15g/mL), hydrochloric acid ( $\rho$  1.19g/mL),nitric acid ( $\rho$  1.40g/mL) and water in the volume of (2+3+5+190).

2.10 Etchant 7: mix volumes of hydrofluoric acid ( $\rho$ 1.15g/mL), hydrochloric acid ( $\rho$  1.19g/mL),nitric acid ( $\rho$  1.40g/mL) and water in the volume of (2+1+1+76).

2.11 Etchant 8: mix volumes of hydrofluoric acid ( $\rho$ 1.15g/mL), hydrochloric acid ( $\rho$  1.19g/mL),nitric acid ( $\rho$  1.40g/mL) and water in the volume of (2+3+5+250).

2.12 Salpeter solution (1 + 19)~ Salpeter solution (1+3).

2.13 Sulfuric acid solution and phosphoric acid solution: evenly mix sulfuric acid( $\rho$

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