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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 22638.1-2016

Replacing GB/T 22638.1-2008

Test methods for aluminium and aluminium alloy foils - Part 1: Determination of thickness

铝箔试验方法 第1部分: 厚度的测定

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Table of Contents

1 Scope

GB/T 22638.1-2016 is the Chinese national standard on test methods for aluminium and aluminium alloy foils - part 1: determination of thickness, in the field of metallurgy. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 13 December 2016 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 November 2017. Classification: ICS 77.040.01, CCS H20. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Part of GB/T 22638 specifies the method for determining the thickness of aluminum foil. The gravimetric method specified in this Part is applicable to the arbitration determination of the thickness of non-composite foils, which have a thickness less than

0.10 mm. The vertical optical method specified in this Part is applicable to the arbitration determination of the thickness of composite foils, which have a thickness less than

0.10 mm. The digital micrometer method specified in this Part is applicable to the arbitration determination of the thickness of aluminum foils, which have a thickness not less than

0.10 mm.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB/T 8005.1-2008 Aluminum and aluminum alloys - Terms and definitions - Part 1.product and method of processing and treatment

GB/T 8170 Rules of rounding off for numerical values & expression and judgement of limiting values

3 Terms and definitions

The terms and definitions defined in GB/T 8005.1-2008, as well as the following terms and definitions, apply to this document.

3.1 Areal density The mass per unit area of aluminum foil.

4 Gravimetric method

4.1 Method principle This Part calculates the thickness and areal density of aluminum foil, by weighing a specimen of aluminum foil with known area and density.

4.2.1 Analytical balance, sensitivity

0.1 mg.

4.2.2 Sampler, a sampler for quantitative standard specimens with a punching area of 100 cm^2.

4.3 Determination

4.3.1 After removing the wrinkled outer layer of the aluminum foil roll, cut a sample from the roll and sandwich the sample between two sheets of paper with an area greater than 100 cm^2. The paper used shall not cause defects in the sample.

4.3.2 Use a sampler (4.2.2) to punch one specimen at a time from the sandwiched aluminum foil. The area deviation of the specimen shall not exceed ±

0.35 cm^2.

4.3.3 It shall wipe the specimen with anhydrous ethanol or other suitable solvent before testing to remove oil or dirt.

4.3.4 Weigh the clean and dry specimen on an analytical balance (4.2.1) to an accuracy of four decimal places; record its mass m.

4.3.5 Repeatedly weigh the same specimen on different balances for calibration. The result error shall be controlled within ±1 mg. Otherwise, the balance shall be repaired or recalibrated.

4.4.1 Calculation of density of aluminum or aluminum alloy

4.4.1.1 Calculation of the arithmetic mean of mass fraction of each element in the tested aluminum or aluminum alloy 4.4.1.1.1 The arithmetic mean of the mass fraction of the elements shall be calculated based on the limit values of the mass fraction of the elements. When only the maximum limit value of the mass fraction of an element is specified, its minimum limit value is considered zero. The arithmetic mean shall be rounded to the significant figures shown in Table 1. 4.4.1.1.2 For composite elements where only the maximum value is specified for the mass fraction limit, such as (iron + silicon), each individual element is considered to have an equal mass fraction. The arithmetic mean of its mass fractions is calculated by dividing the arithmetic mean of the mass fractions of the composite elements (calculated and rounded according to 4.4.1.1.1) by the number of individual elements in the composite element. The result is rounded to the significant digits shown in Table 1. 4.4.1.1.3 When the mass fraction of aluminum is greater than or equal to 99.90% but less than or equal to 99.99%, its arithmetic mean is determined by subtracting the sum of the arithmetic means of the mass fractions of all elements whose maximum mass fraction limit is not less than 0.0010% from 100.00%. Before summing, the arithmetic mean of the mass fractions of each element shall be expressed to the nearest 0.0xx%. After summing, the sum shall be rounded to 0.0x%. 4.4.1.1.4 When the mass fraction of aluminum is greater than or equal to 99.00% but less than 99.90%, its arithmetic mean is determined by subtracting the sum of the arithmetic means of the mass fractions of all elements whose maximum mass fraction limit is not less than 0.010% from 100.00%. Before summing, the arithmetic mean of the mass fractions of each element shall be expressed to the nearest 0.0x%. 4.4.1.1.5 When the mass fraction of aluminum is less than 99.00%, its arithmetic mean is calculated by subtracting the sum of the arithmetic means of the mass fractions of each element from 100.00%, rounding the result to two decimal places.