ICS 77.150.10
CCS H61

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 40319-2021

Wrought aluminium alloy sheets, strips and foils for drawn cans

拉深罐用铝合金板、带、箔材

Issued on: August 20, 2021 **Implemented on: March 1, 2022**

Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC

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1 Scope

China's national standard for the aluminium sheet, strip and foil used to make drawn cans. It specifies the terms and definitions, the classification and the requirements. A drawn and

wall-ironed beverage can is one of the most refined mass-produced objects made: a disc of aluminium is drawn into a cup and then ironed through a series of dies that thin its wall to about a tenth of a millimetre while leaving the base thick, at a rate of hundreds of cans a minute per line. The metal has to survive that without tearing, and it has to come out with a wall thin enough to be economic and strong enough to hold six bars of carbonation pressure. Everything in the specification serves that: the alloy composition, the temper, the thickness tolerance measured in microns, and above all the earing behaviour - the texture-driven tendency of the cup to form scallops at its rim, which is controlled by the rolling and annealing history and which determines how much metal is trimmed away.

This document specifies the classification, quality assurance, requirements, test methods, inspection rules, marking, packaging, transportation, storage, quality certificate and order (or contract) content of aluminum alloy sheets, strips, foils for drawn cans. This document is applicable to aluminum alloy sheets (hereinafter referred to as sheets), aluminum alloy strips (hereinafter referred to as strips), aluminum alloy foils (hereinafter referred to as foils) for food packaging cans (bottles), which are produced by drawing and wall ironing, shallow drawing and deep drawing, and for can (bottle) caps and pull rings used therewith.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard; however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 1732 Determination of impact resistance of coating films

GB/T 2523 Measuring method of surface roughness and peak count for cold-rolled metal sheet (strip)

GB/T 3190 Chemical composition of wrought aluminium and aluminium alloys

GB/T 3199 Wrought aluminium and aluminium alloy products - Packing, marking, transporting and storing

GB/T 3880.3 Wrought aluminium and aluminium alloy sheets, sheets and strips for general engineering - Part

3 Terms and definitions

The terms and definitions defined in GB/T 8005.1, GB/T 26492.3, GB/T 26492.4, as well as the following terms and definitions, apply to this document.

3.1 Drawing and wall ironing The process of forming deep concave parts by plastic flow of

thin sheet/thick foil metal between dies and thinning of the wall thickness of the thin sheet.

3.2 Shallow drawing The process of forming shallow concave parts (the ratio of can height to can diameter is less than 1) by plastic flow of thin sheet/thick foil metal between dies (usually the wall thickness of thin sheet/thick foil does not become thinner).

3.3 Deep drawing The process of forming deep concave parts (the ratio of can height to can diameter is not less than 1) by multiple plastic flows of thin sheet metal between dies (usually the wall thickness of thin sheet does not become thinner).

4 Classification

4.1 Product use Products are divided into three categories according to their use. See Table 1 for product use and use code.

4.2 Designation, state, size specification The product designation, state, size specification and its corresponding use code are shown in Table

2.When the buyer needs other designations, states, size specifications, they shall be determined by negotiation between the supplier and the buyer and indicated in the order form (or contract).

4.3 Product surface type The product surface type, surface type code and its corresponding treatment process and use code are shown in Table 3.

5.1 Food safety assurance

5.2 Product quality assurance For product quality assurance, refer to Appendix A.

6 Requirements

6.1 Chemical composition The chemical composition of 5151 designation shall comply with the provisions of Table 4; the chemical composition of other designations shall comply with the provisions of GB/T 3190.

6.2 Dimensional deviation

6.2.1 Thickness The thickness deviation of the product shall comply with the provisions of Table 5.

6.2.3 Length The allowable deviation of the length of the sheet shall be ; if the purchaser has special requirements for the allowable deviation of the length of the sheet, it shall be determined by negotiation between the supplier and the buyer and indicated in the order (or contract).

6.2.4 Diagonal The difference between the two diagonal lengths of the sheet shall not exceed

6.2.7 Unevenness The unevenness of the product shall comply with the provisions of Table 7; if the purchaser has special requirements for unevenness, it shall be determined by negotiation between the supplier and the buyer and indicated in the order (or contract).

6.2.8 Straightness When strip and foil shapes are tested offline, the straightness testing value after tensioning correction shall not be greater than 10I;

6.3 Tensile mechanical properties

6.3.1 Room temperature tensile mechanical properties The room temperature tensile mechanical properties of the product shall comply with the provisions of Table 8.

7.1 Chemical composition

7.1.1 Routine chemical analysis shall be conducted for elements with numerical values other than the "Al" and "Other" columns of the corresponding designations in Table 4 and GB/T 3190.When it is suspected that the mass fraction of non-routine analysis elements exceeds the limit value of this document, the manufacturer shall analyze these elements.

7.2 Dimension deviation

7.2.1 Dimension rounding Dimension measurement values are not allowed to be rounded off; the method for determining the limit value shall comply with the provisions of

3.3 in GB/T 8170-2008.

7.2.2 Thickness Test according to the method specified in Appendix B; the arbitration method shall be the weight method.

7.2.3 Width, length, diagonal Measure with measuring tools of corresponding accuracy.

7.2.4 Side curvature Test according to the method specified in GB/T 3880.3.

7.2.6 Unevenness Take a whole sheet or cut a specimen of 1500 mm ~ 1800 mm in length from a strip or foil (the specimen shall include the wave part of the product as much as possible). Place the specimen freely on the platform. Test the wave height and wave number according to the method specified in GB/T 3880.3.The wave height is measured using a feeler gauge with a resolution of

0.1 mm; the wave distance is measured using a tool with a resolution of 1 mm.

7.2.10 Others Use measuring tools of corresponding accuracy for testing.

7.3 Tensile mechanical properties

7.3.1 Room temperature tensile mechanical properties Test according to the method specified in GB/T 16865.