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**Methods for determination of surface chromium on electrolytic  
tinplate**

电镀锡钢板表面铬量的试验方法

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### Foreword

The colorimetric method in this standard refers to ASTM A623M-08 "tinplate standard specification" Appendix A7 to develop, an increase of electrolysis. Compared with ASTM A623M-

08 Appendix A7, the main changes in this standard are.

--- Added terms and definitions;

--- increased the principle;

--- increase the sample; - the calibration of the spectrophotometer part of the calibration curve to add the technical content; - the calculation of the test results to add the contents of the numerical revision. This standard is under the jurisdiction of the National Steel Standardization Technical Committee (SAC/TC183). The drafting of this standard. Wuhan Iron and Steel (Group) Company, Metallurgical Industry Information Standards Institute. The main drafters of this standard. single Kaijun, Li Xiaojie, Liu Baoshi, Huang Baihua, Hou Jie, Yu Wenli, Chen Xiaohong. Test Method for Chromium Content of Electroplated Tin Plates

### 1 Scope

China's national methods for determining the surface chromium on electrolytic tinplate. Tinplate is steel sheet electroplated with a very thin layer of tin, and it is the material of the food can. The tin alone is not enough: the surface is given a chromium passivation treatment on top of it, a film only a few nanograms per square centimetre thick, and that film does two indispensable things - it stops the tin oxidising, which would otherwise discolour the can and interfere with lacquering, and it provides the surface to which the internal lacquer adheres. Too little chromium and the lacquer peels or the tin yellows; too much and the lacquer adhesion falls again. Since the quantity involved is far below what any ordinary

surface analysis would detect, the determination has to strip and measure the film. The standard specifies the principles, reagents, apparatus, samples, conditions and procedures, calculation and reporting for both a colorimetric method and an electrolytic method, and applies to the determination of surface chromium on electrolytic tinplate.

This standard specifies the principle of colorimetric method, electrolysis method to determine the chromium content of electroplated tin plate, reagents, test equipment, samples, test conditions and Steps, the calculation of test results, test reports and so on. This standard is applicable to the determination of chromium content on the surface of electroplated tin plate. Color method as an arbitration law. Electrolysis method is recommended as a quick method The surface chromium content is not less than 2 mg/m<sup>2</sup>.

## 2 Normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article Pieces. For undated references, the latest edition (including all modifications) applies to this document. Representation and Judgment of Numerical Correction Rule and Limit Value of GB/T 8170

## 3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Electroplated tinplate surface of chrome surfacechromiumonelectrolytictinplate In order to improve the corrosion resistance of tinplate, tin plating after the passivation treatment, in the tin plating surface deposition of chromium.

## 4 Colorimetric method

4.1 Principles Dissolving the passivation film on the surface of the electroplated tin plate with a mixed solution of sodium hydroxide and sodium phosphate; dissolving the chromium oxide in the passivation film with potassium permanganate solution Into the hexavalent; with diphenylcarbazide solution color, with colorimetric determination of chromium, divided by the sample surface area, that is, per unit area The amount of chromium.

### 4.2 Reagents

4.2.1 Reagent and water purity. This test uses pure reagent and distilled water, or pure water of comparable purity.

#### 4.2.2 Sodium hydroxide (NaOH) - sodium phosphate (Na<sub>3</sub>PO<sub>4</sub>) solution. Weigh

40.0 g of sodium hydroxide and

50.0 g of sodium phosphate into the water, dilute Released to 1.0L.

4.2.3 sulfuric acid ( $\text{H}_2\text{SO}_4$ ) solution (1 3). take 100mL concentrated sulfuric acid ( $\rho=1.84\text{g/mL}$ ) slowly add 300mL of water, shake.

4.2.4 Potassium permanganate ( $\text{KMnO}_4$ ) saturated solution.

4.2.5 Hydrochloric acid ( $\text{HCl}$ ,  $\rho=1.19\text{g/mL}$ ).

**4.2.6 Diphenylcarbazide ( $\text{C}_{13}\text{H}_{14}\text{N}_4\text{O}$ ) solution. Weigh**

0.2 g of diphenylcarbazide, dissolve in

10.0 mL of acetone,

10.0 mL Ethanol (95%) of

10.0 mL of phosphoric acid (85%),

10.0 mL of water. Preparation before use; once the color should be re-prepared.

4.2.7 Chromium standard solution A (chromium content  $0.5\text{mg/mL}$ ). Weigh  $1.4140\text{g}$  potassium dichromate ( $\text{K}_2\text{Cr}_2\text{O}_7$ ) into the water, diluted to  $1.0\text{L}$ .

4.2.8 chromium standard solution B (chromium content  $0.01\text{mg/mL}$ ). with a pipette to absorb  $20\text{mL}$  standard solution A into the volumetric flask, with water dilute