

National Food Safety Standard Metal Materials and Products for Food Contact

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1 Scope

This standard applies to metal materials and products intended for food contact.

2 Terms and Definitions

2.1 Metal Materials and Products for Food Contact

Metal materials and products (including various metal coatings and alloys) that are expected or have been in contact with food under normal conditions of use. Hereinafter referred to as "metal materials and products."

2.2 Metal Coating

A metal layer formed on the surface of solid materials or products in contact with food through various coating techniques.

2.3 Substrate

The material constituting the base of metal materials and products, excluding surface coatings and metal coatings.

2.4 Alloying Elements

One or more metallic or non-metallic elements intentionally added during metal smelting to achieve certain performance requirements (such as tensile strength, hardness, wear resistance, corrosion resistance, electrical conductivity, etc.). Metallic alloying elements include cadmium, copper, chromium, manganese, molybdenum, nickel, tin, etc.; non-metallic alloying elements include carbon, silicon, etc.

2.5 Impurity Elements

Elements unintentionally present in metals.

Metal materials and products shall comply with the provisions of GB 4806.1.

4 Technical Requirements

4.1 Raw Material Requirements

4.1.1

The metal substrates, metal coatings, and welding materials used in metal materials and products shall not pose a hazard to human health.

4.1.2

Manufacturers of metal materials and products shall control the substances used and residual during metal surface treatment processes (such as pickling, oxidation, phosphating, polishing, rust-proof oiling, etc.) to ensure that the amount migrating into food complies with the requirements of GB 4806.1.

4.1.3

The metal substrates and metal coatings used on food contact surfaces shall not use lead, cadmium, arsenic, antimony, mercury, and lithium as alloying elements. The content of impurity elements shall meet the requirements specified in Table 1.

表 1: Requirements for Impurity Element Content in Metal Substrates and Metal Coatings

Metal Substrates and Metal Coatings	Impurity Elements	Content (Mass Fraction)
Stainless Steel	Arsenic (As)	0.01
	Cadmium (Cd)	0.01
	Lead (Pb)	0.01
Food Packaging Steel Sheet	Arsenic (As)	0.03
	Cadmium (Cd) + Lead (Pb)	0.01
Aluminum and Aluminum Alloy Materials	Arsenic (As)	0.01
	Cadmium (Cd) + Lead (Pb) + Mercury (Hg)	0.01
Other Metal Substrates and Metal Coatings	Arsenic (As)	0.03
	Cadmium (Cd)	0.01
	Lead (Pb)	0.01

4.1.4

The composition of metal substrates and metal coatings shall be consistent with the corresponding composition indicated on the product or its grade.

4.1.5

If it is necessary to determine the content of metal material components or to identify the grade through testing, the testing methods shall comply with the relevant requirements of GB 4806.1.

4.2 Sensory Requirements

表 2: Sensory Requirements

Item	Requirements
Sensory	The surface in contact with food shall be moderately clean, the coating shall not crack or peel, and
Soaking Solution	The soaking solution obtained from migration tests

4.3 Physicochemical Indicators

4.3.1 Impurity Element Migration Limits

The migration limits of impurity elements shall comply with the provisions of Table 3.

表 3: Impurity Element Migration Limits

Item	Limit	Test Method
Arsenic (As) / (mg/kg)	0.002	GB 31604.49
Cadmium (Cd) / (mg/kg)	0.002	GB 31604.49
Lead (Pb) / (mg/kg)	0.01	GB 31604.49
Antimony (Sb) / (mg/kg)	0.04	GB 31604.49

* For uncoated iron frying pans, the limit for arsenic is 0.018 mg/kg.

4.3.2 Alloying Element Migration Limits

The migration limits of alloying elements shall comply with the provisions of Table 4.

表 4: Alloying Element Migration Limits

Item	Limit	Test Method
Aluminum (Al) / (mg/kg)	1	GB 31604.49
Chromium (Cr) / (mg/kg)	0.25	GB 31604.49
Cobalt (Co) / (mg/kg)	0.02	GB 31604.49
Copper (Cu) / (mg/kg)	0.02	GB 31604.49

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