



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**Leather and fur - Chemical determination of metal content - Part
1:EXtractable metals**

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Introduction

During the processing of leather and fur, the traditional tanning process and the tanning agents, dyes, auxiliaries and pigments used in the processing may result in leather, fur and their products containing a certain amount of metal elements. In particular, heavy metals, such as:

arsenic, cadmium, chromium, mercury, lead, antimony, selenium and nickel, which can penetrate into the human body through the immersion of perspiration through the skin,

which will severely endanger human health. Furthermore, with the continuous development of the leather and fur industry at the current stage, people have been paying increasing attention to the types and contents of metals that may be contained in their products, and the determination of metal contents in leather and fur has also increasingly become the focus of product quality control. GB/T 22930, which aims to provide a basis for the determination of metal contents in leather and fur, is intended to be composed of two parts.

---Part 1: Extractable Metals. The purpose is to establish a method of determining 22 extractable metals in leather and fur.

---Part 2: Total Metal Content. The purpose is to establish a method of determining the total amount of 24 metals in leather and fur.

The determination of metal content (especially some heavy metals) in leather and fur has always been the focus of the industry. In 2008, China has issued a standard on the test methods GB/T 22930-2008 Leather and Fur - Chemical Tests - Determination of Heavy Metal Content, which specifies the method of determining the total amount and extractable amount of 9 heavy metal elements, such as: lead (Pb), cadmium (Cd) and nickel (Ni). It has been over a decade since

GB/T 22930-2008 was issued and implemented. During this period, with the continuous update of leather and fur technology, and the application of various new materials, there have been an increasing number of metal types that may exist in leather and fur, and the determination of their contents has also attracted increasing attention. First of all, when the current national standard of China was formulated, there was no relevant international standard. The standard was independently formulated in combination with the actual situation in China. With the gradual deepening of international trade, it has gradually been unable to satisfy the demands of the industry. Secondly, the method standards regarding the determination of metal contents in leather and fur have been internationally established. Not only are there more types of metals that can be determined, but also the methods have been further refined. The determination of metal contents is divided into two parts: extractable metals and total metal content, which is more consistent with the current demands of the tests of leather and fur. In view of this, it is indeed necessary to revise and further improve GB/T 22930, so as to continuously adapt to the new changes of domestic and overseas products, and the new demands for product testing, and ensure that the standards are in harmony with the development of the industry.

Leather and Fur - Chemical Determination of Metal Content - Part 1: Extractable Metals

WARNING: the concentrated acids used in this document are all highly corrosive and / or oxidizing liquids. If they come into contact with flammable substances, they will increase the possibility of combustion or explosion, and cause acute or chronic health hazards to the human body. In addition, there are also hazards to the water body. During the test, necessary safety measures shall be taken.

1 Scope

This document describes the test methods for 22 extractable metal contents: aluminum (Al), arsenic (As), barium (Ba), calcium (Ca), cadmium (Cd), cobalt (Co), chromium (Cr), copper (Cu), iron (Fe), potassium (K), magnesium (Mg), lead (Pb), manganese (Mn), molybdenum (Mo), nickel (Ni), mercury (Hg), antimony (Sb), selenium (Se), tin (Sn), titanium (Ti), zinc (Zn)

and zirconium (Zr).

This document is applicable to the determination of 22 extractable metal contents in various types of leather and fur, as well as the determination of extractable chromium in chrome-tanned leather.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 3922 Textiles - Testing Method for Color Fastness to Perspiration (GB/T 3922-2013, ISO 105-E04:2013, MOD)

GB/T 6682 Water for Analytical Laboratory Use - Specification and Test Methods (GB/T 6682-2008, ISO 3696:1987, MOD)

GB/T 39364 Leather - Chemical, Physical, Mechanical and Fastness Tests - Sampling Location (GB/T 39364-2020, ISO 2418:2017, MOD)

QB/T 1267 Fur - Chemical, Physical and Mechanical and Fastness Tests - Sampling Location (QB/T 1267-2012, ISO 2418:2002, MOD)

QB/T 1272 Leather - Chemical Tests - Preparation of Chemical Test Samples (QB/T 1272-2012,

ISO 4044:2008, MOD)

QB/T 1273 Fur - Chemical Tests - Determination of Volatile Matter (QB/T 1273-2012, ISO 4684:2005, MOD)

QB/T 1276 Fur - Chemical Tests - Determination of Matter Soluble in Carbon Tetrachloride (QB/T 1276-2012, ISO 4048:2008, MOD)

QB/T 2716 Leather - Preparation of Chemical Test Samples (QB/T 2716-2018, ISO 4044:2008, MOD)

QB/T 2717 Leather - Chemical Tests - Determination of Volatile (QB/T 2717-2018, ISO 4684:2005, MOD)

QB/T 2718 Leather - Chemical Tests - Determination of Matter Soluble in Dichloromethane (QB/T 2718-2018, ISO 4048:2008, MOD)

3 Terms and Definitions

This document does not have terms or definitions that need to be defined.

4 Principle

Leather specimen is extracted by acidic artificial perspiration; the extract is filtered and acidified, then, passes through inductively coupled plasma optical emission spectrometer (ICP-OES), inductively coupled plasma mass spectrometer (ICP-MS), atomic absorption spectrometer (AAS) or atomic fluorescence spectrometer (AFS). Determine the metal concentration in the extract; calculate the content of extractable metals in the specimen.

NOTE: this method determines the content of extractable metals, not the content of a specific metal compound or metal oxide.

5.1 Unless it is otherwise specified, all reagents used shall be analytically pure, and the test

solutions shall be aqueous solutions.

5.7 Metal element standard stock solution. The mass concentration of each metal element is

purity of the used gas shall be not less than 99.99%.

6.13 Inductively coupled plasma mass spectrometer (ICP-MS); the purity of the used gas shall

be not less than 99.99%.

6.14 Atomic fluorescence spectrometer (AFS), which is used for the determination of mercury

content.

7.1 Sampling

Leather shall comply with the stipulations of GB/T 39364.

Fur shall comply with the stipulations of QB/T 1267.