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**Jewellery -- Determination of the release of nickel -- Method of
spectrometry**

(English Translation)

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Foreword

This Standard is modified in relation to European Standard EN 1811.1998 "Reference Test Method for Release of Nickel from Products Intended to Come into Direct and Prolonged Contact with the Skin" (English edition).

In order to be convenient for application, this Standard makes the following editorial changes.

- a) "This European Standard" was changed into "this Standard";
- b) The comma "," served as decimal point is replaced by the decimal point ".";
- c) "cm³" is replaced by "mL";
- d) The Foreword of the international standard was deleted;
- e) Add Appendix E (Informative) for guidance.

Appendixes A, B, C, D, E and F of this Standard are informative.

This Standard was proposed by China National Light Industry Council.

This standard shall be under the jurisdiction of National Technical Committee on Jewellery of

Standardization Administration of China (SAC/TC 256).

Drafting organizations of this Standard. National Jewellery Quality Supervision and Inspection Center, National Center of Quality Supervision & Inspection on Gold-Silver Products (Nanjing), and National Center of Quality Supervision & Inspection on Gold-Silver Products (Shanghai).

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Jewellery - Determination of the Release of
Nickel - Method of Spectrometry

1 Scope

This Standard specifies a method for simulating the release of nickel from jewellery, in order to determine whether the item releases nickel at a rate greater than $0.5 \mu\text{g}/(\text{cm}^2 \cdot \text{week})$.

This Standard is applicable to the determination of the release of nickel from jewellery, as well as the products intended to come into direct and prolonged contact with the skin (see

2 Normative References

The following normative documents contain provisions which, through reference in this text, constitute provisions of this Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on

this Standard are encouraged to investigate the possibility of applying the most recent editions

of the normative documents indicated below. For undated references, the latest edition of the

normative document referred to applies.

GB 11887-2002 Jewellery - Fineness of Precious Metal Alloys and Designation (ISO 9202.1991, NEQ)

3 Principle

The item to be tested for nickel release is placed in an artificial sweat test solution for one week. The concentration of dissolved nickel in the solution is determined by atomic absorption spectrometry, inductively-coupled plasma spectrometry or other appropriate analytical method. The nickel release is expressed in micrograms per square centimetre per week [$\mu\text{g}/(\text{cm}^2 \cdot \text{week})$].

4 Reagents

Except where indicated, all reagents, distilled water or deionized water or equivalent shall be

of recognized analytical pure grade.

250 mL beaker containing 100 mL of deionized water. Stir and cool to room temperature.

Transfer the solution to a 250 mL volumetric flask and make up to the volume with deionized

water.

500 mL beaker containing 100 mL of deionized water (4.3). Stir and cool to room temperature.

Transfer the solution to a 250 mL volumetric flask and make up to the volume with deionized

water.

5.2 An analytical spectrometer. The instrument shall, after optimization, meet the performance criteria given in 5.2.1 and 5.2.2. It is recommended that either an inductively-coupled plasma-optical emission spectrometer or an electrothermal excitation atomic absorption spectrometer is used.

5.2.1 Minimum precision. The standard deviation of 10 measurements of the absorption of a

full matrix calibration solution containing 0.05 mg nickel per litre shall not exceed 10 %.

5.3 Thermostatically controlled water-bath or oven, capable of maintaining a temperature of

(30 ± 2) °C.

5.4 A vessel with lid, both composed of a non-metallic, nickel-free and nitric-acid-resistant

material, such as glass and/or polypropylene and/or polytetrafluoroethylene and/or polystyrene.

6.1.1 Definition of sample area

Only the surfaces of an item that comes into direct and prolonged contact with the skin shall be analyzed. In this standard such surfaces are defined as "sample area".

6.2 Sample preparation

Gently swirl the sample for 2 min in degreasing solution (4.9) at room temperature. Rinse thoroughly with deionized water and dry. After degreasing, items should be handled with plastic forceps or clean protective gloves.

6.3 Reference disc

As a quality control check, the nickel release from a reference disc may be determined (see Appendix B).

7.1.1 Preparation of deionized and aerated water

Fill a tall-form 2 L beaker with deionized water (4.3), saturate with air by attaching a gas distribution tube to a cork and positioning the lower end of the tube on the bottom of the beaker.

7.1.2 Preparation of artificial sweat

The artificial sweat consists of deionized and aerated water containing.

7.2.1 Place the sample, suspended by its holder, in the test vessel (5.4). Add an amount of

test solution corresponding to approximately 1 mL per cm² sample area. The suspended sample shall be totally immersed. However, it is not essential to immerse areas which are