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## Jewellery and precious metals — Specifications for 1 kilogram gold bar

*Joannerie, bijouterie et métaux précieux — Spécifications pour les  
lingots d'or de 1 kilogramme*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 174, *Jewellery and precious metals*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

The 1 kilogram gold bar (also named gold kilobar) is the most manufactured and traded small gold bar. As the premium associated with this product is generally very low, it is popular not only among institutional and private investors, but also among jewellery manufacturers and industries.

Unlike 400 troy ounces (approximately 12,5 kg) bars, for which a recognized standard is published by the LBMA (London Bullion Market Association) in its Good Delivery Rules, there is no internationally recognized standard for 1 kilogram gold bars. Each market (e.g. COMEX in New York, SGE in Shanghai, TOCOM in Tokyo) has its own rules for accepting those bars, which can include specifications for mass tolerance, dimensions, markings and even chemical composition. Hence, a gold kilobar accepted by one exchange may be rejected by another.

Furthermore, different standards for specification of impurities are co-existing, including SGEB2-2004 used in Chinese market and ASTM B562-95 used by jewellery manufacturers and industries. This ISO standard creates a specification with specification for impurities that will be compatible with those two most commonly used references.

The purpose of this document is hence to propose a set of specifications, which could serve as reference for the exchanges and the industrial markets and favour the usage of gold kilobars.

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# Jewellery and precious metals — Specifications for 1 kilogram gold bar

## 1 Scope

This document specifies the requirements, test methods, inspection, marking, packaging, transportation, storage, quality certificate and the order (or contract) information of one kilogram gold bars.

This document is applicable to one-kilogram cast gold bars produced for investment markets or industrial (jewellery, electronic) markets.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 11426, *Jewellery — Determination of gold in gold jewellery alloys — Cupellation method (fire assay)*

ISO 15093, *Jewellery and precious metals — Determination of high purity gold, platinum and palladium — Difference method using ICP-OES*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

### 3.1

#### cast bar

homogeneous bar produced in a mold directly from melted metal, without further metallurgical treatment after solidification, with a rectangular parallelepiped shape

Note 1 to entry: Usually the cast bar is formed as a truncated pyramid to allow an easier extraction from the mold.

### 3.2

#### top surface

one of the two largest surfaces of the bar, which is the last part of the bar to solidify

## 4 Requirements

### 4.1 Fineness

The minimum fineness of gold bars is 995 ‰. The following finenesses are acceptable:

- 999,9 ‰;
- 999,5 ‰;
- 999 ‰;

— 995 ‰.

Fineness shall be determined by an appropriate analytical method, including, but not limited to, cupellation in accordance with ISO 11426 for fineness up to 999,5 ‰ and difference method using ICP-OES in accordance with ISO 15093).

999,9 ‰ fineness shall be determined with 6 significant numbers and with 5 significant numbers for other finenesses, with no rounding up allowed.

EXAMPLE 998,99 ‰ is marked as 995 ‰, 999,896 ‰ is marked as 999,5 ‰ (or lower).

## 4.2 Chemical composition

For a fineness of 999,9 ‰, two specifications are available depending on the impurity levels, see [Table 1](#).

**Table 1 — Chemical composition**

Element	Specification				
	995	999	999,5	999,9	ISO 24018 999,9
Au	≥995,00 ‰	≥999,00 ‰	≥999,50 ‰	≥999,900 ‰	≥999,900 ‰
Ag	—	—	—	—	≤50 mg/kg
Pd	—	—	—	—	≤50 mg/kg
As	—	—	—	—	≤30 mg/kg
Bi	—	—	—	—	≤20 mg/kg
Cu	—	—	—	—	≤20 mg/kg
Cr	—	—	—	—	≤3 mg/kg
Fe	—	—	—	—	≤20 mg/kg
Mg	—	—	—	—	≤30 mg/kg
Mn	—	—	—	—	≤3 mg/kg
Ni	—	—	—	—	≤3 mg/kg
Pb	—	—	—	—	≤10 mg/kg
Sb	—	—	—	—	≤10 mg/kg
Si	—	—	—	—	≤50 mg/kg
Sn	—	—	—	—	≤10 mg/kg

This list of elements is not exhaustive, and all elements present in the gold have to be quantified and taken into account for fineness determination.

If impurities are determined with a higher precision than the mg/kg, then the result shall be rounded to the unit to check the specification.

EXAMPLE A value of 10,4 mg/kg meets the ≤10 mg/kg requirement.

## 4.3 Physical specification

The gold bar shall have a minimum mass of 1,000 00 kg, and a maximum mass of 1,000 10 kg. No negative tolerance is allowed.

The gold bar shall have the following dimensions:

- Length: 100 mm to 120 mm;
- Width: 47 mm to 56 mm;
- Thickness: 7 mm to 13 mm.



#### 4.4 Surface quality

Bars should have flat and smooth surfaces (a small shrinkage on the top surface is acceptable), and be free from cavities, holes, and significant layering. Edges shall not be sharp and pose a handling hazard.

NOTE There is no specification for the internal quality, but the presence of gas bubbles can lead to bar rejection based on abnormal results of ultrasonic or electrical conductivity testing.

#### 4.5 Markings

All markings shall be only on the top surface. Markings shall be made using pressure stamping, dot matrix or laser markings (or a combination of those techniques). Markings shall be persistent and not alterable during handling and storage.

The following minimum information shall be marked in an unambiguous way:

- a) name or logo of the manufacturer, and/or brand mark;
- b) “gold” or “Au” to indicate the nature of the metal;
- c) mass in kilogram or gram, including the weighing unit, with up to 4 significant figures;  
EXAMPLE “1 kg”, “1,000 kg”, “1 000 g”.
- d) fineness in per thousand (‰) or percent (%), with or without the unit, with 3 or 4 significant figures;  
EXAMPLE “999,9 ‰”, “99,90 %”, “995”.
- e) unique serial number;

The following information may also be added:

- a) assay mark;
- b) manufacturing year;
- c) only for bars in accordance with “999,9 ‰ ISO 24018” list of impurities, the reference “ISO 24018”;
- d) country of origin.

### 5 Security feature

The bar may bear on any side a security feature to guarantee its integrity and prevent counterfeiting. If this feature adds mass to the bar, this shall be disclosed in the certificate of analysis. Presence of a security feature shall not compromise the physical specification as per 4.3.

### 6 Certificate of analysis

A certificate of analysis shall accompany each bar, with at least the following information:

- a) name or logo of the manufacturer;
- b) “gold” or “Au” to indicate the nature of the metal;
- c) mass (as defined in 4.5);
- d) fineness (as defined in 4.5);
- e) unique serial number (same as the one stamped on the bar);
- f) date of manufacturing;