
**Jewellery and precious metals —
Determination of gold — Cupellation
method (fire assay)**

*Joannerie, bijouterie et métaux précieux — Dosage de l'or — Méthode
de coupellation (essai au feu)*



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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).

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).

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For an explanation of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 174, *Jewellery and precious metals*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/SS M21, *Precious metals - Applications in jewellery and associated products*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 11426:2014), which has been technically revised.

The main changes compared to the previous edition are as follows:

- extension of the scope to cover determination of gold in multiple types of alloys, not only in jewellery ones;
- purity of proof samples was re-defined in [Clause 5](#);
- specific procedures are described in [Clause 8](#) for samples with large amount of base metals, containing platinum or palladium, or with a silver/gold ratio higher than 3;
- calculation was adapted to take into account the addition of pure gold and the fineness of the gold used in the proof sample;
- repeatability requirements were changed;
- the use of scorification was removed.

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.

Jewellery and precious metals — Determination of gold — Cupellation method (fire assay)

1 Scope

This document specifies a cupellation method (fire assay) for the determination of gold on a material considered homogeneous. The gold content of the sample lies preferably between 100 and 999,5 parts per thousand (‰) by weight. Fineness above 999,5 ‰ can be determined using a spectroscopy method by difference (e.g. ISO 15093).

The procedure is applicable to most types of gold samples. Some modifications are indicated for specific cases (presence of large amount of base metals, platinum or palladium, silver). It is not compatible with the presence above trace levels of iridium, rhodium and ruthenium (more than 0,25 ‰ for the sum of all three elements).

This method is also intended to be used as the recommended method for the determination of fineness in jewellery alloys covered by ISO 9202.

2 Normative references

There are no normative references in this document.

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

cornet

alloy of gold and precious metals shaped in a roll, prior the parting process

3.2

gold cornet

gold shaped in a roll, after the *parting* (3.3) process

3.3

parting

separation of silver and other metals from gold by digestion of those metals with nitric acid, in a chloride-free environment

3.4

proof sample

synthetic reference sample whose composition is as similar as possible to the sample; cupellation of the proof sample is performed together with the sample, and its result is used to correct the final assay

3.5

inquartation

addition of silver to gold alloys in a specific ratio in order to enable the *parting* (3.3) of gold from silver by means of nitric acid