

Jewellery and precious metals - Determination of  
palladium in palladium alloys - ICP-OES method using  
an internal standard element (ISO 11495:2019)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 11495:2019 sisaldab Euroopa standardi EN ISO 11495:2019 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 11495:2019 consists of the English text of the European standard EN ISO 11495:2019.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 21.08.2019.	Date of Availability of the European standard is 21.08.2019.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

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English Version

**Jewellery and precious metals - Determination of  
palladium in palladium alloys - ICP-OES method using an  
internal standard element (ISO 11495:2019)**

Joaillerie, bijouterie et métaux précieux - Dosage du  
palladium dans les alliages de palladium - Méthode par  
ICP-OES utilisant un étalon interne (ISO 11495:2019)

Schmuck und Edelmetalle - Bestimmung von Palladium  
in Palladiumschmucklegierungen - ICP-OES-Verfahren  
unter Verwendung eines internen Standardelements  
(ISO 11495:2019)

This European Standard was approved by CEN on 21 April 2019.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## European foreword

This document (EN ISO 11495:2019) has been prepared by Technical Committee ISO/TC 174 "Jewellery and precious metals" in collaboration with CCMC.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2020, and conflicting national standards shall be withdrawn at the latest by February 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 11495:2016.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Endorsement notice

The text of ISO 11495:2019 has been approved by CEN as EN ISO 11495:2019 without any modification.

# Contents

Page

<b>Foreword</b>	<b>iv</b>
<b>1 Scope</b>	<b>1</b>
<b>2 Normative references</b>	<b>1</b>
<b>3 Terms and definitions</b>	<b>1</b>
<b>4 Principle</b>	<b>1</b>
<b>5 Reagents</b>	<b>1</b>
<b>6 Equipment</b>	<b>2</b>
<b>7 Sampling</b>	<b>2</b>
<b>8 Procedure</b>	<b>2</b>
8.1 Internal standard solution	2
8.2 Calibration solutions	2
8.3 Sample solutions	2
8.4 Measurements	2
<b>9 Calculation and expression of results</b>	<b>3</b>
9.1 Calculation	3
9.2 Repeatability	4
<b>10 Test report</b>	<b>4</b>
<b>Bibliography</b>	<b>6</b>

## 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)).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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](http://www.iso.org/iso/foreword.html).

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

This third edition cancels and replaces the second edition (ISO 11495:2014), which has been technically revised. The main changes compared to the previous edition are as follows:

- a) the definition of bracketing in [Clause 3](#) has been removed;
- b) the recommended lines in [Clause 4](#) have been removed;
- c) reagents in [Clause 5](#) have been changed and removed, and the requirements about yttrium in [5.4](#) have been removed;
- d) the preparation of the internal standard solution in [8.1](#) has been changed;
- e) the list of standards to be prepared and precisions about qualification of them by linearity as well as way to choose the low and high standards in [8.2](#) have been changed;
- f) the way of preparation by aliquots for both standard and sample solutions in [8.2](#) and [8.3](#) has been removed;
- g) the preparation of both standard and sample solutions in [8.2](#) and [8.3](#) has been changed;
- h) the definition of bracketing and recommended lines in [8.4](#) has been added;
- i) the formulae in [9.1](#) have been adapted after having removed the way of preparation by aliquots;
- j) the emission line as an information to be mentioned in the test report in [Clause 10](#) has been removed;
- k) the document has been editorially revised.

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).

# Jewellery and precious metals — Determination of palladium in palladium alloys — ICP-OES method using an internal standard element

## 1 Scope

This document describes an analytical procedure for the determination of palladium in palladium alloys with a nominal content up to 990 ‰ (parts per thousand), including alloys according to ISO 9202.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

No terms and definitions are listed in this document.

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/>

## 4 Principle

At least two accurately weighed samples are dissolved in aqua regia and made up to an exactly weighed mass. These sample solutions are mixed with the internal standard and made up to the standard measuring volume.

Using ICP-OES, the palladium content of the sample solution is measured by comparison of the ratio intensities of the spectral emission of palladium and appropriate internal standard (e.g. yttrium) line(s) with the ratios for solutions containing known masses of palladium and internal standard (e.g. yttrium) using the bracketing method.

## 5 Reagents

During the analysis, unless otherwise stated, use only reagents of recognised analytical grade and only distilled water or water of equivalent purity.

**5.1 Hydrochloric acid** (HCl), approximately 30 % to 37 % HCl (mass fraction).

**5.2 Nitric acid** (HNO<sub>3</sub>), approximately 65 % to 70 % HNO<sub>3</sub> (mass fraction).

**5.3 Palladium** (Pd) of 999,9 ‰ minimum purity; if a lower palladium content (e.g. 999,5 ‰) is used, appropriate corrections shall be applied.

**5.4 Yttrium compound**, like yttrium chloride (YCl<sub>3</sub>·6H<sub>2</sub>O or Y<sub>2</sub>O<sub>6</sub>), of analytical grade.