

International Standard



4524/1

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Metallic coatings — Test methods for electrodeposited gold and gold alloy coatings — Part 1 : Determination of coating thickness

Revêtements métalliques — Méthodes d'essai des dépôts électrolytiques d'or et d'alliages d'or — Partie 1 : Détermination de l'épaisseur du dépôt

First edition — 1985-03-15

UDC 669.218.7 : 531.717

Ref. No. ISO 4524/1-1985 (E)

Descriptors : coatings, metal coatings, electrodeposited coatings, gold plating, decorative coatings, protective coatings, tests, determination, thickness.



Documents

Price based on 5 pages

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4524/1 was prepared by Technical Committee ISO/TC 107, *Metallic and other non-organic coatings*.

Metallic coatings — Test methods for electrodeposited gold and gold alloy coatings —

Part 1 : Determination of coating thickness

1 Scope and field of application

This part of ISO 4524 specifies methods for the determination of the thickness of electrodeposited gold and gold alloy coatings for engineering, and decorative and protective purposes.

2 References

ISO 1463, *Metallic and oxide coatings — Measurement of coating thickness — Microscopical method.*

ISO 2177, *Metallic coatings — Measurement of coating thickness — Coulometric method by anodic dissolution.*¹⁾

ISO 3497, *Metallic coatings — Measurement of coating thickness — X-ray spectrometric methods.*

ISO 3543, *Metallic and non-metallic coatings — Measurement of thickness — Beta backscatter method.*

ISO 3868, *Metallic and other non-organic coatings — Measurement of coating thicknesses — Fizeau multiple-beam interferometry method.*

ISO 4518, *Metallic coatings — Measurement of coating thickness — Profilometric method.*

ISO 4524/4, *Metallic coatings — Test methods for electrodeposited gold and gold alloy coatings — Part 4 : Determination of gold content.*

3 General

The methods given in this part of ISO 4524 are those which are considered to have an adequate accuracy when properly used

with test specimens for the particular method. If a referee method is required, it shall be agreed between the parties concerned and shall be selected from the test methods given in clauses 4 to 11. The method chosen shall be one which will yield the most reliable results considering such factors as expected coating thickness, shape of components, size of components, coating material, basis material, etc. In those methods requiring a value for the density of the electrodeposited coating the true density of the gold or gold alloy should be used. If the true density of the gold alloy deposit is not known, use a suitable arithmetically calculated value; for example a 60 % (m/m) gold and 40 % (m/m) silver alloy coating would have a calculated density, ρ , expressed in grams per cubic centimetre, of

$$\frac{100}{\frac{60}{19,3} + \frac{40}{10,5}} = 14,5$$

Otherwise, use the value 19,3 g/cm³.

A value for the density is required for coulometric, X-ray, spectrometric, beta backscatter, gravimetric and chemical analysis methods. In these cases, if a density is calculated or assumed, the accuracies given may not be obtainable.

Other test methods may be used if it can be demonstrated that they have a measurement uncertainty of less than 10 %, or that they are as good as or better than the methods given in this part of ISO 4524 for the particular application.

The supplier of a proprietary gold electroplating solution can generally estimate the density of the gold deposited from that solution, but variations can arise due to different operating conditions, ageing of the electrolyte, poor bath maintenance or inclusions of organic matter.

The approximate density of an alloy deposit may be calculated arithmetically provided that its composition is known. How-

1) At present at the stage of draft. (Revision of ISO 2177-1972.)