

INTERNATIONAL STANDARD

ISO
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Nickel alloys — Flame atomic absorption spectrometric analysis —

Part 7: Determination of aluminium content

*Alliages de nickel — Analyse par spectrométrie d'absorption atomique
dans la flamme —*

Partie 7: Dosage de l'aluminium



Reference number
ISO 7530-7:1992(E)

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 7530-7 was prepared by Technical Committee ISO/TC 155, *Nickel and nickel alloys*, Sub-Committee SC 4, *Analysis of nickel alloys*.

ISO 7530 consists of the following parts, under the general title *Nickel alloys — Flame atomic absorption spectrometric analysis*:

- *Part 1: General requirements and sample dissolution*
- *Part 2: Determination of cobalt content*
- *Part 3: Determination of chromium content*
- *Part 4: Determination of copper content*
- *Part 5: Determination of iron content*
- *Part 6: Determination of manganese content*
- *Part 7: Determination of aluminium content*
- *Part 8: Determination of silicon content*
- *Part 9: Determination of vanadium content*

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Nickel alloys — Flame atomic absorption spectrometric analysis —

Part 7: Determination of aluminium content

1 Scope

This part of ISO 7530 specifies a flame atomic absorption spectrometric method for the determination of aluminium in the range of 0,2 % (m/m) to 4 % (m/m) in nickel alloys. Typical compositions of nickel alloys are given in annex B of ISO 7530-1:1990.

The general requirements concerning the apparatus, sampling, dissolution of the test sample, atomic absorption measurements, calculations and test report are given in ISO 7530-1.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 7530. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 7530 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5725:1986, *Precision of test methods — Determination of repeatability and reproducibility for a standard test method by inter-laboratory tests*.

ISO 7530-1:1990, *Nickel alloys — Flame atomic absorption spectrometric analysis — Part 1: General requirements and sample dissolution*.

3 Principle

Dissolution of a test portion in acid, filtration and aspiration of the test solution into a nitrous oxide-

acetylene flame of an atomic absorption spectrometer.

Combustion of the filter from the acid dissolution and volatilization of silica with hydrofluoric acid. Fusion of the residue with potassium pyrosulfate, dissolution of the melt in dilute acid and aspiration of this second solution into a nitrous oxide-acetylene flame of an atomic absorption spectrometer.

Measurement of the absorbance of the resonance line energy from the spectrum of aluminium and comparison with that of calibration solutions at a wavelength of 309,3 nm.

Addition of the results found in both solutions.

4 Reagents

In addition to the reagents listed in ISO 7530-1, the following special reagents are required.

4.1 Hydrofluoric acid, $\rho_{20} = 1,15$ g/ml.

WARNING — Hydrofluoric acid is extremely irritating and corrosive to skin and mucous membranes, producing severe skin burns which are slow to heal. In the case of contact with skin, wash well with water and seek medical advice.

4.2 Potassium pyrosulfate ($K_2S_2O_7$), powder.

4.3 Potassium chloride (KCl), solution.

Transfer 48 g of potassium chloride to a 600 ml beaker, dissolve in 500 ml of water and transfer to a 1 000 ml one-mark volumetric flask. Make up to the mark with water and mix.