Irish Standard
I.S. EN 10361:2015

Alloyed steels - Determination of nickel content - Inductively coupled plasma optical emission spectrometric method

I.S. EN 10361:2015

Incorporating amendments/corrigenda/National Annexes issued since publication:

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National Foreword

I.S. EN 10361:2015 is the adopted Irish version of the European Document EN 10361:2015, Alloyed steels - Determination of nickel content - Inductively coupled plasma optical emission spectrometric method

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 10361

December 2015

ICS 77.040.30

English Version

Alloyed steels - Determination of nickel content - Inductively coupled plasma optical emission spectrometric method

Aciers alliés - Détermination du nickel - Méthode par spectrométrie d'émission optique avec source à plasma induit

Legierte Stähle - Bestimmung des Nickelanteils - Verfahren mittels optischer Emissionsspektrometrie mit induktiv gekoppeltem Plasma

This European Standard was approved by CEN on 20 June 2015.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Contents

Page

European foreword ... **3**

1 Scope ... **4**

2 Normative references ... **4**

3 Principle ... **4**

4 Reagents ... **4**

5 Apparatus ... **5**

6 Sampling ... **6**

7 Procedure ... **6**

8 Determination ... **8**

9 Expression of the results ... **9**

10 Test report ... **9**

Annex A (informative) **Plasma optical emission spectrometer - Suggested performance criteria to be checked** ... **13**

Annex B (informative) **Composition of the samples used for the validation precision test** ... **15**

Annex C (informative) **Graphical representation of the precision data** ... **16**

Bibliography ... **17**

European foreword

This document (EN 10361:2015) has been prepared by Technical Committee ECISS/TC 102 “Methods of chemical analysis of iron and steel”, the secretariat of which is held by SIS.

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of an identical text or by endorsement, at the latest by June 2016 and conflicting national standards shall be withdrawn at the latest by June 2016.

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1 Scope

This European Standard specifies an inductively coupled plasma optical emission spectrometric method for the determination of nickel content (mass fraction) between 5,0 % and 25,0 % in alloyed steels.

The method does not apply to alloyed steels having niobium and/or tungsten contents higher than 0,1 %.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 648, *Laboratory glassware - Single-volume pipettes (ISO 648)*

EN ISO 1042, *Laboratory glassware - One-mark volumetric flasks (ISO 1042)*

3 Principle

Dissolution of a test portion with hydrochloric and nitric acids. Filtration and ignition of the acid insoluble residue. Removal of silica with hydrofluoric acid. Fusion of the residue with potassium hydrogen sulphate (or with potassium disulphate), dissolution of the melt with acid and addition of this solution to the reserved filtrate.

After suitable dilution and, if necessary, addition of an internal reference element, nebulization of the solution into an inductively coupled plasma emission spectrometer and measurement of the intensity of the emitted light (including, where appropriate, that of the internal reference element).

The method uses a calibration based on a very close matrix matching of the calibration solutions to the sample and bracketing of the mass fractions between 0,95 to 1,05 of the approximate content of nickel in the sample to be analysed. The content of all elements in the sample has, therefore, to be approximately known. If the contents are not known the sample shall be analysed by some semi quantitative method. The advantage with this procedure is that all possible interferences from the matrix will be compensated, which will result in high accuracy. This is most important for spectral interferences, which can be severe in very highly alloyed matrixes. All possible interferences shall be kept at a minimum level. Therefore, it is essential that the spectrometer used meets the performance criteria specified in the method for the selected analytical lines.

The optical lines reported in the Table 1 have been investigated and the strongest possible interferences are given. If other optical lines are used, they shall be carefully checked. The analytical line for the internal reference element should be selected carefully. The use of scandium at 363,1 nm or yttrium at 371,0 nm is recommended. These lines are interference-free for the elements and contents generally found in alloyed steels.

4 Reagents

During the analysis, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.

The same reagents should be used for the preparation of calibration solutions and of sample solutions.

4.1 Hydrochloric acid, HCl (ρ_{20} = 1,19 g/ml).

4.2 Nitric acid, HNO_3 (ρ_{20} = 1,33 g/ml).