



NSAI
Standards

Irish Standard
I.S. EN ISO 13520:2019

Determination of ferrite content in austenitic stainless steel castings (ISO 13520:2015)

I.S. EN ISO 13520:2019

Incorporating amendments/corrigenda/National Annexes issued since publication:

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National Foreword

I.S. EN ISO 13520:2019 is the adopted Irish version of the European Document EN ISO 13520:2019, Determination of ferrite content in austenitic stainless steel castings (ISO 13520:2015)

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EUROPEAN STANDARD

EN ISO 13520

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2019

ICS 77.140.80

English Version

Determination of ferrite content in austenitic stainless steel castings (ISO 13520:2015)

Détermination du taux de ferrite des pièces moulées en acier inoxydable austénitique (ISO 13520:2015)

Bestimmung des Ferritgehaltes in austenitischem nichtrostenden Stahlguss (ISO 13520:2015)

This European Standard was approved by CEN on 29 November 2018.

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EN ISO 13520:2019 (E)

Contents	Page
European foreword.....	3

European foreword

The text of ISO 13520:2015 has been prepared by Technical Committee ISO/TC 17 "Steel" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 13520:2019 by Technical Committee CEN/TC 459 "Steel castings and forgings" the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by September 2019, and conflicting national standards shall be withdrawn at the latest by September 2019.

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Endorsement notice

The text of ISO 13520:2015 has been approved by CEN as EN ISO 13520:2019 without any modification.

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**INTERNATIONAL
STANDARD**

**ISO
13520**

Second edition
2015-10-01

**Determination of ferrite content in
austenitic stainless steel castings**

*Détermination du taux de ferrite des pièces moulées en acier
inoxydable austénitique*



Reference number
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Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Significance effects of ferrite content	1
5 Methods of determination of ferrite content	2
5.1 Chemical composition method.....	2
5.2 Magnetic response method.....	2
5.3 Metallographic examination.....	2
6 Ordering information	2
7 General caution	2
8 Estimation of ferrite	3
9 Acceptance standards	3
10 Certification	3
Annex A (normative) Determination of ferrite content by magnetic or metallographic means	4
Annex B (informative) Notes to Schoefer diagram	5

ISO 13520:2015(E)

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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 017, *TC Steel*, Subcommittee SC 11, *SC Steel castings*.

This second edition cancels and replaces the first edition (ISO 13520:2002), which has been technically revised.

Determination of ferrite content in austenitic stainless steel castings

1 Scope

Procedures are covered for estimating ferrite content in certain grades of austenitic iron-chromium-nickel alloy castings that have compositions balanced to create the formation of ferrite as a second phase in amounts controlled within specified limits. Methods are described for estimating ferrite content by chemical, magnetic and metallographic means.

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.

ISO 4990, *Steel castings — General technical delivery requirements*

ISO 9042, *Steels — Manual point counting method for statistically estimating the volume fraction of a constituent with a point grid*

ASTM A799, *Standard Practice for Steel Castings, Stainless, Instrument Calibration, for Estimating Ferrite Content*

BNIF 345, *Evaluation de la teneur en ferrite dans les aciers inoxydables moulés austénitiques*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

ferrite

ferromagnetic, body-centred cubic microstructural constituent of variable chemical composition in iron-chromium-nickel alloys

Note 1 to entry: Ferrite includes both delta and alpha species.

3.2

ferrite content

proportion of total volume of an iron-chromium-nickel alloy present as the ferrite phase

3.3

ferrite percentage

ferrite content expressed as a volume percent

4 Significance effects of ferrite content

The tensile and impact properties, the weldability, and the corrosion resistance of iron-chromium-nickel alloy castings may be influenced beneficially or detrimentally by the ratio of the amount of ferrite to the amount of austenite in the microstructure. The ferrite content may be limited by purchase order requirements or by the design construction codes governing the equipment in which castings will be used. The quantity of ferrite in the structure is fundamentally a function of the chemical composition of the alloy and its thermal history. Because of segregation, the chemical composition and, therefore, the ferrite content, may differ from point to point on a casting. Determination of the ferrite content by

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