



NSAI
Standards

Irish Standard
I.S. EN ISO 10113:2020&LC:2020

Metallic materials - Sheet and strip - Determination of plastic strain ratio (ISO 10113:2020, Corrected version 2020-11)

I.S. EN ISO 10113:2020&LC:2020

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:

Published:

*This document was published
under the authority of the NSAI
and comes into effect on:*

2021-01-26

ICS number:

77.040.10

NOTE: If blank see CEN/CENELEC cover page

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

National Foreword

I.S. EN ISO 10113:2020&LC:2020 is the adopted Irish version of the European Document EN ISO 10113:2020, Metallic materials - Sheet and strip - Determination of plastic strain ratio (ISO 10113:2020, Corrected version 2020-11)

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

For relationships with other publications refer to the NSAI web store.

Compliance with this document does not of itself confer immunity from legal obligations.

In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

This page is intentionally left blank

Corrected Version

Reference: EN ISO 10113:2020

Title: Metallic materials - Sheet and strip - Determination of plastic strain ratio (ISO 10113:2020, Corrected version 2020-11)

Work Item: EC101159

Brussels, 2020-12-09

Please include the following minor editorial correction(s) in the document related to:

the following language version(s) :

- ☒ English
- ☒ French
- ☐ German

for the following procedure :

- ☐ PQ/UQ
- ☐ Enquiry
- ☐ 2nd Enquiry
- ☐ Parallel Enquiry
- ☐ 2nd Parallel Enquiry
- ☐ Formal Vote
- ☐ 2nd Formal Vote
- ☐ Parallel Formal Vote
- ☐ 2nd Parallel Formal Vote
- ☐ UAP
- ☐ TC Approval
- ☐ 2nd TC Approval
- ☐ Publication
- ☒ Parallel Publication

It has been brought to our attention that this document, issued on 2020-02-12, requires modification.

ISO has published (Corrected version 2020-11) of ISO 10113:2020.

Titles and Forewords have been updated accordingly for English and French versions.

We apologise for any inconvenience this may cause.

This page is intentionally left BLANK.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 10113

February 2020

ICS 77.040.10

Supersedes EN ISO 10113:2014

English Version

**Metallic materials - Sheet and strip - Determination of
plastic strain ratio (ISO 10113:2020, Corrected version
2020-11)**

Matériaux métalliques - Tôles et bandes -
Détermination du coefficient d'anisotropie plastique
(ISO 10113:2020, Version corrigée 2020-11)

Metallische Werkstoffe - Blech und Band - Bestimmung
der senkrechten Anisotropie (ISO 10113:2020,
korrigierte Fassung 2020-11)

This European Standard was approved by CEN on 5 January 2020.

This European Standard was corrected and reissued by the CEN-CENELEC Management Centre on 09 December 2020.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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.

CEN members are the national standards bodies of 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 United Kingdom.



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

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

EN ISO 10113:2020 (E)

Contents	Page
European foreword.....	3

European foreword

This document (EN ISO 10113:2020) has been prepared by Technical Committee ISO/TC 164 "Mechanical testing of metals" in collaboration with Technical Committee CEN/TC 459/SC 1 "Test methods for steel (other than chemical analysis)" 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 August 2020, and conflicting national standards shall be withdrawn at the latest by August 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 10113:2014.

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 10113:2020, Corrected version 2020-11 has been approved by CEN as EN ISO 10113:2020 without any modification.

This page is intentionally left blank

INTERNATIONAL STANDARD

**ISO
10113**

Third edition
2020-01

Corrected version
2020-11

Metallic materials — Sheet and strip — Determination of plastic strain ratio

*Matériaux métalliques — Tôles et bandes — Détermination du
coefficient d'anisotropie plastique*



Reference number
ISO 10113:2020(E)

© ISO 2020

ISO 10113:2020(E)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols	2
5 Principle	4
6 Test equipment	5
7 Test piece	6
8 Procedure	6
8.1 General.....	6
8.2 Method without using any extensometer (manual method).....	7
8.2.1 General.....	7
8.2.2 Testing.....	7
8.2.3 Evaluation.....	8
8.3 Method only with length extensometer (semi-automatic method).....	8
8.3.1 General.....	8
8.3.2 Testing.....	8
8.3.3 Evaluation.....	9
8.4 Method with width and length extensometer (automatic method).....	9
8.4.1 General.....	9
8.4.2 Testing.....	9
8.4.3 Evaluation.....	9
9 Additional test results	12
10 Test report	12
Annex A (informative) Methods for investigating sources of errors in <i>r</i>-value determination	13
Annex B (informative) International comparison of symbols used in the determination of plastic strain ratio	23
Bibliography	24

ISO 10113:2020(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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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.

This document was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 2, *Ductility testing*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 459/SC 1, *Test methods for steel (other than chemical analysis)*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 10113:2006), which has been technically revised. The main changes compared to the previous edition are as follows:

- a new structure;
- the addition of the semi-automatic method (see [8.3](#));
- a clear differentiation between the manual, the semi-automatic and the automatic methods (see [8.2](#), [8.3](#) and [8.4](#));
- the addition of the methods of investigating sources of errors in *r*-value determination (see [Annex A](#)).

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.

This corrected version of ISO 10113:2020 incorporates the following corrections:

- Correction of the description of the test in the fourth paragraph of 8.4.2.

Metallic materials — Sheet and strip — Determination of plastic strain ratio

1 Scope

This document specifies a method for determining the plastic strain ratio of flat products (sheet and strip) made of metallic materials.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6892-1:2019, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 9513, *Metallic materials — Calibration of extensometer systems used in uniaxial testing*

ISO 80000-1, *Quantities and units — Part 1: General*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6892-1 and the following apply.

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/>

3.1

plastic strain ratio

r

ratio of the true plastic width strain to the true plastic thickness strain in a test piece that has been subjected to uniaxial tensile stress calculated using [Formula \(1\)](#)

$$r = \frac{\varepsilon_{p_b}}{\varepsilon_{p_a}} \quad (1)$$

where

ε_{p_a} is the true plastic thickness strain;

ε_{p_b} is the true plastic width strain.

Note 1 to entry: The above expression using a single point is only valid in the region where the plastic strain is homogeneous.

Note 2 to entry: Since it is easier and more precise to measure changes in length than in thickness, the following relationship derived from the law of constancy of volume is used up to the percentage plastic extension at maximum force, A_g , to calculate the plastic strain ratio, r [see [Formula \(2\)](#)].

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- Looking for additional Standards? Visit Intertek Inform Infostore
 - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-