NSAI
Standards

Irish Standard
I.S. EN 10373:2021

Determination of the physical and mechanical properties of steels using models

I.S. EN 10373:2021

Incorporating amendments/corrigenda/National Annexes issued since publication:

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Údarás um Chaighdeáin Náisiúnta na hÉireann

National Foreword

I.S. EN 10373:2021 is the adopted Irish version of the European Document EN 10373:2021, Determination of the physical and mechanical properties of steels using models

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 10373

June 2021

ICS 77.080.20; 77.140.01

English Version

Determination of the physical and mechanical properties of steels using models

Détermination des propriétés physiques et mécaniques des aciers à l'aide de modèles

Ermittlung physikalischer und mechanischer Eigenschaften von Stählen mittels Anwendung von Modellen

This European Standard was approved by CEN on 23 May 2021.

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.

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EN 10373:2021 (E)

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European foreword

This document (EN 10373:2021) has been prepared by Technical Committee CEN/TC 459 SC 12 "General issues", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by December 2021, and conflicting national standards shall be withdrawn at the latest by December 2021.

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.

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EN 10373:2021 (E)

Introduction

Since the physical and mechanical properties of steels are ultimately based upon the metallurgical transformations during the production process, there have been numerous efforts of the manufacturers in the past, to design models for providing property data for the whole product, in order to improve the control of the increasingly complex processes during the manufacturing of steel products.

In doing so, the use of models not only helps to reduce the amount of testing in the scope of factory production control, but it gives a more representative overview of the material properties of steels, since models can use all available data, determined during the production process, whereas conventional material testing represents in principle a spot check of the material properties at the time of sampling and at the place where the samples were taken.

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EN 10373:2021 (E)

1   Scope

This document specifies the method for the verification of models for the determination of the property data of steels and the validation of the modelling process. It is applicable where modelling of mechanical or physical properties is used to substitute conventional testing for specific inspection. Models can be based on statistical data, thermo-physical data or indirect measurement (e.g. measurement of magnetic or ultrasonic data), or a combination of these methods.

This document applies only for providing the properties of rolled and/or heat-treated products such as plates, sheets, strip, sections and bars.

This document is used to demonstrate the ability of the model to supply property data which is equivalent to data, measured by conventional testing.

Any self-learning system is excluded from the scope.

NOTE   A self-learning, in the spirit of an auto-adaptive model, is a model which changes its internal parameters by itself.

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.

EN 10021, *General technical delivery conditions for steel products*

EN 10204, *Metallic products - Types of inspection documents*

NOTE   At the time of the first release of this standard, no publications concerning statistical analyses of manufacturing processes and/or statistical methods have been identified, which could have been cited as normative references in this document. The bibliography contains references to technical literature, which can be taken into account.

3   Terms and definitions

For the purposes of this document, the following terms and definitions 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 https://www.electropedia.org/

3.1
model
documented system for the generation of output data using input data

Note 1 to entry: A unique set of input values to the model will always result in the same calculated output value(s).

Note 2 to entry: The model calculates physical and/or mechanical property data from input data, the results of which can also be determined by physical and/or mechanical testing.

Note 3 to entry: An example of a linear model for calculation of tensile strength is given in Annex A.