Irish Standard
I.S. EN ISO 21432:2020

Non-destructive testing - Standard test method for determining residual stresses by neutron diffraction (ISO 21432:2019)

I.S. EN ISO 21432:2020

Incorporating amendments/corrigenda/National Annexes issued since publication:

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This document is based on:	*Published:*
EN ISO 21432:2020	2020-09-23

This document was published under the authority of the NSAI and comes into effect on:	ICS number:
2020-10-12	19.100
	NOTE: If blank see CEN/CENELEC cover page

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National Foreword

I.S. EN ISO 21432:2020 is the adopted Irish version of the European Document EN ISO 21432:2020, Non-destructive testing - Standard test method for determining residual stresses by neutron diffraction (ISO 21432:2019)

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 21432

September 2020

ICS 19.100

English Version

Non-destructive testing - Standard test method for determining residual stresses by neutron diffraction (ISO 21432:2019)

Essais non destructifs - Méthode normalisée de détermination des contraintes résiduelles par diffraction de neutrons (ISO 21432:2019)

Zerstörungsfreie Prüfung - Standardprüfverfahren zur Bestimmung von Eigenspannungen durch Neutronenbeugung (ISO 21432:2019)

This European Standard was approved by CEN on 31 August 2020.

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

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Ref. No. EN ISO 21432:2020 E

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European foreword

The text of 21432:2019 has been prepared by Technical Committee ISO/TC 135 "Non-destructive testing" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 21432:2020 by Technical Committee CEN/TC 138 "Non-destructive testing" 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of an identical text or by endorsement, at the latest by March 2021, and conflicting national standards shall be withdrawn at the latest by March 2021.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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Endorsement notice

The text of 21432:2019 has been approved by CEN as EN ISO 21432:2020 without any modification.

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I.S. EN ISO 21432:2020

INTERNATIONAL STANDARD

ISO 21432

First edition
2019-12

Non-destructive testing — Standard test method for determining residual stresses by neutron diffraction

Essais non destructifs — Méthode normalisée de détermination des contraintes résiduelles par diffraction de neutrons

Reference number
ISO 21432:2019(E)

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Published in Switzerland

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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.

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 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 135, *Non-destructive testing*, Subcommittee SC 5, *Radiographic Testing*.

This first edition cancels and replaces ISO/TS 21432:2005, which has been technically revised. It also incorporates the Technical Corrigendum ISO/TS 21432:2005/Cor 1:2008. Furthermore this document replaces ISO/TTA3:2001.

The main changes compared to ISO/TS 21432 are as follows:

— Figures 1 and 5 were replaced with updated, more suitable versions. The keys for several figures were updated in order to better reflect and explain the content of the figures.

— 5.4 was rearranged to emphasize the distinction between monochromatic instruments and time-of-flight instruments.

— The former Clause 7 became Clause 6 and vice versa. The new order reflects better the real order of steps taken in the preparation of a measurement.

— 7.6 was updated to provide additional details on the determination of the stress-free reference value.

— Clause 10 was slightly modified and the references to the ISO/IEC Guides relevant to uncertainty determination were updated.

— 11.7 was added in order to include uncertainties and errors in the reporting.

— A.5.4 was revised and amended to provide more information on grain size effects and the possibilities to mitigate these.

— A.9 was added to explain the calculation of stresses in the case of macroscopically anisotropic material.

— The Bibliography was updated by including a few new references.

— Throughout the document minor revisions of the text were implemented in order to correct small errors and to improve the clarity.

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.

Introduction

Neutron diffraction is a non-destructive method that can be employed for determining residual stresses in crystalline materials. It can also be used to determine internal stresses in samples subjected to applied stresses. The procedure can be employed for determining stresses within the interior of materials and adjacent to surfaces. It requires specimens or engineering components to be transported to a neutron source. Elastic strains are derived from the measurements, which in turn are converted into stresses. The purpose of this document is to provide an International Standard for reliably determining stresses that are relevant to engineering applications.