Non-destructive testing - Characterization and verification of ultrasonic phased array equipment - Part 3: Complete systems (ISO 18563-3:2024)

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NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 18563-3:2024 sisaldab Euroopa standardi EN ISO 18563-3:2024 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 18563-3:2024 consists of the English text of the European standard EN ISO 18563-3:2024.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 08.05.2024.	Date of Availability of the European standard is 08.05.2024.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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Zerstörungsfreie Prüfung - Charakterisierung und Verifizierung der Ultraschall-Prüfausrüstung mit phasengesteuerten Arrays - Teil 3: Vollständige Prüfsysteme (ISO 18563-3:2024)

This European Standard was approved by CEN on 20 April 2024.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN ISO 18563-3:2024) has been prepared by Technical Committee ISO/TC 135 "Non-destructive testing" in collaboration with 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of an identical text or by endorsement, at the latest by November 2024, and conflicting national standards shall be withdrawn at the latest by November 2024.

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 18563-3:2015.

Any feedback and questions on this document should be directed to the users’ national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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, Türkiye and the United Kingdom.

Endorsement notice

The text of ISO 18563-3:2024 has been approved by CEN as EN ISO 18563-3:2024 without any modification.

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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 document 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 3 *Ultrasonic testing,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 138, *Non-destructive testing,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 18563-3:2015), which has been technically revised.

The main changes are as follows:

— integration of matrix array probes;

— deletion of group 1 and 2 tests;

— addition of a clause on the use of imaging for complete system verification (9.4.3) as a simplification for a more functional standard (characterisation of beams moved to Annex A);

— addition of signal processing techniques using arrays (e.g. total focusing technique (TFM)) in the scope.

A list of all parts in the ISO 18563 series can be found on the ISO website.

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.

Non-destructive testing — Characterization and verification of ultrasonic phased array equipment —

Part 3: Complete systems

1 Scope

This document addresses ultrasonic test systems implementing array probes, for contact technique (with or without wedge) or for immersion technique, with centre frequencies in the range of 0,5 MHz to 10 MHz.

This document provides methods and acceptance criteria for determining the compliance of the complete system (see 3.2). Its purpose is for the verification of the correct operation of the system prior to testing or verification of the absence of degradation of the system.

The methods are not intended to prove the suitability of the system for particular applications but are intended to prove the capability of the complete system (used for an application) to operate correctly according to the settings used. Tests can be performed on individual ultrasonic beams (for phased array technique, see 9.4.4) or on resulting images (for phased array technique and total focusing technique, see 9.4.3).

The tests can be limited to the functions that are intended to be used for a certain application.

This document does not cover the sensitivity setting of the system for a specific application. Nor does it apply to the characterization or verification of the mechanical scanning equipment. It is intended that these items will be covered by the test procedure.

This document does not address the phased array technique using tandem technique.

The characterization of beams, as recommended in case of dead elements or for more in-depth knowledge of the beams, is presented in Annex A. It is not applicable for signal processing technology using arrays.

NOTE Unless stated otherwise, in this document 'TFM' and 'TFM technique' refer to the total focusing technique as defined in ISO 23243, and to related techniques, see for example ISO 23865 and ISO 23234.

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 5577, *Non-destructive testing — Ultrasonic testing — Vocabulary*

ISO 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

ISO 18563-1, *Non-destructive testing — Characterization and verification of ultrasonic phased array equipment — Part 1: Instruments*

ISO 18563-2, *Non-destructive testing — Characterization and verification of ultrasonic phased array equipment — Part 2: Probes*

ISO 22232-2, *Non-destructive testing — Characterization and verification of ultrasonic test equipment — Part 2: Probes*

ISO 23243, *Non-destructive testing — Ultrasonic testing with arrays — Vocabulary*