

FINAL
DRAFT

INTERNATIONAL
STANDARD

ISO/FDIS
23243

ISO/TC 135/SC 3

Secretariat: DIN

Voting begins on:
2020-08-20

Voting terminates on:
2020-10-15

Non-destructive testing — Ultrasonic testing with arrays — Vocabulary

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Full standard:
<https://standards.iteh.ai/catalog/standards/sist/1ea10f2b-289b-44e7-9c73-d748075c3eccc/iso-fdis-23243>

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

ISO/CEN PARALLEL PROCESSING



Reference number
ISO/FDIS 23243:2020(E)

© ISO 2020

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/1ea102b-289b-4de7-9c73-d748075c3eccc/iso-fdis-23243>



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
Introduction.....	v
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
3.1 Terms related to sound.....	1
3.2 Terms related to the test equipment.....	1
3.2.1 Probes.....	1
3.2.2 Instruments.....	10
3.3 Terms related to testing.....	12
3.3.1 Testing techniques.....	12
3.3.2 Signals, presentations and indications.....	16
3.3.3 Evaluation of indications.....	19
Bibliography.....	20

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Full standard at:
<https://standards.iteh.ai/catalog/standards/sist/1ea102b-289b-44e7-9c73-d748075c3eccc/iso-fdis-23243>

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 the European Committee for Standardization (CEN) Technical Committee CEN/TC 138, *Non-destructive testing*, in collaboration with ISO Technical Committee ISO/TC 135, *Non-destructive testing*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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

This document follows a structure similar to that in ISO 5577 but only takes into account terms related to ultrasonic arrays.

The general terms already defined in ISO 5577 are also valid for ultrasonic arrays.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/1ea10f2b-2f9b-4de7-9c73-d74f075c3ecc/iso-fdis-23243>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Full standard:
<https://standards.iteh.ai/catalog/standards/sist/1ea102b-29b-4de7-9c73-d748075c3ecc/iso-fdis-23243>

Non-destructive testing — Ultrasonic testing with arrays — Vocabulary

1 Scope

This document defines terms used in ultrasonic testing with arrays. This includes phased array technology and signal processing technology using arrays, e. g. the full-matrix capture (FMC) (3.3.1.28) and the total focusing technique (TFM) (3.3.1.35).

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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 Terms related to sound

3.1.1

main lobe

main beam

sound beam in the intended direction, typically with the highest pressure within the sound field

Note 1 to entry: This applies to conventional and *array probes* (3.2.1.3).

3.1.2

side lobe

part of the sound field which corresponds to a local maximum in the far field, deviating from the direction of the *main lobe* (3.1.1) and typically lower in amplitude

Note 1 to entry: This applies to conventional and *array probes* (3.2.1.3).

3.1.3

grating lobe

parasitic replication of the *main lobe* (3.1.1) caused by spatial undersampling (low ratio between wavelength and *pitch* (3.2.1.16)), deviating from the direction of the main lobe and possibly of similar amplitude

Note 1 to entry: This applies to *array probes* (3.2.1.3) only.

3.2 Terms related to the test equipment

3.2.1 Probes

3.2.1.1

array

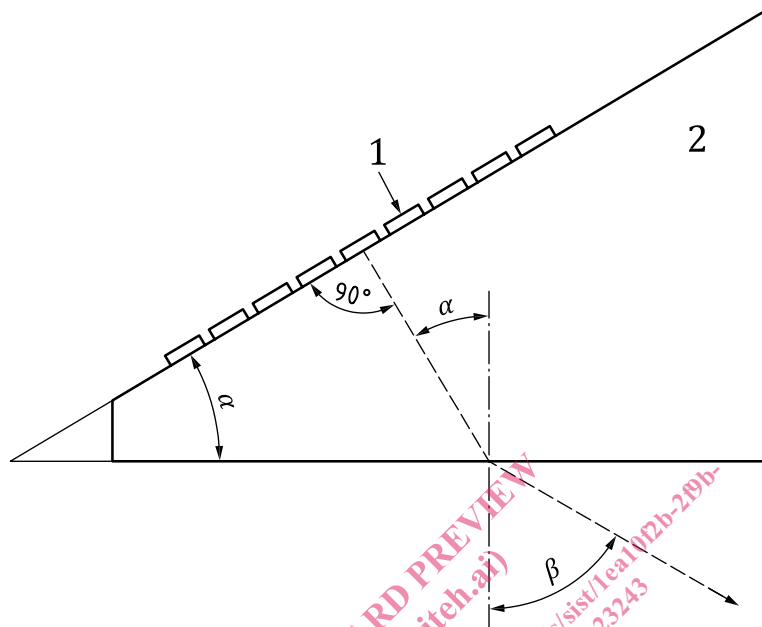
piezoelectric plate divided into several *elements* (3.2.1.2), which are acoustically and electrically separated

3.2.1.2

**array element
element**

smallest part of the *array* (3.2.1.1) acting as a transducer

Note 1 to entry: See [Figure 1](#).



Key

- 1 array element
- 2 wedge
- α wedge angle
- β natural refracted beam angle (3.2.1.26)

Figure 1 — Wedge with relevant parameters

3.2.1.3

array probe

probe with an *array* (3.2.1.1) of *elements* (3.2.1.2) for transmitting and/or receiving

3.2.1.4

arrangement of the array

spatial distribution of all the *elements* (3.2.1.2) in an *array* (3.2.1.1)

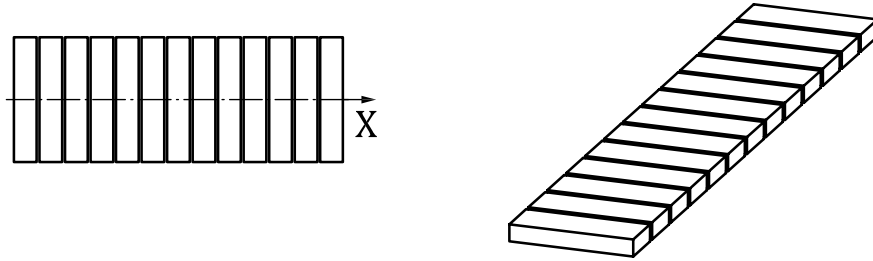
3.2.1.5

linear array

1-D-linear array

array (3.2.1.1) of *elements* (3.2.1.2) arranged in a single straight line allowing steering in one direction (X) and focusing in the depth direction

Note 1 to entry: See [Figure 2](#).

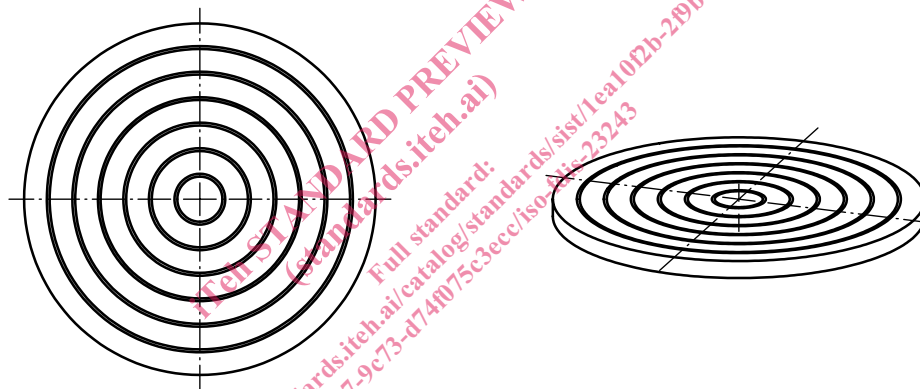
**Key**

X primary axis

Figure 2 — Linear array; 1-D-linear array**3.2.1.6****annular array**

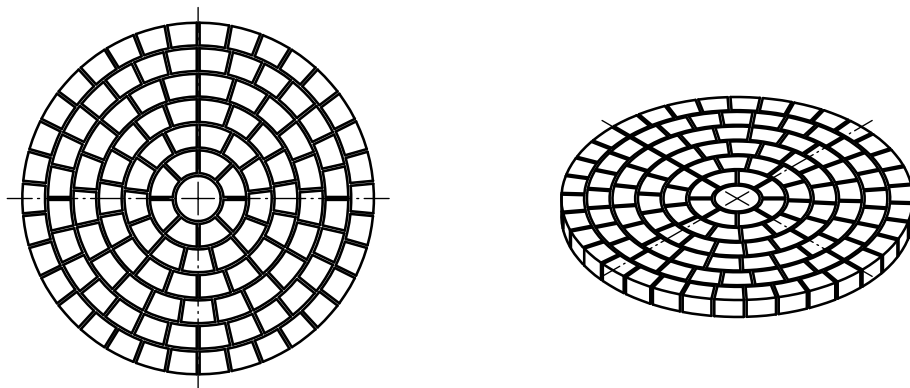
array (3.2.1.1) of ring-shaped *elements* (3.2.1.2) arranged concentrically allowing focusing in the depth direction

Note 1 to entry: See [Figure 3](#).

**Figure 3 — Annular array****3.2.1.7****sectorial annular array**

annular array (3.2.1.6) with the rings divided into sectors allowing steering in two directions and focusing in the depth direction

Note 1 to entry: See [Figure 4](#) and [Figure 5](#).

**Figure 4 — Sectorial annular array**

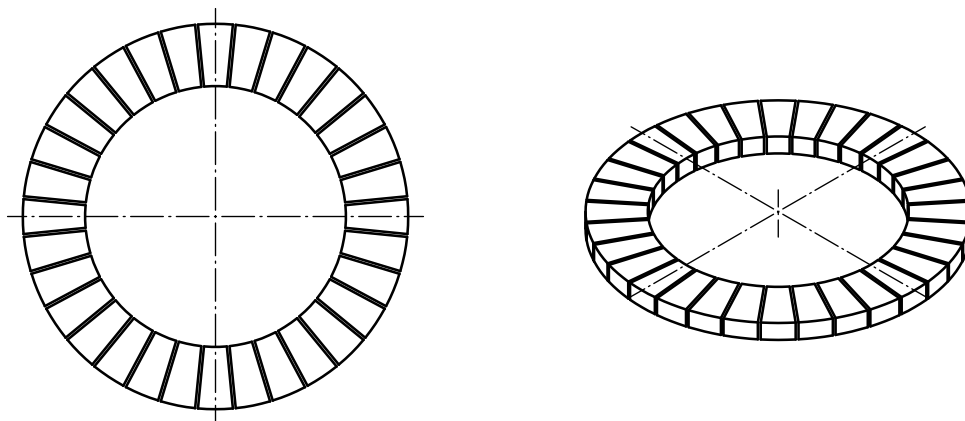


Figure 5 — Partial sectorial annular array

3.2.1.8

1-D-curved array

array (3.2.1.1) arranged on a complete or partial cylinder, where the major transmitting axis is radial

Note 1 to entry: See [Figure 6](#) and [Figure 7](#).



Figure 6 — 1-D-curved array covering a complete circle

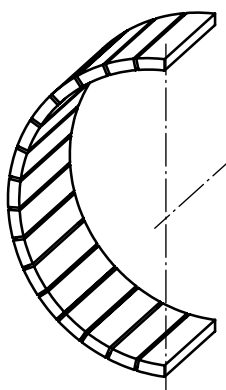


Figure 7 — 1-D-curved array covering part of a circle