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Non-destructive testing — Ultrasonic testing with arrays — Vocabulary

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Contents

Page

Foreword

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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.

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.

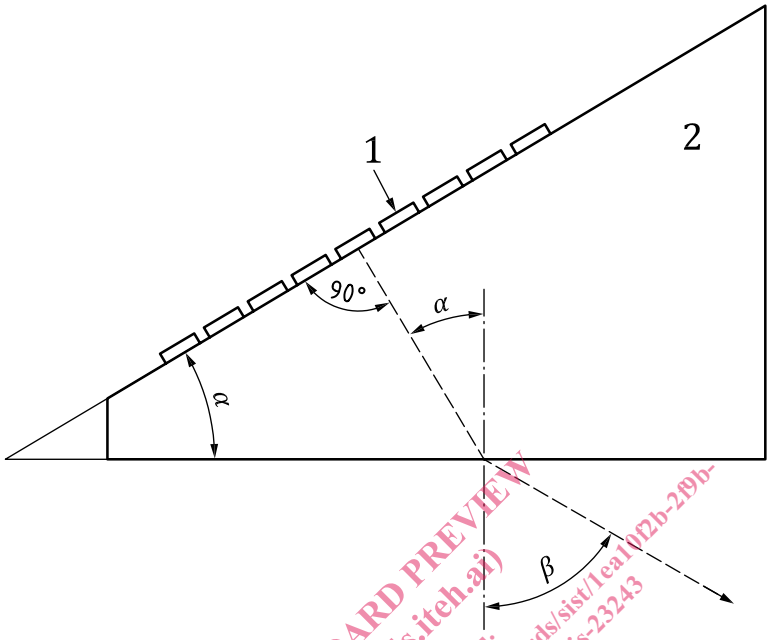
3.2 Terms related to the test equipment

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)

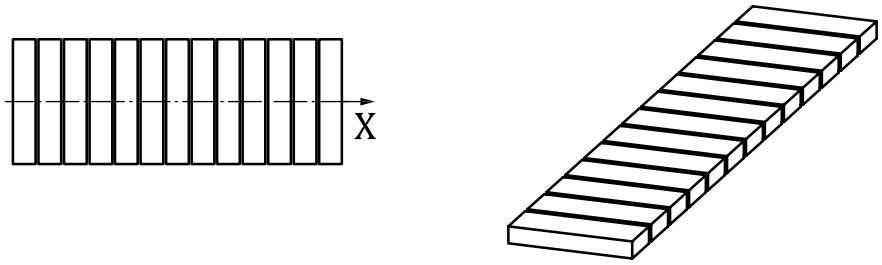
Figure 1 — Wedge with relvant parameters

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.

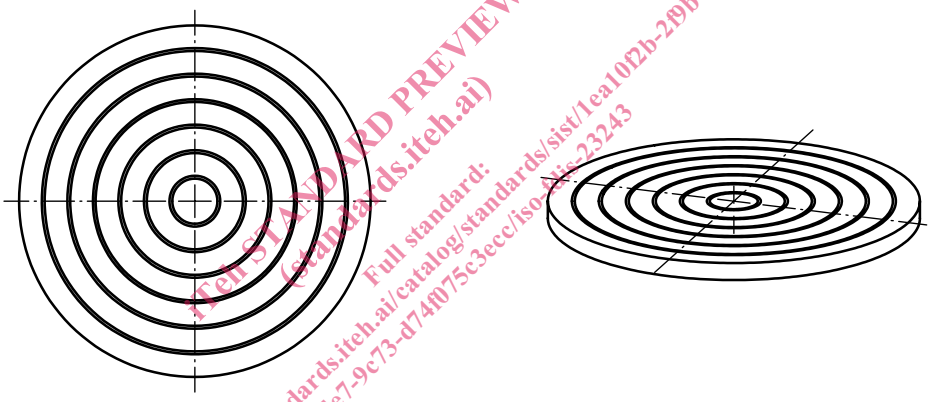


Figure 3 — Annular array

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.

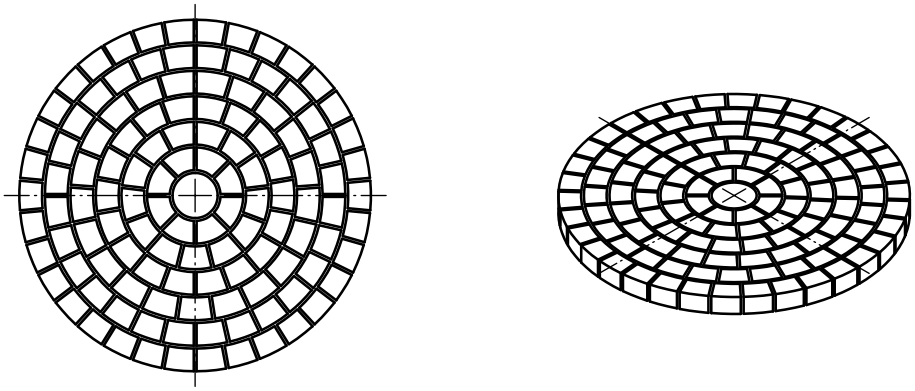


Figure 4 — Sectorial annular array

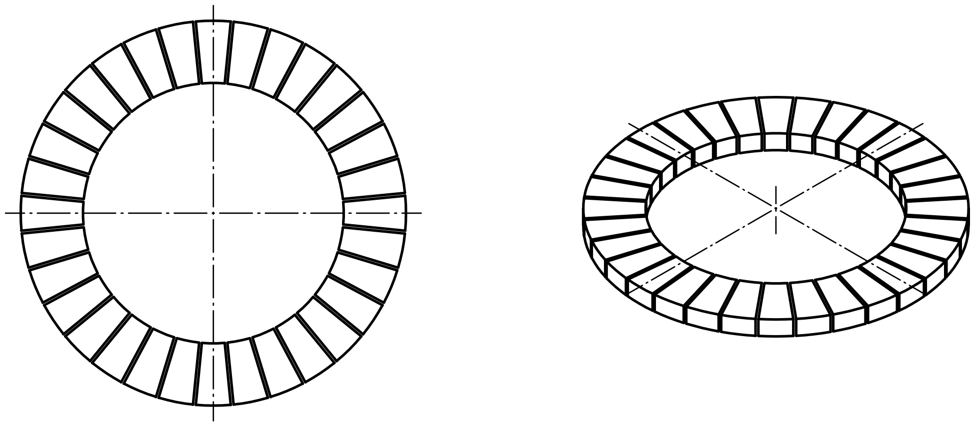


Figure 5 — Partial sectorial annular array

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.

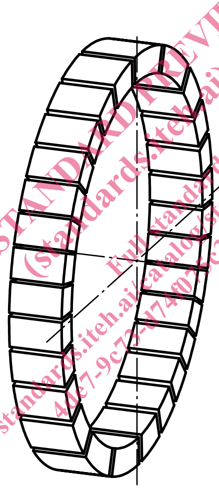


Figure 6 — 1-D-curved array covering a complete circle

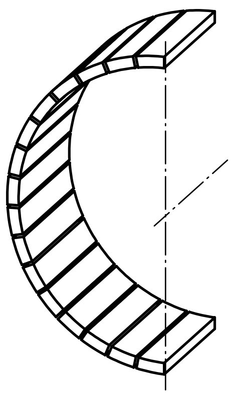


Figure 7 — 1-D-curved array covering part of a circle

