



Industry Specification

Phased Array Ultrasonic Testing of Discontinuities
in Iron Castings – Technical Specification

VERSION 1.1 – OCTOBER 2024

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Note: If printed out, it must be printed in color

INDUSTRY STANDARD FOR PHASED ARRAY ULTRASONIC TESTING OF DISCONTINUITIES IN IRON CASTINGS

1 Scope

The scope of this procedure is limited to an ultrasonic inspection using phased array on a small part of a casting product. The inspection includes re-inspection and evaluation of an already identified UT defect, conclude to be out of specification. The aim is to establish a more accurate dataset for NC decision by the OEM/design owner. The possible outcome from the OEM evaluation is expected to be one of the following:

- a. accepted as-is
- b. to be repaired by welding
- c. rejected without any repair options (component remains scrapped)

This instruction is to be used in agreement between the parties (OEM, Design owner, supplier). The agreement must go through non-conformity handling of any defect found out of specification with potential for a weld repair.

2 Normative references

Standards:

EN 16018-2012	NDT – Terminology – <i>Terms used in ultrasonic testing with phased arrays.</i>
EN 12680-3	NDT- <i>Founding – Ultrasonic testing – Part3: Spheroidal graphite cast iron castings</i>
EN ISO 23243-2020	NDT Ultrasonic testing with arrays – Vocabulary
EN ISO 23864:2021	NDT-UT- <i>Use of automated total focusing technique (TFM) and related technologies</i>
EN ISO 13588-2019	NDT of welds UT <i>Use of automated phased array technology</i>
EN ISO 18563-1	NDT- <i>Characterization and verification of ultrasonic phased array equipment – Part 1 – Instruments</i>
EN ISO 18563-2	NDT- <i>Characterization and verification of ultrasonic phased array equipment – Part 2 – Probes</i>

EN ISO 18563-3	NDT- <i>Characterization and verification of ultrasonic phased array equipment – Part 3 – Combined systems</i>
EN ISO 19285-2017	NDT of welds – PAUT <i>acceptance levels</i>
EN ISO 20601-2018	NDT of welds – UT <i>Use of automated phased array technology for thin-walled steel components</i>
ISO 19675-2017	NDT – UT – <i>Specification for a calibration block for phased array testing (PAUT)</i>

3 Terms and definitions

Refer to the ISO 23243:2020 Ultrasonic testing with arrays, Vocabulary.

WT	Wall Thickness
PAUT	Phased Array Ultrasonic Test
NDT	Non Destructive Testing
TFM	Total Focusing Method
TCG	Time Corrected Gain
FBH	Flat Bottom hole
SDH	Side drilled hole
FSH	Full Screen Hight
PRF	Pulse Repetition Frequency
NC	Non Conforming
MXU	PAUT software on Omniscan X3
TARGET REFERENCE HOLES	Size of hole in the depth of location
OEM	Original Equipment manufacturer of Wind turbines

The purposes of this document.

The purpose of this document is to outline the requirements for conducting an ultrasonic testing using phased array technology (UTPA), for examination of a detected and rejected indication in a casting component.

By the usage of the superior phased array technique, compared to the traditional ultrasonic testing technique used for detection and rejection, it is the aim to be able to gain more accurate information of the indication size, location and geometry, and thereby allowing for a re-evaluation of the individual indication's acceptance based on the requirements included in this procedure.

In addition, the inspection outlined through this procedure aims to detect potential discontinuities in the parent material that can affect the inspection of the weld repair itself after welding if a weld-repair is agreed upon.

3.1

Internal documentation:

An internal instruction according to this procedure must be created including the specific equipment, ref blocks etc.

The following are examples for needed instructions if not included in the above mentioned instruction.

- PAUT *Calibration Verification blocks*
- PAUT *Characterization and Verification combined equipment Group 1*
- PAUT *Characterization and Verification combined equipment Group 2*
- PAUT *Naming Convention for files and documentation.*
- PAUT *Calculation - Equipment with compensation ability 12 dB*
- PAUT *Calculation - Equipment WITHOUT compensation ability 9dB*

Partial Preview