

---

---

**Non-destructive testing of welds —  
Phased array ultrasonic testing  
(PAUT) — Acceptance levels**

*Essais non destructifs des assemblages soudés — Technique ultrasons  
multi-éléments (PAUT) — Niveaux d'acceptation*



This document is a preview generated by EMS



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, 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  
Ch. de Blandonnet 8 • CP 401  
CH-1214 Vernier, Geneva, Switzerland  
Tel. +41 22 749 01 11  
Fax +41 22 749 09 47  
copyright@iso.org  
www.iso.org

# Contents

	Page
<b>Foreword</b> .....	<b>iv</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Symbols</b> .....	<b>1</b>
<b>5 Acceptance levels</b> .....	<b>2</b>
<b>6 Evaluation of indications</b> .....	<b>2</b>
<b>7 Determination of length and height</b> .....	<b>2</b>
7.1 General.....	2
7.2 Determination of length.....	2
7.3 Determination of height.....	2
7.3.1 General.....	2
7.3.2 Using diffracted signals.....	2
7.3.3 Using other signals.....	3
<b>8 Determination of length and maximum amplitude</b> .....	<b>3</b>
<b>9 Acceptance criteria based on length and height</b> .....	<b>3</b>
9.1 General.....	3
9.2 Single indications.....	3
9.2.1 Acceptance criteria for level 1.....	3
9.2.2 Acceptance criteria for level 2.....	3
9.2.3 Acceptance criteria for level 3.....	4
9.3 Cumulative length of indications.....	4
9.3.1 General.....	4
9.3.2 For each single set-up.....	4
9.3.3 Combining set-ups.....	5
9.4 Grouping of indications.....	5
9.5 Point-like indications.....	6
<b>10 Acceptance criteria based on length and amplitude</b> .....	<b>6</b>
10.1 General.....	6
10.2 Longitudinal indications.....	6
10.3 Transverse indications.....	6
10.4 Grouping of indications.....	6
10.5 Cumulative length of indications.....	7
10.5.1 General.....	7
10.5.2 For each single set-up.....	8
10.5.3 Combined set-up.....	8
<b>Annex A (normative) Levels</b> .....	<b>9</b>
<b>Annex B (normative) Fixed amplitude level technique</b> .....	<b>22</b>

## 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](http://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](http://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 on 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 the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 5, *Testing and inspection of welds*.

Requests for official interpretations of any aspect of this document should be directed to the Secretariat of ISO/TC 44/SC 5 via your national standards body. A complete listing of these bodies can be found at [www.iso.org](http://www.iso.org).

# Non-destructive testing of welds — Phased array ultrasonic testing (PAUT) — Acceptance levels

## 1 Scope

This document specifies acceptance levels for the phased array ultrasonic testing technique (PAUT) of full penetration welds in ferritic steels of minimum thickness of 6 mm which correspond to the quality levels of ISO 5817.

These acceptance levels are applicable to indications classified in accordance with ISO 13588.

## 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 5817, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections*

ISO 11666, *Non-destructive testing of welds — Ultrasonic testing — Acceptance levels*

ISO 13588, *Non-destructive testing of welds — Ultrasonic testing — Use of automated phased array technology*

ISO 15626, *Non-destructive testing of welds — Time-of-flight diffraction technique (TOFD) — Acceptance levels*

ISO 17640, *Non-destructive testing of welds — Ultrasonic testing — Techniques, testing levels, and assessment*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5577 and ISO 13588 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

## 4 Symbols

$h$  height

$h_g$  sum of the heights of the individual indications plus the distance between them

$l$  length

$l_g$  sum of the lengths of the individual indications plus the distance between them

$t$  thickness