



**SLOVENSKI STANDARD**  
**kSIST FprEN ISO 16811:2013**  
**01-november-2013**

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**Neporušitveno preskušanje - Ultrazvočne preiskave - 2. del: Nastavitev občutljivosti in območja (ISO 16811:2012)**

Non-destructive testing - Ultrasonic testing - Sensitivity and range setting (ISO 16811:2012)

Zerstörungsfreie Prüfung - Ultraschallprüfung - Empfindlichkeits- und Entfernungjustierung (ISO 16811:2012)

Essais non destructifs - Contrôle par ultrasons - Réglage de la sensibilité et de la base de temps (ISO16811:2012)

**Ta slovenski standard je istoveten z: FprEN ISO 16811**

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**ICS:**

19.100          Neporušitveno preskušanje          Non-destructive testing

**kSIST FprEN ISO 16811:2013**

**en,fr,de**



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EUROPÄISCHE NORM

**FINAL DRAFT**  
**FprEN ISO 16811**

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English Version

## Non-destructive testing - Ultrasonic testing - Sensitivity and range setting (ISO 16811:2012)

Essais non destructifs - Contrôle par ultrasons - Réglage de la sensibilité et de la base de temps (ISO 16811:2012)

Zerstörungsfreie Prüfung - Ultraschallprüfung - Empfindlichkeits- und Entfernungseinstellung (ISO 16811:2012)

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## Contents

	Page
Foreword.....	3

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## Foreword

The text of ISO 16811:2012 has been prepared by Technical Committee ISO/TC 135 “Non-destructive testing” of the International Organization for Standardization (ISO) and has been taken over as FprEN ISO 16811:2013 by Technical Committee CEN/TC 138 “Non-destructive testing” the secretariat of which is held by AFNOR.

This document is currently submitted to the Unique Acceptance Procedure.

This document will supersede EN 583-2:2001.

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# INTERNATIONAL STANDARD

**ISO**  
**16811**

First edition  
2012-04-01

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## Non-destructive testing — Ultrasonic testing — Sensitivity and range setting

*Essais non destructifs — Contrôle par ultrasons — Réglage de la  
sensibilité et de la base de temps*

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## Contents

Page

Foreword .....	V
Introduction .....	vi
1 Scope .....	1
2 Normative references .....	1
3 General .....	1
3.1 Quantities and symbols .....	1
3.2 Test objects, reference blocks and reference reflectors .....	1
3.3 Categories of test objects .....	1
3.4 Contouring of probes .....	2
3.4.1 Longitudinally curved probes .....	3
3.4.2 Transversely curved probes .....	3
3.4.3 Concave scanning surface .....	4
4 Determination of probe index and beam angle .....	4
4.1 General .....	4
4.2 Flat probes .....	4
4.2.1 Calibration block technique .....	4
4.2.2 Reference block technique .....	4
4.3 Probes curved longitudinally .....	4
4.3.1 Mechanical determination .....	4
4.3.2 Reference Block Technique .....	6
4.4 Probes curved transversely .....	6
4.4.1 Mechanical determination .....	6
4.4.2 Reference block technique .....	7
4.5 Probes curved in two directions .....	8
4.6 Probes for use on materials other than non-alloy steel .....	9
5 Time base setting .....	9
5.1 General .....	9
5.2 Reference blocks and reference reflectors .....	9
5.3 Straight beam probes .....	10
5.3.1 Single reflector technique .....	10
5.3.2 Multiple reflector technique .....	10
5.4 Angle beam probes .....	10
5.4.1 Radius technique .....	10
5.4.2 Straight beam probe technique .....	10
5.4.3 Reference block technique .....	10
5.4.4 Contoured probes .....	10
5.5 Alternative range settings for angle beam probes .....	11
5.5.1 Flat surfaces .....	11
5.5.2 Curved surfaces .....	11
6 Sensitivity setting and echo height evaluation .....	13
6.1 General .....	13
6.2 Angle of impingement .....	13
6.3 Distance Amplitude Curve (DAC) technique .....	13
6.3.1 Reference blocks .....	13
6.3.2 Preparation of a Distance Amplitude Curve .....	14
6.3.3 Evaluation of signals using a Distance Amplitude Curve .....	15
6.3.4 Evaluation of signals using a reference height .....	15
6.4 Distance Gain Size (DGS) technique .....	16
6.4.1 General .....	16
6.4.2 Reference blocks .....	18
6.4.3 Use of DGS diagrams .....	18
6.4.4 Restrictions on use of the DGS technique due to geometry .....	20

## ISO 16811:2012(E)

<b>6.5</b>	<b>Transfer correction .....</b>	<b>20</b>
<b>6.5.1</b>	<b>General.....</b>	<b>20</b>
<b>6.5.2</b>	<b>Fixed path length technique .....</b>	<b>20</b>
<b>6.5.3</b>	<b>Comparative technique .....</b>	<b>21</b>
<b>6.5.4</b>	<b>Compensation for local variations in transfer correction .....</b>	<b>22</b>
<b>Annex A</b>	<b>(normative) Quantities and symbols .....</b>	<b>23</b>
<b>Annex B</b>	<b>(normative) Reference blocks and reference reflectors .....</b>	<b>26</b>
<b>Annex C</b>	<b>(normative) Determination of sound path distance and impingement angle in concentrically curved objects .....</b>	<b>29</b>
<b>C.1</b>	<b>Impingement angle .....</b>	<b>29</b>
<b>C.2</b>	<b>Sound path when scanning from the outer (convex) surface: .....</b>	<b>29</b>
<b>C.2.1</b>	<b>Full skip .....</b>	<b>30</b>
<b>C.2.2</b>	<b>Half skip .....</b>	<b>30</b>
<b>C.3</b>	<b>Soundpath when scanning from the inner (concave) surface:.....</b>	<b>31</b>
<b>C.3.1</b>	<b>Full skip .....</b>	<b>31</b>
<b>C.3.2</b>	<b>Half skip .....</b>	<b>32</b>
<b>Annex D</b>	<b>(informative) General DGS diagram .....</b>	<b>33</b>
<b>D.1</b>	<b>Distance .....</b>	<b>33</b>
<b>D.2</b>	<b>Gain .....</b>	<b>33</b>
<b>D.3</b>	<b>Size.....</b>	<b>34</b>
<b>Annex E</b>	<b>(informative) Determination of contact transfer correction factors.....</b>	<b>35</b>
<b>E.1</b>	<b>General.....</b>	<b>35</b>
<b>E.2</b>	<b>Measurement.....</b>	<b>35</b>
<b>E.3</b>	<b>Evaluation.....</b>	<b>35</b>
<b>Bibliography</b>	<b>.....</b>	<b>38</b>

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## Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 16811 was prepared by Technical Committee ISO/TC 135, *Non-destructive testing*, Subcommittee SC 3, *Ultrasonic testing*.

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**ISO 16811:2012(E)****Introduction**

This International Standard is based on EN 583-2:2001, *Non-destructive testing — Ultrasonic examination — Part 2: Sensitivity and range setting*.

The following International Standards are linked.

ISO 16810, *Non-destructive testing — Ultrasonic testing — General principles*

ISO 16811, *Non-destructive testing — Ultrasonic testing — Sensitivity and range setting*

ISO 16823, *Non-destructive testing — Ultrasonic testing — Transmission technique*

ISO 16826, *Non-destructive testing — Ultrasonic testing — Examination for discontinuities perpendicular to the surface*

ISO 16827, *Non-destructive testing — Ultrasonic testing — Characterization and sizing of discontinuities*

ISO 16828, *Non-destructive testing — Ultrasonic testing — Time-of-flight diffraction technique as a method for detection and sizing of discontinuities*

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# Non-destructive testing — Ultrasonic testing — Sensitivity and range setting

## 1 Scope

This International Standard specifies the general rules for setting the timebase range and sensitivity (i. e. gain adjustment) of a manually operated ultrasonic flaw detector with A-scan display in order that reproducible measurements may be made of the location and echo height of a reflector.

It is applicable to techniques employing a single contact probe with either a single or twin transducers, but excludes the immersion technique and techniques employing more than one probe.

## 2 Normative references

The following referenced documents are indispensable for the application 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 2400, *Non-destructive testing — Ultrasonic testing — Specification for calibration block No. 1*

ISO 7963, *Non-destructive testing — Ultrasonic testing — Specification for calibration block No. 2*

EN 12668-3, *Non-destructive testing — Characterization and verification of ultrasonic examination equipment — Part 3: Combined equipment*

## 3 General

### 3.1 Quantities and symbols

A full list of the quantities and symbols used throughout this International Standard is given in Annex A.


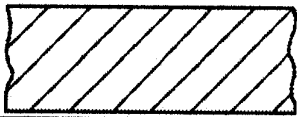
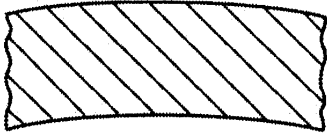



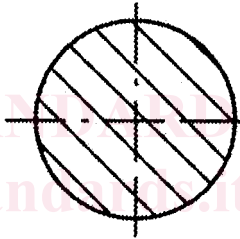
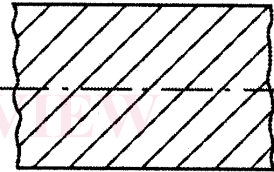
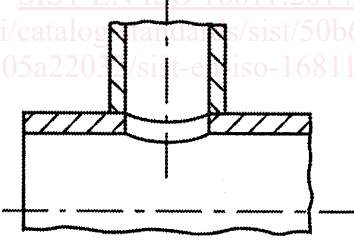
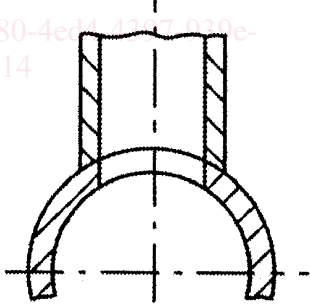
### 3.2 Test objects, reference blocks and reference reflectors

Requirements for geometrical features of test objects, reference blocks and reference reflectors in general are contained in Annex B.

### 3.3 Categories of test objects

The requirements for range and sensitivity setting will depend on the geometrical form of the test object. Five categories of test objects are defined in Table 1.

Table 1 — Categories of test objects

Class	Feature	Section in $x$ -direction	section in $y$ -direction
1	Plane parallel surfaces (e. g. plate/sheet)		
2	Parallel, uniaxially curved surfaces (e. g. tubes)		
3	Parallel surfaces curved in more than one direction (e. g. dished ends)		
4	Solid material of circular cross section (e. g. rods and bars)		
5	Complex shapes (e. g. nozzles, sockets)		

### 3.4 Contouring of probes

Contouring of the probe shoe, for geometry categories 2 to 5, may be necessary to avoid probe rocking, i.e. to ensure good, uniform, acoustic contact and a constant beam angle in the test object. Contouring is only possible with probes having a hard plastic stand-off (normally twin-transducer straight beam probes or angle beam probes with wedges).

The following conditions for the different geometric categories exist (see Table 1 and Figure 1):

- category 1: No probe contouring necessary for scanning in either  $x$ - or  $y$ -direction;
- categories 2 and 4: scanning in  $x$ -direction: Probe face longitudinally curved, scanning in  $y$ -direction: Probe face transversely curved;
- categories 3 and 5: scanning in either  $x$ - or  $y$ -direction: Probe face longitudinally and transversely curved.

The use of contoured probes necessitates setting the range and sensitivity on reference blocks contoured similar to the test object, or the application of mathematical correction factors.

When using equations (1) or (2), problems due to low energy transmission or beam misalignment are avoided.

### 3.4.1 Longitudinally curved probes

#### 3.4.1.1 Convex scanning surface

For scanning on convex surfaces the probe face shall be contoured when the diameter of the test object,  $D_{obj}$ , is below ten times the length of the probe shoe,  $l_{ps}$ , (see Figure 1):

$$D_{obj} < 10l_{ps} \quad (1)$$

#### 3.4.1.2 Concave scanning surface

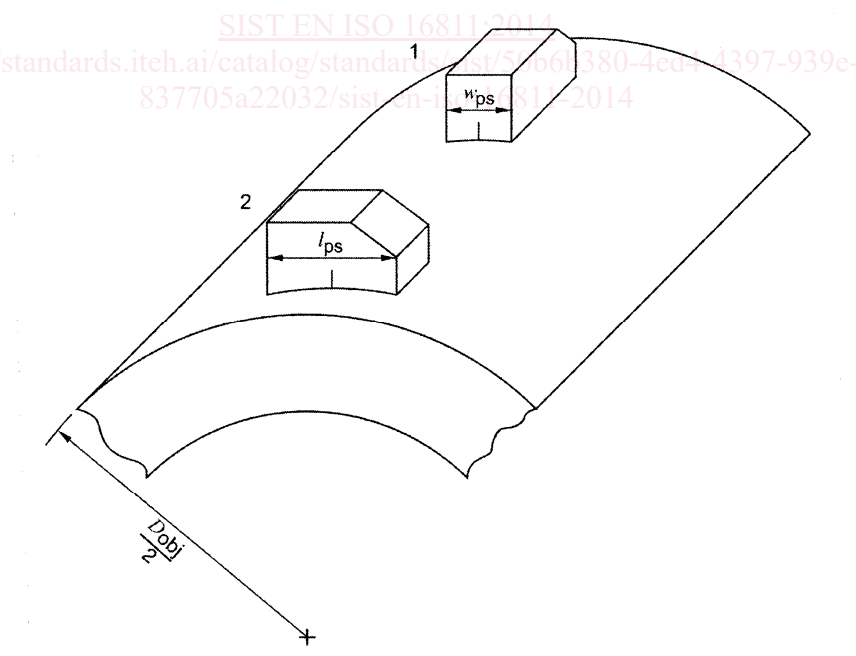
On a concave scanning surface the probe face shall always be contoured, unless adequate coupling can be achieved due to very large radii of curvature.

### 3.4.2 Transversely curved probes

#### 3.4.2.1 Convex scanning surface

For scanning on convex surfaces the probe face shall be contoured when the diameter of the test object,  $D_{obj}$ , is below ten times the width of the probe shoe,  $w_{ps}$ , (see Figure 1):

$$D_{obj} < 10w_{ps} \quad (2)$$



#### Key

- 1 Transversely curved
- 2 Longitudinally curved

**Figure 1 — Length,  $l_{ps}$ , and width,  $w_{ps}$ , of probe shoe in direction of curvature of the test object**