



SLOVENSKI STANDARD
oSIST prEN ISO 5173:2017
01-junij-2017

Porušitveno preskušanje zvarnih spojev na kovinskih materialih - Upogibni preskusi (ISO/DIS 5173:2017)

Destructive tests on welds in metallic materials - Bend tests (ISO/DIS 5173:2017)

Zerstörende Prüfungen von Schweißnähten an metallischen Werkstoffen - Biegeprüfungen (ISO/DIS 5173:2017)

Essais destructifs des soudures sur matériaux métalliques - Essais de pliage (ISO/DIS 5173:2017)

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ICS:

25.160.40 Varjeni spoji in vari Welded joints and welds

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Destructive tests on welds in metallic materials — Bend tests

Essais destructifs des soudures sur matériaux métalliques — Essais de pliage

ICS: 25.160.40

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ISO/DIS 5173:2017(E)

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).

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The committee responsible for this document is ISO/TC 44, *Welding and allied processes*, Subcommittee SC 5, *Testing and inspection of welds*.

This edition cancels and replaces the third edition (ISO 5173:2009+Amd 1:2011) which has been technically revised.

Destructive tests on welds in metallic materials — Bend tests

1 Scope

This International Standard specifies a method for making transverse root, face and side bend tests on test specimens taken from butt welds, butt welds with cladding (subdivided into welds in clad plates and clad welds) and cladding without butt welds, in order to assess ductility and/or absence of imperfections on or near the surface of the test specimen. It also gives the dimensions of the test specimen.

In addition, this International Standard specifies a method for making longitudinal root and face bend tests to be used instead of transverse bend tests for heterogeneous assemblies when base materials and/or filler metal have a significant difference in their physical and mechanical properties in relation to bending.

This International Standard applies to metallic materials in all forms of product with welded joints made by any welding process.

2 Terms and definitions

For the purposes of this document, the following apply

2.1

transverse face bend test specimen for a butt weld

TFBB

specimen for which the surface in tension is the side that contains the greater width of the weld or the side from which the welding arc was first applied, applicable to transverse butt weld specimens

See Figure 1.

2.2

transverse root bend test specimen for a butt weld

TRBB

specimen for which the surface in tension is the side opposite to that of the face butt weld bend test specimen, applicable to transverse butt weld specimens

See Figure 2.

2.3

transverse side bend test specimen for a butt weld

SBB

specimen for which the surface in tension is a cross-section of the weld

See Figure 3.

ISO/DIS 5173:2017(E)**2.4****longitudinal face test specimen for a butt weld root bend test specimen for a butt weld****LFBB****LRBB**

specimen whose direction is parallel to butt weld direction, applicable to face and root bend specimens

See Figure 4.

2.5**face bend test specimen for cladding without a butt weld****FBC**

specimen for which the cladding is in tension, applicable to both transverse and longitudinal specimens

See Figure 5.

2.6**side bend test specimen for cladding without a butt weld****SBC**

specimen for which the cross-section of the cladding overlay is in tension, applicable to both transverse and longitudinal specimens

See Figure 6.

2.7**face bend test specimen for cladding with a butt weld side bend test specimen for cladding with a butt weld****FBCB****SBCB**

specimen for which the cladding is in tension or for which the cross-section of the cladding overlay is in tension and which contains a butt weld

See Figures 7 and 8.

3 Principle

Submitting a test specimen, taken transversely or longitudinally from a welded joint, to plastic deformation by bending it, without reversing the bending direction, in such a way that one of the surfaces or cross-sections of the welded joint is in tension.

Unless otherwise specified, the test shall be carried out at an ambient temperature of between 10 °C and 35 °C. Tests carried out under controlled conditions, where required, shall be made at temperature of (23 ± 5) °C.

The test shall be made in accordance with one of the methods described in Clause 6.

4 Symbols and abbreviated terms**4.1 Symbols**

See Table 1 and Figures 1 to 15.

4.2 Abbreviated terms

TFBB	Transverse face bend test specimen for a butt weld
TRBB	Transverse root bend test specimen for a butt weld
SBB	Transverse side bend test specimen for a butt weld
LFBB	Longitudinal face bend test specimen for a butt weld
LRBB	Longitudinal root bend test specimen for a butt weld
FBC	Face bend test specimen for cladding without a butt weld
SBC	Side bend test specimen for cladding without a butt weld
FBCB	Face bend test specimen for cladding with a butt weld
SBCB	Side bend test specimen for cladding with a butt weld

Table 1 — Symbols and designations

Symbol	Designation	Unit
A	minimum percentage elongation after fracture required by the material specification	%
b	width of the test specimen	mm
b_1	width of outside fusion line	mm
d	diameter of the former or the inner roller	mm
D	outside diameter of the pipe ^a	mm
l	distance between the rollers	mm
L_f	initial distance between contact of the roller and the centre line of the weld	mm
L_o	original gauge length	mm
L_s	maximum width of the weld after machining	mm
L_t	total length of the test specimen	mm
r	radius of the test specimen edges	mm
R	radius of the rollers	mm
t	thickness of the test piece	mm
t_c	thickness of the cladding	mm
t_s	thickness of the test specimen	mm
t_w	thickness of base material under cladding	mm
α	bending angle	°
^a The term “pipe”, alone or in combination, is used to mean “pipe”, “tube” or “hollow section (without rectangular cross section)”.		

4.3 Figures corresponding to the abbreviations

Figures 1 to 8 represent bend test specimens for butt welds and cladding.

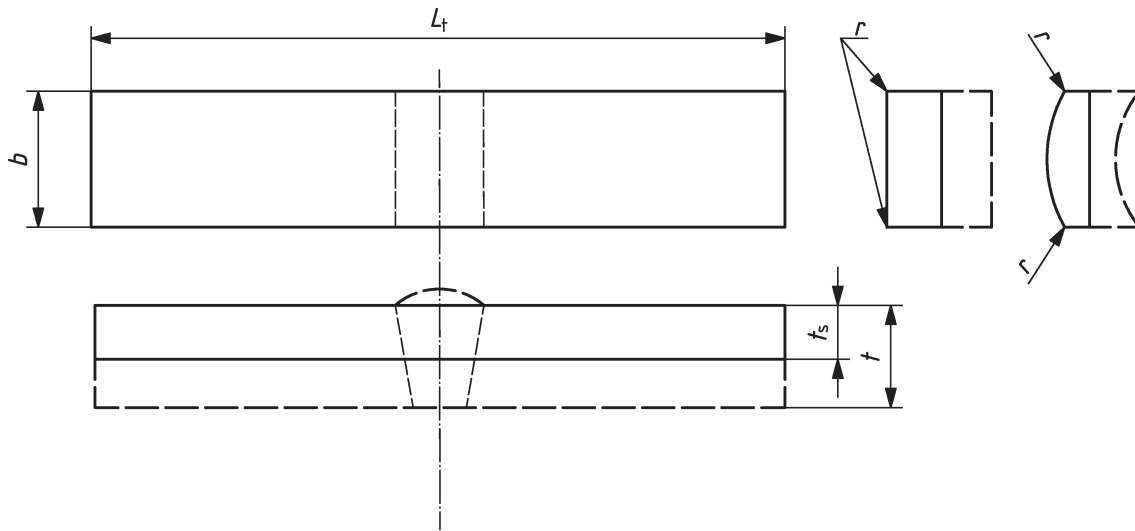


Figure 1 — Transverse face bend test specimen for a butt weld (TFBB)

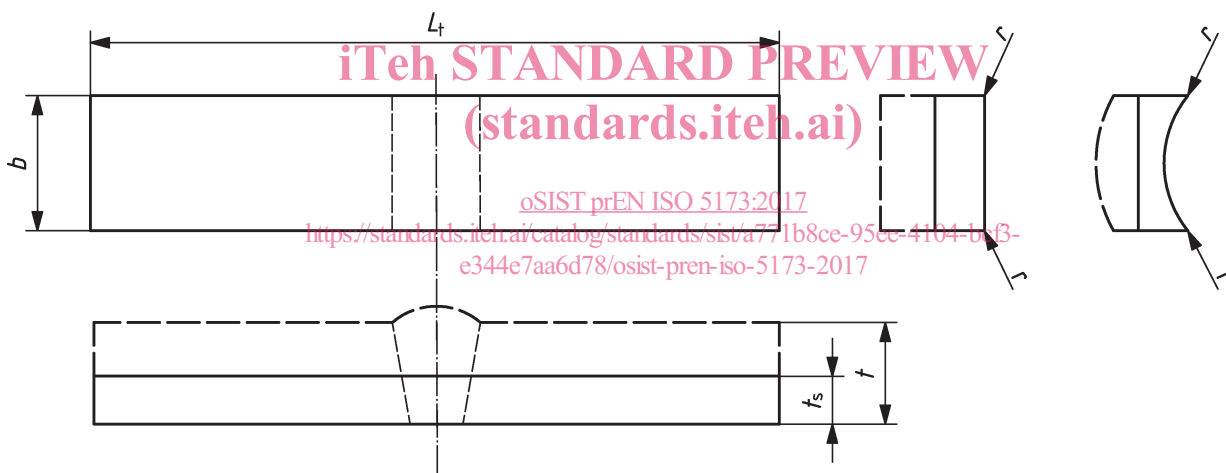


Figure 2 — Transverse root bend test specimen for a butt weld (TRBB)

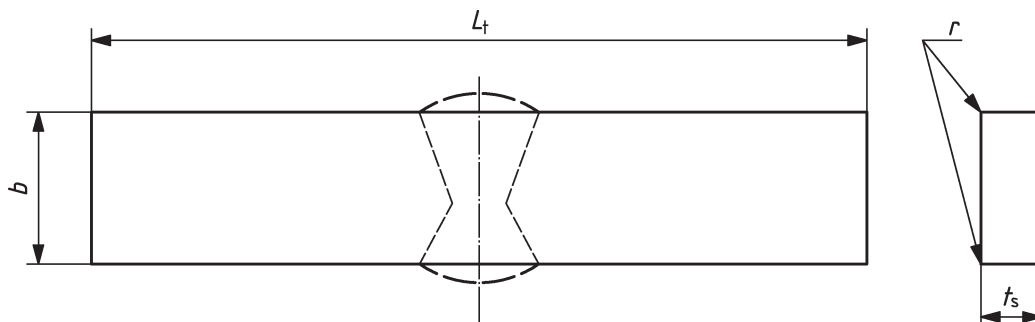


Figure 3 — Transverse side bend test specimen for a butt weld (SBB)

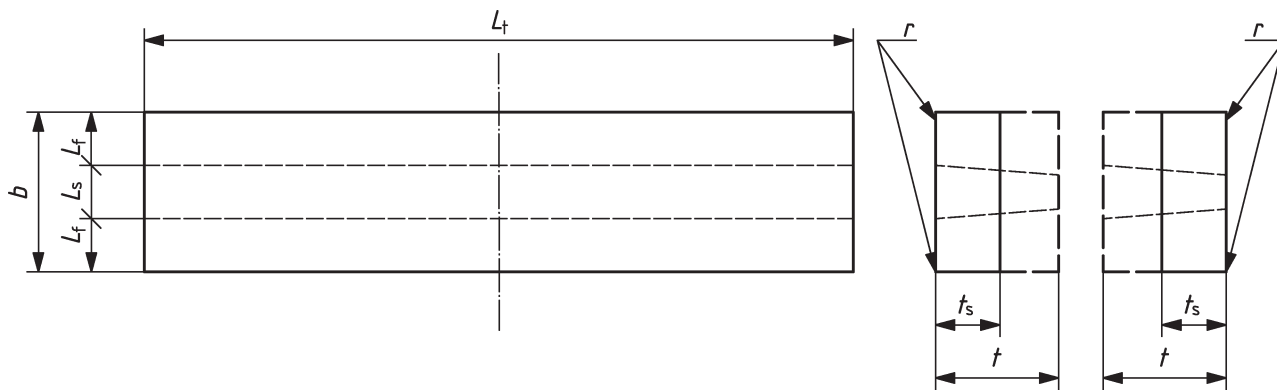


Figure 4 — Longitudinal bend test specimen for a butt weld (LFBB and LRBB)

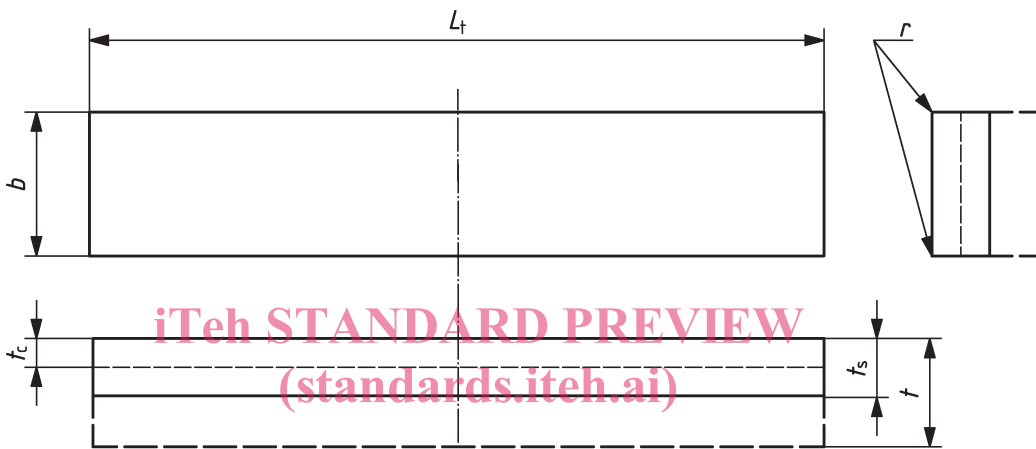


Figure 5 — Face bend test specimen for cladding without a butt weld (FBC)

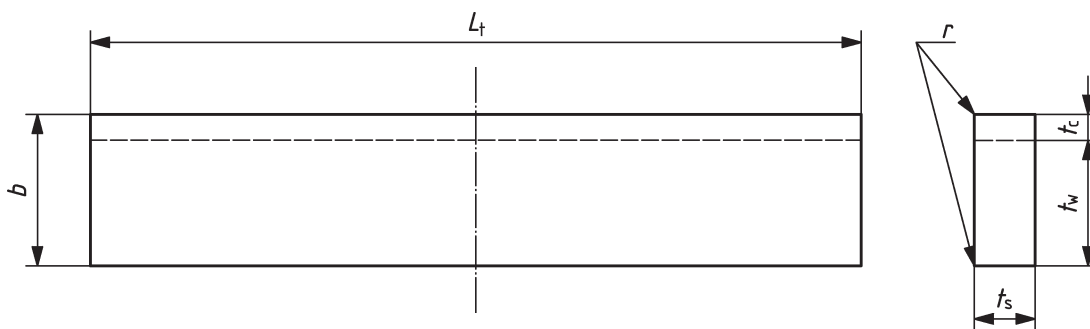


Figure 6 — Side bend test specimen for cladding without a butt weld (SBC)