



**SLOVENSKI STANDARD**  
**SIST EN 288-3:1996/A1:1999**

**01-december-1999**

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Specification and approval of welding procedures for metallic materials - Part 3: Welding procedure tests for the arc welding of steels

Anforderung und Anerkennung von Schweißverfahren für metallische Werkstoffe - Teil 3: Schweißverfahrensprüfungen für das Lichtbogenschweißen von Stählen

Descriptif et qualification d'un mode opératoire de soudage pour les matériaux métalliques - Partie 3: Epreuve de qualification d'un mode opératoire de soudage à l'arc sur acier

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**Ta slovenski standard je istoveten z: EN 288-3:1992/A1:1997**

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**ICS:**

25.160.10      Varilni postopki in varjenje      Welding processes

**SIST EN 288-3:1996/A1:1999**                      **en**

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EUROPEAN STANDARD

EN 288-3:1992/A1

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 1997

ICS 25.160.10

Descriptors: welding, arc welding, steels, procedure, qualification, tests, description, specifications, setting-up conditions

English version

**Specification and approval of welding procedures  
for metallic materials - Part 3: Welding procedure  
tests for the arc welding of steels**

Descriptif et qualification d'un mode opératoire de soudage pour les matériaux métalliques - Partie 3: Epreuve de qualification d'un mode opératoire de soudage à l'arc sur acier

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This amendment 1 modifies the European Standard EN 288-3:1992. This amendment was approved by CEN on 1996-12-11. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

# CEN

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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## Foreword

This Amendment EN 288-3:1992/A1:1997 to EN 288-3:1992 has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DS.

This Amendment to the European Standard EN 288-3:1992 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 1997, and conflicting national standards shall be withdrawn at the latest by December 1997.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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## 1 Scope

Amend the list of processes as follows :

Arc welding is covered by the following processes in accordance with EN 24063 :

- 111 - metal-arc welding with covered electrode ;
- 114 - flux-cored metal-arc welding without gas shield ;
- 121 - submerged arc welding with wire electrode ;
- 122 - submerged arc welding with strip electrode ;
- 131 - metal-arc inert gas welding, MIG welding ;
- 135 - metal-arc active gas welding, MAG welding ;
- 136 - flux-cored wire metal-arc welding with active gas shield ;
- 137 - flux-cored wire metal-arc metal with inert gas shield ;
- 141 - tungsten inert gas welding, TIG welding ;
- 15 - plasma arc welding.

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## 2 Normative references

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Delete the text of clause 2 and replace by the following :

This european standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this european standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 287-1	Approval testing of welders - Fusion welding - Part 1 : Steels
EN 288-1	Specification and approval of welding procedures for metallic materials - Part 1 : General rules for fusion welding
EN 288-2	Specification and approval of welding procedures for metallic materials - Part 2 : Welding procedure specification for arc welding
EN 571-1	Non destructive testing - Penetrant testing - Part 1 : General principles
EN 875	Destructive tests on welds in metallic materials - Impact tests - Test specimen location, notch orientation and examination
EN 895	Destructive tests on welds in metallic materials - Transverse tensile test

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- pr EN 910 Destructive test on welds in metallic materials - Bend test
- pr EN 970 Non-destructive examination of fusion welds - Visual examination
- pr EN 1043-1 Destructive test on welds in metallic materials - Hardness testing - Part 1: Hardness test on arc welded joints
- pr EN 1290 Non destructive examination of welds - Magnetic particle testing of welds
- pr EN 1321 Destructive tests on welds in metallic materials - Macroscopic and microscopic examination of welds
- pr EN 1435 Non destructive examination of welds - Radiographic examination of welded joints
- pr EN 1714 Non destructive examination of welds - Ultrasonic examination of welded joints
- EN ISO 6947 Welds - Working positions - Definitions of angles of slope and rotation (ISO 6947:1990)
- EN 24063 Welding brazing, soldering and braze welding of metals - Nomenclature of processes and reference numbers for symbolic representation on drawings (ISO 4063:1990)
- EN 25817 Arc-welded joints in steel - Fusion welding - Guidance on quality levels for imperfections (ISO 5817:1992)
- CEN CR 12187 Welding - Guidelines for a grouping system of materials for welding purpose  
<https://standards.iteh.ai/catalog/standards/sist/960fb8f5-3aa2-4094-8986-da0a3651e722/sist-en-288-3-1996-a1-1999>

#### 4 Preliminary welded procedure specification (pWPS)

Delete the text of clause 4 and replace by the following :

The preliminary welding procedure specification shall be prepared in accordance with EN 288-2. It shall specify the tolerance for all the relevant parameters.

#### 6.2 Shape and dimensions of test pieces

Delete the text of 6.2 and replace by the following :

The test pieces shall be of a sufficient size to ensure a reasonable heat distribution.

In figures 1 to 5 "t" is the thickness of the thicker component part from  $t_1$  and  $t_2$

If  $t > 100$  mm test piece dimensions a and b may be reduced by agreement.

Additional test pieces, or longer test pieces than the minimum size, may be prepared in order to allow for extra and/or for re-testing specimens (see 7.5).

If required by the application standard, the direction of plate rolling shall be marked on the test piece when impact tests are required to be taken in the Heat Affected Zone (HAZ).

The thickness and/or pipe outside diameter of the test pieces shall be selected in accordance with 8.3.2.1 to 8.3.2.4.

Unless otherwise agreed, the shape and minimum dimensions of the test piece shall be as follows :

### 6.2.3 Full penetration T-butt joint

Delete the text of 6.2.3 and replace by the following :

A T-butt joint is considered as a fully penetrated joint.

### 6.2.5 Fillet weld

Amend the title to "Fillet weld in plate or pipe".

Delete the text of 6.2.5 and replace by the following :

The test piece shall be in accordance with figure 4 or 5.

These may also be used for partial penetration joints (with or without edge preparation).

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### 6.3 Welding of test pieces

Delete the text of 6.3 and replace by the following :

Preparation and welding of test pieces shall be carried out in accordance with the pWPS, and under the general conditions of welding in production which they shall represent. Welding positions and limitations for the angle of slope and rotation of the test piece shall be in accordance with EN ISO 6947.

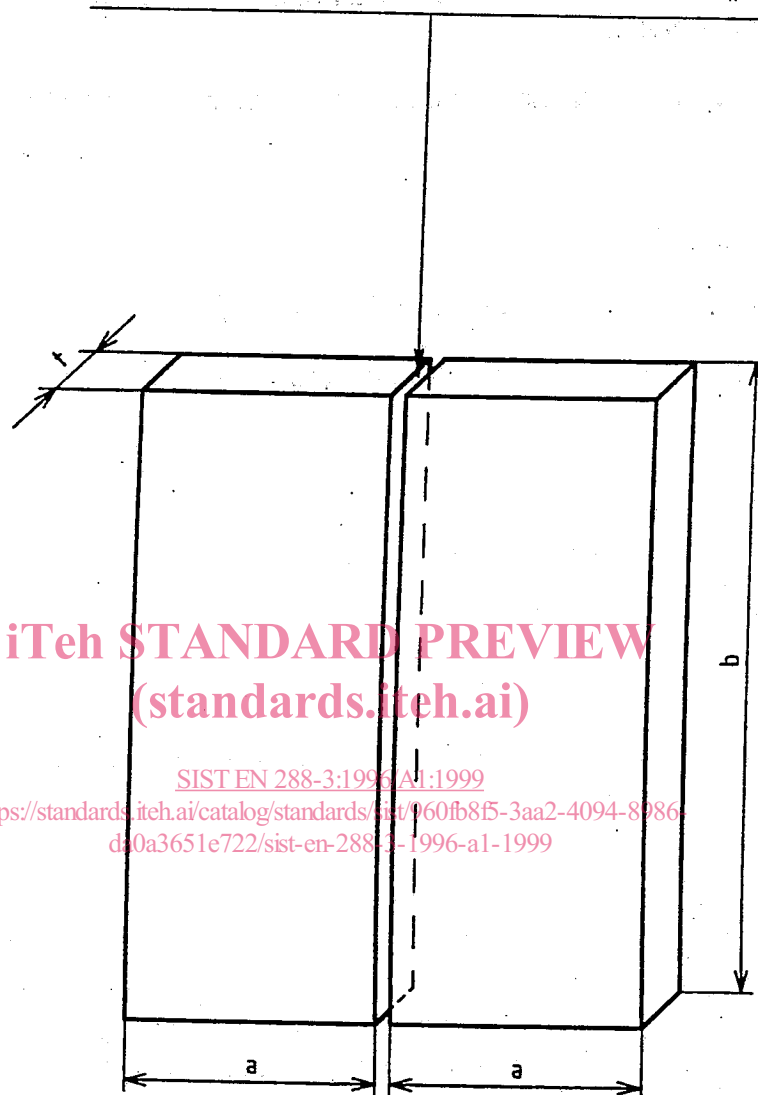
If tack welds are to be fused into the final joint they shall be included in the test piece.

Welding and testing of the test pieces shall be witnessed by an examiner or examining body.

### Figure 1 and figure 3

Amend as follows :

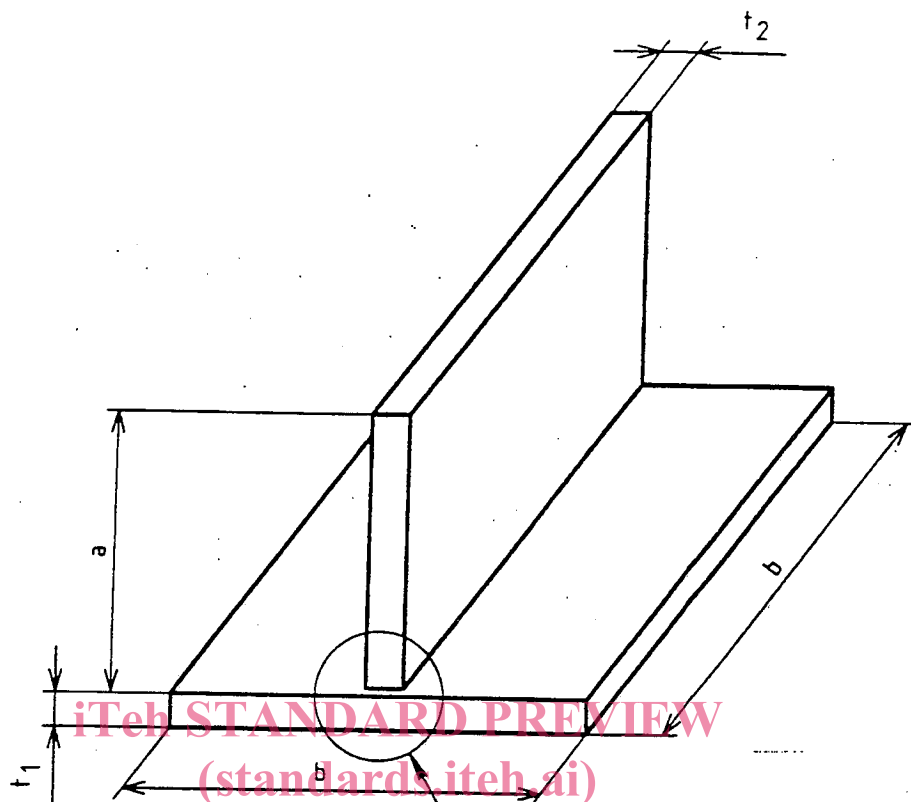
Edge preparation and fit-up as detailed  
in the preliminary Welding Procedure Specification (pWPS)



$a = 3t$  ; minimum value 150 mm  
 $b = 6t$  ; minimum value 350 mm

Figure 1 : Test piece for a butt weld in plate





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Edge preparation and fit-up as detailed  
in the preliminary Welding Procedure Specification (pWPS)

$a = 3t$  ; minimum value 150 mm  
 $b = 6t$  ; minimum value 350 mm

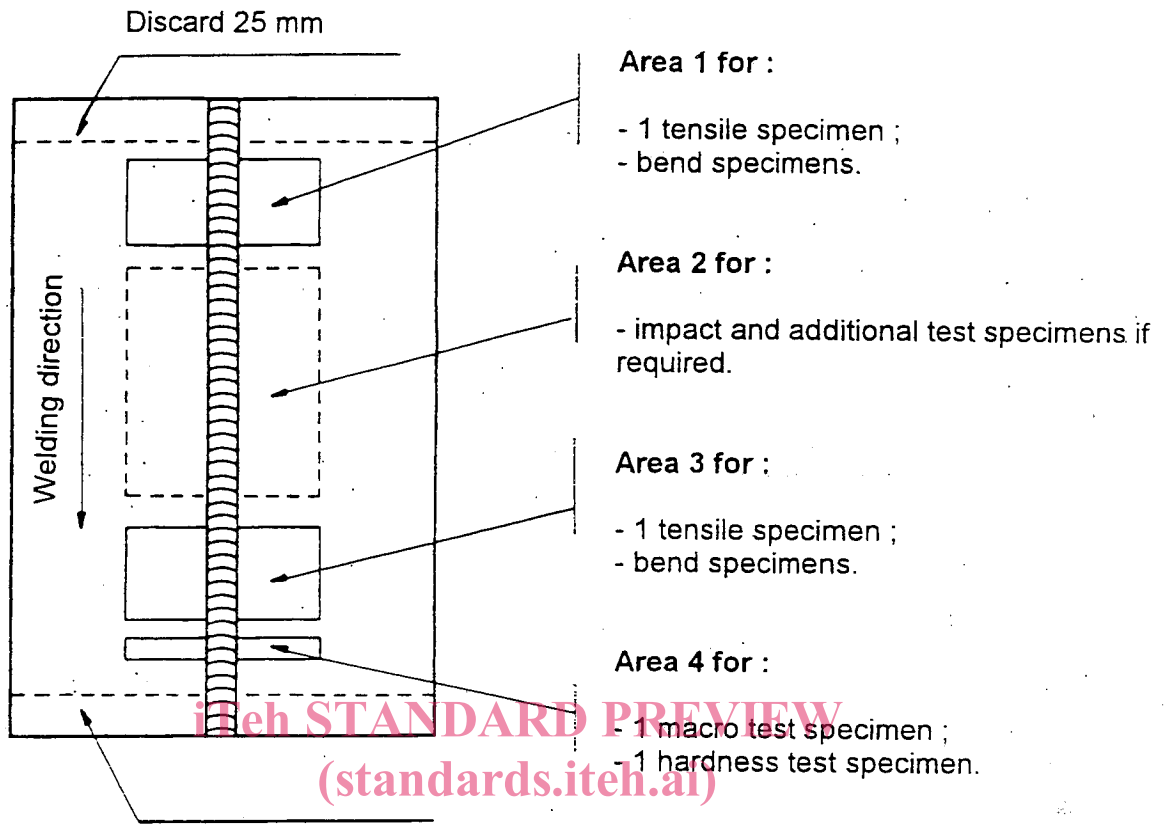
Figure 3 : Test piece for a T-butt joint

Table 1 : Examination and testing of the test pieces

Amend as follows :

Test piece	Type of test	Extent of testing	Footnote
Butt-weld figures 1 and 2	Visual	100 %	-
	Radiographic or ultrasonic	100 %	4
	Surface crack detection	100 %	1
	Transverse tensile test	2 specimens	-
	Transverse bend test	2 root and 2 face specimens	2
	Impact test	2 sets	6
	Hardness test	required	3
	Macro-examination	1 specimen	-
T-butt joint (5) figure 3 Branch connection (5) figure 4	Visual	100 %	-
	Surface crack detection	100 %	1
	Ultrasonic or radiographic	100 %	4 and 7
	Hardness test	required	3
	Macro-examination	2 specimens	-
Fillet weld on plate (5) figure 5 Fillet weld on pipe (5) figure 4	Visual	100 %	-
	Surface crack detection	100 %	1
	Macro-examination	2 specimens	-
	Hardness test	required	3
<p>NOTE 1 : Penetrant testing or magnetic particle testing. For non-magnetic materials, penetrant testing.</p> <p>NOTE 2 : 2 root and 2 face bend test specimens may be preferably substituted by 4 side bend test specimens for <math>t \geq 12</math> mm.</p> <p>NOTE 3 : Not required for parent metals : - ferritic steels with <math>R_m \leq 430</math> N/mm<sup>2</sup> <math>R_e \leq 275</math> N/mm<sup>2</sup> ; - group 9 steels.</p> <p><math>R_e</math> is defined in the relevant product standard.</p> <p>NOTE 4 : Ultrasonic testing is only applicable for ferritic steels and for <math>t &gt; 8</math> mm.</p> <p>NOTE 5 : Testing as detailed does not provide information on the mechanical properties of the joint. Where these properties are relevant to the application an additional approval shall also be held e.g. a butt weld approval.</p> <p>NOTE 6 : 1 set in the weld metal and 1 set in the HAZ. Required only for <math>t \geq 12</math> mm and only for parent metals having specified impact properties or when required by the application standard. If a testing temperature has not been specified, testing shall be performed at room temperature. See also 7.4.4.</p> <p>NOTE 7 : For outside diameter <math>\leq 50</math> mm no ultrasonic test is required. For outside diameter <math>&gt; 50</math> mm and where it is not technically possible to carry out ultrasonic examination, a radiographic examination shall be carried out provided that the joint configuration will allow meaningful results.</p>			

Figure 6 and figure 7 : Amend the notes on the figures as follows :



Discard 25 mm [SIST EN 288-3:1996/A1:1999](https://standards.iteh.ai/catalog/standards/sist/960fb8f5-3aa2-4094-8986-da0a3651e722/sist-en-288-3-1996-a1-1999)

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NOTE : Not to scale. [da0a3651e722/sist-en-288-3-1996-a1-1999](https://standards.iteh.ai/catalog/standards/sist/960fb8f5-3aa2-4094-8986-da0a3651e722/sist-en-288-3-1996-a1-1999)