



SLOVENSKI STANDARD
SIST EN 12517:1999
01-december-1999

Neporušitvena preiskava zvarov - Radiografska preiskava zvarnih spojev - Stopnje sprejemljivosti

Non-destructive examination of welds - Radiographic examination of welded joints - Acceptance levels

Zerstörungsfreie Prüfung von Schweißverbindungen - Durchstrahlungsprüfung von Schweißverbindungen - Zulässigkeitsgrenzen

Contrôle non destructif des assemblages soudés - Contrôle par radiographie des assemblages soudés - Niveaux d'acceptation

<https://standards.iteh.ai/catalog/standards/sist/4be895fc-6638-4fc1-be10-ced26cf8934e/sist-en-12517-1999>

Ta slovenski standard je istoveten z: EN 12517:1998

ICS:

25.160.40 Varjeni spoji in vari Welded joints

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EUROPEAN STANDARD

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Descriptors: welded joints, butt welds, steels, non destructive tests, quality control, weld defects, radiographic analysis, acceptability

English version

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This European Standard was approved by CEN on 31 January 1998.

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This European Standard exists 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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 1998, and conflicting national standards shall be withdrawn at the latest by August 1998.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

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

This standard specifies acceptance levels for indications from imperfections in steel butt welds detected by radiography. If agreed, the acceptance levels may be applied to other types of welds or materials.

The acceptance levels may be related to welding standards, application standards, specifications or codes. Such a relationship is shown in EN 12062 for EN 25817.

This standard assumes that the radiographic examination has been carried out in accordance with EN 1435.

When assessing whether a weld meets the requirements specified for a weld quality level, the sizes of imperfections permitted by standards are compared with the dimensions of indications revealed by a radiograph made of the weld.

2 Normative references

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 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 970	https://standards.itec.org/catalog/standards/sist-en-12517-1999/ced26c8f934e/sist-en-12517-1999 Non destructive examination of fusion welds - Visual examination
EN 1435	Non destructive examination of welded joints - Radiographic examination of fusion welded joints
EN 12062	Non destructive examination of welds - General rules for metallic materials
EN 25817	Arc welded joints in steel - Guidance of quality levels for imperfections (ISO 5817:1992)
EN 26520	Classification of imperfections in metallic fusion welds, with explanation (ISO 6520:1982)
EN 30042	Arc welded joints in aluminium and its weldable alloys - Guidance on quality levels for imperfections (ISO 10042:1992)

3 Radiographic technique

Depending on the weld quality level, radiographic technique A or B in accordance with EN 1435 is used as shown in table 1.

Table 1: Radiographic examination

Quality levels in accordance with EN 25817 or EN 30042	Examination techniques and levels in accordance with EN 1435	Acceptance levels in accordance with prEN 12517
B	B	1
C	B 1)	2
D	A	3
1) However, the maximum area for a single exposure shall correspond to the requirements of class A of EN 1435.		

4 General

Welded joints should be visually examined and evaluated in accordance with EN 970 before radiographic examination.

The acceptance levels in this document are basically valid for evaluation of imperfections which cannot be detected and evaluated by visual examination. Surface imperfections (such as undercut and excessive penetration, surface damage, weld spatter, etc.) which due to object geometry cannot be evaluated, but where the interpreter suspects the EN 25817 quality levels are not fulfilled, shall be subject to more specific examination.

When quantification of undercut and/or excessive penetration by radiography is required, specific procedures using test exposures may be applied in order to established a basis for approximate quantification in accordance with the requirements of EN 25817. This shall be subject to agreement between the contracting parties.

5 Acceptance levels

The acceptance levels for indications are shown in table 2. The defect types are those listed in EN 25817.

The symbols used in table 2 are the following :

- l length of imperfection, in millimeters ;
- s minimal butt weld thickness, in millimeters ;
- L examined length of the welded joint, in millimeters ;
- h height of imperfection, in millimeters ;
- b width of weld reinforcement, in millimeters.

Table 2 : Acceptance levels for indications in butt welds

No	Type of imperfections in accordance with EN 26520	Acceptance level 3 ¹⁾	Acceptance level 2 ¹⁾	Acceptance level 1
1	Cracks (100)	not permitted	not permitted	not permitted
2	Crater cracks (104)	permitted one per each 40 mm of the weld	not permitted	not permitted
3	Porosity and gas pores (2011, 2013, 2014 and 2017)	$l \leq \min(0,5 s; 5 \text{ mm})$ $\Sigma l \leq s$ for $L = \min(12 s; 150 \text{ mm})$	$l \leq \min(0,4 s; 4 \text{ mm})$ $\Sigma l \leq s$ for $L = \min(12 s; 150 \text{ mm})$	$l \leq \min(0,3 s; 3 \text{ mm})$ $\Sigma l \leq s$ for $L = \min(12 s; 150 \text{ mm})$
4	Wormholes (2016)	$l \leq \min(0,5 s; 4 \text{ mm})$ $\Sigma l \leq s$ for $L = \min(12 s; 150 \text{ mm})$	$l \leq \min(0,4 s; 3 \text{ mm})$ $\Sigma l \leq s$ for $L = \min(12 s; 150 \text{ mm})$	$l \leq \min(0,3 s; 2 \text{ mm})$ $\Sigma l \leq s$ for $L = \min(12 s; 150 \text{ mm})$
5	Solid and metallic inclusions (300) and elongated cavities (2015)	$l \leq 2s$ and $\Sigma l \leq L/10$ SIST EN 12517:1999 https://standards.iteh.ai/catalog/standards/sist/4be895fc-6638-4fc1-be10-ced26cf934e/sist-en-12517-1999	$l \leq s$ and $\Sigma l \leq L/10$	$l \leq \max(0,3 s; 6 \text{ mm})$ and $l \leq 25 \text{ mm}$ $\Sigma l \leq s$ for $L = \min(12 s; 150 \text{ mm})$
6	Copper inclusions (3042)	not permitted	not permitted	not permitted
7	Lack of fusion (401)	Permitted, but only intermittently and not breaking the surface $l \leq 25 \text{ mm}$ and $\Sigma l \leq 25 \text{ mm}$ for $L = \min(12 s; 150 \text{ mm})$	Not permitted	Not permitted
1) Acceptance levels 3 and 2 may be specified with prefix X which denoted that all indications over 25 mm are unacceptable.				
(to be continued)				

Table 2 (concluded)

No	Type of imperfections in accordance with EN 26520	Acceptance level 3 ¹⁾	Acceptance level 2 ¹⁾	Acceptance level 1
8	Lack of penetration (402)	$l \leq 25$ mm and $\Sigma l \leq 25$ mm for $L = \min(12 \text{ s}; 150 \text{ mm})$	Permitted if not breaking the surface $l \leq 12$ mm and $\Sigma l \leq 15$ mm for $L = \min(12 \text{ s}; 150 \text{ mm})$	Not permitted
9 2)	Undercut (501)	Smooth transition is required $h \leq 1,5$ mm	Smooth transition is required $h \leq 1$ mm	Smooth transition is required $h \leq 0,5$ mm
10 2)	Excessive penetration (504)	Moderately high $h \leq \min(5 \text{ mm}; (1 \text{ mm} + 1,2 \text{ b}))$	Fairly high $h \leq \min(4 \text{ mm}; (1 \text{ mm} + 0,6 \text{ b}))$	Of good shape Smooth transition to parent metal $h \leq \min(3 \text{ mm}; (1 \text{ mm} + 0,3 \text{ b}))$
11 2)	Local protusion (5041)	Permitted	Occasional local excess permitted provided the transition is smooth	
12 2)	Stray flash and spatter (601), (602)	Acceptance of stray flash depends on type of parent metal and likelihood of cracking		
		Acceptance of spatter depends on type of parent metal		
<p>1) Acceptance levels 3 and 2 may be specified with prefix X which denoted that all indications over 25 mm are unacceptable.</p> <p>2) Surface imperfections : The acceptance levels are those defined for visual examination. These defects are normally accepted or rejected for visual examination.</p>				