SLOVENSKI STANDARD
SIST EN 1708-2:2001

01-december-2001

Varjenje - Opis zvarnih spojev na jeklu - 2. del: Deli tlaļ nih posod brez tlaļ ne obremenitve

Welding - Basic weld joint details in steel - Part 2: Non internal pressurized components

Schweißen - Verbindungselemente beim Schweißen von Stahl - Teil 2: Nicht innendruckbeanspruchte Bauteile

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Soudage - Descriptif de base des assemblages soudés en acier - Partie 2: Composants non soumis a une pression interne

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Ta slovenski standard je istoveten z: **EN 1708-2:2000**

ICS:

25.160.40	Varjeni spoji in vari	Welded joints

SIST EN 1708-2:2001 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1708-2

July 2000

ICS 25.160.40

English version

Welding - Basic weld joint details in steel - Part 2: Non internal pressurized components

Soudage - Descriptif de base des assemblages soudés en acier - Partie 2: Composants non soumis à une pression interne

Schweißen - Verbindungselemente beim Schweißen von Stahl - Teil 2: Nicht innendruckbeanspruchte Bauteile

This European Standard was approved by CEN on 30 June 2000.

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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.

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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

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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of an identical text or by endorsement, at the latest by January 2001, and conflicting national standards shall be withdrawn at the latest by January 2001.

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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.

This European Standard is composed of the two following parts:

- Part 1: Pressurized components;
- Part 2: Non internal pressurized components.

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1 Scope

The purpose of this European Standard is to exemplify sound and accepted welded connections applicable to welded not internal pressurized steel components. It does not promote the standardization of connections that may be regarded as mandatory or restrict development in any way. The requirements of carrying capacity, fitness for purposes, fatigue and corrosion stress are to be considered if necessary.

This standard contains examples of connections welded by the following processes (process numbers according to EN ISO 4063):

- Manual metal arc welding (111);
- self-shielded tubular-cored arc welding (114);
- Submerged arc welding (12);
- MIG welding; Metal inert gas welding (131);
- MAG welding; Metal active gas welding (135)
- Tubular cored metal arc welding with active gas shield (136);
- Tubular cored metal arc welding with inert gas shield (137);
- TIG welding; Tungsten inert gas arc welding (141).

Other processes by agreement.

Further requirements should be considered in accordance with existing application standards.

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 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 (including amendments).

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EN 288-3
Specification and approval of welding procedures for metallic materials – Part 3: Welding procedures tests for the arc welding of steels

EN 1792
Welding – Multilingual list of items for welding and related processes

EN ISO 4063
Welding and allied processes – Nomenclature of processes with reference numbers (ISO 4063 : 1998)

EN 12345
Welding – Multilingual terms for welded joints with illustrations

EN 22553
Welded, brazed and soldered joints – Symbolic representation on drawings (ISO 2553 : 1992)

EN 29692
Metal-arc welding with covered electrode, gas-shielded metal-arc welding and gas welding – Joint preparations for steel (ISO 9692 : 1992)

EN ISO 9692-2
Welding and allied processes – Joint preparation – Part 2: Submerged arc welding of steels (ISO 9692-2 : 1998)

3 Requirements

3.1 Selection of detail

The connections recommended are not considered to be equally suitable for all service conditions, nor is the order in which they are shown indicative of their relative characteristics. In selecting the appropriate detail to use from the several alternatives shown for each type of connection, consideration shall be given to the existing fabrication and service conditions that pertain.

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3.2 Joint preparation

3.2.1 General

The limitations quoted in weld profiles and sizes are based on commonly accepted sound practice, but they can be subjected to modifications if required by special welding techniques or design conditions.

The terminology and symbolization used in this standard follow EN 1792, EN 12345 and EN 22553.

3.2.2 Joint preparation geometry

The recommended joint preparation geometry (e. g. included angles, root gaps, root radius and depth of root faces) are given in EN 29692 and in EN ISO 9692-2.

In cases where full penetration butt joints are indicated, it is intended that they shall be back chipped or gouged and back welded, or alternatively that the welding procedure shall be such as to ensure sound and effective root penetration.

3.2.3 Butt joints with significant difference of thickness

Depending on the type of load (type of action effect) and the difference of thickness, adjustment with the weld or bevelling is necessary (see Table 1 and Figure 1) when the direction of strength is perpendicular to the weld.

Table 1 - Guidelines for weld preparation on butt joints with significant difference of thickness

Type of load (type of action effect)	Difference of thickness, h, mm	Adjustment with the weld		Angle of the slope [a]	Figures
		suggested	not permitted		
members with predominantly static loads	≤ 10	X	–	–	1a and 1b
	> 10	–	X	20° ≤ α ≤ 45°	1c and 1d
members significantly susceptible to fatigue or to risk of brittle fracture	≤ 3	X	–	–	1b
	> 3	–	X	10° ≤ α ≤ 30° [b]	1c and 1d

Key: X = permitted; – = not permitted or not necessary

[a]) The angle of the slope depends on the actual acceptable notch case.

[b]) In case of low loaded components α can be raised up to 45°.

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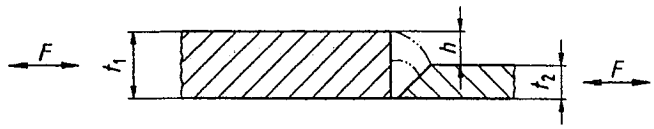
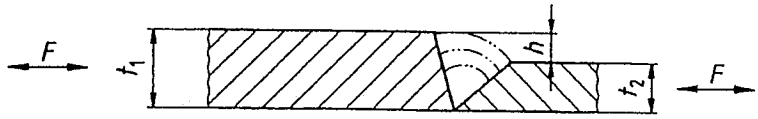


a)



b)

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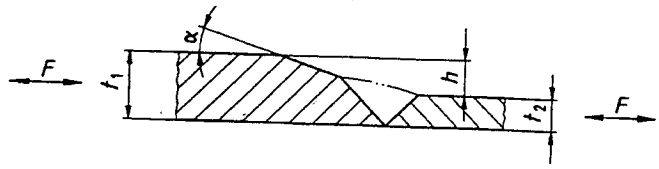
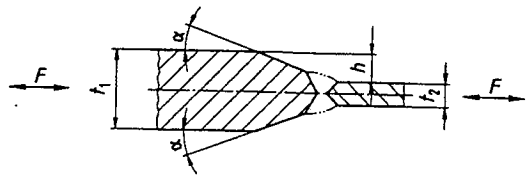


c)



d)

Figure 1 - Sketches of adjustment on difference of thickness

3.2.4 Weld sizes

The thickness of welds (in particular of fillet welds), which are not determined by their profile, are based on the assumption that the joint need not to be stronger than the connected parts.

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Fillet welds for T-joints (see Figure 2) should respect the following condition (see formulars [1] and [2]):

[1] $3 \text{ mm} \leq a \leq 0{,}7 \times t_2$

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NOTE In special cases the above limit of $0{,}7 \times t_2$ can be exceeded.

[2] $a \geq \sqrt{t_{max}} - 0{,}5 \text{ mm}$

NOTE Only up to 30 mm plate thickness except for process 12 (submerged arc welding).

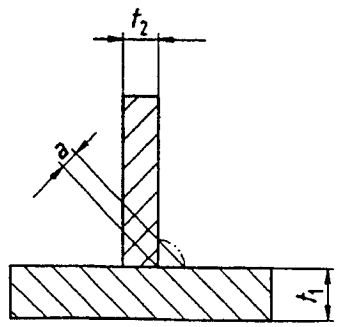

Figure 2 - Sketch of a T-joint

3.3 Typical connections

Typical connections are given in Table 2. For connections that not are mentioned (e.g. full penetration joint) reference has to be made to EN 29692 and EN ISO 9692-2.

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4 Symbols and abbreviations

For the purposes of this standard, the following symbols and abbreviations apply:

WPAR = Welding procedure approval record

a = weld design throat thickness

b = root gap

B = width of profile or plate

c = distance to auxiliary attachement

d = size of bevel or diameter

D = distance of the stiftener and size of opening

F = load strength

g = width of weld in two flange plate

h = difference of thickness

i = distance of the opening and weld to the web

k = penetration depth and corner distance

l = length

m = size of mechanical bevelling

R = radius

t = plate thickness

t_R = thickness of stached flange end

z = leg length of the weld

α = included angle (i.e. angle of the slope)

δ = angle of T-joint

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NOTE All dimentions in the following tables are guide values.

Table 2 - Typical joint preparation

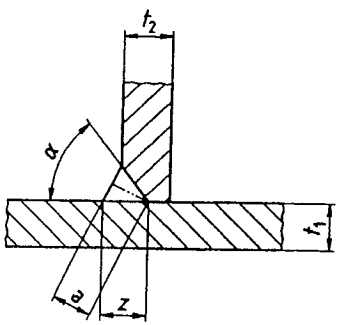
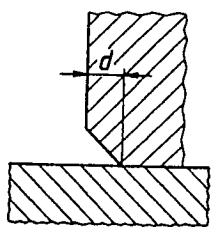
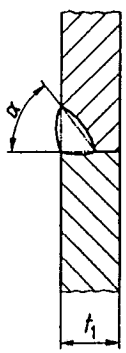
No.	Figure	Application/ condition	Note	Ref. to EN 29692 / EN ISO 9692-2
2.1 Weld thickness evaluation				
2.1.1		partial penetration welds $\alpha \leq 60°$	if the leg length of the weld z is specified, the weld throat can be assumed equal to a without any other indication: $a = d$ applicable to double side weld, too 	1.4
2.1.2				1.4

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Table 2 (continued)

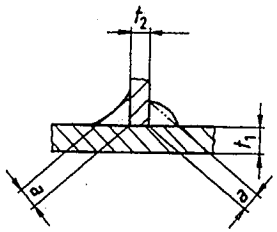
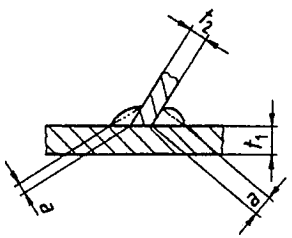
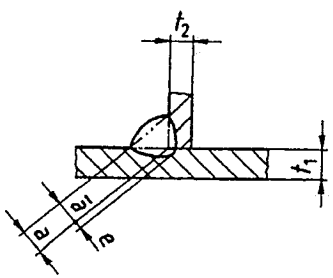
No.	Figure	Application/ condition	Note	Ref. to EN 29692 / EN ISO 9692-2
2.1.3		design throat of fillet welds	measured from the theoretical root point	3.10 A
2.1.4				4.10.10 C
2.1.5			applicable only for fully mechanized and automatic processes and $a = \bar{a} + e$ e to be settled by WPAR according to EN 288-3	3.10 A

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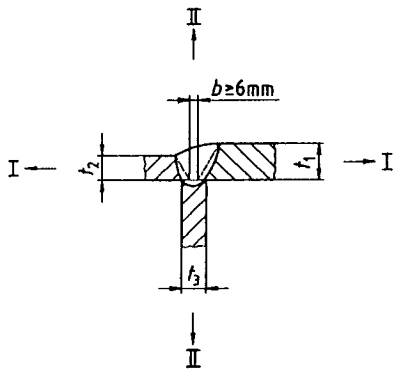
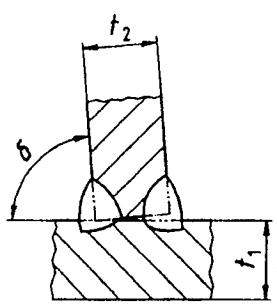
Table 2 (continued)

No.	Figure	Application/ condition	Note	Ref. to EN 29692 / EN ISO 9692-2
2.1.6		multiple joint of three components $t_3 \geq b + 4$ mm	for I – I direction stress: $a = t_2$ (for $t_2 < t_1$); for II – II direction stress: $a = b$; this type of joint is very sensitive to lack of fusion, which, due to the geometry, is difficult to detect with non-destructive testing of weld metal.	
2.1.7		$t_2 \geq 10$ mm $80° \leq \delta \leq 90°$	fillet welds without joint preparation of the web	4.10.10 C

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