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**Standard qualification procedure
for welding technique of stainless
steel**

ICS 25.160.01

Descriptors : stainless steels, arc welding, approval testing, qualification approval,
examination (quality assurance), work certificates

Reference number : JIS Z 3821 : 2001 (E)

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS Z 3821 : 1989** is replaced with **JIS Z 3821 : 2001**.

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In the event of any doubts arising as to the contents,
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Standard qualification procedure for welding technique of stainless steel

1 Scope This Japanese Industrial Standard specifies the testing methods and the criteria for the standard qualification procedure for the welding technique of stainless steel by shielded metal arc welding, TIG welding and gas shielded arc welding. However, the full automatic welding is excluded.

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS G 3459 *Stainless steel pipes*

JIS G 4304 *Hot rolled stainless steel plates, sheets and strip*

JIS G 4305 *Cold rolled stainless steel plates, sheets and strip*

JIS K 1105 *Argon*

JIS K 1106 *Liquid carbon dioxide*

JIS Z 3001 *Welding terms*

JIS Z 3122 *Methods of bend test for butt welded joint*

JIS Z 3221 *Stainless steel covered electrodes*

JIS Z 3321 *Stainless steel, welding rods and solid wires*

JIS Z 3323 *Stainless steel flux cored wires*

3 Definitions For the purposes of this Standard, the definitions given in **JIS Z 3001** and the following definitions apply.

- a) **test material** The plate or pipe prepared for the test.
- b) **test specimen** The plate or pipe welded, including the one in process of welding.
- c) **test piece** The piece machined to the specified shape and dimensions from a test specimen for the purpose of bend test.
- d) **combined welding** The welding in which the first one to three passes are performed by TIG welding, followed by shielded metal arc welding.

4 Classification of tests for welding techniques Tests for welding techniques shall be classified as shown in Table 1, depending on welding method, welding position, type of joint and the like, and their symbols shall be as shown in Table 1.

Table 1 Classification of tests for welding techniques

Classification of test			Type of joint			Test for test piece
Welding method	Symbol	Welding position	Shape of test material	Thickness and nominal diameter of test material	With/without backing strip ⁽¹⁾	
Shielded metal arc welding	CN-F	Flat	Plate	Thickness: 9.0 mm ⁽³⁾	N	Face bend and root bend
	CN-V	Vertical				
	CN-H	Horizontal				
	CN-O	Overhead				
	CA-O					
	CN-P CN-PM ⁽²⁾	Horizontal fixing Vertical fixing	Pipe	Nominal diameter: 150 A ⁽⁴⁾ Thickness: 11.0 mm	N	
TIG welding	TN-F	Flat	Plate	Thickness: 3.0 mm ⁽⁵⁾	N	
	TN-V	Vertical				
	TN-H	Horizontal				
	TN-O	Overhead				
	TN-P	Horizontal fixing Vertical fixing	Pipe	Nominal diameter: 100 A ⁽⁴⁾ Thickness: 3.0 mm		
Gas shielded arc welding	MN-F	Flat	Plate	Thickness: 9.0 mm ⁽³⁾	N	
	MA-F				A	
	MN-V	Vertical			N	
	MA-V				A	
	MN-H	Horizontal			N	
	MA-H				A	

Notes (1) A means "with backing strip" and N means "without backing strip".

(2) The first one to three passes are performed by TIG welding, followed by shielded metal arc welding (combined welding).

(3) Tolerances on thickness shall comply with **JIS G 4304**.

(4) Tolerances on diameter and thickness shall comply with **JIS G 3459**.

(5) Tolerances on thickness shall comply with **JIS G 4304** or **JIS G 4305**.

Remarks : Details of the thickness of plate and the outside diameter of pipe shall be as shown in Fig. 3 to Fig. 7.

5 Welding method The methods of welding test materials shall be any of the following:

- Shielded metal arc welding
- Combined welding

- c) TIG welding
- d) MIG welding and MAG welding (including CO₂ gas arc welding), among gas shielded arc welding methods

6 Welding position

- a) Positions for the welding of plate shall be flat, vertical, horizontal and overhead, and their details shall be as shown in Fig. 1.
- b) Positions for the welding of pipe shall be horizontal fixing and vertical fixing, and their details shall be as shown in Fig. 2.

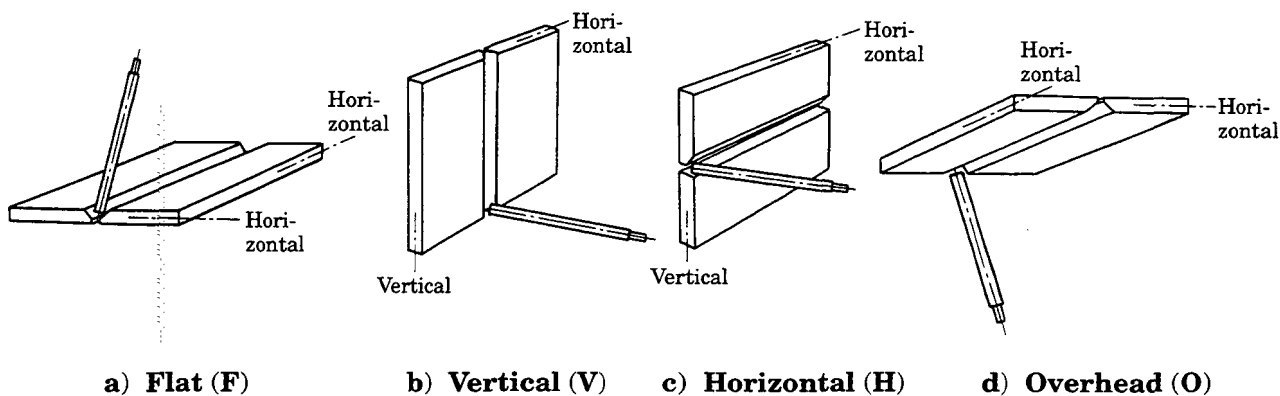


Fig. 1 Welding positions for plate

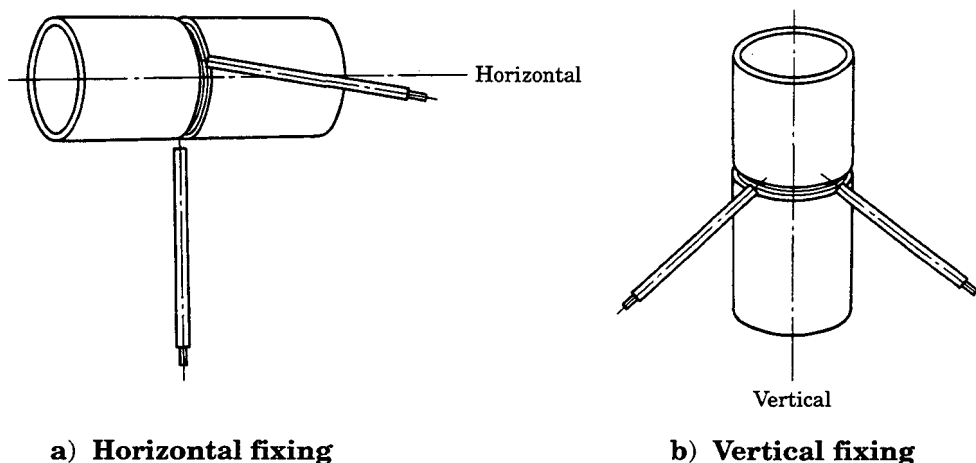
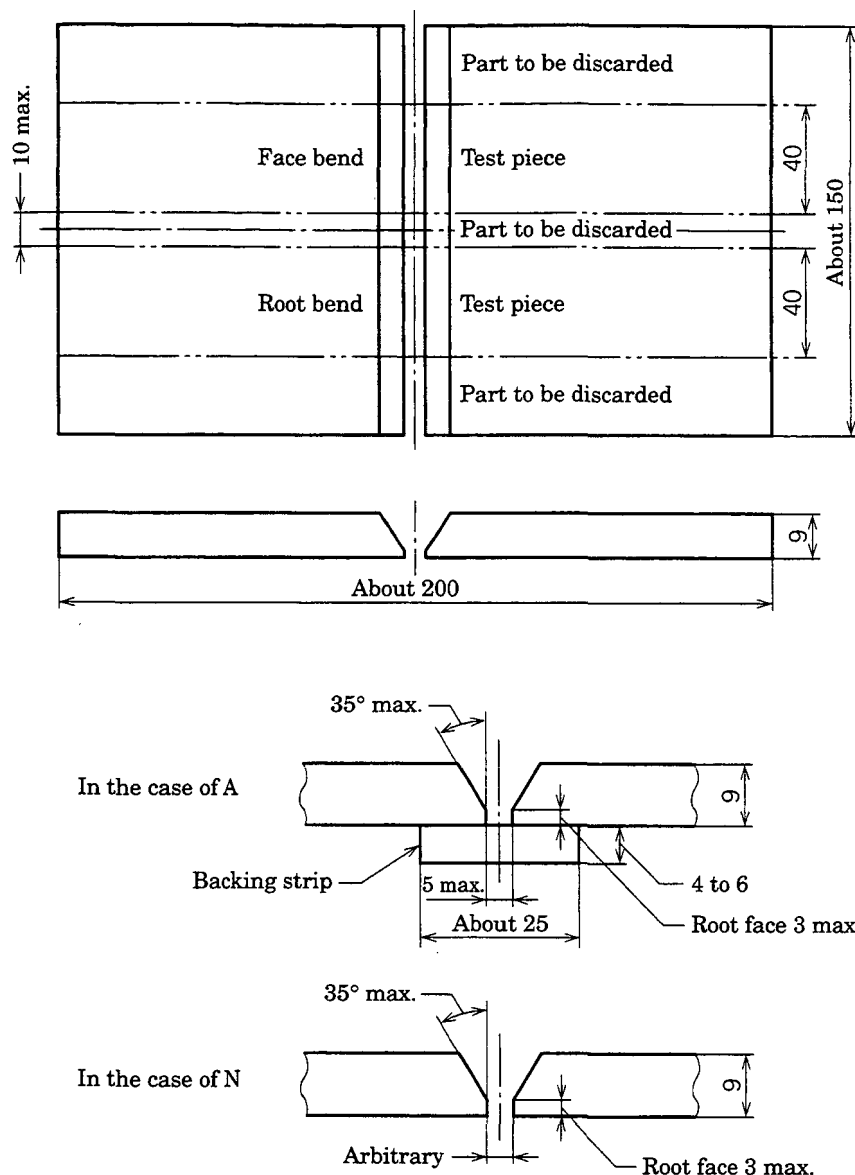


Fig. 2 Welding positions for pipe

7 Shape and dimensions of test material

- a) Plate test material shall be divided into that for shielded metal arc welding, that for TIG welding and that for gas shielded arc welding, and details of each shall be as shown in Fig. 3, Fig. 4 and Fig. 5.
- b) Pipe test material shall be divided into that for shielded metal arc welding and that for TIG welding, and details of each shall be as shown in Fig. 6 and Fig. 7.

Unit : mm



Remarks : The standard groove shall be V-shaped. (A ㄥ-shaped groove is permissible.)

Fig. 3 Shape and dimensions of plate test material for shielded metal arc welding and sampling position of test piece