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Standard qualification procedure for semi-automatic welding technique

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Standard qualification procedure for semi-automatic welding technique

1 Scope This Japanese Industrial Standard shall specify the standard qualification procedure for semi-automatic welding technique by MAG welding, and self-shielded arc welding.

Remarks: Normative references to this Standard are as follows.

JIS G 3101	<i>Rolled steels for general structure</i>
JIS G 3103	<i>Carbon steel and molybdenum alloy steel plates for boilers and other pressure vessels</i>
JIS G 3106	<i>Rolled steels for welded structure</i>
JIS G 3136	<i>Rolled steels for building structure</i>
JIS G 3445	<i>Carbon steel tubes for machine structural purposes</i>
JIS G 3454	<i>Carbon steel pipes for pressure service</i>
JIS G 3455	<i>Carbon steel pipes for high pressure service</i>
JIS G 3456	<i>Carbon steel pipes for high temperature service</i>
JIS G 3461	<i>Carbon steel boiler and heat exchanger tubes</i>
JIS K 1105	<i>Argon</i>
JIS K 1106	<i>Liquid carbon dioxide</i>
JIS Z 3001	<i>Welding terms</i>
JIS Z 3122	<i>Methods of bend test for butt welded joint</i>
JIS Z 3312	<i>MAG welding solid wires for mild steel and high strength steel</i>
JIS Z 3313	<i>Flux cored wires for gas shielded and self-shielded metal arc welding of mild steel, high strength steel and low temperature service steel</i>
JIS Z 3316	<i>TIG welding rods and wires for mild steel and low alloy steel</i>

2 Definitions For the main terms used in this Standard the definitions in **JIS Z 3001** apply, and the rest of the terms are as follows.

- (1) **Combined welding** The welding in which initial 1 to 3 passes are performed by TIG-welding, and the subsequent passes are performed by MAG-welding.
- (2) **Test material** Plates or pipes prepared for test
- (3) **Test specimen** Welded plate or pipe
- (4) **Test piece** A piece machined to the specified shape and dimensions from a test specimen in order to carry out the bend test

3 Classification of qualification for welding technique The qualification for welding technique shall be classified as indicated in Table 1 by the welding method, welding position, kind of joints, and division of the thickness of the test material, ect., and its symbol shall be as indicated in Table 1.

Table 1 Classification of qualification for welding technique

Kind of joint	Division of thickness of test material (mm)	Shape of groove	With/without backing metal ⁽¹⁾	Welding position	Welding method and symbol		
					MAG welding	Combined welding	Self-shielded arc welding
Butt welding of plates	Thin plate (3.2 in thickness)	Square groove or single V groove	N	Flat position (F)	SN - 1F		
				Vertical position (V)	SN - 1V		
				Horizontal position (H)	SN - 1H		
				Overhead position (O)	SN - 1O		
	Medium plate (9.0 in thickness)	Single V groove	A	Flat position (F)	SA - 2F		SS - 2F
				Vertical position (V)	SA - 2V		SS - 2V
				Horizontal position (H)	SA - 2H		SS - 2H
				Overhead position (O)	SA - 2O		SS - 2O
			N	Flat position (F)	SN - 2F	SC - 2F	
				Vertical position (V)	SN - 2V	SC - 2V	
				Horizontal position (H)	SN - 2H	SC - 2H	
				Overhead position (O)	SN - 2O	SC - 2O	
	Thick plate (19.0 in thickness)	Single V groove	A	Flat position (F)	SA - 3F		SS - 3F
				Vertical position (V)	SA - 3V		SS - 3V
				Horizontal position (H)	SA - 3H		SS - 3H
				Overhead position (O)	SA - 3O		SS - 3O
			N	Flat position (F)	SN - 3F	SC - 3F	
				Vertical position (V)	SN - 3V	SC - 3V	
				Horizontal position (H)	SN - 3H	SC - 3H	
				Overhead position (O)	SN - 3O	SC - 3O	
Butt welding of pipes	Thin wall pipe (4.9 in wall thickness)	Square groove or single V groove	N	Horizontally and vertically fixed position (P)	SN - 1P		
	Medium wall pipe (11.0 in wall thickness)	Single V groove	A	Horizontally and vertically fixed position (P)	SA - 2P		SS - 2P
			N	Horizontally and vertically fixed position (P)	SN - 2P	SC - 2P	
	Thick wall pipe (20 or over in wall thickness)	Single V groove	A	Horizontally and vertically fixed position (P)	SA - 3P		SS - 3P
			N	Horizontally and vertically fixed position (P)	SN - 3P	SC - 3P	

Note (1) A; A backing metal is used. N; No backing metal is used.

Remarks: For details of thickness of plates and external diameter of pipes, refer to Figs. 3 to 8.

4 Welding method The methods to weld the test material shall be one of the following methods.

- (1) MAG welding
- (2) Combined welding
- (3) Self-shielded arc welding

5 Welding positions

5.1 The positions to carry out the welding of the plates shall be flat position, vertical position, horizontal position, and overhead position, and the details shall be as given in Fig. 1.

5.2 The positions to carry out the welding of the pipes shall be horizontally fixed position (vertical position welding and overhead position welding) and vertically fixed position (horizontal position welding), and the details shall be as given in Fig. 2.

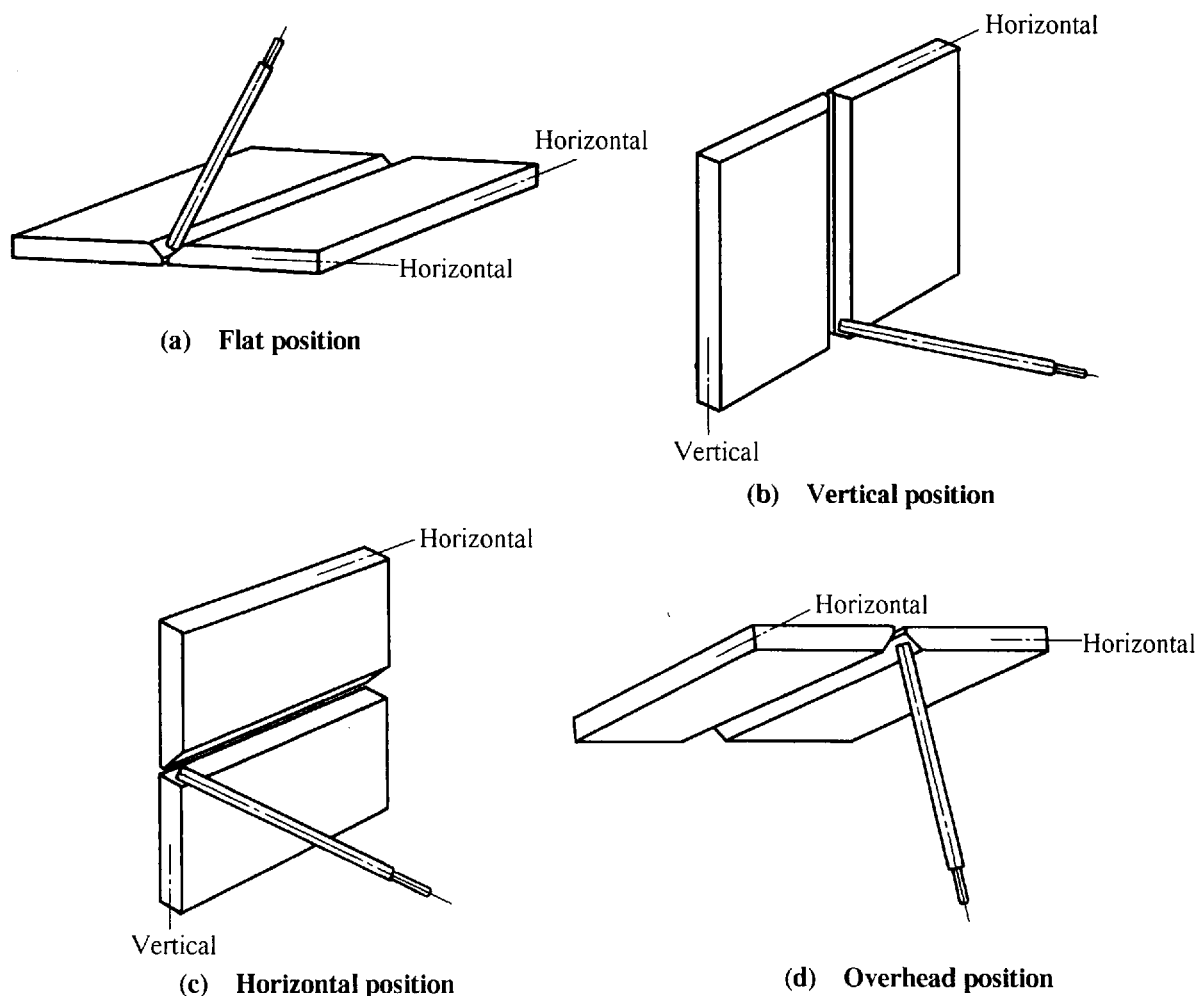


Fig. 1 Welding position for butt welding of plates

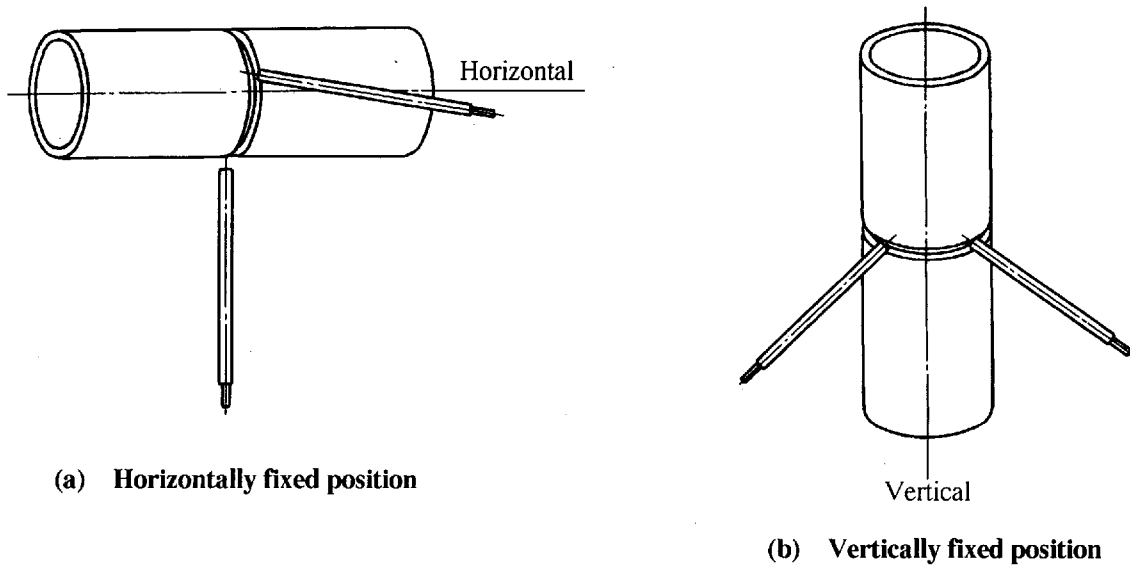


Fig. 2 Welding position for butt welding of pipes

6 Shape and dimensions of test materials The shape and dimensions of the test materials shall be as follows.

- (1) The test material of plate shall be classified into thin plate, medium plate and thick plate, and the details shall be as given in Figs. 3 to 5.
- (2) The test material of pipe shall be classified into thin wall pipe, medium wall pipe and thick wall pipe, and the details shall be as given in Figs. 6 to 8.