

JIS

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS Z 3801 : 1997

Standard qualification procedure for manual welding technique

ICS 25.160.01

Descriptors : arc welding, gas welding, approval testing, testing, qualification approval,
manual control systems

Reference number : JIS Z 3801 : 1997 (E)

Z 3801 : 1997

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

Date of Establishment: 1954-09-18

Date of Revision: 1997-08-20

Date of Public Notice in Official Gazette: 1997-08-20

Investigated by: Japanese Industrial Standards Committee
Divisional Council on Welding

JIS Z 3801: 1997, First English edition published in 1998-03

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

© JSA 1998

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

Standard qualification procedure for manual welding technique

1 Scope This Japanese Industrial Standard specifies the standard qualification procedure for manual welding technique by shielded metal arc welding, TIG welding, and gas welding.

Remarks: The normative references to this Standard are as follows.

- JIS G 3101 *Rolled steels for general structure*
- JIS G 3103 *Carbon steel and molybdenum alloy steel plates for boilers and other pressure vessels*
- JIS G 3106 *Rolled steels for welded structure*
- JIS G 3136 *Rolled steels for building structure*
- JIS G 3445 *Carbon steel tubes for machine structural purposes*
- JIS G 3454 *Carbon steel pipes for pressure service*
- JIS G 3455 *Carbon steel pipes for high pressure service*
- JIS G 3456 *Carbon steel pipes for high temperature service*
- JIS G 3461 *Carbon steel boiler and heat exchanger tubes*
- JIS K 1101 *Oxygen*
- JIS K 1105 *Argon*
- JIS K 1902 *Dissolved acetylene*
- JIS Z 3001 *Welding terms*
- JIS Z 3122 *Methods of bend test for butt welded joint*
- JIS Z 3201 *Gas welding rods for mild steel*
- JIS Z 3211 *Covered electrodes for mild steel*
- JIS Z 3212 *Covered electrodes for high tensile strength steel*
- JIS Z 3316 *Tig welding rods and wires for mild steel and low alloy steel*

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 shielded metal arc welding.
- (2) **test material** Plates or pipes to be prepared for test
- (3) **test specimen** Plates or pipes welded
- (4) **test piece** A piece cut out into the specified shape and dimensions from a test specimen in order to carry out bend test

3 Classification of qualification procedure for welding technique The qualification procedure 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, and its symbol shall be as indicated in Table 1.

Table 1 Classification of qualification procedure 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			
					Shielded metal arc welding	TIG welding	Combined welding	Gas welding
Butt welding of plates	Thin plate (3.2 in thickness)	Square groove or single V groove	N	Flat position (F)	N-1F	T-1F		G-1F
				Vertical position (V)	N-1V	T-1V		G-1V
				Horizontal position (H)	N-1H	T-1H		G-1H
				Overhead position (O)	N-1O	T-1O		G-1O
	Medium plate (9.0 in thickness)	Single V groove	A	Flat position (F)	A-2F			
				Vertical position (V)	A-2V			
				Horizontal position (H)	A-2H			
				Overhead position (O)	A-2O			
		Single V groove	N	Flat position (F)	N-2F		C-2F	
				Vertical position (V)	N-2V		C-2V	
				Horizontal position (H)	N-2H		C-2H	
				Overhead position (O)	N-2O		C-2O	
	Thick plate (19.0 in thickness)	Single V groove	A	Flat position (F)	A-3F			
				Vertical position (V)	A-3V			
				Horizontal position (H)	A-3H			
				Overhead position (O)	A-3O			
		Single V groove	N	Flat position (F)	N-3F		C-3F	
				Vertical position (V)	N-3V		C-3V	
				Horizontal position (H)	N-3H		C-3H	
				Overhead position (O)	N-3O		C-3O	
Butt welding of pipes	Thin wall pipe (4.9 in thickness)	Square groove or single V groove	N	Horizontally and vertically fixed position (P)	N-1P	T-1P		G-1P
	Medium wall pipe (11.0 in thickness)	Single V groove	A	Horizontally and vertically fixed position (P)	A-2P			
			N	Horizontally and vertically fixed position (P)	N-2P		C-2P	
	Thick wall pipe (20 or over in thickness)	Single V groove	A	Horizontally and vertically fixed position (P)	A-3P			
			N	Horizontally and vertically fixed position (P)	N-3P		C-3P	

Note (¹) A; The backing-metal is used.

N; No backing metal is used.

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

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

- (1) Shielded metal arc welding
- (2) TIG welding
- (3) Combined welding
- (4) Gas 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 welding) and vertically fixed position (horizontal welding), and the details shall be as given in Fig. 2.

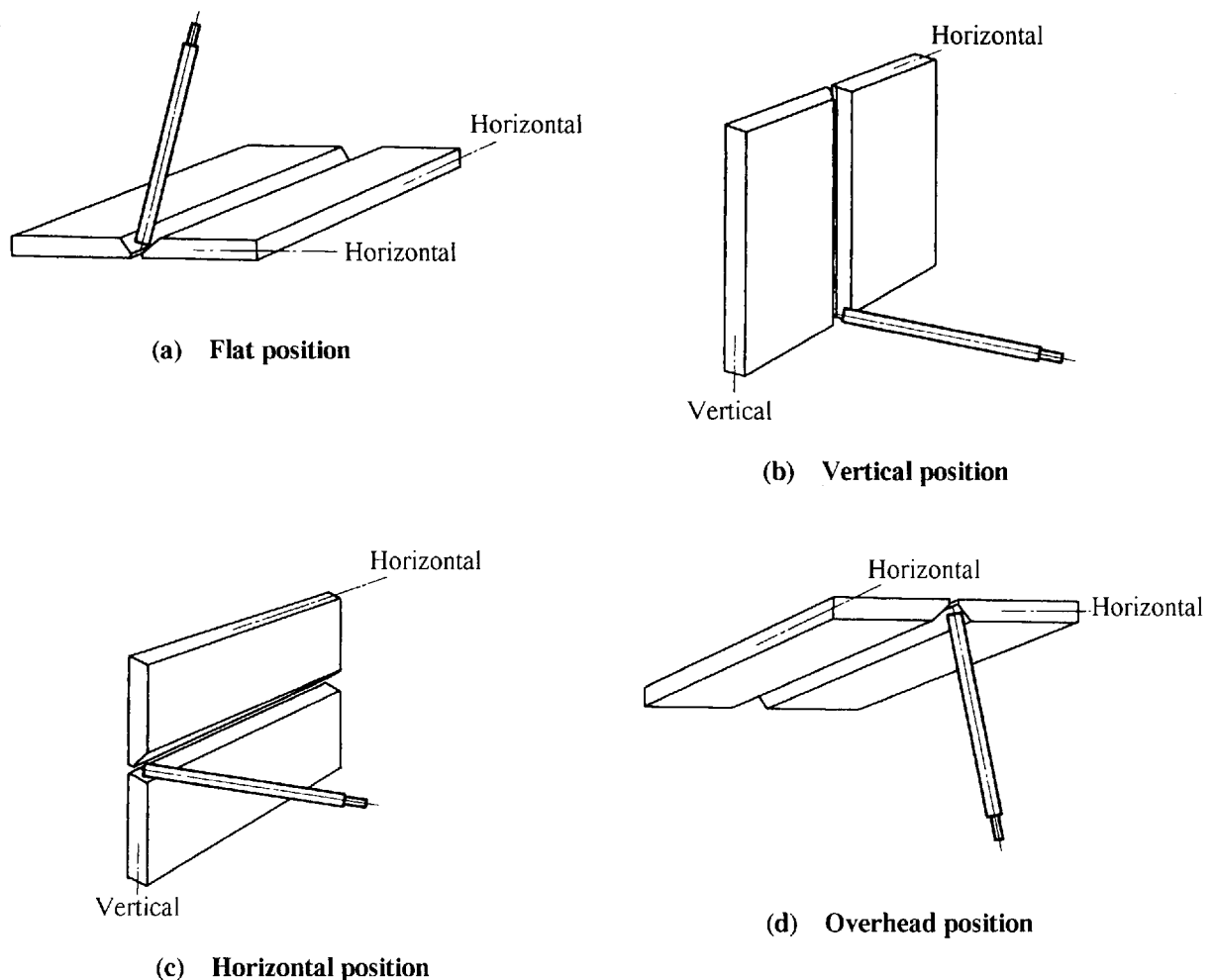


Fig. 1 Welding position for butt welding of plates

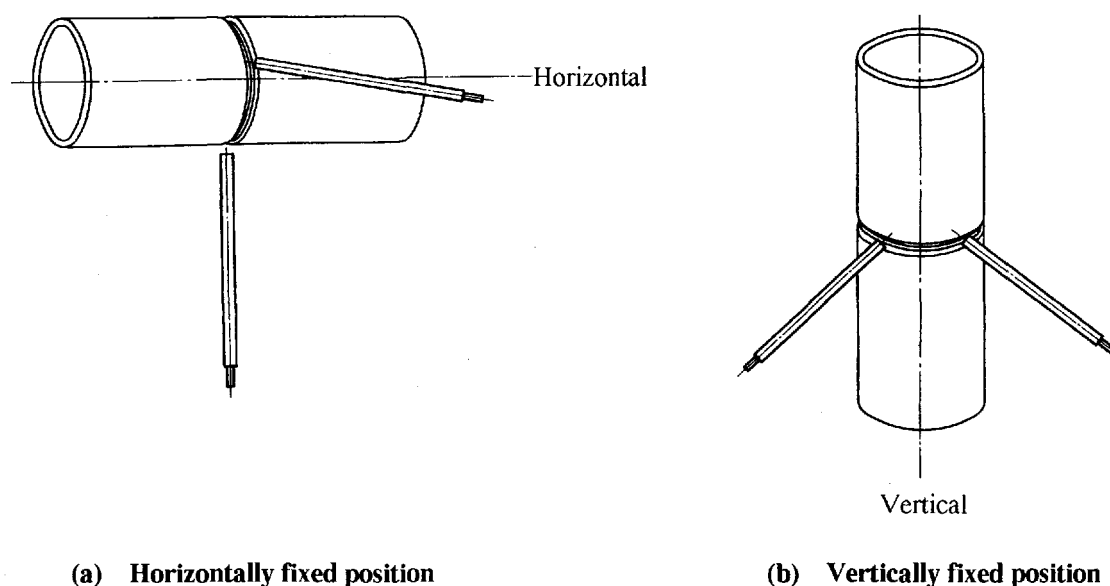
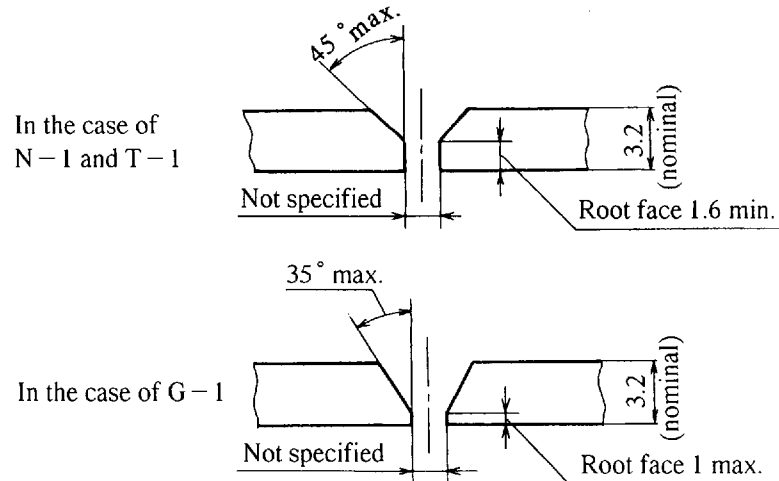
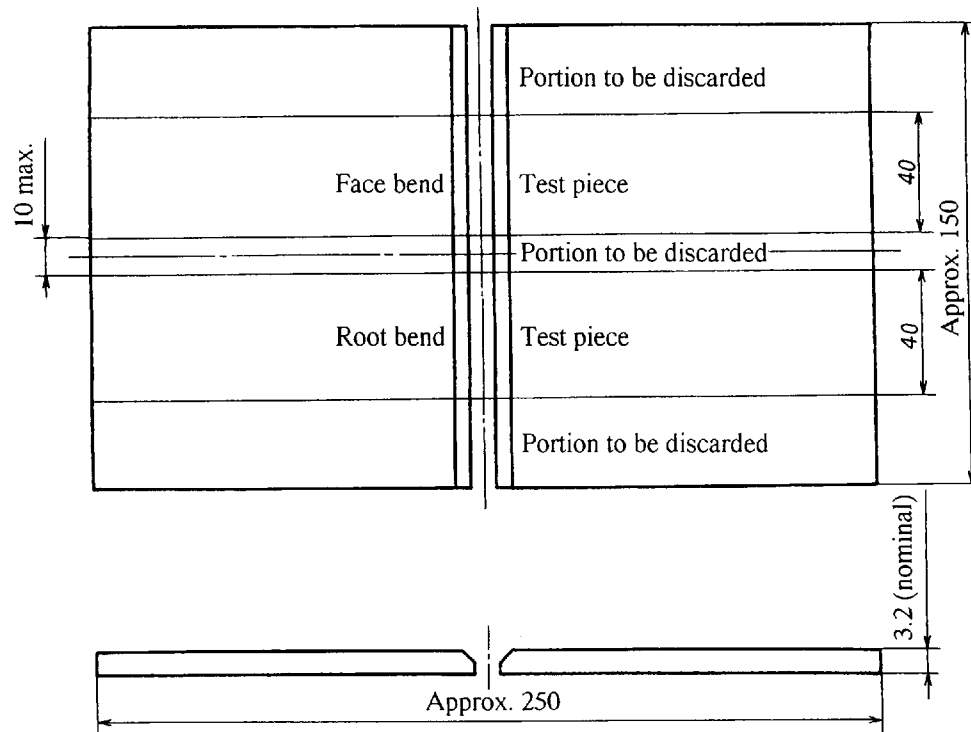


Fig. 2 Welding position for butt welding of pipes

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

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

Unit: mm



Remarks: The shape of groove shall be of square groove or of single V groove.

Fig. 3 Shape and dimensions of test material for thin plate, and test piece sampling position