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(JWES)

**Flux cored wires for gas shielded
and self-shielded metal arc welding
of atmospheric corrosion resisting
steel**

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In the event of any doubts arising as to the contents,
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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 as the result of proposal for revision of Japanese Industrial Standard submitted by The Japan Welding Engineering Society (JWES) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently, **JIS Z 3320:2007** is replaced with this Standard.

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Flux cored wires for gas shielded and self-shielded metal arc welding of atmospheric corrosion resisting steel

Introduction

This Japanese Industrial Standard has been prepared based on the first edition of **ISO 17632** published in 2004 with some modifications of the technical contents. **ISO 17632** is a combined standard of **EN 758** and the standard used around the Pacific Rim. Either or both of the standards may be applied to the specific global markets. According to this, this Standard gives requirements of flux cored wires of atmospheric corrosion resisting steel referred from the parts corresponding to the standards used in Pacific Rim (**ISO 17632** System B) in the text.

The portions given sidelines or dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies the flux cored wires for gas shielded and self-shielded metal arc welding of atmospheric corrosion resisting steel (hereafter referred to as “wires”).

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows:

ISO 17632:2004 *Welding consumables—Tubular cored electrodes for gas shielded and non-gas shielded metal arc welding of non-alloy and fine grain steels—Classification* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

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

JIS G 0321 *Product analysis and its tolerance for wrought steel*

JIS G 3101 *Rolled steels for general structure*

JIS G 3106 *Rolled steels for welded structure*

JIS G 3114 *Hot-rolled atmospheric corrosion resisting steels for welded structure*

JIS G 3140 *Higher yield strength steel plates for bridges*

JIS Z 3001-1 *Welding and allied processes—Vocabulary—Part 1: General*

JIS Z 3001-2 *Welding and allied processes—Vocabulary—Part 2: Welding processes*

JIS Z 3011 *Welding position defined by means of angles of slope and rotation*

NOTE : Corresponding International Standard: ISO 6947:1990 *Welds—Working positions—Definitions of angles of slope and rotation* (MOD)

JIS Z 3111 *Methods of tension and impact tests for deposited metal*

NOTE : Corresponding International Standard: ISO 15792-1:2000 *Welding consumables—Test methods—Part 1: Test methods for all-weld metal test specimens in steel, nickel and nickel alloys* (MOD)

JIS Z 3118 *Method for measurement of amount of hydrogen evolved from steel welds*

NOTE : Corresponding International Standard: ISO 3690 *Welding and allied processes—Determination of hydrogen content in ferritic steel arc weld metal* (MOD)

JIS Z 3121 *Methods of tensile test for butt welded joints*

JIS Z 3129 *Test method and preparation of test specimens for single-run and two-run welding technique in steel*

NOTE : Corresponding International Standard: ISO 15792-2:2000 *Welding consumables—Test methods—Part 2: Preparation of single-run and two-run technique test specimens in steel* (MOD)

JIS Z 3181 *Method of fillet weld test for welding consumables*

NOTE : Corresponding International Standard: ISO 15792-3 *Welding consumables—Test methods—Part 3: Classification testing of positional capacity and root penetration of welding consumables in a fillet weld* (MOD)

JIS Z 3184 *Method of preparing deposited metal pad and samples for chemical analysis*

NOTE : Corresponding International Standard: ISO 6847 *Welding consumables—Deposition of a weld metal pad for chemical analysis* (MOD)

JIS Z 3200 *Welding consumables—Technical delivery conditions for welding filler materials—Type of product, dimensions, tolerances and markings*

NOTE : Corresponding International Standard: ISO 544 *Welding consumables—Technical delivery conditions for welding filler materials—Type of product, dimensions, tolerances and markings* (MOD)

JIS Z 3253 *Shielding gases for fusion welding and thermal cutting*

NOTE : Corresponding International Standard: ISO 14175:1997 *Welding consumables—Shielding gases for arc welding and cutting* (MOD)

JIS Z 3423 *Procurement guidelines for welding consumables*

NOTE : Corresponding International Standard: ISO 14344 *Welding and allied processes—Flux and gas shielded electrical welding processes—Procurement guidelines for consumables* (MOD)

JIS Z 8401 *Guide to the rounding of numbers*

NOTE : Corresponding International Standard: ISO 31-0:1992 *Quantities and units—Part 0: General principles* (MOD)

3 Terms and definitions

For the purposes of this Standard, the terms and definitions given in **JIS Z 3001-1** and **JIS Z 3001-2** apply.

4 Classification and designation

Wires shall be classified according to the tensile properties (deposited metal of multi-run welding or welded joint of single-run welding), impact test temperature, usability characteristics, applicable welding position, shielding gas, welding division (division of single-run welding/multi-run welding and with/without post-weld heat treatment), chemical composition of deposited metal and Charpy absorbed energy level. The combination of division symbols shall be as given in table 1. The designation for classification of wires shall be as given in figure 1.

The division according to the hydrogen content of deposited metal may be added. Also, the different division according to the mechanical properties with/without post-weld heat treatment may be given even for a single wire. Moreover, the other division according to the combination of different shielding gases may apply.

Table 1 Division symbols and combinations thereof

Symbol for tensile properties	Symbol for impact test temperature	Symbol for usability characteristics	Symbol for applicable welding position	Symbol for shielding gas	Symbol for welding division	Symbol for chemical composition of deposited metal	Symbol for Charpy absorbed energy level
43, 49, 55, 57	Y, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	T1, T5, T15	0, 1	C, M, G	A, P, AP	CC, NCC, NCC1	No symbol, U
		T7	0, 1	N			
		T4, T6	0	N			
		TG	0, 1	C, M, G, N			
<u>49J</u>	0	T1, T5, T15, TG	0, 1	C, M, G		NCC, NCC1	U
<u>57J</u>	1						
<u>78J</u>	2					<u>NCC1J</u>	
43, 49, 55, 57	No symbol	T1, T5, T15	0, 1	C, M, G	S	CC, NCC, NCC1	No symbol, U
		T7, T13, T14	0, 1	N			
		T2	0	C, M, G			
		T3, T4, T6, T10	0	N			
		TG	0, 1	C, M, G, N			



Figure 1 Classification and coding method of wires

Table 2 Tensile properties of deposited metal

Symbol for tensile properties of deposited metal	Tensile strength MPa	0.2 % proof stress MPa	Elongation %
43	430 to 600	330 min.	20 min.
49	490 to 670	390 min.	18 min.
49J	490 to 670	400 min.	18 min.
55	550 to 740	460 min.	17 min.
57	570 to 770	490 min.	17 min.
57J	570 to 770	500 min.	17 min.
78J	780 to 980	700 min.	13 min.
NOTE : 1 MPa = 1 N/mm ²			