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GB/T 17854-2018

Replacing GB/T 17854-1999

Solid wire electrodes/flux combinations for submerged arc welding of stainless steels

埋弧焊用不锈钢焊丝-焊剂组合分类要求

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Issued by: General Administration of Quality Supervision, Inspection and Quarantine of the PRC;

Standardization Administration of the PRC.

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Foreword

This Standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard replaces GB/T 17854-1999 “Stainless steel electrodes and fluxes for submerged arc welding”. As compared with GB/T 17854-1999, the main changes are as follows:

- CHANGE the standard’s name to “Solid wire electrodes/flux combinations for submerged arc welding of stainless steels”;

- According to JIS Z 3324:2010, ADJUST the method of classification for stainless steel wire electrodes-flux combinations;

- DELETE the technical requirements for wire electrodes, executed in accordance with GB/T 29713 “Wire electrodes, strip electrodes, wires and rods for arc welding of stainless and heat resisting steels”;

- DELETE the technical requirements for flux, and the relevant content is adjusted to GB/T 36037 “Fluxes for submerged arc welding and electroslag welding”;

- According to JIS Z 3324:2010, ADD five classifications for deposited metal of F309L, F312, F16-8-2, F317L, and F347L, and CHANGE “F316CuL” to “F316LCu”;

- According to the actual application needs of China, ADD four classifications for deposited metal of F309LMo, F385, F2209, and F2594;

- According to JIS Z 3324:2010, ADJUST the Ni content of the deposited metal classification F308L from “9.0%~11.0%” to “9.0%~12.0%”, and ADJUST the Ni content of F316L and F316LCu from “11.0%~14.0%” to “11.0%~16.0%”;

- According to JIS Z 3324:2010, ADJUST the percentage elongation after fracture of the deposited metal classification F308L from “25%” to “30%”, and ADJUST the percentage elongation after fracture of F410 from “20%” to “15%”, ADJUST the percentage elongation after fracture of F430 from “17%” to “15%”;

- According to JIS Z 3324:2010, ADJUST the heat treatment specifications of deposited metal classifications F410 and F430;

- According to GB/T 25777 “Preparation methods of deposited metal specimens for chemical analysis”, ADJUST the preparation of deposited

Solid wire electrodes/flux combinations for submerged arc welding of stainless steels

1 Scope

This Standard specifies the classification, technical requirements, test methods, re-inspection, technical delivery conditions, and other contents of solid wire electrodes-flux combinations for submerged arc welding of stainless steels.

This Standard is applicable to the classification requirements for solid wire electrodes-flux combinations for submerged arc welding of stainless steels. Among the deposited metals, chromium content shall not be less than 11%; nickel content shall not be more than 38%.

2 Normative references

The following documents are indispensable for the application of this document. For the dated references, only the versions with the dates indicated are applicable to this document. For the undated references, the latest version (including all the amendments) are applicable to this document.

GB/T 1954 Methods of measurement for ferrite content in austenitic Cr-Ni stainless steel weld metals (GB/T 1954-2008, ISO 8249:2000, MOD)

GB/T 2652 Tensile test methods on weld and deposited metal (GB/T 2652-2008, ISO 5178:2001, IDT)

GB/T 4334 Corrosion of metals and alloys - Test methods for intergranular corrosion of stainless steels (GB/T 4334-2008, ISO 3651-1:1998 & ISO 3651-2:1998, MOD)

GB/T 18591 Welding - Guidance on the measurement of preheating temperature, interpass temperature and preheat maintenance temperature (GB/T 18591-2001, idt ISO 13916:1996)

GB/T 25774.1 Test methods for welding consumables - Part 1: Preparation and testing of deposited metal specimens for mechanical properties in steel nickel and nickel alloys (GB/T 25774.1-2010, ISO 15792-1:2000, MOD)

GB/T 25775 Technical delivery conditions for welding consumables - Type of product dimensions tolerances and markings (GB/T 25775-2010, ISO

4.4 Ferrite content of weld metal

The ferrite content of weld metal shall be determined by negotiation between the supplier and the buyer.

5 Test methods

5.1 Chemical analysis of deposited metal

5.1.1 Specimen preparation

Deposited metal specimens for chemical analysis shall be prepared according to the provisions of GB/T 25777, or may be prepared on the specimens for mechanical properties or the pull-rods after breaking. In the arbitration test, it shall be carried out in accordance with the provisions of GB/T 25777.

5.1.2 Analysis method

The chemical composition of deposited metal can be analyzed by any suitable analytical method. In the arbitration test, it shall be carried out according to the analytical method confirmed by the supplier and the buyer.

5.2 Mechanical properties of deposited metal

5.2.1 Base metal for test

The base material for the tensile test of deposited metal shall be a steel plate equivalent to the chemical composition of the deposited metal. If other base materials are used, it shall use the test welding consumables or other equivalent welding consumables to weld the isolation layer on the groove face and the surface of base plate. The thickness after processing shall not be less than 3 mm.

5.2.2 Flux drying specification

The flux before welding shall be dried at 250 °C~400 °C for 1 h~2 h or be dried according to the specification recommended by the manufacturer.

5.2.3 Specimen preparation

5.2.3.1 The specimens for mechanical properties shall be prepared according to GB/T 25774.1. Specimen type 1.6 shall be adopted.

5.2.3.2 Welding using Φ3.2 mm or Φ4.0 mm of wire electrodes shall be carried out according to the specifications specified in Table 3. When using other dimensions of wire electrodes, the welding shall be carried out according to the

Appendix A

(Informative)

Flux type

For ease of application, this Standard provides the flux type code and main chemical composition according to GB/T 36037, SEE Table A.1.

Table A.1 -- Flux type code and main chemical composition

Flux type code	Main chemical composition (mass fraction) %	
MS (Silicon-manganese type)	$MnO+SiO_2$	≥50
	CaO	≤15
CS (Silicon-calcium type)	$CaO+MgO+SiO_2$	≥55
	$CaO+MgO$	≥15
CG (Magnesium-calcium type)	$CaO+MgO$	5~50
	CO_2	≥2
	Fe	≤10
CB (Magnesium-calcium-alkali type)	$CaO+MgO$	30~80
	CO_2	≥2
	Fe	≤10
CG-I (Iron powder magnesium-calcium type)	$CaO+MgO$	5~45
	CO_2	≥2
	Fe	15~60
CB-I (Iron powder magnesium-calcium-alkali type)	$CaO+MgO$	10~70
	CO_2	≥2
	Fe	15~60
GS (Silicon-magnesium type)	$MgO+SiO_2$	≥42
	Al_2O_3	≤20
	$CaO+CaF_2$	≤14
ZS (Silicon-zirconium type)	ZrO_2+SiO_2+MnO	≥45
	ZrO_2	≥15
RS (Silicon-titanium type)	TiO_2+SiO_2	≥50
	TiO_2	≥20
AR (Aluminum-titanium type)	$Al_2O_3+TiO_2$	≥40

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