



# NIPPON KAIJI KYOKAI

Approval No. NKY-3640  
Certificate No. TA231372E



## *Certificate* OF TYPE APPROVAL

Article: Welding Consumables for 2 1/4 Cr-1 Mo Steels  
 Brand: CM-A106  
 Applicant: Kobe Steel, Ltd., Saijo Plant  
 6400-1, Misonou, Saijo-Cho, Higashi-Hiroshima, Hiroshima, Japan  
 Manufacturer: Kobe Steel, Ltd., Saijo Plant  
 6400-1, Misonou, Saijo-Cho, Higashi-Hiroshima, Hiroshima, Japan  
 Grade: Manufacturer's Specification (AWS A5.5 E9016-B3)  
 Welding Process: Manual Welding  
 Welding Positions and Max. Diameter of Electrode: See Table 1  
 Current: AC and DCEP  
 Shielding Gas: Not Applicable  
 Applicable Grade of Parent Material: Class 1 and Class 2 of Grade 22 specified in  
 ASTM A387 and Equivalent Steels  
 Remarks: 1) Chemical composition and mechanical properties are to comply with the  
 requirements specified in Table 2 and Table 3.  
 2) Test requirements for annual inspection are to comply with Table 4.

THIS IS TO CERTIFY that the above mentioned welding consumable has been approved by the NIPPON KAIJI KYOKAI in accordance with the requirements of the Society's Rules.

This Certificate will remain in force until 28 September 2024.

Issued at Tokyo on 7 December 2023.

  
  
 Y. Takao  
 General Manager  
 Material and Equipment Department

Note : The validity of this certificate may be renewed by endorsement on the attached sheet upon completion of the annual inspections.

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Table 1 Welding Positions and Max. Diameter of Electrode

Butt Weld		Fillet Weld	
Flat:	5.0mm	Flat:	5.0mm
Horizontal:	5.0mm	Horizontal Vertical:	5.0mm
Overhead:	4.0mm	Horizontal:	5.0mm
		Horizontal Overhead:	4.0mm
		Overhead:	4.0mm
Vertical Upward:	4.0mm	Vertical Upward:	4.0mm
Vertical Downward:	Not Applicable	Vertical Downward:	Not Applicable

Table 2 Chemical Composition of Electrode (%)

C	Si	Mn	P	S	Cr	Mo
0.05	0.60	0.90	0.03	0.03	2.00	0.90
~	max.	max.	max.	max.	~	~
0.12					2.50	1.20

Table 3 Mechanical Properties after Stress Relief Annealing (1hour at 690°C)

Deposited Metal Tensile Test			Butt Weld Tensile Test
Tensile strength (N/mm <sup>2</sup> )	Yield point (N/mm <sup>2</sup> )	Elongation (%)	Tensile strength (N/mm <sup>2</sup> )
621 min.	531 min.	17 min.	621 min.

Table 4 Test Requirements for Annual Inspection

Kind of test	Test assembly <sup>1), 2), 3), 4), 5)</sup>			Kind and number of test specimens to be taken from test assembly
	Number	Plate thickness (mm)	Welding position	Tensile test specimen <sup>6), 7)</sup> : 1
Deposited metal test	1	20	Flat	

Notes:

- 1) The approved applicable grades of parent material are to be applied. Other parent material with appropriate buttering may be applied subject to the approval of the Society.
- 2) Shape and dimension of test assembly are to be in accordance with Fig. M6.1, Chapter 6, Part M of the NK Rules.
- 3) Test assembly is to be welded in accordance with 6.2.5, Chapter 6, Part M of the NK Rules.
- 4) The diameter of the wire is to be within the range specified by Kobe Steel, Ltd., Saijo Plant but not exceeding the maximum diameter approved.
- 5) Stress relief annealing is to be conducted under the condition of 1hour at 690°C.
- 6) Kind of test specimen is to be 1C specified in Table M3.1, Chapter 3, Part M of the NK Rules.
- 7) Mechanical properties are to comply with the requirements specified in Table 3.