DAIKO 190

SMAW

NICKEL ALLOYS
Monel 400

DESCRIPTION

Nickel-copper electrode for Monel alloy 400

It has raised levels of Mn and Ti to avoid hot cracking and porosity. In addition to welding the parent metal alloy 400, it also used for surfacing of steel. The weld metal is resistant to corrosion by seawater, salt and reducing acids. Dissimilar welding applications include joint between Monel alloys and carbon steels, copper and copper-nickel alloys. Applications include offshore and marine construction, heat exchangers, piping, desalination plant, chemical, petrochemical and power engineering industries.

SPECIFICATIONS

EN ISO 14172	E Ni 4060	**AWS A5.11**	ENiCu-7
Shielding	-	**Positions**	PA, PB, PC, PD, PE, PF
Current	DC+	**Packaging Type**	Carton box and tube.

ASME QUALIFICATIONS

F-No (QW432)	42
A-No (QW442)	-

CHEM. COMP. %	DEFAULT
C	0.07
Mn	3.5
Ni	64
Al	0.05
P	0.005
S	0.005
Si	0.8
Cu	30
Fe	1
Ti	0.9

MECHANICAL PROPERTIES	MIN. PER STANDARD	PRODUCT
Tensile strength R_m MPa	480	620
Yield strength $R_{p0.2}$ MPa	200	350
Elongation A (L_0=5d_0) %	27	45
Impact Charpy ISO-V	-	60J @ -196°C
Impact Charpy ISO-V	-	-

WELDING PARAMETERS	2.5 mm	3.2 mm	4.0 mm	4.8 mm
Ampere	50A - 80A	80A - 110A	110A - 150A	150A - 200A
Voltage	-	-	-	-
Packaging	60 pcs/kg	29 pcs/kg	19 pcs/kg	13 pcs/kg
Packaging Type	Carton box and tube.	Carton box and tube.	Carton box and tube.	Carton box and tube.

NOTES

Pcs/kg is indicative, actual number may vary ± 5%.

Monel 400

DESCRIPTION

APPLICATION

The weld metal based on Monel 400 alloy is characterized by high levels of Mn and Ti, a crucial element in preventing hot cracking and porosity. It is suitable for welding the 400 alloy and similar base materials, as well as other components in the Ni-Cu alloy system, such as pure nickel and cupronickel. Although welds with the K500 alloy are satisfactory, they don't match the strength of the precipitation-hardened alloy. Additionally, 400 alloy castings with a Si content of 1.5% or higher may exhibit crack susceptibility in the heat-affected zone (HAZ). In dissimilar joints between the 400 alloy and other alloys or steels, dilution with Fe (20-30%) or Cr (3-6%) can reduce the ductility of the weld metal near the fusion zone boundary. Direct welds on mild or low-alloy steels are satisfactory if dilution is controlled; however, for stainless steels and alloys with higher chromium content, the use of ERNiCr-3 wire is preferable and sometimes necessary. The 400 alloy offers a favorable combination of mechanical strength, thermal conductivity, and corrosion resistance in marine environments, inorganic salts, sulfuric and hydrofluoric acids, hydrogen fluoride, and alkalis. Typical applications include **heat exchangers, piping, vessels, and evaporators** in offshore, marine, chemical, petrochemical, and power engineering sectors. No preheating is required, while interpass control is paramount.

ALLOY TYPE

Nickel-copper alloy based on alloy 400 with increased levels of manganese and titanium to suppress hot cracking and porosity.

MICROSTRUCTURE

Solid solution, single phase alloy, slightly ferromagnetic near room temperature.

MATERIALS

EN W.Nr.: 2.4360, 2.4361, 2.4365
ASTM: A494 M-35-1, A494 M-35-2
UNS: N04400, N04405, N05500
PROPRIETARY: Monel® Alloy 400, R405, K500 (Special Metals), Nicorros (VDM)