DAIKOWT 657

GTAW

NICKEL ALLOYS
50/50Nb

DESCRIPTION

Rod made of 55% nickel and 44% chromium alloy

Rod that ensures a metallic deposit corresponding to the 657 alloy, with exceptional corrosion resistance. Excellent for the overlaying of carbon and stainless steels, it provides a nickel-chromium alloy surface that is excellently resistant to corrosive attacks, even at high temperatures between 800 and 950 °C, including atmospheres with ash, sulfur, and vanadium. Widely used for furnace components, tube plates, supports and spacers, maritime applications, power plants, refineries, and petrochemical industries.

SPECIFICATIONS

EN ISO 18274	S Ni6072 (NiCr44Ti)	**AWS A5.14**	ERNiCr-4
Shielding	I1	**Positions**	PA, PB, PC, PD, PE, PF
Current	DC-	**Packaging Type**	5kg carton tube

ASME QUALIFICATIONS

F-No (QW432)	43
A-No (QW442)	-

PREN

44

CHEM. COMP. %	DEFAULT
C	0.01
Mn	0.1
Ni	55
Cr	44
P	0.002
S	0.002
Si	0.1
Cu	0.2
Fe	0.2
Ti	0.6

MECHANICAL PROPERTIES	MIN. PER STANDARD	PRODUCT
Tensile strength R_m MPa	690*	740
Yield strength $R_{p0.2}$ MPa	0	420
Elongation A (L_0=5d_0) %	0	30
Impact Charpy ISO-V	-	130J @ 20°C
Impact Charpy ISO-V	-	110J @ -50°C

WELDING PARAMETERS	1.6 mm	2.4 mm
Ampere	80A - 120A	130A - 160A
Voltage	10V - 13V	14V - 18V
Packaging	Ø 1,0÷4,0mm	Ø 1,0÷4,0mm
Packaging Type	5kg carton tube	5kg carton tube

DAIKO

50/50Nb

DESCRIPTION

APPLICATION

Specifically designed to adapt to the IN-657 alloy, this subfamily is also suitable for welding the machined version containing titanium of the IN-671 alloy. The IN-657 alloy, characterized by a high chromium content, offers exceptional resistance to hot corrosion in the temperature range between 800 and 950 °C. This resistance is crucial to counteract the corrosive attack of combustion ashes containing vanadium pentoxide and alkali metal sulfates, often resulting from the combustion of lower-grade heavy fuel oils. Castings made from IN-657 alloy are widely used in various components of oil furnaces and boilers, such as tube sheets, pipe supports, and spacers, used in ships, power plants, refineries, and petrochemical plants. At lower concentrations of chromium and niobium, primary dendrites belonging to the gamma phase form during solidification, which may increase the tendency for crack formation. A higher content of chromium and niobium promotes the formation of the primary dendritic alpha phase, which, although less ductile, is more prone to cold cracking during cooling. The presence of carbon and nitrogen reduces ductility and therefore their content is kept to a minimum. It is essential to maintain a short arc length to avoid nitrogen absorption. Preheating is generally required: 150-200 °C for 10 mm thicknesses, 200-250 °C for most applications, and up to 450 °C for thicker sections. It is crucial to maintain interpass temperatures and allow slow cooling.

ALLOY TYPE

50Cr-50Ni alloy for high temperature corrosion resistance.

MICROSTRUCTURE

Cr-rich alpha phase (bcc) and a Ni-rich gamma phase (fcc). The precise structure depends on thermal cycle and effects on the control of weld metal cracking.

MATERIALS

EN W.Nr.: 2.4678, 2.4680, 2.4813
ASTM: A560 gr. 50Cr-50Ni-Cb
PROPRIETARY: IN-657, IN-671 (Inco Alloy Products), Paralloy N50W (Doncasters Paralloy), 50-50 Cb (Duraloy)