G-TECH 657

SMAW

NICKEL ALLOYS
50/50Nb

DESCRIPTION

Rutile-basic coated electrode for alloy 657 for high temperature corrosion resistance

Alloy 657 has exceptional resistance to hot corrosion (800-950°C). Excellent weldability with a spatter free arc, self-releasing slag producing a very smooth bead appearance. It is used in a wide range of components in oil-fired furnaces and boilers such as tube sheets, tube hangers, supports and spacers in ships, power stations, refineries, and petrochemical plants. The weld pool and slag are easy to control and facilitate the achievement of a clean bead surface even in narrow preparations and in root pass.

SPECIFICATIONS

EN ISO 14172	E Ni 6172 (NiCr50Nb)	**AWS A5.11**	ENiCr-4
Werkstoff Number	2.4813	**Shielding**	-
Positions	PA, PB, PC, PD, PE, PF	**Current**	DC+
Packaging Type	Carton box and tube.		

ASME QUALIFICATIONS

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

PREN

49

CHEM. COMP. %	DEFAULT
C	0.07
Mn	1
Ni	47
Cr	49
Nb	1.8
P	0.01
S	0.01
Si	0.5
Cu	0.05
Fe	0.5

MECHANICAL PROPERTIES	MIN. PER STANDARD	PRODUCT
Tensile strength R_m MPa	760	780
Yield strength $R_{p0.2}$ MPa	550	560
Elongation A (L_0=5d_0) %	0	30
Impact Charpy ISO-V	-	130J @ 20°C
Impact Charpy ISO-V	-	110J @ -50°C

WELDING PARAMETERS	2.5 mm	3.2 mm	4.0 mm	4.8 mm
Ampere	50A - 70A	75A - 100A	80A - 140A	125A - 150A
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%.

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)