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

ISO 14172	E Ni 6172 (NiCr50Nb)	**AWS A5.11**	ENiCr-4
Werkstoff Number	2.4813	**Certifications**	-
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)	-

FERRITE

-

PREN

49

HARDNESS

-

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	VARIANT
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 mm	
Ampere	50A - 70A	75A - 100A	80A - 140A	125A -
Voltage	-	-	-	
Packaging	60 pcs/kg	29 pcs/kg	19 pcs/kg	13 p
Packaging Type	Carton box and tube.	Carton box and tube.	Carton box and tube.	Carton box and

DAIKO

50/50Nb

DESCRIPTION

APPLICATION

Formulated for compatibility with alloy IN-657, these consumables are also well-suited for welding the titanium-bearing wrought version, IN-671. Alloy 657, renowned for its elevated chromium content, exhibits exceptional resistance to hot corrosion (800-950°C). This resistance is particularly effective against fuel ash containing vanadium pentoxide and alkali metal sulfates, emanating from the combustion of low-grade heavy fuel oils. IN-657 castings find extensive applications in oil-fired furnaces and boilers, playing crucial roles in various components like tube sheets, tube hangers, supports, and spacers. These components are vital in diverse settings, including ships, power stations, refineries, and petrochemical plants. The alloy's composition carefully balances chromium, niobium, carbon, and nitrogen to reduce sensitivities to solidification and cold cracking. Maintaining low levels of carbon and nitrogen is crucial, with precautions like minimizing arc length to avoid nitrogen pickup. Preheating is typically necessary, ranging from 150-200°C for 10mm thickness, 200-250°C for most applications, and up to 450°C for the thickest sections. It is imperative to manage interpass temperatures and facilitate a slow cooling process.

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)