DAIKOWM 718

GMAW

NICKEL ALLOYS
718

DESCRIPTION

Solid wire for Nickel based high strength alloy 718

It matches Alloy 718 and the weld metal is age-hardenable with mechanical properties comparable to those of the base metals. Its mechanical properties depend on the post weld heat treatment. Thanks to its excellent corrosion resistance to many media it is used in a wide range of applications such as components for liquid fuelled rockets, rings, casings and various formed sheet metal parts for aircraft and land-based gas turbine engines, cryogenic tankage and for cladding in the oil and gas industry.

SPECIFICATIONS

EN ISO 18274	S Ni 7718	**AWS A5.14**	ERNiFeCr-2
Shielding	I1, I3	**Positions**	PA, PB, PC, PD, PE, PF, PG
Current	DC+	**Packaging Type**	Drums, DIN 760 reel, B300, D200 and D100 spools.

PREN

27.4

CHEM. COMP. %

C	0.07
Mn	0.1
Ni	52
Cr	17.5
Nb	5
Al	0.4
P	0.008
S	0.001
Mo	3
Si	0.15
Cu	0.05
Fe	20.5
Ti	0.9

MECHANICAL PROPERTIES

	MIN. PER STANDARD	PRODUCT
Tensile strength R_m MPa	1140 Age-hardened condition*	830
Yield strength $R_{p0.2}$ MPa	0	560
Elongation A (L_0=5d_0) %	0	28
Impact Charpy ISO-V	-	60J @ -196°C
Impact Charpy ISO-V	-	-

WELDING PARAMETERS

	1.0 mm	1.2 mm
Ampere	140A - 200A	150A - 210A
Voltage	23V - 27V	25V - 29V
Packaging	Ø 0,8÷1,6mm	Ø 0,8÷1,6mm
Packaging Type	Drums, DIN 760 reel, B300, D200 and D100 spools.	Drums, DIN 760 reel, B300, D200 and D100 spools.

NOTES

* Typical weld metal tensile strength, only as indication.

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DESCRIPTION

APPLICATION

The subfamily 718 is specifically designed for welding the base metal alloy 718, ensuring exceptional corrosion resistance under various environmental conditions. The weld metal can be subjected to age-hardening treatment, thus granting it considerable mechanical properties that are closely influenced by post weld heat treatment (PWHT). It is commonly employed in tungsten arc welding processes of Cr-Ni-NB-Mo alloys, as the use of high heat input processes like GMAW can often cause microfissures. This alloy finds its main application in welding high-strength aerospace components, liquid fuel rocket parts, rings, casings, and various formed sheet elements for gas turbine engines used in land-based vehicles and aircraft, as well as in cryogenic tanks. It is also utilized for fasteners, instrumentation components, and for cladding and overlay of parts in the oil and gas industry. The temperature range of use spans from -250 °C to 700 °C.

ALLOY TYPE

The nominal composition (wt. %) of filler metal of this classification is 52 Ni, 18 Fe, 19 Cr, 5 Nb plus Ta, 3 Mo, and 1 Ti.

MICROSTRUCTURE

Fully austenitic microstructure with Nb- and Ti-rich carbides.

MATERIALS

Suitable for welding Cr-Ni-Nb-Mo alloy and 718, 706, and X-750 alloys.
EN W.Nr.: 2.4668 (NiCr19Fe19Nb5Mo3), 2.4669 (NiCr15Fe7TiAl)
ASTM: B637, 5589
UNS: N07718, N09706, N07750

WELDING & PWHT

Before performing welding or heating any nickel-based alloy, it is essential to thoroughly clean the base metal. Oil, grease, paints, lubricants, marking pencils, temperature-indicating materials, thread compounds, and other similar materials may contain sulfur or lead, which can cause cracking or embrittlement of the base or filler metal during welding or heating. Welding of nickel-based and fully austenitic steels requires particular attention to minimize heat input, interpass temperature, and dilution with the base metal. It is advisable to maintain a low heat input, with a maximum of 1.5 kJ/mm, and an interpass temperature not exceeding 100 °C.