



DAIKOWM 323



CAST IRON
NiFe-CI

DESCRIPTION

Wire rod for welding and repairing graphitic cast irons

Nickel/iron based wire rod for welding and repair of graphitic and mechanical cast irons. Also suitable for joining cast iron with steel in general. Its main applications are in the repair and maintenance of machine tool bases, engine blocks, casting defects elimination, pumps, cylinders, pistons. Making small beads and hammering the deposit are recommended to avoid cracks. Castings containing phosphorus levels higher than normal, approximately 0.20%, are more readily welded using these electrodes than with an electrode of the ENi-CI classification.

SPECIFICATIONS

ISO	-	AWS A5.15	ERNiFe-CI
DIN	-	Werkstoff Number	-
Certifications	-	Shielding	I1, M13
Positions	PA, PB, PC, PD, PE, PF, PG	Current	DC+

ASME QUALIFICATIONS

F-No (QW432)	FERRITE	PREN	HARDNESS
-	-	-	170HB - 200HB
A-No (QW442)	-		

CHEM. COMP. %

	DEFAULT	MECHANICAL PROPERTIES	MIN	VARIANT
C	0.03	Tensile strength R _m MPa	270	450
Mn	0.3	Yield strength R _{p0.2} MPa	250	230
Ni	55	Elongation A (L ₀ =5d ₀) %	6	10
S	0.02	Impact Charpy ISO-V	-	-
Si	0.2	Impact Charpy ISO-V	-	-

WELDING PARAMETERS

	1 mm	1.2 mm
Ampere	170A - 210A	180A - 220A
Voltage	24V - 28V	26V - 30V
Packaging	Ø 0,8÷1,6mm	Ø 0,8÷1,6mm
Packaging Type	Drums, B300, D200 and D100 spools.	Drums, B300, D200 and D100 spools.

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NiFe-Cl

DESCRIPTION

CAST IRON
NiFe-Cl

APPLICATION

The NiFe alloy is well-suited for welding various grades of cast iron, with a particular emphasis on spheroidal graphite (SG), nodular, or ductile irons, as well as some alloy cast irons. This alloy offers a harmonious balance of strength, ductility, and toughness, complemented by favorable machinability. Additionally, NiFe consumables can be applied to high-alloy austenitic irons (Ni-Resist). When welding flake graphite grades, a preheat of 300-350°C is recommended, while SG grades benefit from low heat input and low-temperature techniques to mitigate the risk of heat-affected zone (HAZ) hot cracking. It is crucial to note that martensitic Ni-Hard cast irons and white irons are generally considered unweldable due to their heightened crack sensitivity. Furthermore, NiFe consumables prove effective in welding transition joints between cast iron and cast steels, as well as cast iron and mild/low alloy steels. Common components addressed by this welding process include machine bases, pump bodies, engine blocks, gears, and transmission housings.

ALLOY TYPE

Nominally Fe-55% Ni alloy for the repair and joining of cast iron.

MICROSTRUCTURE

The structure depends on the chemical composition and the speed of solidification and subsequent cooling down.

MATERIALS

The NiFe weld metals produce higher strength than the pure nickel cast iron types and are therefore preferable for dissimilar joints, higher strength cast irons and spheroidal graphite cast irons.

EN W.Nr.: 1563:2018 Spheroidal graphite cast irons, 1562:2019-06 Malleable cast irons.

ASTM: A602, A47, A338, A220.

WELDING & PWHT

Welding procedures are commonly executed without preheat, but situations involving heavy multipass deposits or highly restrained joints may necessitate preheat in the range of 150-250°C. Prior to initiating the welding process, meticulous preparation of surfaces is crucial, involving careful gouging and/or grinding with limited heat application to prevent crack propagation. The designated welding area should be diligently cleaned, removing contaminants such as sand, oil, grease, paint, or rust to the greatest extent possible. Preheating becomes particularly beneficial for eliminating impregnated oil on used castings undergoing repairs. In instances where welding is conducted without preheat, it is advisable to minimize the width of the Heat-Affected Zone (HAZ) by employing a low heat input and maintaining a low interpass temperature. The application of a skip welding technique can prove advantageous in achieving this objective. For welds involving thicker sections or highly restrained conditions, preheating within the range of 150-250°C may become imperative. Light peening, aimed at reducing contraction stresses, can offer additional benefits, although caution is warranted to prevent the depletion of weld metal ductility. In certain scenarios, buttering the joint faces or the sides of the repair cavity before the filling process can be a desirable practice, regardless of whether preheat is applied. Upon completion of the welding process, it is recommended to allow the workpiece to cool gradually, with the option of insulation if deemed necessary for optimal results.

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