



DAIKOWT 55

GTAW

CAST IRON
NiFe-CI

DESCRIPTION

Rod for welding cast iron

Nickel-based rod, specifically designed for welding gray cast iron castings, both for joints between castings and for joining to mild steel. Also suitable for the repair of castings, it produces weld beads of moderate hardness, which require tools with carbide inserts for subsequent processing. To ensure optimal results, a preheat and interpass temperature of at least 180 °C is recommended throughout the welding process.

SPECIFICATIONS

| | | | |
|------------------|------------------------|-----------|-----------|
| EN ISO 1071 | S NiFe-1 | AWS A5.15 | ERNiFe-CI |
| Werkstoff Number | 2.4472 | Shielding | 11 |
| Positions | PA, PB, PC, PD, PE, PF | Current | DC- |

HARDNESS

180HB

| CHEM. COMP. % | | MECHANICAL PROPERTIES | | MIN. PER STANDARD | PRODUCT |
|---------------|-------|---------------------------------------------------|--|---------------------------|---------------------------|
| 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 | 20 |
| P | 0.013 | Impact Charpy ISO-V | | - | - |
| S | 0.02 | Impact Charpy ISO-V | | - | - |
| | | WELDING PARAMETERS | | 1.6 mm | 2.4 mm |
| | | Ampere | | 80A - 120A | 130A - 160A |
| | | Voltage | | 10V - 13V | 14V - 18V |
| | | Packaging | | - | - |
| | | Packaging Type | | product.packaging_ types. | product.packaging_ types. |



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NiFe-CI

DESCRIPTION

CAST IRON
NiFe-CI

APPLICATION

The NiFe alloy is designed to weld various types of cast iron, with a particular focus on spheroidal graphite (SG), nodular or ductile cast irons, as well as some special cast iron alloys. This alloy provides an optimal combination of strength, ductility, and toughness, while ensuring good workability. NiFe consumables are versatile and can also be used on certain high-alloy austenitic cast irons (Ni-Resist). For flake graphite cast iron grades, preheating of 300-350 °C is recommended; however, for SG grades, a buttering procedure using low heat input and low temperature techniques is advised to avoid hot cracking in the heat affected zones (HAZ). It is important to note that Ni-Hard martensitic and white cast irons are generally unweldable due to their high susceptibility to cracking. NiFe consumables are also ideal for creating transition joints between cast iron and cast steels or between cast iron and mild/low-alloy steels. Common components include ****machine bases, pump bodies, engine blocks, gears, and gearbox housings****.

ALLOY TYPE

Nominally Fe-40% 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

In many cases, welding can be performed without preheating; however, for heavy multi-pass deposits or joints with high constraints, preheating between 150-250 °C may be necessary. Prior to welding, surfaces must be prepared by gouging and/or grinding, minimizing heat input to prevent crack propagation. It is essential that the area to be welded is as free from contaminants like sand, oil, grease, paint, or rust as possible. Preheating can be helpful in eliminating oil impregnated in castings to be repaired. If proceeding without preheat, it is preferable to limit the width of the HAZ using low heat input and low interpass temperature welding techniques. Using a fractional welding technique can be advantageous. For welding of thicker sections or with high constraints, preheating in the range of 150-250 °C might be necessary. Additionally, light peening to reduce contraction stresses can be beneficial, but it's crucial not to compromise the ductility of the weld metal. Buttering of the joining faces or sides of the repair cavity is also recommended before completion, regardless of the preheat applied. After welding, gradual cooling of the piece, with insulation if necessary, is highly recommended.

