# DAIKOWT 718

GTAW

NICKEL ALLOYS
718

## DESCRIPTION

**Solid rod 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

| | | | |
|---|---|---|---|
| **ISO 18274** | S Ni 7718 | **AWS A5.14** | ERNiFeCr-2 |
| **DIN** | - | **Werkstoff Number** | - |
| **Certifications** | - | **Shielding** | I1 |
| **Positions** | PA, PB, PC, PD, PE, PF | **Current** | DC- |

## ASME QUALIFICATIONS

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

## FERRITE

-

## PREN

27.4

## HARDNESS

-

## CHEM. COMP. %

| | DEFAULT |
|---|---|
| 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 | VARIANT |
|---|---|---|
| Tensile strength $R_m$ MPa | 1140 Age-hardened condition* | 720 |
| Yield strength $R_{p0.2}$ MPa | 0 | 500 |
| Elongation A ($L_0$=5$d_0$) % | 0 | 60 |
| Impact Charpy ISO-V | - | 80J @ -196°C |
| Impact Charpy ISO-V | - | - |

## WELDING PARAMETERS

| | 1.6 mm | 2.4 mm |
|---|---|---|
| Ampere | 80A - 120A | 130A - 160A |
| Voltage | 10V - 13V | 14V - 18V |
| Packaging | Ø 1,0÷4,0mm | Ø 1,0÷4,0mm |
| Packaging Type | 5kg carton tube | 5kg carton tube |

# 718

DESCRIPTION



## APPLICATION

Engineered to align seamlessly with Alloy 718, this material assures outstanding corrosion resistance across diverse environments. The weld metal, characterized by remarkable strength, undergoes age-hardening, and its mechanical properties are intricately shaped through post-weld heat treatment. Typically employed through the gas tungsten arc welding (GTAW) process for Cr-Ni-Nb-Mo alloys, as high heat input methods such as gas metal arc welding (GMAW) may potentially induce micro-fissuring. Primarily deployed for welding high-strength aircraft components, liquid-fueled rocket components, rings, casings, and an array of sheet metal parts for both aircraft and land-based gas turbine engines, including cryogenic tankage. Beyond these applications, it proves valuable in fasteners, instrumentation parts, and serves a vital role in cladding or overlay within the oil and gas industry. The temperature range of its application 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

In preparation for welding or heating a nickel-base alloy, prioritizing the cleanliness of the base metal is imperative. Contaminants such as oil, grease, paint, and materials containing sulfur or lead pose a risk of inducing cracking (embrittlement) in both the base metal and the weld metal during these procedures. When dealing with fully austenitic and nickel base steels, exercise meticulous control over factors like heat input, interpass temperature, and dilution with the parent metal. Adhere strictly to a low heat input (max 1.5 kJ/mm) and maintain an interpass temperature limit of 100°C to ensure optimal outcomes.