# G-TECH 310

SMAW

**SUPERAUSTENITIC STEELS**
310

## DESCRIPTION

**Rutile-basic coated electrode for 310 stainless steels**

This electrode is used to weld 310 fully austenitic stainless steels. Applications include heat shields, furnace and boiler parts, heat exchanger and ducting for the good resistance to high temperature oxidation of these alloys. Also suitable for dissimilar joints, buffer layers, weld overlay and cryogenic applications. Excellent weldability with a spatter free arc, self-releasing slag producing a very smooth bead appearance.

## SPECIFICATIONS

| | | | |
|---|---|---|---|
| **EN ISO 3581-A** | E 25 20 R 12 | **AWS A5.4** | E310-16 |
| **Shielding** | - | **Positions** | PA, PB, PC, PD, PE, PF |
| **Current** | DC+, AC | **Packaging Type** | Carton box |

## ASME QUALIFICATIONS

| | |
|---|---|
| **F-No (QW432)** | 5 |
| **A-No (QW442)** | - |

## PREN

26.66

| CHEM. COMP. % | DEFAULT |
|---|---|
| C | 0.1 |
| Mn | 2 |
| Ni | 21 |
| Cr | 26 |
| P | 0.02 |
| S | 0.01 |
| Mo | 0.2 |
| Si | 0.6 |
| Cu | 0.1 |

| MECHANICAL PROPERTIES | MIN. PER STANDARD | PRODUCT |
|---|---|---|
| Tensile strength $R_m$ MPa | 550 | 580 |
| Yield strength $R_{p0.2}$ MPa | 350 | 400 |
| Elongation A ($L_0$=5$d_0$) % | 20 | 40 |
| Impact Charpy ISO-V | - | 70J @ 20°C |
| Impact Charpy ISO-V | - | - |

| WELDING PARAMETERS | 2.5 mm | 3.2 mm | 4.0 mm | 5.0 mm |
|---|---|---|---|---|
| Ampere | 50A - 80A | 80A - 110A | 110A - 150A | 150A - 200A |
| Voltage | - | - | - | - |
| Packaging | 56 pcs/kg | 29 pcs/kg | 19 pcs/kg | 12 pcs/kg |
| Packaging Type | Carton box | Carton box | Carton box | Carton box |

## NOTES

Pcs/kg is indicative, actual number may vary ± 5%.

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# 310

DESCRIPTION

## APPLICATION

The product is primarily used for welding 25% Cr-20% Ni (310) alloys, which can be wrought or cast, and contain up to 0.25% carbon. To ensure maximum resistance to cracking and microfissures during solidification, the manganese content in the welding metal is increased to 2-5%. The high alloy content of type 310 provides excellent oxidation resistance up to maximum temperatures of about 1200 °C, making it ideal for heat shields, furnace components, and ducts. These consumables are also suitable for mixed welds and dissimilar joints, including those where PWHT application is necessary. However, it is important to consider that the relatively high thermal expansion coefficient may cause thermal fatigue in transition joints subjected to thermal cycling. In such situations, the use of nickel-based consumables is generally recommended. Further applications include cushioned layers and overlays. The fully austenitic welding metal is suitable for specialized applications requiring low magnetic permeability (typically <1.01). Additionally, 310 welding metals intrinsically withstand temperatures down to -196 °C, making them suitable for cryogenic installations. Preheating is not necessary. It is preferable to maintain the interpass temperature below 150 °C and heat input below 1.5 kJ/mm; this is crucial especially for processes with high heat input, such as SAW.

## ALLOY TYPE

25%Cr-20%Ni (310) stainless steel.

## MICROSTRUCTURE

Fully austenitic.

## MATERIALS

**EN W. N.**: 1.4826 (GX40CrNiSi22-10), 1.4828 (X15CrNiSi2012,), 1.4837 (GX40CrNiSi25-12), 1.4840 (GX15CrNi2520), 1.4841 (X15CrNiSi25-21), 1.4846 (X 40 CrNi 25-21), 1.4847 (X 8 CrNiAlTi 20-20), 1.4848 GX40CrNiSi25-20), 1.4335 (X1CrNi25-21), 1.4435 (X2CrNiMo18-14-3), 1.4446 (X1CrNiMoN22-25-3), 1.4547 (X3CrNiMoTi25-25)

**ASTM**: 310, 310S, CK20, 305, 314, 725LN, 316L

**UNS**: S31000, S31008, S31050, S31603

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