DAIKOWM 310Mn

GMAW

SUPERAUSTENITIC STEELS
310

DESCRIPTION

Solid wire for 25%Cr-20%Ni-3%Mn stainless steels

Modified 310 wire rod for joining and surfacing of matching and similar heat resisting, rolled, forged and cast steels used in annealing shops, hardening shops, steam boiler construction, crude oil industry and the ceramics industry. Manganese is added to the formulation to improve hot working properties and increase strength, toughness and hardenability. The temperature range between 650 to 900°C should be avoided due to the risk of embrittlement.

SPECIFICATIONS

EN ISO 14343-A	G 25 20	**AWS A5.9**	(E310)
Shielding	M12, M13	**Positions**	PA, PB, PC, PD, PE, PF, PG
Current	DC+	**Packaging Type**	Drums, B300, D200 and D100 spools.

ASME QUALIFICATIONS

F-No (QW432)	6
A-No (QW442)	-

PREN

25.1

HARDNESS

85HRB

CHEM. COMP. %

	DEFAULT
C	0.12
Mn	3.3
Ni	20.4
Cr	25.1
P	0.01
S	0.005
Si	1

MECHANICAL PROPERTIES

	MIN. PER STANDARD	PRODUCT
Tensile strength R_m MPa	550	610
Yield strength $R_{p0.2}$ MPa	350	400
Elongation A (L_0=5d_0) %	20	35
Impact Charpy ISO-V	-	90J @ 20°C
Impact Charpy ISO-V	-	32J @ -196°C

WELDING PARAMETERS

	1.0 mm	1.2 mm
Ampere	160A - 220A	200A - 270A
Voltage	25V - 29V	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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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