DAIKOWM 312

GMAW

AUSTENITIC STAINLESS STEELS
312

DESCRIPTION

Solid wire for dissimilar joints and difficult to weld steels

These consumables are used to weld similar steels, medium and high carbon hardenable steels. The has extreme tolerance to dilution and it is useful to weld unknown specification steels. Even with considerable dilution by austenite-forming elements such as nickel, the microstructure remains two-phase A/F and thus highly resistant to weld metal cracks and fissures. Weld deposit is work hardenable and gives good wear resistance. Applications include tool steels, shafts, gear teeth, free-cutting steels, dissimilar alloy combinations, buffer layers, weld overlay.

SPECIFICATIONS

EN ISO 14343-A	G 29 9	**AWS A5.9**	ER312
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)	8

FERRITE

% 40

PREN

30.33

HARDNESS

300HV

CHEM. COMP. %

	DEFAULT
C	0.1
Mn	1.8
Ni	9.5
Cr	30
P	0.02
S	0.005
Mo	0.1
Si	0.4
Cu	0.1

MECHANICAL PROPERTIES

	MIN. PER STANDARD	PRODUCT
Tensile strength R_m MPa	650	785
Yield strength $R_{p0.2}$ MPa	450	635
Elongation A (L_0=5d_0) %	15	10
Impact Charpy ISO-V	-	27J @ 20°C
Impact Charpy ISO-V	-	-

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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DAIKO

312

DESCRIPTION

APPLICATION

Designed for welding hardenable steels with medium and high carbon content, with or without specific requirements, such as tool steels, shafts, gears, free-cutting steels, dissimilar alloys, bearing layers, overlays, and other similar applications. The combination of high alloy content and ferrite (40-50 FN) ensures exceptional tolerance to dilution across a wide range of hardenable steels and alloys, even with minimal or no preheat. It is particularly effective for welding free-cutting steels or steels with a low Mn:S ratio (especially if <20), where other welding solutions may not prevent hot cracking due to boundary liquation in the fusion zone. The weld deposit is prone to work hardening, providing excellent wear and friction resistance. It is also effective against corrosion and high temperatures up to about 1000 °C. However, it is not recommended for structural applications above 300 °C or for welds requiring post-weld heat treatment due to the risk of embrittlement. Not indicated for heavy joint filling, nor for sub-zero applications where high notch toughness is required.

ALLOY TYPE

Austenite-ferrite weld metal composition of nominally 29%Cr-9%Ni for dissimilar joints and difficult to weld steels.

MICROSTRUCTURE

Duplex austenite-ferrite microstructure with about 40% ferrite.

MATERIALS

Medium and high carbon hardenable steels, tool steels and free-cutting steels.

WELDING & PWHT

The procedure varies based on the base material. Preheat is generally not necessary for small components and bearing layers, but is recommended for thicker high carbon steels to prevent quench cracking in the HAZ and to control maximum hardness, between 100-250 °C. Although 29.9 alloys offer good high-temperature oxidation resistance, the high ferrite content weld metal is susceptible to 475 °C embrittlement at temperatures above 300 °C and sigma phase embrittlement at high temperatures. Therefore, this alloy is not suitable for high-temperature structural applications or where PWHT is expected.

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