



DAIKOWT 312

GTAW

AUSTENITIC STAINLESS STEELS

312

DESCRIPTION

Solid rod 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

ISO 14343-A	W 29 9	AWS A5.9	ER312
DIN	-	Werkstoff Number	-
Certifications	CE	Shielding	11
Positions	PA, PB, PC, PD, PE, PF	Current	DC-

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	VARIANT
Tensile strength R_m MPa	650	790
Yield strength $R_{p0.2}$ MPa	450	640
Elongation A ($L_0=5d_0$) %	15	10
Impact Charpy ISO-V	-	50J @ 20°C
Impact Charpy ISO-V	-	-

WELDING PARAMETERS

	1.6 mm	2.4 mm
Ampere	80A - 100A	110A - 160A
Voltage	-	-
Packaging	Ø 1,0÷4,0 mm	Ø 1,0÷4,0 mm
Packaging Type	5kg carton tube	5kg carton tube

V 01/2024



The information in this datasheet is the result of detailed research and is considered accurate as of the publication date. However, we cannot guarantee its complete accuracy, and it is subject to change without notice. Actual results may vary due to many factors like welding procedures, material composition, temperature conditions, bevel configuration, and specific manufacturing techniques. We accept no liability for any errors or omissions in this datasheet. For the most current information, please visit www.daikowelding.com.





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DESCRIPTION

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APPLICATION

Suitable for welding medium and high carbon hardenable steels, including those with known or unknown specifications like tool steels, shafts, gear teeth, free-cutting steels, dissimilar alloy combinations, buffer layers, overlays, etc. The welding material, featuring a high alloy and high ferrite content (40-50FN), exhibits exceptional tolerance to dilution on a wide range of hardenable and alloy steels, often requiring minimal or no preheat. It is effective for welding free-cutting steels or those with a low Mn:S ratio, especially below 20, preventing hot cracking due to liquation at the fusion boundary. The resulting weld deposit work-hardens, offering excellent wear and friction resistance. It is useful for corrosion resistance and high-temperature scaling up to about 1000°C. However, it's not recommended for structural applications above 300°C or for welds that undergo post-weld heat treatment due to potential embrittlement. Additionally, it is not suitable for filling up heavy joints, sub-zero applications, or situations requiring high notch toughness.

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 is contingent upon the base material. Preheating is generally unnecessary for small components and buffer layers; however, it is advisable for thicker high-carbon steels to prevent potential Heat-Affected Zone (HAZ) quench cracking and regulate peak hardness, typically in the range of 100-250°C. Despite the excellent high-temperature oxidation resistance of 29%Cr-9%Ni alloys, it's crucial to note that duplex high ferrite weld metal may experience 475°C embrittlement above approximately 300°C and sigma embrittlement at elevated temperatures. Consequently, this alloy is not employed in applications involving high-temperature structural service or Post Weld Heat Treatment (PWHT).

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