DAIKOWT 420C

GTAW

FERRITIC - MARTENSITIC STAINLESS STEEL
420

DESCRIPTION

Martensitic harfacing wire rod for 13%Cr stainless steels

This wire rod deposits a weld metal similar to 420B with higher carbon content and is used for surfacing operation requiring corrosion resistance and wear resistance on matching base materials and also on CMn steels. The higher carbon content results in higher hardness but lower toughness. Application include welding of similar parental metal, weld overlay and thermal spraying. Suitable for cladding of continuous casting rolls.

SPECIFICATIONS

ISO 14343-B	SS420	AWS A5.9	ER420
DIN	-	Werkstoff Number	-
Certifications	-	Shielding	I1
Positions	PA, PB, PC, PD, PE, PF	Current	DC-

ASME QUALIFICATIONS

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

FERRITE

-

PREN

13

HARDNESS

40HRC - 50HRC PWHT

CHEM. COMP. %

	DEFAULT
C	0.4
Mn	0.6
Ni	0.5
Cr	13
P	0.03
S	0.03
Si	0.5
Cu	0.3

MECHANICAL PROPERTIES

	MIN	VARIANT
Tensile strength R_m MPa	450	750
Yield strength $R_{p0.2}$ MPa	250	500
Elongation A (L_0=5d_0) %	15	30
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÷4,0mm	Ø 1,0÷4,0mm
Packaging Type	5kg carton tube	5kg carton tube

ANTI-WEAR CHARACTERISTICS

Adhesive wear	▲▲▲△△
Abrasive wear	▲▲▲△△
Impact	▲▲▲△△
Corrosion	▲▲△△△
Heat	▲▲▲△△

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APPLICATION

Sharing similarities with ER410, this alloy distinguishes itself through a slight increase in both chromium and carbon contents. Its utilization extends to a myriad of surfacing operations where a combination of corrosion resistance (attributed to its 12 percent chromium composition) and augmented hardness for heightened wear resistance is paramount. This alloy finds its primary application in surfacing the sealing faces of valves employed in gas, water, and steam piping systems, especially under service temperatures reaching up to +450 °C. Beyond this, its versatility encompasses various applications, including welding similar parental metal, weld overlay, thermal spraying, and the cladding of continuous casting rolls. Remarkably, if the envisaged application demands the use of parts in the "as-welded" condition, achieving a ductile joint is entirely feasible. This is achieved through the application of austenitic fillers, with options such as 22 12 L/309, 18 8 Mn/307, or 25 20/310 proving suitable for this purpose.

ALLOY TYPE

Ferritic martensitic stainless steels.

MICROSTRUCTURE

The microstructure comprises tempered martensite and some carbide.

MATERIALS

Corrosion resistant Cr-steels as well as other similar-alloyed steels with C-contents ≤ 0.30 % (repair welding), heat resistant Cr-steels of similar chemical composition.
EN W.Nr.: 1.4006 (X12Cr13), 1.4021 (X20Cr13), +
ASTM: 410, 420.

WELDING & PWHT

Implementing pre-heating and meticulous interpass temperature control during welding, coupled with a deliberate and gradual cooling process followed by Post Weld Heat Treatment (PWHT), serves as effective preventive measures against cracking. For joint welding, a recommended preheating temperature of +200 - 300 °C is advisable, the specific value depending on the alloy type and strength levels. Correspondingly, the interpass temperature should be maintained within the same range. Ensuring an optimal heat input is crucial, avoiding extremes with a recommended range of 0.5 - 1.5 kJ/mm. The hardness of the deposit is contingent upon the degree of dilution with the base metal and its chemical composition. Generally observed is the correlation where higher degrees of dilution and higher C-content in the base metal result in increased deposit hardness. Post-weld heat treatment becomes a requisite to reinstate ductility to the weld zone. This involves tempering at temperatures ranging from +700 - 750 °C, a process aimed at enhancing the toughness of the welded structure. This comprehensive approach guarantees the mechanical integrity and performance of the welded joints.