DAIKOWT 2209

GTAW

DUPLEX - SUPERDUPLEX
2209

DESCRIPTION

Duplex stainless steel rod for welding 22% Cr ferritic-austenitic stainless steel

Rod for welding ferritic-austenitic duplex steels which, in addition to providing high tensile strength and toughness, offers excellent resistance to stress corrosion cracking and pitting. The service temperature ranges from -60 °C to 250 °C. Controlled dilution and careful purging are essential to obtain the best properties. It ensures high-quality standards and ease of use.

SPECIFICATIONS

EN ISO 14343-A	W 22 9 3 N L	**AWS A5.9**	ER2209
Certifications	CE, TUV	**Shielding**	I1
Positions	PA, PB, PC, PD, PE, PF	**Current**	DC-
Packaging Type	5kg carton tube		

ASME QUALIFICATIONS

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

FERRITE

% 25-50

PREN

36.81

CHEM. COMP. %

C	0.01
Mn	1.45
Ni	8.6
Cr	23.2
N	0.17
P	0.015
S	0.015
Mo	3.3
Si	0.45
Cu	0.05

MECHANICAL PROPERTIES

	MIN. PER STANDARD	PRODUCT
Tensile strength R_m MPa	550	710
Yield strength $R_{p0.2}$ MPa	450	570
Elongation A (L_0=5d_0) %	20	36
Impact Charpy ISO-V	-	120J @ -50°C
Impact Charpy ISO-V	-	-

WELDING PARAMETERS

	1.6 mm	2.4 mm	3.2 mm
Ampere	80A - 100A	110A - 160A	120A - 200A
Voltage	-	-	-
Packaging	Ø 1,0÷4,0mm	Ø 1,0÷4,0mm	Ø 1,0÷4,0mm
Packaging Type	5kg carton tube	5kg carton tube	5kg carton tube

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DESCRIPTION

APPLICATION

The 2209 subfamily is used in pipes, plates, fittings, and forgings made from duplex stainless steel. This type of steel has a microstructure composed of about 50% austenite with a ferritic matrix. This composition, together with the general level of alloying, ensures superior strength compared to conventional austenitic steels, such as type 316L. It also offers excellent corrosion resistance in a wide range of environments, along with notable resistance to chloride-induced stress corrosion cracking (CSCC) and pitting attack in chlorinated environments, such as seawater. These characteristics make the alloys particularly appreciated in offshore applications in the oil, gas, chemical, and petrochemical sectors, including piping systems, flow lines, risers, and manifolds.

ALLOY TYPE

22%Cr standard ferritic-austenitic duplex stainless steels.

MICROSTRUCTURE

Multipass welds in the as-welded condition contain about 25-50% ferrite depending on dilution and heat input/cooling rate conditions.

MATERIALS

EN W.Nr.: 1.4462 (X2CrNiMoN22-5-3), 1.4362 (X2CrNiN23-4)
ASTM: A182 Gr F51, A890 Gr 4A (cast)
UNS: S31803, S32205, S32101, S32304, S32001, J92205
PROPRIETARY: SAF2205, SAF 2304 (Sandvik), Uranus® 45N, 35N (Industeel), A903 (voestalpine), Cronifer 2205LCN (VDM), Maresist F51 (Schmidt + Clemens), SM22Cr (Nippon Steel Corporation), LDX 2101 (Outokumpu)

WELDING & PWHT

Generally, preheating is not necessary for welding. It is advisable to maintain a maximum interpass temperature of 150 °C. The heat input should be between 1.0 and 2.5 kJ/mm, depending on the material thickness; however, some codes limit the value to a maximum of 1.75 or 2.0 kJ/mm. Although welds on duplex stainless steels are almost always left as-welded, solution treatment is generally required for major repairs on castings. Studies and experience have shown that a water quench treatment at 1120 °C for 3-6 hours, with or without a cooling step at 1060 °C before quenching, imparts excellent metallurgical properties.