



DAIKOWS 2209



DUPLEX - SUPERDUPLEX
2209

DESCRIPTION

Solid duplex stainless wire rod for welding 22% Cr ferritic-austenitic stainless steel

The deposit of this rod wire, designed for welding ferritic-austenitic duplex steels, possess, in addition to high tensile strength and toughness, also excellent resistance to stress corrosion cracking and pitting. The operating temperature range is -60 °C up to 250 °C. To ensure particularly good weld metal properties care must be taken to achieve controlled dilution and thorough back purging. It offers very high quality standards for ease of operation and good mechanical properties.

SPECIFICATIONS

ISO 14343-A	S 22 9 3 N L	AWS A5.9	ER2209
DIN	-	Werkstoff Number	-
Certifications	-	Shielding	DAIKOFLUX 900-W
Positions	PA, PB, PC	Current	DC/AC

ASME QUALIFICATIONS	FERRITE	PREN	HARDNESS
F-No (QW432)	6	% 25-50	36.81
A-No (QW442)	-		-

CHEM. COMP. %	DEFAULT	MECHANICAL PROPERTIES	MIN	VARIANT
C	0.01	Tensile strength R _m MPa	550	690
Mn	1.45	Yield strength R _{p0.2} MPa	450	550
Ni	8.6	Elongation A (L ₀ =5d ₀) %	20	36
Cr	23.2	Impact Charpy ISO-V	-	60J @ -50°C
N	0.17	Impact Charpy ISO-V	-	-
P	0.015	WELDING PARAMETERS 2.4 mm		
S	0.015	Ampere	250A - 420A	
Mo	3.3	Voltage	28V - 32V	
Si	0.45	Packaging	Ø 2,0÷4,0mm	
Cu	0.05	Packaging Type	K415 spool and drums.	



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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APPLICATION

Duplex stainless steel pipes, plates, fittings, and forgings exhibit a microstructure comprising approximately equal parts of austenite and a ferrite matrix. This composition, in tandem with a general alloying level, imparts notable characteristics. These alloys exhibit high strength compared to standard austenitic steels like type 316L, ensuring robustness in various applications. Their corrosion resistance extends across diverse environments, making them well-suited for challenging conditions. Notably, they demonstrate elevated resistance to chloride-induced stress corrosion cracking (CSCC) and pitting attacks in chloride-rich environments, such as seawater. In the offshore oil/gas, chemical, and petrochemical process industries, these alloys find expanding applications, encompassing pipework systems, flowlines, risers, manifolds, and more. Additionally, the filler metal derived from these alloys is utilized for welding stainless structures requiring exceptionally high strength.

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

Preheating is typically considered unnecessary in welding processes, and adherence to a maximum interpass temperature of 150°C is recommended. The acceptable range for heat input falls within 1.0-2.5 kJ/mm, contingent on material thickness, though certain codes impose more stringent limits, often capping it at 1.75 or 2.0 kJ/mm. While welds in wrought duplex stainless steels are commonly left in the as-welded condition, substantial repairs to castings are typically specified in the solution-treated state. Experience in the field has consistently demonstrated favorable material properties when employing a treatment regimen involving exposure to 1120°C for 3-6 hours, followed by a water quenching process. In some instances, incorporating an additional cooling step to 1060°C before quenching has shown promising results in further enhancing the structural characteristics and overall performance of the welded components.

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