



# 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

EN ISO 14343-A	S 22 9 3 N L	AWS A5.9	ER2209
Shielding	DAIKOFLUX 900-W	Positions	PA, PB, PC
Current	DC/AC	Packaging Type	K415 spool and drums.

## ASME QUALIFICATIONS

### FERRITE

### PREN

F-No (QW432)	6	% 25-50	36.81
A-No (QW442)	-		

## CHEM. COMP. %

### DEFAULT

## MECHANICAL PROPERTIES

### MIN. PER STANDARD

### PRODUCT

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	<b>WELDING PARAMETERS</b>		
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.	

## NOTES

SAW mechanical properties depend on wire/flux combination, refer to flux TDS.



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DESCRIPTION

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## 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.

