



# DAIKOFCW 2209P



DUPLEX - SUPERDUPLEX  
2209

## DESCRIPTION

Rutile all position flux cored wire for 22% Cr duplex stainless steels

Rutile flux cored wire for welding and cladding in all positions thanks to the fast-freezing slag. It offers excellent weldability, easy handling and slag control in all positions resulting in high productivity with outstanding welding performance. It is designed to weld 2205, 2304 and other similar types of duplex. It is used in offshore oil&gas applications and in chemical and petrochemical industries

## SPECIFICATIONS

EN ISO 17633-A	T 22 9 3 N L P M213	AWS A5.22	E2209T1-4
Shielding	M21	Positions	PA, PB, PC, PD, PE, PF, PG
Current	DC+	Packaging Type	B5300 spool

## ASME QUALIFICATIONS

### FERRITE

### PREN

F-No (QW432)	6	% 25-50	36.85
A-No (QW442)	-		

## CHEM. COMP. %

### DEFAULT

## MECHANICAL PROPERTIES

### MIN. PER STANDARD

### PRODUCT

C	0.03	Tensile strength R <sub>m</sub> MPa	550	750
Mn	0.8	Yield strength R <sub>p0.2</sub> MPa	450	600
Ni	9.4	Elongation A (L <sub>0</sub> =5d <sub>0</sub> ) %	20	30
Cr	22.9	Impact Charpy ISO-V	-	45J @ -20°C
N	0.15	Impact Charpy ISO-V	-	-
P	0.02	<b>WELDING PARAMETERS</b>		
S	0.008		1.2 mm	1.6 mm
Mo	3.5	Ampere	120A - 240A	200A - 350A
Si	0.6	Voltage	20V - 28V	28V - 32V
		Packaging	Ø 1,2÷1,6mm	Ø 1,2÷1,6mm
		Packaging Type	B5300 spool	B5300 spool

## NOTES

D200 spool and Ø 1,0 mm available upon request.





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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.

