



G-TECH 2594

SMAW

DUPLEX - SUPERDUPLEX
2507

DESCRIPTION

Rutile-basic coated electrode for Superduplex ferritic-austenitic stainless steels

Offshore applications exploit the high resistance to pitting (typical pitting resistance equivalent number "PREn" of 43) and stress corrosion cracking in seawater. It is also highly resistant to caustic alkalis and phosphoric acid. Widely used in oil and gas production and process. Its rutile-basic coating ensures an excellent combination of welding performance in all positions, except for vertical down, and a high resistance to cracking providing smooth arc transfer.

SPECIFICATIONS

ISO 3581-A	E 25 9 4 N L R 42	AWS A5.4	E2594-16
DIN	-	Werkstoff Number	-
Certifications	-	Shielding	-
Positions	PA, PB, PC, PD, PE, PF	Current	DC+, AC

ASME QUALIFICATIONS	FERRITE	PREN	HARDNESS
F-No (QW432)	5	-	42.54
A-No (QW442)	-		

CHEM. COMP. %	DEFAULT	MECHANICAL PROPERTIES	MIN	VARIANT
C	0.035	Tensile strength R _m MPa	620	760
Mn	0.9	Yield strength R _{p0.2} MPa	550	550
Ni	9.5	Elongation A (L ₀ =5d ₀) %	18	20
Cr	25.5	Impact Charpy ISO-V	-	47J @ 20°C
N	0.24	Impact Charpy ISO-V	-	-
P	0.02			
S	0.01			
Mo	4			
Si	0.7			
Cu	0.3			

WELDING PARAMETERS	2.5 mm	3.2 mm	4 mm
Ampere	50A - 80A	70A - 110A	100A - 160A
Voltage	-	-	-
Packaging	56 pcs/kg	30 pcs/kg	19 pcs/kg
Packaging Type	Carton box	Carton box	Carton box

V 01/2024



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

Superduplex stainless steel pipes, plates, fittings, and forgings exhibit a microstructure comprising approximately equal parts of austenite and a ferrite matrix. This unique composition, in conjunction with a general alloying level, imparts notable characteristics: Superduplex exhibits high strength in comparison to standard austenitic steels like type 316L. Its robustness extends to good general corrosion resistance across diverse environments. Additionally, the alloy demonstrates exceptional resistance to chloride-induced stress corrosion cracking (CSCC) and pitting attacks in chloride-rich environments, such as seawater. In scenarios involving dilute sulfuric acid contaminated with chloride ions, 2507 outperforms 904L—a highly alloyed austenitic steel designed for pure sulfuric acid resistance. These alloys are increasingly finding broader applications in the offshore oil/gas, chemical, and petrochemical process industries. Their versatile use encompasses pipework systems, flowlines, risers, manifolds, and other critical components.

ALLOY TYPE

25%Cr ferritic-austenitic superduplex stainless steels.

MICROSTRUCTURE

Austenite-ferrite duplex microstructure in AW or solution annealed condition with an approximate 30- 60% ferrite level, depending on heat cycle conditions.

MATERIALS

EN W.Nr.: 1.4410 (X2CrNiMoN25-7-4).

ASTM: A182 F53, A182 F55, A890 Gr5A, A890 Gr6A.

UNS: S32750, S32760, J93404.

PROPRIETARY: SAF 2507 (Sandvik), Uranus® 47N (Industeel).

WELDING & PWHT

Preheating is typically deemed unnecessary, with stringent control over the interpass temperature, capped at 150°C. While a heat input ranging between 1.0 and 2.0 kJ/mm (depending on material thickness) is generally deemed acceptable, it's worth noting that numerous codes impose a stricter maximum limit, often restricting it to 1.5 or 1.75 kJ/mm. Notably, welds in wrought duplex stainless steels are customarily left in the as-welded condition. However, for substantial repairs to castings, specifications often recommend adopting the solution-treated condition. Drawing from accumulated experience, it has been observed that desirable material properties can be attained through a treatment regimen involving exposure to 1120°C for a duration of 3-6 hours, followed by a water quenching process. This established procedure has demonstrated positive outcomes in enhancing the structural characteristics and overall performance of the welded components.

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