G-TECH 2594B

SMAW

DUPLEX - SUPERDUPLEX
2507

DESCRIPTION

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 basic coating ensures excellent positional welding characteristics with good gap bridging ability. The weld pool and slag are easy to control and facilitate the achievement of a clean bead surface even in narrow preparations and in root pass.

SPECIFICATIONS

ISO 3581-A	E 25 9 4 N L B 42	**AWS A5.4**	E2594-15
DIN	-	**Werkstoff Number**	-
Certifications	-	**Shielding**	-
Positions	PA, PB, PC, PD, PE, PF	**Current**	DC+;

ASME QUALIFICATIONS

F-No (QW432)	5
A-No (QW442)	-

FERRITE

% 30-60

PREN

42.54

HARDNESS

-

CHEM. COMP. %

	DEFAULT
C	0.035
Mn	0.9
Ni	9.5
Cr	25.5
N	0.24
P	0.02
S	0.01
Mo	4
Si	0.7
Cu	0.3

MECHANICAL PROPERTIES

	MIN	VARIANT
Tensile strength R_m MPa	620	850
Yield strength $R_{p0.2}$ MPa	550	630
Elongation A (L_0=5d_0) %	18	22
Impact Charpy ISO-V	-	40J @ -40°C
Impact Charpy ISO-V	-	-

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

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DESCRIPTION

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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DAIKO