AVESTA 2507/P100

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Welding wire TIG

For welding steel such as:

Outokumpu	EN	ASTM	SS*	BS*	NF*
2507	1.4410	S32750	2328	–	Z3 CND 25-06 Az

* Obsolete national standards, replaced by EN 10088.

CHARACTERISTICS

AVESTA 2507/P100 is intended for welding super duplex alloys, such as 2507, ASTM S32750, S32760, S32550 and S31260. It can also be used for welding duplex, type 2205, if extra high corrosion resistance is required, e.g. in root runs in tubes.

AVESTA 2507/P100 produces a ferritic-austenitic weld metal. The higher content of Cr, Ni, Mo and N compared to 2205 provides excellent mechanical and corrosion properties.

AVESTA 2507/P100 is over-alloyed with respect to nickel to ensure that the right ferrite balance is achieved in the weld metal.

WELDING DIRECTIONS

The weldability of 2507/P100 is excellent. However, super duplex steels are somewhat more difficult to weld compared to austenitic steels such as 316L, mainly with respect to fluidity and penetration into the parent metals.

To utilise the good properties of a duplex steel it is of utmost importance to obtain a good ferrite content in the weld. This is best achieved by welding with sufficient root gap of 0.08-0.1" (2-2.5 mm), by using the right amount of filler metal and by welding with a controlled heat input. The 2507/P100 is more prone to hot cracking than 2205 and should be welded with a heat input not exceeding 38.1 kJ/in (1.5 kJ/mm) and by keeping the interpass temperature at a maximum of 212°F (100°C.)

Welding without filler metal (TIG-dressing) is not advisable, as the ferrite content will increase drastically, which will have a negative effect on both mechanical and corrosion properties

WELDING DATA

∅ (inch)	∅ (mm)	Current (A)	Voltage (V)
1/16"	1.60	80–110	10–12
3/32"	2.40	130–160	16–18
1/8"	3.20	160–200	17–19

For further recommendations, please contact Avesta Welding.

Approvals: -

Standard designations

EN 12072 25 9 4 L N

Shielding gas recommendations

The most frequently used shielding gas is pure argon (Ar) with a gas flow of 12-17 ft³/hour (6–8 l/min).

Addition of up to 2%Nitrogen (N_2) is advantageous and will affect the mechanical as well as the corrosion properties in a positive way.

Addition of about 30% helium (He) will increased the energy of the arc. This will produce a wider weld and a better fluidity of the melt pool and is often used in automatic welding. Welding tubes, pipes etc often require a purging gas protection.

Common purging gases are pure Ar, Ar+2%N_2 and Formier gas (90%N_2+10%H_2), with a flow of 20-42 ft³/hour (10–20 l/min).

Chemical composition - Typical values, %

C	0.02	Cr	25.0
Si	0.35	Ni	9.5
Mn	0.4	Mo	4.0
		N	0.25

Ferrite: 50 FN WRC-92

Mechanical properties – Typical values, IIW

		Typ. values	Typ. values
Yield strength, $R_{p0,2}$		660 N/mm²	96 ksi
Tensile strength, R_m		860 N/mm²	125 ksi
Elongation, A5		28 %	28 %
Impact strength, KV	+20°C	190 J	140 ft·lb
	–40°C	170 J	125 ft·lb

Interpass temperature: Max. 212°F (100°C)

Heat input: Max. 38.1 kJ/in (1.5 kJ/mm)

Heat treatment: Generally none. In special cases quench annealing at 2012-2102°F (1100–1150°C.)

Structure: Austenite with 45–55 % ferrite.

Scaling temperature: Approx. 1562°F (850°C) (air).

Corrosion resistance: Excellent resistance to pitting and stress corrosion cracking in chlorine-containing environments. Pitting resistance is in accordance with ASTM G48-A, better than 104°F (40°C).