

For welding steel such as:

Outokumpu	EN	ASTM	SS*	BS*	NF*
AVESTA P7 is an all-round wire for difficult-to-weld steels such as Mn-steels, tool steels and high temperature grades.					

* Obsolete national standards, replaced by EN 10088.

CHARACTERISTICS

AVESTA 312 is a high-alloyed consumable designed for welding C/Mn-steels, tool steels, spring steels, high temperature steels and other difficult-to-weld steels. 312 is also suitable for dissimilar welds between stainless and mild steel connections.

AVESTA 312 provides a ferritic-austenitic structure with a high resistance to hot and solidification cracking. The mechanical properties as well as wear resistance are very good.

AVESTA 312 is also, due to its good corrosion resistance, suitable for some applications in the pulp and paper industry.

WELDING DIRECTIONS

Welding is performed using direct current negative polarity (DC-). Welding can also be performed using pulsed current which can be advantageous when welding in positions and for the welding of thin gauges.

When welding stainless steel to unalloyed or low-alloyed steels, it is advisable/necessary to reduce the dilution of the weld as much as possible. Welding should therefore be performed with a limited heat input and appropriate bevel angle.

Welding to primer-coated sheet should be avoided, as there is a significant risk of pore formation. The paint should therefore be removed from all surfaces that are likely to be exposed to temperatures above 932°F (500°C).

WELDING DATA

Ø (inch)	Ø (mm)	Current (A)	Voltage (V)
0.045"	1.14	60– 80	9–11
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.

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 about 30% helium (He) or 1–5% hydrogen (H₂) will increase the energy of the arc. This will give a wider weld and a better fluidity of the melt pool. It is also advantageous because the welding speed can generally be increased why these kind of shielding gases are often used in automatic welding.

Standard designations

EN 12072	29 9
AWS A5.9	ER312

Chemical composition - Typical values, %

C	0.11	Cr	30.0
Si	0.45	Ni	9.5
Mn	1.9		
Ferrite:	60 FN WRC-92		

Mechanical properties – Typical values, IIW

	Typ. values	Typ. values
Yield strength, Rp0,2	650 N/mm ²	94 ksi
Tensile strength, Rm	810 N/mm ²	117 ksi
Elongation, A5	26 %	26 %
Impact strength, KV +20°C	40 J	29 ft·lb
Hardness	240 Brinell	–

Interpass temperature: Max. 300°F (150°C)

Heat input: Max. 50.8 kJ/in (2.0 kJ/mm)

Heat treatment: Generally none. In special cases quench annealing at 1922°F (1050°C). Alloys of this type are somewhat susceptible to sigma phase formation in the temperature range 932-1742°F (500–950°C).

Structure: Austenite with 40–60 % ferrite.

Scaling temperature: Approx. 2012°F (1100°C) (air).

Corrosion resistance: Good resistance in sulphur containing environments such as sulphate boilers in pulp industry.

Approvals: –