AVESTA P16

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Welding wire TIG

For welding steel such as:

Outokumpu	EN	ASTM	SS*	BS*	NF*
4565	1.4565	S34565	–	–	–
254 SMO®	1.4547	S31256	2378	–	–
4529	1.4529	N08926	–	–	–
Also for welding nickel base alloys to stainless steel and mild steel.					

* Obsolete national standards, replaced by EN 10088.

CHARACTERISTICS

AVESTA P16 is a nickel base alloy designed for welding 7Mo-steels such as Outokumpu 4565 and similar, with the highest requirements on pitting and crevice corrosion resistance. The consumable is also suitable for welding nickel based alloys such as Inconel 625 and Incoloy 825 and for dissimilar welds between stainless or nickel-based alloys and mild steel.

The chemical composition corresponds to that of Alloy 59 (ERNiCrMo-13).

AVESTA P16 produces a fully austenitic weld metal with good properties at low temperatures. The resistance to hot cracking is better than for example the 625 types of consumables.

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 fully austenitic and nickel-based steels, great care should be taken to minimise the risk of getting hot or solidification cracking. The heat input should not exceed 38.1 kJ/in (1.5 kJ/mm) and the interpass temperature should be max. 212°F (100°C). The construction should be properly designed with a sufficient root gap of 0.08-0.1″ (2–2.5 mm) to ensure full penetration and as little dilution as possible of the base material.

It is also essential to perform a good post weld cleaning of weld and heat affected zone, e.g. brushing followed by pickling.

WELDING DATA

∅ (inch)	∅ (mm)	Current (A)	Voltage (V)
1/8″	3.20	140–180	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 ft^3/hour (6–8 l/min).

Addition of about 30% helium (He) or 1–5% hydrogen (H_2) will increased the energy of the arc. This will produce a wider weld and better fluidity of the weld pool.

Welding tubes, pipes etc. often requires a purging gas protection. Common purging gases are pure Ar and Formier gas (90%N_2+10%H_2), with a flow of 20-42 ft^3/hour (10–20 l/min).

Standard designations

EN 18274 Ni Cr 25 Mo 16

AWS A5.14 ERNiCrMo-13

Chemical composition - Typical values, %

C	0.01	Cr	25.0
Si	0.1	Ni	60.0
Mn	0.2	Mo	15.0
Fe	<1.0	Nb	<0.1
Ferrite:	0 FN		

Mechanical properties – Typical values, IIW

		Typ. values		Typ. values	
Yield strength, $R_{p0,2}$		510	N/mm^2	74	Ksi
Tensile strength, R_m		760	N/mm^2	110	ksi
Elongation, A5		43	%	43	%
Impact strength, KV	+20°C	135	J	100	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 2102-2192°F (1150–1200°C).

Structure: Fully austenitic.

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

Corrosion resistance: Superior resistance to pitting and crevice corrosion (CPT >176°F (80°C), ASTM G48-A).

Approvals: –