

For welding steel such as:

Outokumpu	EN	ASTM	BS*	NF*	SS*
Avesta P5 is primarily used when surfacing unalloyed or low-alloyed steels and when joining molybdenum-alloyed stainless and carbon steels.					

\* Obsolete national standards, replaced by EN 10088.

### Characteristics

AVESTA FCW-3D P5 is a new type of flux-cored wire with very good weldability in all welding positions. The flux composition ensures excellent arc stability, very little spatter, a smooth weld surface and self-releasing slag.

AVESTA FCW-3D P5 is a molybdenum-alloyed wire of the 309LMo type, which is primarily designed for dissimilar joints between stainless steels and low-alloyed steels. The filler metal is also widely used for surfacing low-alloyed steels offering a composition that is more or less equal to that of AISI 316 already from the first run.

AVESTA FCW-3D P5 has a composition that under normal welding conditions will ensure a crack resistant weld metal with a ferrite content of min. 3%.

### Welding directions

AVESTA FCW-3D P5 should be welded using direct current positive polarity (DC+) with a recommended wire stick-out of 15–20 mm. When welding stainless to mild steel or low-alloy steel, 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. Compared to the MIG-method, the range of welding current and voltage is considerably wider.

### Welding data

Ø Inch	Horizontal		Vertical up		Overhead	
	A	V	A	V	A	V
0.045	160-280	25-31	140-180	23-28	150-200	24-29

The above parameters are intended for Ar+CO<sub>2</sub> shielding gas.

For further recommendations, please contact Avesta Welding.

### Shielding gas recommendations

Welding is preferably done using an Ar-based shielding gas with addition of 15–25% CO<sub>2</sub>, which will give the best result with respect to arc stability, melt pool control and with a minimum of spatter. However, 100% CO<sub>2</sub> can also be used. If 100% CO<sub>2</sub> is used, the welding voltage should be increased by 2–3 V to ensure the right arc length.

Gas flow rate is typically 20–25 l/min.

### Standard designations

EN 12073	T 23 12 2 L P M/C 2
AWS A5.22	E309LMoT1-4/1

### Chemical composition - Typical values, %

C	0.03	Cr	23.5
Si	0.7	Ni	13.0
Mn	1.4	Mo	2.4
Ferrite:	25 FN WRC-92		

### Mechanical properties – Typical values, IIW

	Typ. values	
Yield strength, Rp <sub>0.2</sub>	470 N/mm <sup>2</sup>	68 ksi
Tensile strength, R <sub>m</sub>	660 N/mm <sup>2</sup>	96 ksi
Elongation, A <sub>5</sub>	29 %	29 %
Impact strength, KV	+20°C	50 J
	-10°C	46 J
Hardness	220 Brinell	

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

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

**Heat treatment:** Generally none. For constructions that include low-alloyed steels in mixed joints, a stress-relieving annealing stage may be advisable. However, this type of alloy may be susceptible to embrittlement-inducing precipitation in the temperature range 1022–1742°F (550–950°C). Always consult the supplier of the parent metal or seek other expert advice to ensure that the correct heat treatment process is carried out.

**Structure:** Austenite with 20–30 % ferrite.

**Scaling temperature:** Approx. 1742°F (950°C) (air).

**Corrosion resistance:** Superior to 316L. Excellent resistance to pitting and crevice corrosion in chloride containing environments. The corrosion resistance obtained in the first layer when surfacing is equivalent to that of 316.

**Approvals:**