

For welding steel such as:

Outokumpu	EN	ASTM	SS*	BS*	NF*
For welding N06690/2.4642 and for overlay welding of carbon/low-alloy steels. Particularly suited for the conditions in nuclear fabrication.					

* Obsolete national standards, replaced by EN 10088.

Characteristics

AVESTA P690 is a nickel-base electrode with a basic type coating.

AVESTA P690 is suitable for many welding applications, such as joining nickel base alloys, e.g. Inconel 690 as well as for joining unalloyed or low-alloy steels to stainless steels and nickel base alloys.

AVESTA P690 is also well suited for depositing overlays on carbon steel, especially when there are stringent requirements regarding service at high temperatures, or in the construction of nuclear reactors.

P690 is unsusceptible to sigma phase embrittlement and shows little tendency towards carbon diffusion. It is therefore very well suited for constructions in service at elevated temperatures.

Welding directions

AVESTA P690 should be welded using positive pole DC. When welding, the material should be allowed to cool to below 100°C before the next run is deposited. Excessive broadening of the weld by weaving should be avoided.

It is very important to clean the workpieces carefully prior to welding as oil, grease and paint can give rise to pore formation and brittleness. Easily fusible metals such as tin, zinc and lead have a similar effect.

Weld deposit data

Metal recovery approx. 110%

Packaging and weights

Diam. mm	Length mm	Weight/ capsule, kg	Approx. No. of electrodes/ capsule	Weight/ carton, kg
3.25	350	4.10	115	12.30
4.0	350	4.54	79	13.62

Standard designations

AWS A5.11 ENiCrFe-7

Typical analysis % (All weld metal)

C	Si	Mn	Cr	Nb	Mo	Fe	Ni
0.03	0.4	3.0	30.0	1.5	0.3	9.0	Bal.
Ferrite 0 FN							

Mechanical properties

	Typical values (IIW)	Min. values AWS A5.11
Yield strength, R _{p0.2}	400 N/mm ²	-
Tensile strength, R _m	640 N/mm ²	-
Elongation, A ₅	35 %	-
Impact strength, KV		
+ 20°C	110 J	
-196°C	100 J	
Hardness approx.	220 Brinell	

Welding data

DC+	Diam., mm	Current, A
	3.25	70-110
	4.0	100-145

Interpass temperature: Max. 100°C.

Heat input: Max. 1.5 kJ/mm.

Heat treatment: Generally none. In special cases quench annealing at 1050°C.

Structure: Fully austenitic.

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

Corrosion resistance: Very good resistance to stress corrosion cracking in oxidising acids and water at high temperatures. Also very good resistance to intergranular corrosion due to the low carbon content and absence of sigma phase.

Approvals: -

Welding positions

