P12-R basic

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Covered electrodes

For welding steel such as:

Outokumpu	EN	ASTM	SS*	BS*	NF*
254 SMO®	1.4547	S31254	2378	–	–
Also for welding nickel base alloys to stainless or unalloyed steels and for surfacing.					

* Obsolete national standards, replaced by EN 10088.

Characteristics

AVESTA P 12-R basic is a nickel base type electrode with a chemical composition corresponding to that of AWS E NiCrMo-12.

The electrode, which is based on a fully alloyed core wire, has a weldability that in many respects is similar to that of rutile electrodes. Among other properties, it offers easy slag removal.

AVESTA P12-R basic is designed for welding 6Mo-steels such as AvestaPolarit 254 SMO and similar, where the corrosion requirements are very high. It is also suitable for the welding of nickel base alloys such as Inconel 625 and Incoloy 825, as well as for dissimilar welds between stainless or nickel base alloys and mild steel.

AVESTA P12-R basic produces a fully austenitic weld metal with good properties at low temperatures.

Welding directions

When welding fully austenitic steels, care should be taken to avoid hot cracking. The heat input should therefore be kept to a low level and the material should be allowed to cool to below 100°C before the next run is welded. Avoid igniting the electrode beside the weld and finish every bead with a circular movement to avoid pipes.

Weaving more than twice the core diameter is not recommended.

Weld deposit data at maximum welding current

Diam. mm	Length mm	N	B	H	T	Metal recovery, approx. %
2.0	250	0.61	170	0.59	36	107
2.5	300	0.64	90	0.90	44	104
3.25	350	0.66	44	1.39	59	106
4.0	350	0.70	28	2.14	60	108

Packaging data

Diam. mm	Length mm	Weight/ capsule, kg	Approx. No. of electrodes/ capsule	Weight/ carton, kg
2.0	250	1.60	163	9.60
2.5	300	1.80	98	10.80
3.25	350	4.10	116	12.30
4.0	350	4.54	88	13.62

Standard designations

EN 14172	E Ni Cr 21 Mo Fe Nb
AWS A5.11	ENiCrMo-12

Typical analysis % (All weld metal)

C	Si	Mn	Cr	Ni	Mo	Nb	Fe
0.02	0.4	0.4	21.5	bal.	9.5	2.2	2.0

Ferrite 0 FN

Mechanical properties	Typical values (IIW)		Min. values AWS A5.11	
Yield strength, $Rp_{0,2}$	465	N/mm²	–	N/mm²
Tensile strength, R_m	705	N/mm²	650	N/mm²
Elongation, A_5	37	%	35	%
Impact strength, KV				
+20°C	80	J		
-40°C	80	J		
Hardness approx.	220	Brinell		

Welding data

DC+ or AC	Diam., mm	Current, A
	2.0	25– 45
	2.5	40– 70
	3.25	60– 95
	4.0	90–135
	5.0	130–190

Interpass temperature: Max. 100°C.

Heat input: Max. 1.5 kJ/mm.

Heat treatment: Generally none. In special cases quench annealing at 1150–1200°C.

Structure: Fully austenitic.

Scaling temperature: Approx. 1100°C (air)

Corrosion resistance: Maximum resistance to pitting and crevice corrosion in chloride containing environments. Good resistance in sulphuric and phosphoric acid contaminated by chlorides.

Approvals: CWB, TÜV

Welding positions