




AVESTA 3D ELECTRODES easy and versatile in all welding positions

Welder-friendly, all-round electrode

Prefabrication welding in workshops, on-site welding, overlay welding and repair welding are just some of the uses of covered electrodes. Adding a further dimension to this great flexibility in the welding of stainless steels, Avesta 3D electrodes can be used in the flat, vertical-up and overhead positions.

Avesta 3D

 Avesta's 3D range of covered electrodes has been specially developed for flexible welding in all positions except vertical-down.

Because 3D electrodes have a very wide parameter box, they have a large working range. They have extremely good weldability and give a stable arc. Both the slag and the weld pool are easy to control. A short arc is to be used for welding. The slag is self-releasing and leaves an even, beautiful weld finish.

Suitable metal thicknesses are 3 mm upwards. For thinner materials, Avesta 4D electrodes are recommended.

There are Avesta 3D electrodes for welding: austenitic stainless steels (with or without molybdenum); duplex stainless steels; and, stainless steels to carbon steels.

Avesta 3D electrodes can be used for, amongst other things, prefabrication welding in workshops, on-site welding and repair welding in, for example, the pulp, paper and chemical industries (storage tanks, process vessels, etc.).

As they place severe demands on filler metal performance, single-sided root beads are one of the specialties of the 3D range. The arc, weld pool and slag are all highly controllable. Consequently, Avesta 3D ensures top-class root beads every time.

Weld metal composition

Standard designations

Avesta 3D electrode	Chemical composition, typical values, %							Typical ferrite*	EN 1600	AWS A5.4
	C	Si	Mn	Cr	Ni	Mo	Other			
308L/MVR	0.02	0.8	0.6	19.5	10.1	–	–	8	E 19 9 L R	E308L-17
316L/SKR	0.02	0.8	0.7	18.5	12.0	2.7	–	8	E 17 11 2 L R	E316L-17
2205	0.02	0.8	0.7	22.7	9.3	3.0	N 0.16	34	E 22 9 3 N L R	E2209-17
309L	0.02	0.8	0.8	23.0	13.2	–	–	15	E 23 13 L R	E309L-17
P5	0.02	0.8	0.8	22.5	13.0	2.5	–	20	E 22 12 2 L R	E309MoL-17

* The ferrite content of pure weld metal. FN 0-18 in Schaeffler-DeLong, FN >18 as per WRC-92.

Mechanical properties, typical values

Approvals

Avesta 3D electrode	R _{p0,2}	R _m	A ₅	Impact strength, KV, J		Brinell hardness	TÜV	DNV
	N/mm ²	N/mm ²	%	+20°C	Low temp.			
308L/MVR	430	550	36	55	45 (-40°C)	200	x	x
316L/SKR	445	555	34	54	52 (-40°C)	210	x	x
2205	670	820	25	45	40 (-20°C)	240	x	x
309L	460	550	36	50	45 (-40°C)	200	x	x
P5	550	660	32	50	45 (-10°C)	200	x	x

Choice of filler metals

Dimensions and packaging data

EN	ASTM	Outokumpu steel designation	Recommended Avesta 3D electrode
1.4301	304	4301	308L/MVR
1.4307	304L	4307	
1.4311	304LN	4311	
1.4541	321	4541	
1.4436	316	4436	316L/SKR
1.4432	316L	4432	
1.4429	316LN	4429	
1.4571	316Ti	4571	
1.4462	S32205	2205	2205
Joints between molybdenum free stainless steels and carbon or low-alloy steels. Overlay welding of carbon or low-alloy steels.			309L
Joints between molybdenum alloyed stainless steels and carbon or low-alloy steels. Overlay welding of carbon or low-alloy steels.			P5

Avesta 3D electrode	Diameter and length, mm					
	1.60	2.00	2.50	3.25	4.00	5.00
308L/MVR	250	300	350	350	450	450
316L/SKR	250	300	350	350	450	450
2205	–	300	350	350	450	450
309L	–	300	300	350	450	450
P5	–	300	300	350	450	450

Avesta Welding's covered electrodes are delivered in moisture-proof, plastic capsules packed in cartons. The electrodes can also be supplied vacuum-packed.

Welding recommendations

Avesta 3D electrode	Diameter mm	Flat (PA) Current, A	Vertical-up (PF) Current, A	Vertical-down (PG) Current, A
308L/MVR	1.6	25– 45	25–35	25– 45
316L/SKR	2.0	30– 55	30–45	30– 55
2205	2.5	45– 70	45–55	45– 70
309L	3.25	60–110	70–90	60–110
P5	4.00	90–150		
	5.00	150–200		

Welding current can be either DC+ or AC. However, DC+ always gives the best weldability. A short arc is to be used for welding. Use a slight weaving motion in the flat position. Increase this in vertical-up welding. Because the arc is stable throughout the entire working range, these electrodes are extremely versatile.

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