

SAFINOX R 308L

MMA Electrodes

Stainless and Heat resistant steels

SAFINOX R 308L is a semi-basic MMA electrode suitable for the welding of austenitic steels Cr-Ni steels or cast steels containing 16-20%Cr and 8-12%Ni, i.e. AISI 304, AISI 304L. This electrode can also be used for welding of stainless steels of the same type whether stabilised or not for services temperatures up to +350°C. The weld deposit has a carbon content <0,04%.

It is particularly suitable for food, nuclear, chemical industry and associated applications.

This electrode offers excellent operability and is particularly suitable for downhand butt and fillet welding applications, the 2.5mm and 3.2mm diameter electrodes can be used for positional welding.

Combines a stable spray arc transfer resulting in excellent weld bead shape and appearance with a slight concave profile in horizontal vertical fillet welds. There is very little spatter and in combination with the self-releasing slag, post welding cleaning time is maintained to a minimum. Under wet corrosive conditions suitable for operating temperatures up to 350°C, resistant to scaling up to 800°C. Suitable for use with either AC [minimum OCV 50V] or DC positive. Easy arc striking and restriking. Efficiency 100%.



Semi-basic electrode for welding type 304-308L austenitic stainless steels. Low carbon content.

Classification

EN ISO	1600 : E 19 9 L R 12
AWS	A5.4: E 308L-17

Approvals

ABS	BV	DB	DNV	GL	TÜV
E308L-17	UP	●	308L	4550	●

CE

Chemical analysis (Typical values in %)

	C	Mn	Si	P	S	Cr	Ni	Ferrite
All weld metal	0.025	0.9	0.8	≤ 0.030	≤ 0.025	19.8	9.5	5-10

All-weld metal Mechanical Properties

Heat Treatment	Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation A5 (%)	Impact Energy ISO - V (J)
				20 °C
As Welded	≥ 320	≥ 520	≥ 35	≥ 60

Materials

1.4301 (X4CrNi18-10); 1.4303 (X4CrNi 18-12); 1.4306 (X2CrNi19-11); 1.4308 (GX5CrNi19-11); 1.4311 (X2CrNi18-10); 1.4319 (X5CrNi17-8); 1.4541 (X6CrNiTi18-10); 1.4550 (X6CrNiNb18-10); 1.4552 (GX5CrNiNb19-10)

AISI 304-304L-303-302-301; ASTM A312 Grades TP308, TP308L; ASTM A351 Grades CF3, CF3A

Storage

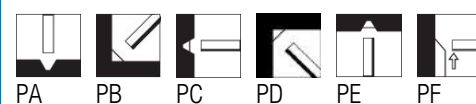
Keep dry and avoid condensation.

Re-drying not generally required.

If necessary 250°-300°C for 1 hour, 5 times max.

Current condition and welding position

AC; DC+



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Stainless and Heat resistant steels



Packaging data

Diam. (mm)	Length (mm)	Current (A)	Approx. weightn(kg/1000)	CBOX		VPMD	
				PC	Code	PC	Code
2.0	300	30-60	11.3	340	●	150	●
2.5	300	55-80	18.9	190	●	90	●
3.2	350	70-110	35.0	120	●	55	●
4.0	350	120-140	52.5	80	●	40	●
5.0	350	145-180	82.0	50	●	20	●

SAFINOX R 309L

MMA Electrodes

Stainless and Heat resistant steels

SAFINOX R 309L is a semi-basic MMA electrode depositing a low C – 22/24%Cr – 12/14%Ni weld metal with approx. 12% delta-ferrite promoting high resistance to hot cracking. This electrode has three main applications:

- Buffer layers and claddings on unalloyed and low-alloy steels which are already corrosion resistant in the first layer.
- Dissimilar joints (austenitic steels to ferritic steels) with operating temperatures up to 300°C. In case of higher temperatures, use ALIN 182.
- Welding of stainless steels of similar composition.

This electrode offers excellent operability and is particularly suitable for downhand butt and fillet welding applications, the 2.5mm and 3.2mm diameter electrodes can be used for positional welding.

Exhibits a stable spray arc transfer resulting in excellent weld bead shape and appearance with a slight concave profile in horizontal vertical fillet welds. There is very little spatter and in combination with the self-releasing slag, post welding cleaning time is maintained to a minimum. Easy arc striking and restriking. Suitable for use with either AC [minimum OCV 50V] or DC positive. Efficiency 100%.



Semi-basic electrode for welding austenitic stainless steels containing 22% Cr and 12% Ni.

Classification

EN ISO	3581-A: E 23 12 L R 12
AWS	A5.4: E 309L-17

Approvals

ABS	BV	DB	DNV	GL	LRS	TÜV
E309L-16	UP	●	309L	4332	SS/CMn	●



Chemical analysis (Typical values in %)

	C	Mn	Si	P	S	Cr	Ni	Ferrite
All weld metal	≤ 0.040	0.9	0.9	≤ 0.025	≤ 0.025	23.5	12.2	5-20

All-weld metal Mechanical Properties

Heat Treatment	Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation A5 (%)	Impact Energy ISO - V (J)
				20 °C
As Welded	≥ 400	≥ 520	≥ 30	≥ 47

Materials

Joining of unalloyed or low-alloy steels/cast steels to stainless or heat resisting steels. Buffer layer on steel components where final layers are to be deposited using other stainless steel electrodes.

ASTM A249, A312, A409, A814 Grades TP309, TP309S

AISI 309-309S

Storage

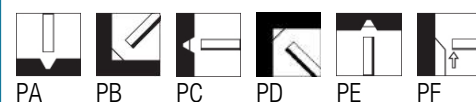
Keep dry and avoid condensation.

Re-drying not generally required.

If necessary 250°-300°C for 1 hour, 5 times max.

Current condition and welding position

AC; DC+



SAFINOX R 309L

MMA Electrodes

Stainless and Heat resistant steels



Packaging data

Diam. (mm)	Length (mm)	Current (A)	Approx. weightn(kg/1000)	CBOX		VPMD	
				PC	Code	PC	Code
2.5	300	55-80	19.3	190	●	90	●
3.2	350	70-110	36.2	120	●	55	●
4.0	350	120-140	54.1	80	●	40	●
5.0	350	145-180	86.6	50	●	20	●

SAFINOX R 316L

MMA Electrodes

Stainless and Heat resistant steels

SAFINOX R 316L is a semi-basic MMA electrode suitable for the welding of austenitic steels Cr-Ni steels or cast steels containing 16-20%Cr, 10-14%Ni and 2-3%Mo, i.e. AISI 316 and 316L, having an extra low carbon content. This electrode can also be used for welding of stainless steels of the same type whether stabilised or not for services temperatures up to +400°C.

It is particularly suitable for offshore, chemical industry, hydro power plants and general construction applications.

This electrode offers excellent operability and is particularly suitable for downhand butt and fillet welding applications, the 2.5mm and 3.2mm diameter electrodes can be used for positional welding.

Exhibits a stable spray arc transfer resulting in excellent weld bead shape and appearance with a slight concave profile in horizontal vertical fillet welds. There is very little spatter and in combination with the self-releasing slag, post welding cleaning time is maintained to a minimum. Under wet corrosive conditions suitable for operating temperatures up to 400°C, resistant to scaling up to 800°C. Easy arc striking and restriking. Suitable for use with either AC [minimum OCV 50V] or DC positive. Efficiency 100%.



Semi-basic electrode for welding AISI 316 austenitic stainless steels. Excellent resistance to marine corrosion.

Classification

EN ISO	3581-A: E 19 12 3 L R 12
AWS	A5.4: E 316L-17

Approvals

ABS	BV	DB	DNV	GL	LRS	RINA	TÜV
E316L-16	UP	●	316L	4571	316L	316L	●

CE

Chemical analysis (Typical values in %)

	C	Mn	Si	P	S	Cr	Ni	Mo	Ferrite
All weld metal	0.035	0.9	0.8	≤ 0.025	≤ 0.025	19.0	12.0	2.6	5-10

All-weld metal Mechanical Properties

Heat Treatment	Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation A5 (%)	Impact Energy ISO - V (J)
				20 °C
As Welded	≥ 350	≥ 510	≥ 30	≥ 50

Materials

AISI 316-316L-316LN

ASTM A312 Grades TP316, TP316L

1.4401 (X4CrNiMo17-12-2), (GX2CrNiMo18-10); 1.4404 (X4CrNiMo17-12-2); 1.4406 (X2CrNiMo17-11-2); 1.4408 (GX5CrNiMo19-11); 1.4429 (X2CrNiMo17-13-3); 1.4435 (X2CrNiMo18-14-3); 1.4436 (X4CrNiMo17-13-3); 1.4571 (X6CrNiMoTi17-12-2); 1.4580 (X6CrNiMoNb17-12-2); 1.4581 (GX5CrNiMoNb19-11); 1.4583 (X10CrNiMoNb18-12)

ASTM A351 Grades CF3M, CF3MA

SAFINOX R 316L

MMA Electrodes

Stainless and Heat resistant steels

Storage

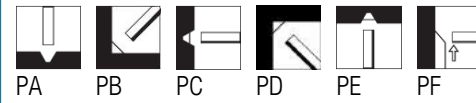
Keep dry and avoid condensation.

Re-drying not generally required.

If necessary 250°-300°C for 1 hour, 5 times max.

Current condition and welding position

AC; DC+



Packaging data

Diam. (mm)	Length (mm)	Current (A)	Approx. weightn(kg/1000)	CBOX		SMPA		VPMD	
				PC	Code	PC	Code	PC	Code
1.60	300	20-40	7.1					250	●
2.0	300	30-60	11.5	310	●			150	●
2.5	300	55-80	18.4	190	●	30	●	90	●
3.2	350	70-110	35.7	120	●	20	●	55	●
4.0	350	120-140	52.3	80	●			40	●
5.0	350	145-180	84.8	50	●			20	●

STARINOX 308L

MMA Electrodes

Stainless and Heat resistant steels

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Classification

EN ISO	3581-A: E 19 9 L R 12
AWS	A5.4: E 308L-16

Approvals

ABS	BV	DB	DNV	GL	TÜV
E308L-16	UP	●	308L	4550	●

CE

Chemical analysis (Typical values in %)

	C	Mn	Si	P	S	Cr	Ni	Ferrite
All weld metal	0.025	0.9	0.8	≤ 0.030	≤ 0.025	19.8	9.5	5-10

All-weld metal Mechanical Properties

Heat Treatment	Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation A5 (%)	Impact Energy ISO - V (J)
				20 °C
As Welded	≥ 320	≥ 520	≥ 35	≥ 60

Materials

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AISI 304-304L-303-302-301; ASTM A312 Grades TP308, TP308L; ASTM A351 Grades CF3, CF3A

Storage

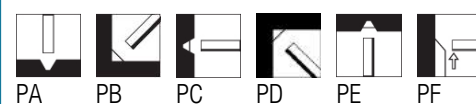
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Current condition and welding position

AC; DC+



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Packaging data

Diam. (mm)	Length (mm)	Current (A)	Approx. weightn(kg/1000)	GASP		VPMD	
				PC	Code	PC	Code
2.0	300	30-60	11.2	310	●	150	●
2.5	300	55-80	18.7	190	●	90	●
3.2	350	70-110	35.0	120	●	55	●
4.0	350	120-140	52.8	80	●	40	●
5.0	350	145-180	81.6	50	●	20	●

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Approvals

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Chemical analysis (Typical values in %)

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All weld metal	≤ 0.040	0.9	0.9	≤ 0.025	≤ 0.025	23.5	12.2	5-20

All-weld metal Mechanical Properties

Heat Treatment	Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation A5 (%)	Impact Energy ISO - V (J)
				20 °C
As Welded	≥ 400	≥ 520	≥ 30	≥ 47

Materials

Joining of unalloyed or low-alloy steels/cast steels to stainless or heat resisting steels. Buffer layer on steel components where final layers are to be deposited using other stainless steel electrodes.

ASTM A249, A312, A409, A814 Grades TP309, TP309S

AISI 309-309S

Storage

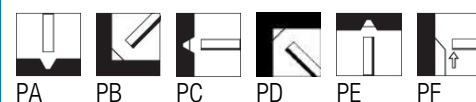
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If necessary 250°-300°C for 1 hour, 5 times max.

Current condition and welding position

AC; DC+



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Packaging data

Diam. (mm)	Length (mm)	Current (A)	Approx. weightn(kg/1000)	GASP		VPMD	
				PC	Code	PC	Code
2.5	300	55-80	19.3	190	●	90	●
3.2	350	70-110	36.2	120	●	55	●
4.0	350	120-140	54.1	80	●	40	●
5.0	350	145-180	86.6	50	●	20	●

STARINOX 316L

MMA Electrodes

Stainless and Heat resistant steels

STARINOX 316L is a semi-basic MMA electrode suitable for the welding of austenitic steels Cr-Ni steels or cast steels containing 16-20%Cr, 10-14%Ni and 2-3%Mo, i.e. AISI 316 and 316L, having an extra low carbon content. This electrode can also be used for welding of stainless steels of the same type whether stabilised or not for services temperatures up to +400°C.

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Classification

EN ISO	3581-A: E 19 12 3 L R 12
AWS	A5.4: E 316L-16

Approvals

ABS	BV	DB	DNV	GL	LRS	RINA	TÜV
E316L-16	UP	●	316L	4571	316L	316L	●



Chemical analysis (Typical values in %)

	C	Mn	Si	P	S	Cr	Ni	Mo	Ferrite
All weld metal	0.035	0.9	0.8	≤ 0.025	≤ 0.025	19.0	12.0	2.6	5-10

All-weld metal Mechanical Properties

Heat Treatment	Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation A5 (%)	Impact Energy ISO - V (J)
				20 °C
As Welded	≥ 350	≥ 510	≥ 30	≥ 50

Materials

AISI 316-316L-316LN

ASTM A312 Grades TP316, TP316L

1.4401 (X4CrNiMo17-12-2), (GX2CrNiMoN18-10); 1.4404 (X4CrNiMo17-12-2); 1.4406 (X2CrNiMoN17-11-2); 1.4408 (GX5CrNiMo19-11); 1.4429 (X2CrNiMoN17-13-3); 1.4435 (X2CrNiMo18-14-3); 1.4436 (X4CrNiMo17-13-3); 1.4571 (X6CrNiMoTi17-12-2); 1.4580 (X6CrNiMoNb17-12-2); 1.4581 (GX5CrNiMoNb19-11); 1.4583 (X10CrNiMoNb18-12)

ASTM A351 Grades CF3M, CF3MA

Storage

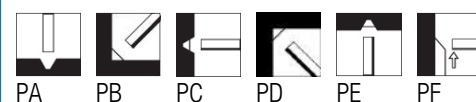
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Re-drying not generally required.

If necessary 250°-300°C for 1 hour, 5 times max.

Current condition and welding position

AC; DC+



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MMA Electrodes

Stainless and Heat resistant steels



Packaging data

Diam. (mm)	Length (mm)	Current (A)	Approx. weightn(kg/1000)	GASP		VPMD	
				PC	Code	PC	Code
1.60	300	20-40	7.1	430	●		
2.0	300	30-60	11.5	310	●	150	●
2.5	300	55-80	18.4	190	●	90	●
3.2	350	70-110	35.7	120	●	55	●
4.0	350	120-140	52.3	80	●	40	●
5.0	350	145-180	84.8	50	●	20	●