

**Fluxtype:** Calcium-Silicate

**Classification:** ISO 14174 (stainless steels) – S F CS 2 5742 DC  
 ISO 14174 (low alloy steels) – S F CS 1 63 DC  
 EN 760 (stainless steels) – SF CS 2 DC

**Characteristics:**

Specially designed for welding austenitic stainless steels WP 380 is also suitable for welding both low-alloy steels for use at elevated temperatures as well as the combination with austenitic stainless steels. As a result of the semi-basic flux characteristics crack free welds are obtained for most grades of stainless steels welded with the corresponding wire electrodes. The metallurgical behavior of the flux is neutral (C-neutral, low Si pick-up and low Mn burn-out) without Cr compensation.

It is suitable for welding DC using single or DC/AC for multi-wire processes and produces smooth weld beads free of slag residuals with flat weld interfaces even in narrow gaps and on preheated work pieces.

**Application:**

Joint welding and surfacing of:

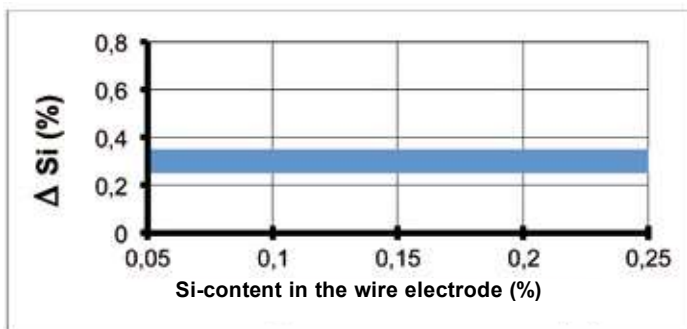
- creep-resistant CrMo-steels such as 12CrMo19-5/A355 grade P22-P5 or X20CrMoWV12-1/A351 for boiler, vessel and pipe fabrication
- martensitic and ferritic Cr(NiMo)-steels acc. to EN 10088 with the appropriate wire electrodes in conjunction with the corresponding heat treatments
- austenitic CrNi(Mo)-steels (including ELC-grades) acc. to EN 10088; resistant against intergranular corrosion in both the as-welded and solution-treated condition
- high-alloy CrNi(Mo)-steels for use at low temperatures and heat-resistant steels
- high-alloy Cr(NiMo)-steels in combination with low-alloy steels (dissimilar joints)
- Nickel-base alloys using NiCr- and NiCrMo- wire electrodes acc. to AWS A5.14 / EN ISO 18274

**Characteristic chemical Constituents:**

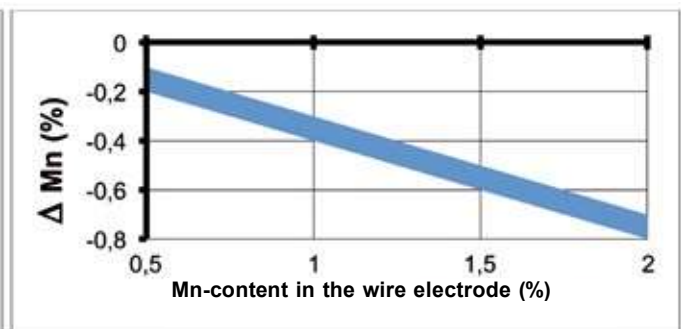
SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	CaO + MgO	CaF <sub>2</sub>
30 %	5 %	35 %	20 %
Basicity according to Boniszewski: ~1.3			

**Metallurgical behaviour acc. to ISO 14174 type of current DC:**

Pick-up Silicon



Pick-up/Burn-out Manganese



**Flux density:** 1.5 kg/dm<sup>3</sup> (l)

**Grain size acc. to ISO 14174** 1 – 16 (Tyler 10 x 150)

## Chemical composition of all-weld metal acc. to EN ISO 15792-1 and AWS A5.9/5.23/5.14:

(characteristical values in wt. %)

Wire electrode		C	Si	Mn	Cr	Ni	Mo	Nb
BA-S2Mo	EA2	< 0.08	< 0.5	< 1.0			0.5	
BA-S CrMo5	EB6	< 0.08	< 0.7	< 0.6	5.5		0.6	
BA-S CrMo9	EB8	< 0.12	< 0.8	< 1.2	8.0-10.0		0.8-1.2	Cu: < 0.35
BA-S CrMo91	EB91	< 0.10	< 0.5	< 1.2	8.5-10.5	0.6	1.0	0.02-0.10 V: 0.2
BA-WIRE 308L	ER308L	< 0.03	< 1.0	< 2.5	19.5-22.0	9.0-11.0		
BA-WIRE 309L	ER309L	< 0.03	< 1.0	< 2.5	23.0-25.0	12.0-14.0		
BA-WIRE 316L	ER316L	< 0.03	< 1.0	< 2.5	18.0-20.0	11.0-14.0	2.0-3.0	
BA-WIRE 318	ER318	< 0.08	< 1.0	< 2.5	18.0-20.0	11.0-14.0	2.0-3.0	8 x C/1.0 max
BA-WIRE 347	ER347	< 0.08	< 1.0	< 2.5	19.0-21.0	9.0-11.0		10 x C/1.0 max
BA-WIRE 2209	ER2209	< 0.03	< 0.9	< 2.0	21.5-23.5	7.5-9.5	2.5-3.5	N: 0.08-0.20
BA-WIRE 276	ERNiCrMo-4	< 0.02	< 0.4	< 1.0	14.5-16.0	> 50.0 Fe ≈ 4.0-7.0	15.0-17.0	W ≈ 4 / V: 0.35 Co < 2.5

## Mechanical properties of all-weld metal acc. to EN ISO 15792-1 and AWS A5.9/5.23/5.14:

(characteristical values)

Wire electrode		Heat treat - ment	0.2 % Proof stress MPa	1.0 % Proof stress MPa	Tensile strength MPa	Elong. %	Impact ISO-V (J)		
							RT	-120 °C -184 °F	-196 °C -321 °F
BA-S2Mo	EA2	S	> 440		> 540	> 20	> 90		
BA-S CrMo5	EB6	A	> 470		> 600	> 18	> 70		
BA-S CrMo91 1)	EB91	A	> 540		> 660	> 17	> 47		
BA-WIRE 308L	ER308L	AW ST1	> 340 > 250	> 280	> 540 > 520	> 35 > 35	> 70 > 80		> 40 > 50
BA-WIRE 309L	ER309L	AW	> 380		> 580	> 30	> 70		
BA-WIRE 316L	ER316L	AW ST2	> 350 > 270	> 380 > 300	> 550 > 520	> 30 > 35	> 70 > 80		> 40 > 50
BA-WIRE 318	ER318	AW ST2	> 370 > 290	> 410 > 330	> 580 > 550	> 30 > 35	> 80 > 80	> 40 > 60	
BA-WIRE 347	ER347	AW ST1	> 360 > 280	> 400 > 310	> 570 > 550	> 30 > 35	> 80 > 80		> 40 > 50
BA-WIRE 2209	ER2209	AW	> 550	> 600	> 750	> 25	> 80	-60°C: >40	
BA-WIRE 276 2)	ERNiCrMo-4	AW	> 400		> 700	> 35	> 80		> 60

1) Maximum wire diameter 2,4 mm

2) Maximum wire diameter 2,0 mm

S = stress relieved 620 °C

A = annealed 740 – 760 °C

ST1 = solution treated 1,050 °C / water

ST2 = solution treated 1,080 °C / water

**Approvals:**

VdTUEV 1153

**with wire electrodes:**

S 19 9 L (ER308L); S 19 9 Nb (ER347); S 19 9 L Nb (ER347L); S 19 12 3 L (ER316L);  
 S 19 12 3 Nb (ER318); S 23 12 L (ER309L); S 22 9 3 N L (ER2209)  
 S CrMo91 (EB91)

Deutsche Bahn

S 19 9 L (ER308L); S 19 9 Nb (ER347); S 19 12 3 L (ER316L);  
 S 19 12 3 Nb (ER318); S 23 12 L (ER309L)

**Packaging:**

15 kg PE-coated Aluminium bags

**Storage and redrying:**

Unopened originally packed flux bags can be stored up to 2 years in dry storage rooms after date of delivery ex-factory. Redrying conditions specific to the flux:  $200 \pm 50$  °C effective flux temperature. Usually, if austenitic stainless steels are to be welded flux redrying can be neglected.



*Versatile flux for welding stainless steels, but also suitable for welding Ni-alloys as well as low alloyed steels.*

