

**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 behaviour 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:

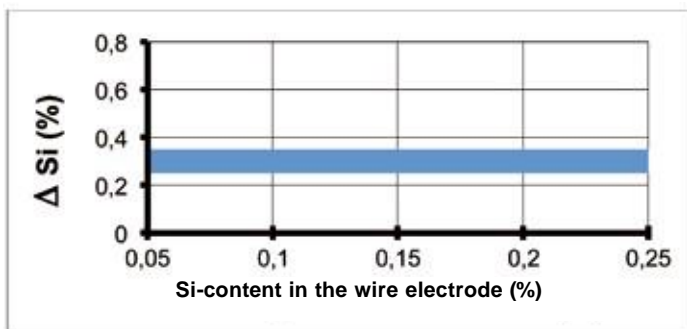
- creep-resistant CrMo-steels such as 12CrMo19-5/A355 grade P22-P5 or X20CrMoWV12-1/A351 for boiler, vessel and pipe fabrication
- martensitic and ferritic Cr(NiMo)-steels acc. to EN 10088 with the appropriate wire electrodes in conjunction with the corresponding heat treatments
- austenitic CrNi(Mo)-steels (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:**

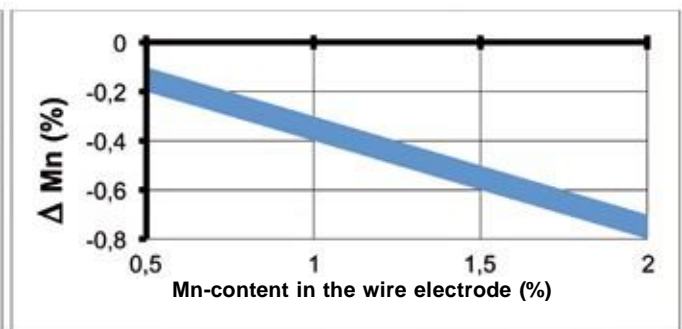
| SiO <sub>2</sub>                        | Al <sub>2</sub> O <sub>3</sub> | CaO + MgO | CaF <sub>2</sub> |
|---|--------------------------------|-----------|------------------|
| 30 %                                    | 5 %                            | 35 %      | 20 %             |
| Basicity according 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)

**Current-carrying capacity:** up to 900 A DC using one wire

## 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 | < 0.7 | < 0.8 | 9         | 0.6                    | 1.0       | 0.05 / 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<br>Fe ≈ 4.0-7.0 | 15.0-17.0 | W ≈ 4 / V: 0.35<br>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 treatment | 0.2 % Proof stress MPa | 1.0 % Proof stress MPa | Tensile strength MPa | Elong. % | Impact ISO-V (J) |                    |                    |
|----------------|------------|----------------|------------------------|------------------------|----------------------|----------|------------------|--------------------|--------------------|
|                |            |                |                        |                        |                      |          | RT               | -120 °C<br>-184 °F | -196 °C<br>-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             | > 340                  |                        | > 540                | > 35     | > 70             |                    | > 40               |
|                |            | ST1            | > 250                  | > 280                  | > 520                | > 35     | > 80             |                    | > 50               |
| BA-WIRE 309L   | ER309L     | AW             | > 380                  |                        | > 580                | > 30     | > 70             |                    |                    |
| BA-WIRE 316L   | ER316L     | AW             | > 350                  | > 380                  | > 550                | > 30     | > 70             |                    | > 40               |
|                |            | ST2            | > 270                  | > 300                  | > 520                | > 35     | > 80             |                    | > 50               |
| BA-WIRE 318    | ER318      | AW             | > 370                  | > 410                  | > 580                | > 30     | > 80             | > 40               |                    |
|                |            | ST2            | > 290                  | > 330                  | > 550                | > 35     | > 80             | > 60               |                    |
| BA-WIRE 347    | ER347      | AW             | > 360                  | > 400                  | > 570                | > 30     | > 80             |                    | > 40               |
|                |            | ST1            | > 280                  | > 310                  | > 550                | > 35     | > 80             |                    | > 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 /Deutsche Bahn S 19 9 L (ER308L); S 19 9 Nb (ER347); S 19 9 Nb L (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)  
VdTUEV 1153 S CrMo91 (EB9)

**with wire electrodes:****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.*

