



# FCW-3D 309L

For welding steels such as  
Outokumpu

EN

ASTM

BS

NF

SS

AVESTA 309L is primarily used for surfacing unalloyed or low-alloy steels and when joining non-molybdenum-alloyed stainless and carbon steels.

## Standard designations

EN ISO 17633 T 23 12 L P M/C 2

AWS A5.22 E309LT1-4/-1

## Characteristics and welding directions

AVESTA FCW-3D 309L is a high-alloy 23 Cr 13 Ni wire primarily intended for surfacing on low-alloy steels and for dissimilar welds between mild steel and stainless steels.

AVESTA FCW-3D 309L is an all-round wire for welding in the flat, horizontal-vertical, vertical-up and overhead positions.

## Welding data

| Diameter<br>mm | Welding<br>position | Current<br>A | Voltage<br>V |
|----------------|---------------------|--------------|--------------|
| 1.20           | Flat, horizontal    | 150 – 240    | 24 – 32      |
|                | Vertical-up         | 130 – 160    | 23 – 28      |
|                | Overhead            | 150 – 200    | 24 – 29      |

## Shielding gas

Ar + 15 – 25% CO<sub>2</sub> offers the best weldability, but 100% CO<sub>2</sub> can also be used (voltage should be increased by 2V).

Gas flow rate 20 – 25 l/min.

## Chemical composition, all weld metal (typical values, %)

| C    | Si  | Mn  | Cr   | Ni   |
|------|-----|-----|------|------|
| 0.03 | 0.7 | 1.4 | 23.5 | 13.0 |

Ferrite 18 FN WRC-92

| Mechanical<br>properties         | Typical<br>values (IIW) | Min. values<br>EN ISO 17633 |
|----------------------------------|-------------------------|-----------------------------|
| Yield strength R <sub>p0,2</sub> | 390 N/mm <sup>2</sup>   | 320 N/mm <sup>2</sup>       |
| Tensile strength R <sub>m</sub>  | 550 N/mm <sup>2</sup>   | 510 N/mm <sup>2</sup>       |
| Elongation A <sub>5</sub>        | 35 %                    | 25 %                        |
| Impact strength KV<br>+20°C      | 55 J                    |                             |
| Hardness                         | 210 Brinell             |                             |

**Interpass temperature:** Max. 150°C.

**Heat input:** Max. 2.0 kJ/mm.

**Heat treatment:** Generally none.

For constructions that include low-alloy steels in mixed joints a stress-relieving annealing stage may be advisable. However, this type of alloy may be susceptible to embrittlement-inducing precipitation in the temperature range 500 – 950°C. Always consult the supplier of the parent metal or seek other expert advice to ensure that the correct heat treatment process is carried out.

**Structure:** Austenite with 5 – 10% ferrite.

**Scaling temperature:** Approx. 1000°C (air).

**Corrosion resistance:** Corrosion resistance superior to type 308L fillers. When surfacing on mild steel, a corrosion resistance equivalent to ASTM 304 is obtained from the first bead.

## Approvals

- CE
- CWB
- DB
- TÜV