

For welding steel such as:

| Outokumpu                                                                                                                                               | EN | ASTM | SS* | BS* | NF* |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|----|------|-----|-----|-----|
| Overalloyed electrode for surfacing unalloyed steel, joint welding molybdenum alloyed stainless steel to unalloyed steel and for welding clad material. |    |      |     |     |     |

\* Obsolete national standards, replaced by EN 10088.

#### Characteristics

AVESTA P5-PW AC/DC is a rutile-acid type electrode, which is easy to use and offers good weldability using both positive pole DC and AC.

AVESTA P5-PW is a molybdenum-alloyed electrode of the 309LMO type, which is primarily designed for surfacing low-alloyed steels and for joining stainless and low-alloyed steels (dissimilar joints). When used for surfacing, the composition obtained is more or less equal to that of ASTM 316 from the very first run.

AVESTA P5-PW has a composition, which, under normal welding conditions, ensures a crack resistant weld metal with a ferrite content of min. 3%.

#### Welding directions

When welding stainless steel to unalloyed or low-alloyed steels, it is advisable/necessary to reduce the dilution of the weld as much as possible. Welding should therefore be performed with a limited heat input and appropriate bevel angle.

Welding to primer-coated sheet should be avoided, as there is a significant risk of pore formation. The paint should therefore be removed from all surfaces that are likely to be exposed to temperatures above 932°F (500°C).

#### Weld deposit data

Metal recovery approx. 105%.

#### Packaging data

| Diam. inch | Diam. mm | Length mm/inch | Weight/capsule lbs | Eelectrode capsule, approx. | Weight/carton, lbs |
|------------|----------|----------------|--------------------|-----------------------------|--------------------|
| 5/64       | 2.0      | 250 / 10       | 3.5                | 180                         | 21                 |
| 3/32       | 2.5      | 300 / 12       | 4.2                | 116                         | 25                 |
| 1/8        | 3.25     | 350 / 14       | 9.1                | 114                         | 27                 |
| 5/32       | 4.0      | 350 / 14       | 10.0               | 89                          | 30                 |

Approvals: -

#### Standard designations

EN 1600                      E 23 12 2 L R  
AWS A5.4                    E309MoL-17

#### Typical analysis % (All weld metal)

| C                    | Si  | Mn  | Cr   | Ni   | Mo  |
|----------------------|-----|-----|------|------|-----|
| 0.02                 | 0.8 | 1.0 | 22.5 | 13.5 | 2.7 |
| Ferrite 20 FN WRC-92 |     |     |      |      |     |

#### Mechanical properties

|                                   | Typical values (IIW)  |          |
|-----------------------------------|-----------------------|----------|
| Yield strength, R <sub>p0.2</sub> | 525 N/mm <sup>2</sup> | 76 ksi   |
| Tensile strength, R <sub>m</sub>  | 660 N/mm <sup>2</sup> | 96 ksi   |
| Elongation, A <sub>5</sub>        | 31 %                  | 31 %     |
| Impact strength, KV +20°C         | 25 J                  | 18 ft-lb |
| Hardness approx.                  | 225 Brinell           |          |

#### Welding data

| DC+ or AC | Diam., inch | Current, A |
|-----------|-------------|------------|
|           | 5/64        | 25– 60     |
|           | 3/32        | 35– 80     |
|           | 1/8         | 80–120     |
|           | 5/32        | 100–160    |

Open circuit voltage

**Interpass temperature:** Max. 300°F (150°C).

**Heat input:** Max. 50.8 kJ/in (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 1022–1742°F (550–950°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 15–20 % ferrite.

**Scaling temperature:** Approx. 1742°F (950°C) (air)

**Corrosion resistance:** Superior to 316L. The corrosion resistance obtained in the first layer when surface welding corresponds to that of 316.

#### Welding positions

