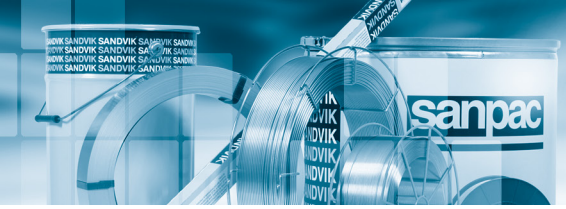


Datasheet updated 2012-08-02 19:04:20 (supersedes all previous editions)

# Sandvik 19.12.3.LR

## (Covered electrodes)

Sandvik 19.12.3.LR is a covered chromium-nickel-molybdenum electrode with rutile-acid coating welding of steels of 316 types as well as overlays giving 316 type composition.

The electrode has excellent arc stability and fast burn off rate with minimal stub loss. It is also characterized by improved moisture resistance, self peeling slag, easy post weld finishing. Sandvik 19.12.3.LR gives smooth uniform beads and works in any standard weld position.

**Applications**
Sandvik 19.12.3.LR is used for welding steels of the following types:

| | |
|---|---|
| UNS | S31600, S31603, S31653, S31609 and S31635 |
| ASTM | 316, 316L, 316LN, 316H and 316Ti |

In cases where creep strength is of secondary importance, Sandvik 19.12.3.LR is suitable for welding of corresponding stabilized austenitic steels. When a weld metal similar to the parent metal is not required, Sandvik 19.12.3.LR can be used for welding ferritic and martensitic steels.

### STANDARDS

- AWS E316L-17
- EN number E 19 12 3 LR

### CHEMICAL COMPOSITION - ALL WELD METAL

The following data are valid for all-weld metal.

### CHEMICAL COMPOSITION (NOMINAL), WT%

| C | Si | Mn | Cr | Ni | Mo |
|---|---|---|---|---|---|
| <0.02 | 0.8 | 0.7 | 18.5 | 10 | 2.7 |

### MICROSTRUCTURE - WELD METAL

Austenitic matrix with a ferrite content of 5–10 FN according to DeLong.

### MECHANICAL PROPERTIES - WELD METAL

The following data are valid for as welded all-weld metal.

### MECHANICAL PROPERTIES (NOMINAL), AT 20°C

| | | |
|---|---|---|
| Yield strength, $R_{P0.2}$ | MPa | 445 |
| Tensile strength, $R_M$ | MPa | 590 |
| Elongation, $A_5$ | % | 36 |
| Hardness | HB | 210 |

### IMPACT STRENGTH (NOMINAL), CHARPY V

| Temperature, °C | 20 | -40 |
|---|---|---|
| KV, J | 60 | 55 |

### CORROSION PROPERTIES - WELD METAL

Sandvik 19.12.3.LR is resistant to intergranular corrosion according to ASTM A262 practice E in the as-welded and quench-annealed condition.

### APPROVALS

- CE
- DNV
- TÜV

Contact your nearest sales office for full details.

**MARKING**

| | |
|---|---|
| Printing | Sandvik 19.12.3.LR/316L-17 |
| Tip colour | – |

**DEPOSITION AND WORKING DATA**

**ELECTRODE DATA**

| Electrode diameter, mm | 1.6 | 2.0 | 2.5 | 3.2 | 4.0 | 5.0 |
|---|---|---|---|---|---|---|
| Length, mm | 250 | 300 | 350 | 350 | 450 | 450 |
| Max deposition rate, kg weld metal/h (approx) | 0.60 | 0.77 | 1.06 | 1.54 | 2.22 | 3.28 |
| Effective value, kg weld metal/kg electrodes | 0.52 | 0.58 | 0.57 | 0.58 | 0.60 | 0.64 |
| Change value, electrodes/kg weld metal | 278 | 143 | 76 | 45 | 23 | 15 |
| Burn-off time per electrode at max current, s | 22 | 32 | 44 | 58 | 63 | 66 |
| Metal recovery | 109 | 106 | 108 | 107 | 107 | 104 |

## Working data

| | | |
|---|---|---|
| Welding positions | diameter <=3.2 mm | all except vertical down |
| | diameter >=4.0 mm | preferably flat position |
| Current/polarity | DC+ or AC | |

| Diameter, mm | Current, A |
|---|---|
| 1.6 | 25–50 |
| 2.0 | 30–60 |
| 2.5 | 45–80 |
| 3.2 | 70–120 |
| 4.0 | 90–160 |
| 5.0 | 150–220 |

DISCLAIMER:
Recommendations are for guidance only, and the suitability of a material for a specific application can be confirmed only when we know the actual service conditions. Continuous development may necessitate changes in technical data without notice. This datasheet is only valid for Sandvik materials.