

SANDVIK 59S

WELDING FLUX

DATASHEET

Sandvik 59S is a highly basic, agglomerated flux for electroslag strip surfacing. It gives excellent slag removal and bead appearance. Flux Sandvik 59S is used together with strip electrodes of nickel alloy type, such as ERNiCr-3, ERNiCrMo-3, ERNiCu7 and ERNiCrFe-7 or similar.

CHEMICAL COMPOSITION (NOMINAL), %

| SiO ₂ | Al ₂ O ₃ +TiO ₂ | CaO+MgO | F- |
|------------------|--|---------|----|
| 5 | 20 | 50 | 30 |

FLUX DATA

| | |
|---|---------------------------|
| Bulk weight | 1.0 kg/l |
| Basicity (Boniszewski) | 5.0 |
| Current capacity using 60 x 0.5 mm strip electrode | 3000 A |
| Flux consumption | 0.6 kg/kg strip electrode |
| Redrying, when necessary | 350°C, 4 h |

STRIP WELDING

ALLOYING VECTOR

The alloying vector describes the difference in chemical composition between the filler metal and the undiluted all-weld metal due to the influence of the flux.

| Element | Sandvik strip electrode | |
|---------|--------------------------|------------------------------|
| | Sanicro 72HP ERNiCr-3 | Sanicro 69HP (ERNiCrFe-7) |
| C | 0 | 0.003 |
| Si | 0 | +0.1 |
| Mn | -0.35 | -0.1 |
| Cr | -0.2 | -0.7 |
| Ni | +1.5 | +1.3 |
| N | +0.001 | +0.001 |
| Nb | -0.35 | -0.15 |

WELDING PARAMETERS

Direct current, with electrode positive is normally used.

| Strip electrode | Current, A | Voltage, V | Travel speed, mm/min |
|-----------------|------------|------------|----------------------|
| 30x0.50 | 500-700 | 24-28 | 140-180 |
| 60x0.50 | 1100-1300 | 24-28 | 140-180 |
| 90x0.50 | 1650-1800 | 24-28 | 140-180 |

SURFACING

The chemical compositions below are typical results after weld surfacing on A508 class 3.

| Alloy type | 600 | 690 |
|-----------------|--------------|--------------|
| No. of layers | 2 | 2 |
| Strip electrode | Sanicro 72HP | Sanicro 69HP |
| C | 0.01 | 0.01 |
| Si | 0.3 | 0.3 |
| Mn | 2.7 | 1.2 |
| Cr | 19.6 | 29.3 |
| Ni | 71.9 | 56.6 |
| Mo | 0.1 | 0 |
| Nb | 2.5 | 1.8 |
| N | 0.02 | 0.03 |
| Fe | 2.9 | 10.5 |

| Alloy type | 600 | 690 |
|------------------|--------------|--------------|
| No of layers | 3 | 3 |
| Strip electrodes | Sanicro 72HP | Sanicro 69HP |
| C | 0.01 | 0.01 |
| Si | 0.3 | 0.3 |
| Mn | 2.7 | 1.2 |
| Cr | 19.7 | 29.7 |
| Ni | 72.0 | 57.3 |
| Mo | 0.1 | 0 |
| Nb | 2.5 | 1.8 |
| N | 0.02 | 0.04 |
| Fe | 2.5 | 9.3 |

All four surfacing's have passed side bend testing (ASME IX) after heat treatment at 610°C for 24 hours.

WIRE WELDING

ALLOYING VECTOR

The alloying vector describes the difference in chemical composition between the filler metal and the undiluted all-weld metal due to the influence of the flux.

| Element | Sandvik wire electrode | |
|---------|------------------------|--------------|
| | Sanicro 72HP | Sanicro 69HP |

| | ERNiCr-3 | (ERNiCrFe-7) |
|----|----------|--------------|
| C | 0 | 0.003 |
| Si | 0 | +0.1 |
| Mn | -0.35 | -0.1 |
| Cr | -0.2 | -0.7 |
| Ni | +1.5 | +1.3 |
| N | +0.001 | +0.001 |
| Nb | -0.35 | -0.15 |

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.