

Sanicro® 625 is an austenitic nickel-chromium alloy characterized by:

- Extremely good corrosion resistance in widely varying acidic and chloride containing environments
- High strength
- Excellent fabrication properties.

Sanicro® 625 can be used in a wide range of temperatures from -196°C to 815°C (-321°F to 1500°F). Typical uses include hydraulic and instrumentation systems, heat-exchangers and high-temperature applications. However, it should be noted that prolonged exposure to temperatures above 600°C (1100°F) may lead to embrittlement.

## Standards

- UNS: N06625
- ISO: NW6625

## Product standards

ASTM B444, Grade 1 and Grade 2  
ASME SB444, Grade 1 and Grade 2  
ISO 6207

## Chemical composition (nominal)

### Chemical composition (nominal) %

| C     | Si  | Mn   | P      | S      | Cr   | Ni | Mo  | Fe | Nb  |
|-------|-----|------|--------|--------|------|----|-----|----|-----|
| 0.025 | 0.2 | 0.15 | ≤0.015 | ≤0.015 | 21.5 | 61 | 8.7 | 4  | 3.5 |

## Applications

Sanicro® 625 is an extremely versatile nickel alloy, suitable for use in both oxidizing and reducing acidic environments, such as:

- Hydrochloric acid
- Nitric acid
- Phosphoric acid

- Chloride containing environments

The grade can also be used for a wide range of temperatures from -196°C to 815°C (-321°F to 1500°F). Typical areas of use include hydraulic systems, heat-exchangers and high-temperature applications.

Some industrial examples are:

- High temperature aerospace
- Chemical process industry
- Power industry

## Corrosion resistance

### Wet corrosion

Sanicro® 625 shows very good resistance to pitting corrosion, intergranular corrosion and is virtually immune to stress corrosion cracking in chloride-containing environments. The grade is able to withstand general corrosion in both severe oxidizing and non-oxidizing acids.

Resistance in chloride environments is also extremely good owing to the high PRE number,  $\geq 48$ .

Pitting Resistance Equivalent, PRE  
 $PRE = \%Cr + 3.3 \times \%Mo + 16 \times \%N$

### High temperature corrosion

In addition to its excellent wet corrosion resistance, Sanicro® 625 is also able to resist oxidation and scaling at high temperature.

## Forms of supply

Sanicro® 625 seamless nickel alloy tubing is supplied bright annealed in the outside diameter range 6 - 42 mm (0.25" - 1.625") and wall-thickness 0.89 - 5.0 mm (0.035" - 0.197"). Some dimensions may be supplied annealed and white pickled.

Tubing is supplied as:

- Annealed (Grade 1)
- Solution annealed (Grade 2)

### Tolerances

Sanicro® 625, OD 6-42 mm EN 10305-1

| Size<br>OD, mm | Tolerances<br>OD, mm | Wall thickness % |
|----------------|----------------------|------------------|
| 6-30           | +/-0.08              | +/-10            |
| 32-40          | +/-0.15              | +/-10            |
| 42             | +/-0.20              | +/-10            |

## Mechanical properties

### At 20°C, metric units

| Condition             | Proof strength  | Tensile strength | Elongation |
|-----------------------|-----------------|------------------|------------|
|                       | $R_{p0.2}^{1)}$ | $R_m$            | $A_2''$    |
|                       | MPa             | MPa              | %          |
| Grade 1 <sup>2)</sup> | ≥415            | ≥827             | ≥30        |
| Grade 2 <sup>3)</sup> | ≥276            | ≥690             | ≥30        |

### At 68°F, imperial units

| Condition             | Proof strength  | Tensile strength | Elongation |
|-----------------------|-----------------|------------------|------------|
|                       | $R_{p0.2}^{1)}$ | $R_m$            | $A_2''$    |
|                       | ksi             | ksi              | %          |
| Grade 1 <sup>2)</sup> | ≥60             | ≥120             | ≥30        |
| Grade 2 <sup>3)</sup> | ≥40             | ≥100             | ≥30        |

1) Corresponds to 0.2% offset yield strength

2) Annealed at 871°C (1600°F) minimum

3) Solution annealed at 1093°C (2000°F) minimum

## Physical properties

Density: 8.36 g/cm<sup>3</sup>, 0.30 lb/in<sup>3</sup>

## Welding

The weldability of Sanicro® 625 is good. Suitable methods of fusion welding are manual metal-arc welding (MMA/SMAW) and gas-shielded arc welding, with the TIG/GTAW method as first choice.

For Sanicro® 625, heat-input of <1.5 kJ/mm and interpass temperature of <100°C (210°F) are recommended. A string bead welding technique should be used.

### Recommended filler metals

TIG/GTAW or MIG/GMAW welding

ISO 18274 S Ni 6625/AWS A5.14 ERNiCrMo-3 (e.g. Exaton Ni60)

MMA/SMAW welding

ISO 14172 E Ni 6625/AWS A5.11 ENiCrMo-3 (e.g. Exaton Ni60)

### 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 Alleima materials.