

Sanicro 59 is a nickel-chrome-molybdenum alloy of type alloy 59. It is a versatile alloy with excellent wet corrosion resistance for the most demanding applications. It combines excellent corrosion resistance in oxidizing and reducing media, has excellent resistance in chloride containing media and to localized corrosion environments. Sanicro 59 has excellent thermal stability compared to other common nickel alloys and has therefore outstanding resistance to intermetallic precipitation during welding. Applications for Sanicro 59 are found in aggressive and contaminated corrosive media including scrubbers for flue gas desulfurisation (FGD), chemical process plants and in severe offshore and petrochemical environments.

Sanicro 59 is used for joining matching alloys or dissimilar joining to other nickel alloys such as UNS N10276 (2.4819), type UNS N06022 (2.4602), UNS N06625 (2.4856) and N08825 (2.4858). It provides strong, tough, Nb-free weld metal for dissimilar welds in super-austenitic and super-duplex stainless steel joints or combinations of these with nickel alloys. Sanicro 59 can be used for surfacing.

STANDARDS

- ISO 18274: NiCr23Mo16/Ni 6059
- AWS A5.14/ASME SFA-5.14: ERNiCrMo-13
- W.Nr.: 2.4605

Product Approvals

- ISO 15156/NACE MR0175
- CE
- TÜV

Contact your nearest sales office for details.

Please note that the Werkstoff Nr. corresponds to the base material of the same grade.

CHEMICAL COMPOSITION (NOMINAL) %

Chemical composition (nominal) %

C	Si	Mn	P	S	Cr	Ni	Mo	Co	Al	Fe
≤0.010	≤0.10	≤0.5	≤0.015	≤0.010	23	59	15.5	≤0.3	0.3	≤0.5

APPLICATIONS

Applications for Sanicro 59 are found in contaminated mineral acid environments such as sulfuric acid, hydrochloric acid, phosphoric acid, nitric acid etc. Components in sulfuric acid coolers, digesters and bleachers. Chemical, petrochemical, marine, pharmaceutical, energy production and pollution control.

Sanicro 59 is approved in ISO15156/MR0175 (highest test level VII in sour-gas environments).

Sanicro 59 is used to weld most of the nickel alloys such as alloy 59, C-22, C-276 etc. It can also be used for

joining nickel alloys with duplex stainless steels, super duplex stainless steels and hyper duplex stainless steels.

FORMS OF SUPPLY

Sanicro 59 is available in wire and rods.

WELD METAL CHARACTERISTICS

The following data is typical for non heat treated all-weld metal made by the TIG, MIG or PAW methods using argon as shielding gas.

Chemical composition (nominal) %

C	Si	Mn	Cr	Ni	Mo
0.007	0.02	0.2	23	60	15.5

The microstructure is fully austenitic.

MECHANICAL PROPERTIES

Temperature	°C	20	-196
Yield strength, R _{p0.2}	MPa	470	-
Tensile strength, R _m	MPa	750	-
Elongation, A	%	40	-
Reduction in area, Z	%	45	-
Impact strength, Charpy V	J	170	130
Hardness, Vickers	HV10	250	-

CORROSION RESISTANCE

Sanicro 59 shows very good resistance to pitting corrosion, intergranular corrosion (corrosion rate <0.9 mm/year when tested acc. to ASTM G28 A) and is almost immune to stress corrosion cracking in chloride-containing environments.

FABRICATION

Recommended welding data

MIG/GTAW welding

Electrode positive is used to give good penetration in all types of welding joint. The table shows common conditions for MIG welding.

Wire diameter, mm (in.)	Wire feed, m/mm (in./min)	Current, A	Voltage, V	Gas, l/min. (CFH)
Spray arc welding				
1.0 (0.039)	6 - 12 (236-472)	150 - 230	26 - 31	22 (46)
1.2 (0.047)	5 - 9 (197-354)	170 - 280	27 - 32	22 (46)
1.6 (0.063)	3 - 5 (118-197)	230 - 370	29 - 33	22 (46)
Pulsed arc welding ¹⁾				
1.2 (0.047)	3 - 10 (118-394)	150 - 250	23 - 31	20 (42)

¹⁾ Pulse parameters:

- Peak current 300 - 400 A
- Background current 50 - 150 A

- Frequency 80 - 120 Hz

Shielding gases are used for sufficient protection of the weld pool.

TIG/GTAW welding

The parameters for TIG welding depend largely upon the base metal thickness and the welding application.

Electrode negative and a shielding gas of argon or helium should be used to prevent oxidation of the weld metal.

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.