



Grade	Code	UNS	Austenitic Stainless Steel
AISI 309S	X12CrNi23-13	S30908	

Steel Properties

AISI 309S is an austenitic stainless steel grade designed to retain its mechanical integrity and surface stability under elevated-temperature conditions. Its main characteristics include strong resistance to oxidation at high temperatures, good weldability, and resistance to thermal cycling. In the annealed condition, it provides good ductility and formability, while its austenitic structure can cause noticeable work hardening during processing. **AISI 309S** is designed to perform more effectively in high-temperature service conditions than standard austenitic stainless steels.

Chemical Analysis (AISI 309S)

C %	Mn %	Si %	P %	S %	Cr %	Ni %	Fe %
≤ 0.08	≤ 2.00	≤ 1.00	≤ 0.045	≤ 0.03	22.00 – 24.00	12.00 – 15.00	Balance

Mechanical Properties (Solution annealed)

Product Form	Rp0.2 [MPa]	Rm [MPa]	Elongation [%]	Hardness [HB]	Density [g/cm ³]
Bar	≥ 205	≥ 515	≥ 30	—	7.90
Plate	≥ 205	≥ 515	≥ 40	≤ 217	7.90
Sheet	≥ 205	≥ 515	≥ 40	≤ 217	7.90

* Mechanical properties for bar products are given based on **ASTM A479/A479M**.

** Mechanical properties for plate and sheet products are given based on **ASTM A240/A240M**.

Application Area

Sector	Most Common Products
Heat Treatment and Industrial Furnaces	Annealing boxes, retorts and muffles, furnace fans and shafts
Iron & Steel and Metallurgy	Radiant tubes, thermowells, furnace baffle plates
Energy and Incineration Plants	Boiler baffle plates, burner components, boiler tube hangers
Cement and Mineral Processing	Rotary kiln components, calciner components, high-temperature furnace equipment
Glass Industry	Glass forming equipment, annealing furnace components, thermowells
Industrial Process Equipment	Salt bath vessels, heat exchangers, high-temperature baffle plates



Description

AISI 309S, is a stainless steel noted for its ability to operate for extended periods at elevated temperatures. It can be used in equipment exposed to repeated heating and cooling and is suitable for welded fabrication. However, it does not provide the same performance in every high-temperature environment; the service atmosphere, exposure time at temperature, and whether the component is under load are important factors in material selection. In addition, **AISI 309S** is intended for high-temperature service and therefore should not be selected as a direct substitute for corrosion-focused grades such as 316L, 904L, or similar materials in chloride-bearing or highly aggressive chemical environments.

Norm

AISI 309S, UNS S30908, 1.4833, X12CrNi23-13,

Standard

Product Form	ASTM Specification
Bar	ASTM A276/A276M, ASTM A479/A479M
Plate	ASTM A240/A240M
Sheet	ASTM A240/A240M

Alternative Grades

1. **AISI 310S** – Offers higher temperature and oxidation resistance than 309S.
2. **AISI 314** – A close alternative with strong resistance to oxidation at high temperatures.
3. **316Ti** – Its stabilized structure makes it suitable for consideration in certain hot-service and welded applications.