



Grade	Code	UNS	Austenitic Stainless Steel
254 SMO/ 1.4547	X1CrNiMoCuN20-18-7	S31254	

Steel Properties

254 SMO/ 1.4547 is a highly alloyed super-austenitic stainless steel grade. Compared with conventional austenitic stainless steels, it offers much higher resistance to pitting, crevice corrosion, general corrosion and stress corrosion cracking. This grade combines high mechanical strength with good ductility, formability and weldability, providing a long service life under aggressive operating conditions.

Chemical Analysis (254 SMO/ 1.4547)

C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	N %	Cu %	Fe %
≤0,020	≤0,70	≤1,00	≤0,030	≤0,010	19,50– 20,50	17,50– 18,50	6,00– 7,00	0,18– 0,25	0,50– 1,00	Bal.

Mechanical Properties (Solution annealed)

Product form	Rp0.2 [MPa]	Rm [MPa]	Elongation [%]	Hardness [HB]	Density [g/cm ³]
Bar	≥300	650–850	≥35	≤250	8,00
Plate – quarto	≥310	655–850	≥40	≤223	8,00
Sheet – cold rolled	≥320	690–850	≥35	≤223	8,00

Application Areas

Industry	Common Products
Marine and shipbuilding	Seawater piping, ballast water treatment UV chambers, marine exhaust gas scrubbers
Offshore oil and gas	Hydraulic and instrumentation tubing, manifolds, valve bodies
Chemical and petrochemical	Process piping, chemical storage tanks, heat exchangers
Pulp and paper	Bleaching towers, bleaching chemical piping, tall oil distillation columns
Flue gas cleaning	Scrubber and absorber bodies, spray pipes and nozzles, flue gas ducts
Desalination and water treatment	High-pressure seawater piping, evaporators and brine heaters, heat exchangers
Power generation	Condenser tubes, seawater cooling lines, flue gas desulfurization equipment
Food and beverage	Process tanks, hygienic piping, plate heat exchangers
Pharmaceutical and bioprocess	Reactor vessels, high-purity process piping, CIP cleaning system equipment
Mining and hydrometallurgy	Leach tanks, corrosive slurry pipelines, pump and valve components



Description

254 SMO/ 1.4547 is a grade that requires somewhat tighter control during fabrication than standard austenitic stainless steels. During machining, low cutting speeds and suitable cutting tools are preferred due to work hardening, while welding operations require controlled heat input and suitable nickel-based filler metals. When necessary, solution annealing is performed at 1150–1200 °C followed by rapid cooling. Since intermetallic phases may form, it is not suitable for long-term use in the 600–1000 °C range; however, thanks to its austenitic structure, it can exhibit very good impact strength down to –196 °C. Therefore, **254 SMO/ 1.4547** is a special stainless steel grade that retains its reliability at low temperatures but is not preferred for continuous high-temperature service.

Designations

254 SMO®, EN 1.4547, DIN/W.Nr. 1.4547, X1CrNiMoCuN20-18-7, UNS S31254, ASTM A182 F44

Standard

Product form	ASTM specification
Bar	ASTM A276/A276M, ASTM A479/A479M
Plate	ASTM A240/A240M – UNS S31254
Sheet	ASTM A240/A240M – UNS S31254
Pipe – seamless	ASTM A312/A312M, ASTM A213/A213M, ASTM A269/A269M
Pipe – welded	ASTM A312/A312M, ASTM A249/A249M, ASTM A269/A269M, ASTM A358/A358M, ASTM A409/A409M

Alternative Grades

1. Alloy 926 – EN 1.4529 / UNS N08926
2. Super Duplex 2507 – EN 1.4410 / UNS S32750 / F53
3. AISI 904L – EN 1.4539 / UNS N08904