

310MoLN, 1.4466, Stainless Steel

SS 310MoLN, WNR 1.4466, UNS S31050, AISI 310MoLN,
Grade 310MoLN, AFNORZ 1 CND25.22AZ

310moln stainless steel grade is a fully austenitic stainless steel that does not have intermetallic phases such as intergranular carbide precipitations. For applications in urea plants 310MoLN steel grade has a specifically designed optimized chemical composition. To stabilize and strengthen the austenitic phase the nitrogen in the chemical composition helps. 310 MoLN, material gives excellent corrosion-resistance in urea carbamate environments such as high-pressure strippers. Among wrought austenitic stainless steels it has a fairly high base cost. And it has a fairly high embodied energy and a fairly low ductility.

Material	
Material designation	
1.4466	SEL
S31050	UNS
X1CrNiMoN25-22-2	EN
310 MOLN	AISI
Standards	
10088-3	EN ISO
310MoLn A182	ASTM

Chemical Composition						
	SS 310MoLN	WNR 1.4466	UNS S31050	AISI 310MoLN	GRADE 310MoLN	AFNORZ1C ND25.22AZ
Carbon	0.020max	0.020max	0.020max	0.020max	0.020max	0.020max
Manganese	2.00max	2.00max	2.00max	2.00max	2.00max	2.00max
Chromium	24.0-26.0	24.0-26.0	24.0-26.0	24.0-26.0	24.0-26.0	24.0-26.0
Phosphorus	0.025max	0.025max	0.025max	0.025max	0.025max	0.025max
Sulfur	0.010max	0.010max	0.010max	0.010max	0.010max	0.010max
Molybdenum	2-2.50	2-2.50	2-2.50	2-2.50	2-2.50	2-2.50
Nickel	21.0-23.0	21.0-23.0	21.0-23.0	21.0-23.0	21.0-23.0	21.0-23.0
Nitrogen	0.10-0.16	0.10-0.16	0.10-0.16	0.10-0.16	0.10-0.16	0.10-0.16
Silicon	0.70max	0.70max	0.70max	0.70max	0.70max	0.70max
Iron	Bal	Bal	Bal	Bal	Bal	Bal

Mechanical Properties

	SS 310MoLN	WNR 1.4466	UNS S31050	AISI 310MoLN	GRADE 310MoLN	AFNORZ1 CND25.22 AZ
Tensile Strength, Mpa(psi)	540-740 (78320-1073 27)	540-740 (78320-1073 27)	540-740 (78320-1073 27)	540-740 (78320-1073 27)	540-740 (78320-107 327)	540-740 (78320-107 327)
Yield Strength, Mpa(psi)	250(36259)	250(36259)	250(36259)	250(36259)	250(36259)	250(36259)
Elongation %	40	40	40	40	40	40
Reduction in Area, %	-	-	-	-	-	-
Hardness, Brinell	95	95	95	95	95	95

The grade is characterized by :

- Excellent resistance to corrosion in ammonium carbamate and nitric acid
- Excellent resistance to intergranular corrosion
- High resistance to pitting and crevice corrosion
- Good weldability

Applications:

- Stripper Tubes
- Outerlayer of bimetallic
- Ferrules
- Carbamate Condensers
- Decomposers
- Reactor Coils

General corrosion

- S31050 was originally developed for stripper tubes used in the production of urea.
- S31050 has excellent corrosion resistance in urea/carbamate solutions at high pressures and temperatures.
- S31050 is also highly resistant to inorganic acids

Intergranular corrosion

- S31050 is highly resistant to intergranular corrosion after welding.

Pitting and crevice corrosion

- S31050 has very good resistance to pitting, and is also far more resistant to crevice corrosion than ASTM 316L.

Stress corrosion cracking (SCC)

- Conventional austenitic stainless steels of type ASTM 304 and 316 are susceptible to stress corrosion cracking (SCC) in chloride-bearing solutions at temperatures exceeding about 60°C (140°F). The higher nickel content makes S31050 slightly more resistant

Erosion corrosion

- The good mechanical strength of S31050 makes it resistant to erosion-corrosion. Ferrules for urea strippers are one application where this property is utilised.

Weldability

- The weldability of S31050 is good. Welding must be carried out without preheating, and normally there is no need for any subsequent heat treatment.
- S31050 has low thermal conductivity and high thermal expansion.