316L mod

316L mod has been specially developed for urea plant applications. It is a 316L modified stainless steel with extra-low silicon content and substantial higher molybdenum content. The low carbon content, combined with a well-balanced chemistry, makes the alloy fully austenitic, free of intermetallic phase precipitations. The ferrite level is kept under 0.6% in the solution annealing and water quenched conditions. The alloy is designed for improved corrosion resistance properties in urea-carbonate environments and can meet the Huey test easily as a Urea grade stainless steel. The general corrosion rate is normally set at 0.6 mm/year maximum for unsensitized material (ASTM A262 Practice C – five periods of 48h, lower than 3.3um/48h).

Chemical Composition, %

element	Cr	Ni	Fe	Mo	N	C	Mn	Si	P	S
min.	17.00	13.00	bal.	2.20						
max.	18.50	15.00		3.00	0.22	0.030	2.00	1.00	0.040	0.030

Chemical Composition according to 30-A10S-95. Some compositional limits of other specifications may vary slightly.

Designation and standards

National Standards	Material designation	Chemical composition	Forgings	Rod and bar	Plate and sheet	Strip	Seamless tube
CWCEC	316L mod	30-A10S-95	30-A10S-95	30-A10S-95	30-A10S-95	30-A10S-95	30-A10S-95
DIN	1.4435 X2CrNiMo18-14-3	DIN 10088-1	DIN 10222-5	DIN 10088-3 DIN 10272	DIN 10088-2	DIN 10088-2	DIN 10297-2 DIN 10216-5

Density 7.90g/cm^3

Corrosion resistance

- high resistance to corrosion in ammonium carbamate
- high resistance to intergranular corrosion

Applications

Typical urea plant applications of Urea Grade 316L mod are:

- carbamate condensers
- scrubbers
- decomposers
- high pressure piping.