SINOXX 4435 Steel

Designation by Standards

Brand Name	Ravne	Mat. No.	DIN	EN	AISI/SAE
SINOXX 4435	PK327	1.4435	-	X2CrNiMo18-14-3	316L

Chemical Composition (in weight %)

C	Si	Mn	Cr	Mo	Ni	V	W	Others
max. 0.03	max. 1.00	max. 2.00	18.00	2.75	13.75	-	-	-

Description
SINOXX 4435 is often substituted for 316 stainless due to its superior weldability with no appreciable difference in price or properties. It combines good availability in all forms and size ranges with great strength and corrosion resistance.

Applications
Components used in marine environments and chemical equipment. Suitable for any application where 316 stainless is used and stronger welds are desirable.

Physical properties (average values) at ambient temperature
Modulus of elasticity [10^3 x N/mm^2]: 200, 186 (200^{o}C), 172 (400^{o}C)
Density [g/cm^3]: 8.0
Thermal conductivity [W/m.K]: 15.0
Electric resistivity [Ohm mm^2/m]: 0.75
Specific heat capacity[J/g.K]: 0.500
Magnetisable: No

Coefficient of Linear Thermal Expansion 10^{-6} ^{o}C^{-1}

20-100^{o}C	20-300^{o}C	20-500^{o}C
16.0	17.0	18.0

Quenching
Harden from a temperature of 1020-1120^{o}C followed by water or air (sufficiently fast) quenching. Structure is austenite.

Mechanical properties at at ambient temperature
Condition: Solution-Annealed condition

For diameter d<=160 mm
0.2% proof stress: 200 N/mm^2
1% proof stress: 225 N/mm^2
Tensile strength: 500-700 N/mm^2
Elongation: 40% (Longit.)
Charpy notch (ISO-V): 100 J (Longit.)

For diameter 160<d<=250 mm
0.2% proof stress: 200 N/mm^2
1% proof stress: 225 N/mm^2
Tensile strength: 500-700 N/mm^2
Elongation: 30% (Transv.)

Charpy notch (ISO-V): 60 J (Transv.)

Resistance to intercrystalline corrosion
In as delivered condition: Yes
In sensitised condition: Yes

0.2% Proof Stress in N/mm^2 vs. Temperature in ^{o}C

100^{o}C	150^{o}C	200^{o}C	250^{o}C	300^{o}C	350^{o}C	400^{o}C	450^{o}C	500^{o}C	550^{o}C
200	180	165	153	145	139	135	130	128	127

1% Proof Stress in N/mm^2 vs. Temperature in ^{o}C

100^{o}C	150^{o}C	200^{o}C	250^{o}C	300^{o}C	350^{o}C	400^{o}C	450^{o}C	500^{o}C	550^{o}C
165	150	137	127	119	113	108	103	100	98

Forging
Hot forming temperature: 1200-900^{o}C, slow cooling in air.

Machinability
Low speeds and constant feeds will minimize this alloy's tendency to work harden. Tougher than 304 stainless with a long stringy chip, the use of chip breakers is recommended.

Welding
All common fusion and resistance methods except oxyacetylene welding have proven successful. Use AWS E/ER 316L filler metal for best results.

Corrosion Resistance
Resistant to a wide variety of marine environments, salts, dilute nitric, acetic and sulfuric acids.

Cold working
Shearing, stamping, heading and drawing can be successfully performed . To remove internal stresses, a post-work annealing is recommended.

Forms manufactured: Please see the Dimensional Sales Program.

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