

1.3816, X8CrMnN18-18, ASTM A289 - Non-magnetic Steel Datasheet

1.3816, [X8CrMnN18-18](#), ASTM [A289](#) Nonmagnetic retaining rings for 50MW-200MW power generator, acc. to ASTM A289, SEW 390

Chemical Composition

Grade	Chemical composition WT %										
	C	Si	Mn	P	S	Cr	Ni	N	Ti	V	Al
ASTM A289	0.10	0.8	17.5-20	0.06	0.015	17.5-20	2.00	0.45-0.80	0.10	0.25	0.04
1.3816, X8CrMnN18-18	0.12	1.0	17.5-20	0.06	0.03	17.5-20	1.00	0.40-0.70			

Mechanical Properties

- Grade 1
 - Tensile strength ksi/MPa: min 145/1000
 - 0.2% Offset Yield Strength Psi/MPa: Min 135/930
 - Elongation in 2 in. or 50mm, min 28%
 - Reduction of Area, min 60%
 - Charpy V-Notch Energy, min. ft/lb/J: 70/95
- Grade 2
 - Tensile strength ksi/MPa: min 155/1070
 - 0.2% Offset Yield Strength Psi/MPa: Min 145/1000
 - Elongation in 2 in. or 50mm, min 25%
 - Reduction of Area, min 55%
 - Charpy V-Notch Energy, min. ft/lb/J: 65/88
- Grade 3
 - Tensile strength ksi/MPa: min 165/1140
 - 0.2% Offset Yield Strength Psi/MPa: Min 160/1105
 - Elongation in 2 in. or 50mm, min 20%
 - Reduction of Area, min 50%
 - Charpy V-Notch Energy, min. ft/lb/J: 60/81
- Grade 4
 - Tensile strength ksi/MPa: min 170/1170

- 0.2% Offset Yield Strength Psi/MPa: Min 165/1140
- Elongation in 2 in. or 50mm, min 19%
- Reduction of Area, min 48%
- Charpy V-Notch Energy, min. ft/lb/J: 58/79
- Grade 5
 - Tensile strength ksi/MPa: min 175/1205
 - 0.2% Offset Yield Strength Psi/MPa: Min 170/1170
 - Elongation in 2 in. or 50mm, min 17%
 - Reduction of Area, min 45%
 - Charpy V-Notch Energy, min. ft/lb/J: 55/75
- Grade 6
 - Tensile strength ksi/MPa: min 185/1275
 - 0.2% Offset Yield Strength Psi/MPa: Min 180/1240
 - Elongation in 2 in. or 50mm, min 14%
 - Reduction of Area, min 40%
 - Charpy V-Notch Energy, min. ft/lb/J: 50/68
- Grade 7
 - Tensile strength ksi/MPa: min 195/1345
 - 0.2% Offset Yield Strength Psi/MPa: Min 190/1310
 - Elongation in 2 in. or 50mm, min 12%
 - Reduction of Area, min 35%
 - Charpy V-Notch Energy, min. ft/lb/J: 40/54
- Grade 8
 - Tensile strength ksi/MPa: min 200/1380
 - 0.2% Offset Yield Strength Psi/MPa: Min 195/1345
 - Elongation in 2 in. or 50mm, min 10%
 - Reduction of Area, min 30%
 - Charpy V-Notch Energy, min. ft/lb/J: 35/47

Physical Properties

- Modulus of elasticity [$10^3 \times \text{N/mm}^2$]: 195

- Density [g/cm³]: 7.70

20-100°C	20-200°C	20-300°C	20-400°C
16.0	17.10	17.90	18.70

Heat Treatment

Harden from a temperature of 1020-1120°C followed by water or air quenching.

Hot forming temperature: 1150-950°C.

Welding Properties

Machining Properties

Similar or Equivalents Steel Grade

1.3816, X8CrMnN18-18, ASTM A289 Grade 3, P900