



# ZERON<sup>®</sup> 100, SUPER DUPLEX

## UNS No - S32760

Zeron 100 is a super duplex stainless steel. It is a highly alloyed stainless steel intended for use in forceful situations. High strength, toughness, magnificent corrosion resistance and its resistance to corrosion in a wide range of organic and inorganic acids is only a couple of attributes that make this duplex stainless steel attractive to a variety of industries. In conclusion, it is highly resistant to strong alkalis and resists corrosion in various non-oxidizing acids. Utilization of this super duplex stainless steel is not recommended when it includes extended exposure to temperatures greater than 572° F. This exposure causes a considerable reduction in toughness. Notice the chemical composition of duplex 2507 and Zeron 100 are same; however, Zeron 100 contains marginally more copper and tungsten. The copper substance (min. 0.5, max 1.0) grants magnificent resistance to corrosion in many non-oxidizing and mineral acids like hydrochloric and sulfuric acid.

### Applications

- Oil and gas industry applications
- Pollution control
- Pulp and paper
- Power generation
- Flue-gas desulfurization
- Chemical, pharmaceutical
- Desalination
- Mining and mineral industries
- Marine industries

### Characteristics

- Guaranteed corrosion performance (PREn  $\geq$  40)
- Excellent corrosion resistance in mineral acids such as hydrochloric and sulfuric
- High resistance to pitting and crevice corrosion
- Excellent resistance to stress corrosion cracking in both chloride and sour environments
- High resistance to erosion corrosion and corrosion fatigue
- Excellent mechanical properties
- Possibility for weight reduction over austenitic, standard duplex and nickel base alloys
- Good weldability

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## Machining

ZERON 100 requires a slightly more careful in machining than the 300 series austenitic. If heavy or uneven machining to tight tolerances is to be completed on wrought ZERON 100 components, machining should be done in stages. If all else fails, a stress relieving heat treatment can be enforced, however, this can result in a reduction of toughness and corrosion resistance. Literature giving points of cutting speeds, tool materials, etc. for an extensive range of machining operations is accessible from our Sales Department.

## Forming

Can be cold worked by each and every standard technique.

## Welding

Where a solution anneal and extinguish as a post-weld heat treatment is to be done, ZERON 100 is normally welded with coordinating composition consumables (ZERON 100M). With over alloyed consumables (ZERON 100X), no post-weld heat treatment is essential. Corrosion and mechanical properties like the parent metal can be acquired after recommended techniques. An individual brochure on the optimum parameters for a scope of welding operations is available from our Sales Department.

## Heat Treatment

ZERON 100 should be solution annealed in the temperature scope 1100-11400C (2012-20840F) after by water quenching.

## Cold Working

ZERON 100 can be sufficiently cold formed by different process, however the high mechanical properties should be considered into account. It is recommended that any cold work in excess of 10%-15% is removed by solution annealing and water quenching. It should be noticed that cold working over these limits can result in hardness levels above those predetermined standards, for example, NACE MR0175.

## Hot Working

Hot forming of ZERON 100 should be completed in the temperature range 11000C TO 12800C (2012-23360F). It is recommended that this is pursued by solution annealing and water quenching. Segments should subsequently be pickled or completely machined.

## Chemical Properties

C	N	Si	P	S	Cr	Mn	Fe	Ni	Cu	Mo	W
0.05 Max	0.2-0.3	1.0 Max	0.03 Max	0.01 Max	24.0 - 6.0	1.0 Max	Balance	6.0- 8.0	0.50- 1.0	3.0- 4.0	0.5- 1.0

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## Mechanical Properties

Tensile Strength (ksi)	0.2% Yield Strength (ksi)	Elongation% in 2 inches
109 - 130	80	25

## Physical Properties

Properties	Units	Temperature in °C
Density	7.84 g/cm <sup>3</sup>	Room
Specific Heat	0.115 Kcal/kg.C	20°
Melting Range	1377-1455 °C	-
Modulus of Elasticity	199 KN/mm <sup>2</sup>	22°
Electrical Resistivity	85.1 μΩ.cm	Room
Coefficient of Expansion	11.1 μm/m °C	20-100°
Thermal Conductivity	14.2 W/m-°K	20°

## ASTM Specifications

Pipe / Tube	Sheet / Plate	Bar
A 790, A 928, A 789	A 240	A 276

## Availability

MANUFACTURING
Fasteners
Custom Machining
Custom Fabrication
Piping / Spools
Stamped Parts
Flanges
Compression Fittings

RAW MATERIALS
Pipes
Tubes
Bars
Sheets
Plates
Wires

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