



## Alloy 316/316L

### Quick Facts

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Alloy 316 and or 316L [UNS S31600/S31603] is a chromium-nickel-molybdenum austenitic stainless steel, developed to provide improved corrosion resistance to Alloy 304/304L in moderately corrosive environments. It is often used in processes which containing chlorides and/ or halides. It also provides higher creep, stress-to-rupture and tensile strength at elevated temperatures. It is common practice to be dual certified as 316/316L. Reason, low carbon of 316L combined with an addition of nitrogen enables 316L to meet mechanical properties of 316. It is a non-magnetic Alloy in annealed condition, but can be slightly magnetic as a result of cold working or welding.

### Typical Applications

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- Chemical and Petrochemical processing, vessel, tanks, heat exchanger, piping systems, valves and pumps,
- Food and Beverage processing
- Marine
- Medical
- Pharmaceutical processing
- Water treatment
- Textiles
- Power generation and Nuclear



## Stock Range

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We stock a comprehensive range of round bars, sizes between 14mm and 280mm in diameter  
Flat Bars with a thickness between 18mm – 84mm and a width max. of 250mm.

We are offering as well:

General forgings

Rings

Blocks

Primarily manufactured in: Europe, US

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## Industry Specifications

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- ASTM A240
- ASME SA 240
- AMS 5524/5507
- QQ-S-766

Material may also be supplied against Customer specifications, subject to enquiry.

## Melting Practices

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- VIM/ESR or VAR
- Triple melted



## Chemical Analysis

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### Chemical Composition, % 316

	C	Mn	P	S	Si	Cr	Ni	Mo	N	-	-	-	-	-	Fe
Min	-	-	-	-	-	16	10	2.00	-	-	-	-	-	-	Bal.
Max	0.08	2.00	0.045	0.03	0.75	18	14	3.00	0.10	-	-	-	-	-	Bal.

### Chemical Composition, % 316L

	C	Mn	P	S	Si	Cr	Ni	Mo	N	-	-	-	-	-	Fe
Min	-	-	-	-	-	16	10	2.00	-	-	-	-	-	-	Bal.
Max	0.03	2.00	0.045	0.03	0.75	18	14	3.00	0.10	-	-	-	-	-	Bal.

## Mechanical Properties

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	Tensile Strength (ksi) min.	Yield Strength (0.2% offset), (ksi) min.	Elongation in 2" or 4D min%	Reduction of Area, %	Hardness, Rockwell B	-
316	75	30	40	-	95 max	-
316L	70	25	40	-	95 max	-
Typical	85	44	56	69	81	-



## Machinability

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Alloy 316/316L is subject to work hardening during deformation and is subject to chip breaking. The best machining results are achieved with slower speed, heavier feeds, excellent lubrication, sharp tooling and powerful rigid equipment.

## Corrosion Resistance

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In most applications Alloy 316/316L has superior corrosion resistance to Alloy 304/304L. Alloy 316/316L performs well in sulfur containing e.g. in pulp and paper industry. One exception is in highly oxidizing acids such as nitric acid.

Alloy 316/316L also has good resistance to pitting in phosphoric and acetic acid. It performs well in boiling 20% phosphoric acid. The alloy can also be used in the food and pharmaceutical process industries where it is utilized to handle hot organic and fatty acids in an effort to minimize product contamination.

Alloy 316/316L performs well in fresh water service even with high levels of chlorides. The alloy has excellent resistance to corrosion in marine environments under atmospheric conditions.

The higher molybdenum content of Alloy 316/316L assures it will have superior pitting resistance to Alloy 304/304L in applications involving chloride solutions, particularly in an oxidizing environment.

In most instances, the corrosion resistance of Alloys 316 and 316L will be roughly equal in most corrosive environments. However, in environments that are sufficiently corrosive to cause intergranular corrosion of welds and heat-affected zones Alloy 316L should be used because of its low carbon content.