

304/L

Austenitic Grade

DESCRIPTION:

304/L is the low carbon variation of 304 (max carbon of .03) stainless steel. It is one of the most common and versatile grades of stainless steel.

This austenitic grade exhibits excellent corrosion resistance, formability, and weldability. Some refer to 304/L as 18/8 stainless for its minimum of 18% chromium and 8% nickel. 304/L meets the corrosion properties of 304 and has slightly lower mechanical properties.

APPLICATIONS:

- Food Processing
- Architectural
- Kitchen and Appliance
- Construction
- Chemical Processing

CHEMICAL COMPOSITION:

Carbon	0.03 max
Chromium	18.0 – 20.0
Nickel	8.0 – 11.0
Manganese	2.0 max
Silicon	0.75 max
Nitrogen	0.10 max
Phosphorus	0.045 max

MECHANICAL PROPERTIES:

Yield Strength	25 KSI min
Tensile Strength	70 KSI min
Elongatin	40%
Hardness	92 Rockwell B

STAINLESS STRUCTURALS CAN PRODUCE THIS ALLOY IN BEAMS, CHANNELS, ANGLES, TEES AND CUSTOM SHAPES.

Disclaimer:

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304H

Austenitic Grade

DESCRIPTION:

304H grade is a modification of the most widely used 18/8 stainless. 304H has a controlled carbon content (carbon of .04 to .10 %) which increases its strength at elevated temperatures.

304H has a corrosion resistance similar to 304/304L. This austenitic grade is subject to carbide precipitation in weld zones due to its higher carbon content.

APPLICATIONS:

- Oil and Gas
- Boilers and Heat Exchangers
- Power and Industrial Plants

CHEMICAL COMPOSITION:

Carbon	0.04 – 0.10
Chromium	18.0 – 20.0
Nickel	8.0 – 10.5
Manganese	2.0 max
Silicon	0.75 max
Nitrogen	0.10 max
Phosphorus	0.045 max

MECHANICAL PROPERTIES:

Yield Strength	30 KSI min
Tensile Strength	75 KSI min
Elongatin	40%
Hardness	92 Rockwell B

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305

Austenitic Grade

DESCRIPTION:

305 grade is an austenitic stainless grade that has a slightly higher nickel content that decreases work hardening. The corrosion resistance of 305 is similar to 304.

This alloy is mainly used in deep drawing applications and cannot be hardened by heat treatment. 305 is very formable but when welded it can have hot cracking at the seams.

APPLICATIONS:

- Cold Drawing applications
- Electronic parts
- Deep Drawn parts

CHEMICAL COMPOSITION:

Carbon	0.12 max
Chromium	17.0 – 19.0
Nickel	10.0 – 13.0
Manganese	2.0 max
Silicon	1.0 max
Phosphorus	0.04 max

MECHANICAL PROPERTIES:

Yield Strength	30 KSI min
Tensile Strength	75 KSI min
Elongation	40%
Hardness	92 Rockwell B

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308

Austenitic Grade

DESCRIPTION:

308 is an austenitic grade of stainless steel. It is most commonly used as a filler material when welding type 304 stainless. 308 grade contains 20% chromium and 11% nickel.

APPLICATIONS:

- Filler material when welding 304 Stainless

CHEMICAL COMPOSITION:

Carbon	0.8 max
Chromium	19.0 – 21.0
Nickel	10.0 – 12.0
Manganese	2.0 max
Silicon	0.75 max
Phosphorus	0.045 max

MECHANICAL PROPERTIES:

Yield Strength	30 KSI min
Tensile Strength	85 KSI min
Elongation	40%
Hardness	88 Rockwell B

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316/L

Austenitic Grade

DESCRIPTION:

316/L is the lower carbon variation of 316 (max carbon of .03) stainless steel. This austenitic grade provides higher corrosion and pitting resistance than type 304/304L because of its higher nickel and molybdenum content. 316/L also has higher strength at elevated temperatures and it avoids carbide precipitation due to welding. 316/L has excellent weldability but is more difficult to form and machine than type 304. 316/L has slightly lower mechanical properties than straight 316 grade.

APPLICATIONS:

- Chemical Processing
- Food Processing / Packaging
- Water/Wastewater and Marine
- Pulp and Paper
- Construction

CHEMICAL COMPOSITION:

Carbon	0.03 max
Chromium	16.0 – 18.0
Nickel	10.0 – 14.0
Manganese	2.0 max
Silicon	0.75 max
Nitrogen	0.10 max
Phosphorus	0.045 max

MECHANICAL PROPERTIES:

Yield Strength	25 KSI min
Tensile Strength	70 KSI min
Elongatin	40%
Hardness	95 Rockwell B

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316LN

Austenitic Grade

DESCRIPTION:

316LN is a low carbon, nitrogen enhanced version of 316 grade. 316LN has increased corrosion and pitting resistance compared to 304/304L. The nitrogen in this grade of stainless adds resistance to sensitization, provides solid solution hardening, and raises the minimum yield strength compared to type 316/L.

APPLICATIONS:

- Medical Devices / Surgical Instruments
- Pharmaceutical Industry
- Chemical Industry
- Textiles
- Pulp and Paper

CHEMICAL COMPOSITION:

Carbon	0.03 max
Chromium	16.0 – 18.0
Nickel	10.0 – 14.0
Manganese	2.0 max
Silicon	0.75 max
Nitrogen	0.10 – 0.16
Phosphorus	0.045 max

MECHANICAL PROPERTIES:

Yield Strength	30 KSI min
Tensile Strength	75 KSI min
Elongatin	40%
Hardness	95 Rockwell B

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316Ti

Austenitic Grade

DESCRIPTION:

316Ti is a titanium-stabilized version of type 316. It has the same corrosion and pitting resistance as 316. The addition of titanium creates a resistance to sensitization and protects against chromium carbide precipitation. This alloy can be used for extended times at higher temperatures without compromising its corrosion resistance.

APPLICATIONS:

- Marine
- Pulp and Paper
- Heat Exchangers
- Processing and Packaging

CHEMICAL COMPOSITION:

Carbon	0.08 max
Chromium	16.0 – 18.0
Nickel	10.0 – 14.0
Titanium	5*C+N min - .70 max
Manganese	2.0 max
Silicon	0.75 max
Nitrogen	0.10 max
Phosphorus	0.045 max

MECHANICAL PROPERTIES:

Yield Strength	30 KSI min
Tensile Strength	75 KSI min
Elongation	40%
Hardness	95 Rockwell B

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317/L

Austenitic Grade

DESCRIPTION:

317/L is an austenitic stainless with increased nickel, chromium, and molybdenum to provide better corrosion resistance and a higher resistance to chemical effects from acids.

The lower carbon content in 317/L allows for resistance to intergranular corrosion and a higher tensile strength at higher temperatures. 317/L is weldable but it is more difficult to machine than 304 and 316.

APPLICATIONS:

- Chemical Plants
- Textiles
- Petrochemical processing
- Food Processing
- Pulp and Paper

CHEMICAL COMPOSITION:

Carbon	0.03 max
Chromium	18.0 – 20.0
Nickel	11.0 – 15.0
Manganese	2.0 max
Silicon	0.75 max
Nitrogen	0.10 max
Phosphorus	0.045 max

MECHANICAL PROPERTIES:

Yield Strength	30 KSI min
Tensile Strength	75 KSI min
Elongatin	40%
Hardness	95 Rockwell B

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321

Austenitic Grade

DESCRIPTION:

321 is an austenitic stainless steel that is similar to 304 in corrosion resistance and weldability. 321 is harder to form than most austenitic grades because of its spring back effect. The benefit of 321 is that it has added titanium of five times the carbon content, which prevents or reduces carbide precipitation during welding. This alloy is generally used in high-temperature applications.

APPLICATIONS:

- High Temperature applications
- Chemical Processing
- Aircraft engines
- Oil and Gas
- Expansion joints

CHEMICAL COMPOSITION:

Carbon	0.08 max
Chromium	17.0 – 19.0
Nickel	9.0 – 12.0
Titanium	0.70 max
Manganese	2.0 max
Silicon	0.75 max
Phosphorus	0.04 max

MECHANICAL PROPERTIES:

Yield Strength	30 KSI min
Tensile Strength	75 KSI min
Elongatin	40%
Hardness	95 Rockwell B

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347

Austenitic Grade

DESCRIPTION:

347 stainless steel is stabilized with columbium, which eliminates carbide precipitation. 347 is similar to 321 but has slightly better corrosion resistance in oxidizing environments. 347 has very good intergranular corrosion resistance when welded. Like 321, this alloy is generally used in high-temperature environments.

APPLICATIONS:

- Heat Exchangers
- Chemical Processing
- Oil Refineries

CHEMICAL COMPOSITION:

Carbon	0.04 -0.08
Chromium	17.0 – 19.0
Nickel	9.0 – 13.0
Manganese	2.0 max
Silicon	0.75 max
Phosphorus	0.045 max

MECHANICAL PROPERTIES:

Yield Strength	30 KSI min
Tensile Strength	75 KSI min
Elongatin	40%
Hardness	95 Rockwell B

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254 SMO

Austenitic Grade

DESCRIPTION:

Alloy 254 SMO is a high-end austenitic stainless steel with higher molybdenum and nitrogen with lower carbon content. This alloy combines strength nearly twice the level of the 300 series stainless and outstanding resistance to pitting, stress corrosion cracking, and crevice corrosion. In some instances, 254 SMO is a better and more cost effective solution than high nickel or titanium alloys. This alloy is frequently used in high chloride and marine environments.

APPLICATIONS:

- Chemical and Food Processing
- Petroleum production and Oil and Gas
- Saltwater and Marine applications
- Desalination processes

CHEMICAL COMPOSITION:

Carbon	0.02 max
Chromium	19.5 – 20.0
Nickel	17.5 – 18.5
Manganese	1.0 max
Silicon	0.80 max
Nitrogen	0.18 – 0.22
Phosphorus	0.03 max
Molybdenum	6.0 – 6.5

MECHANICAL PROPERTIES:

Yield Strength	45 KSI min
Tensile Strength	95 KSI min
Elongatin	35%
Hardness	96 Rockwell B

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904/L

Austenitic Grade

DESCRIPTION:

904L is a super-austenitic stainless that provides moderate to high corrosion resistance in many different environments.

904L has very good weldability but this alloy does not machine well. With a high nickel and chromium content, this grade also has strong stress corrosion cracking, pitting, and corrosion resistance. This alloy was originally designed for uses in chemical processing applications.

APPLICATIONS:

- Chemical Processing
- Oil and Gas
- Pulp and Paper
- Pharmaceuticals
- Heat Exchangers and Condensers

CHEMICAL COMPOSITION:

Carbon	0.02 max
Chromium	19.0 – 23.0
Nickel	23.0 – 28.0
Manganese	2.0 max
Silicon	1.0 max
Phosphorus	0.045 max
Molybdenum	4.0 – 5.0

MECHANICAL PROPERTIES:

Yield Strength	31 KSI min
Tensile Strength	71 KSI min
Elongation	36%
Hardness	70-90 Rockwell B

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AL6XN

Austenitic Grade

DESCRIPTION:

AL6XN is a super-austenitic stainless steel that is low-carbon and nitrogen bearing for high purity. This alloy was originally designed as a seawater resistant material.

AL6XN has also been found to be useful in many corrosive environments.

Because of AL6XN's high strength and corrosion resistance, this alloy is a better choice than duplex stainless. It is also more cost effective than nickel alloys.

APPLICATIONS:

- Marine applications
- Offshore Oil and Gas
- Chemical Processing
- Heat Exchangers
- Desalination processes

CHEMICAL COMPOSITION:

Carbon	0.03 max
Chromium	20.0 – 22.0
Nickel	23.5 – 25.5
Manganese	2.0 max
Silicon	1.0 max
Nitrogen	0.18 – 0.25
Phosphorus	0.04 max
Molybdenum	6.0 – 7.0

MECHANICAL PROPERTIES:

Yield Strength	45 KSI min
Tensile Strength	95 KSI min
Elongatin	30%
Hardness	88 Rockwell B

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309

Heat Resistant Grade

DESCRIPTION:

309 stainless steel is an austenitic grade with high chromium content and low nickel content that is generally used in elevated temperature applications.

Some of the beneficial characteristics of 309 stainless is its high corrosion resistance, heat resistance, and resistance to oxidation.

309 has good fabrication and weldability characteristics.

APPLICATIONS:

- High Heat applications
- Heat Exchangers and Boilers
- Aircraft and Auto parts
- Refineries
- Chemical Processing

CHEMICAL COMPOSITION:

Carbon	0.08 max
Chromium	22.0 – 24.0
Nickel	12.0 – 15.0
Manganese	2.0 max
Silicon	0.75 max
Phosphorus	0.045 max

MECHANICAL PROPERTIES:

Yield Strength	30 KSI min
Tensile Strength	75 KSI min
Elongation	40%
Hardness	95 Rockwell B

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310S

Heat Resistant Grade

DESCRIPTION:

310S is a high-alloyed austenitic stainless steel designed for elevated temperature applications.

Some of the beneficial characteristics include good corrosion resistance, high strength in elevated temperatures, and excellent oxidation resistance. With a high nickel and chromium content, this alloy is superior to 304 or 309 in most applications. 310S has good welding characteristics.

APPLICATIONS:

- Furnace parts
- Furnace Conveyors
- Heat Exchangers
- Welding Filler wire

CHEMICAL COMPOSITION:

Carbon	0.08 max
Chromium	24.0 – 26.0
Nickel	19.0 – 22.0
Manganese	2.0 max
Silicon	1.0 max
Phosphorus	0.045 max

MECHANICAL PROPERTIES:

Yield Strength	30 KSI min
Tensile Strength	75 KSI min
Elongation	40%
Hardness	95 Rockwell B

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314

Heat Resistant Grade

DESCRIPTION:

314 stainless steel is an austenitic, heat resistant grade that is very similar to type 310S.

The difference is that 314 has a higher level of silicon, which improves oxidation resistance at elevated temperatures.

Alloy 314 has the best high-temperature resistance capabilities of any chromium nickel stainless grades.

APPLICATIONS:

- High-Temperature applications
- Furnace parts
- Furnace conveyor systems
- Heat Exchangers

CHEMICAL COMPOSITION:

Carbon	0.25 max
Chromium	23.0 – 26.0
Nickel	19.0 – 22.0
Manganese	2.0 max
Silicon	1.50 – 3.00
Phosphorus	0.045 max

MECHANICAL PROPERTIES:

Yield Strength	45 KSI min
Tensile Strength	95 KSI min
Elongation	40%
Hardness	85 Rockwell B

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330

Heat Resistant Grade

DESCRIPTION:

330 is an austenitic stainless that was developed to provide excellent resistance to oxidizing and carburizing at high temperature applications. It also has a very high nickel content. The oxidation resistance is also enhanced by the silicon content.

APPLICATIONS:

- Chemical Processing
- Power Generation
- Thermal Processing
- Mufflers, Radiant Tubes

CHEMICAL COMPOSITION:

Carbon	0.08 max
Chromium	18.0 – 20.0
Nickel	34.0 – 37.0
Manganese	2.0 max
Silicon	0.75 – 1.50
Phosphorus	0.03 max

MECHANICAL PROPERTIES:

Yield Strength	30 KSI min
Tensile Strength	80 KSI min
Elongation	40%
Hardness	70 Rockwell B

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409

Ferritic Grade

DESCRIPTION:

Grade 409 is a stabilized ferritic stainless steel. It is stabilized by titanium and chromium, with the 11% chromium being the minimum amount needed for the passive surface that gives stainless steel its corrosion resistance. 409 stainless is primarily used for applications where oxidation and corrosion protection needs to exceed that of carbon steel. Grade 409 provides medium strength, good formability, and weldability but it does not have a uniform surface appearance. Because of this, it is generally used for applications where surface finish is not critical like automotive exhaust systems.

APPLICATIONS:

- Automotive Exhaust Systems
- Power Generation
- Furnace and Heat Exchangers
- Agriculture Equipment

CHEMICAL COMPOSITION:

Carbon	0.03 max
Chromium	10.5 – 11.7
Nickel	0.5 max
Titanium	0.48 – 0.75
Manganese	1.0 max
Silicon	1.0 max
Phosphorus	0.04 max

MECHANICAL PROPERTIES:

Yield Strength	25 KSI min
Tensile Strength	55 KSI min
Elongatin	25%
Hardness	88 Rockwell B

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410S

Ferritic Grade

DESCRIPTION:

Grade 410S is a ferritic stainless steel that is a low carbon variation of type 410 stainless steel.

Due to the lower carbon and the addition of titanium and/or columbium, this alloy minimizes austenite formation at higher temperatures, which prevents hardening.

This helps prevent cracking when welding. 410S cannot be hardened by heat treatment but it can be welded.

This alloy has good oxidation resistance as well.

APPLICATIONS:

- Automotive exhaust components
- Oil and Gas
- Petrochemical processing
- Thermal Processing
- Mining machinery
- Quenching racks

CHEMICAL COMPOSITION:

Carbon	0.08 max
Chromium	11.5 – 13.5
Nickel	0.60 max
Manganese	1.0 max
Silicon	1.0 max
Phosphorus	0.04 max

MECHANICAL PROPERTIES:

Yield Strength	30 KSI min
Tensile Strength	60 KSI min
Elongation	22%
Hardness	75 Rockwell B

STAINLESS STRUCTURALS CAN PRODUCE THIS ALLOY IN BEAMS, CHANNELS, ANGLES, TEES AND CUSTOM SHAPES.

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2101

Duplex Grade

DESCRIPTION:

2101 is a lean duplex stainless steel that was developed for general-purpose uses where superior strength and stress-corrosion cracking is required over 300 series stainless steels. 2101's corrosion resistance is superior to 304/L and comparable to 316/L. Some of the beneficial characteristics of 2101 duplex include its high strength, corrosion and pitting resistance, ease of fabrication, weldability, and cost efficiency.

APPLICATIONS:

- Water and Wastewater Treatment
- Food and Beverage Processing
- Chemical Processing
- Building and Construction
- Desalination processes

CHEMICAL COMPOSITION:

Carbon	0.03
Chromium	21.0 – 22.0
Nickel	1.35 – 1.70
Manganese	4.0 – 6.0
Silicon	1.0 max
Nitrogen	0.20 – 0.25
Phosphorus	0.04 max
Molybdenum	0.10 – 0.80

MECHANICAL PROPERTIES:

Yield Strength	65 KSI min
Tensile Strength	94 KSI min
Elongatin	30%
Hardness	290 Brinell Max

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2304

Duplex Grade

DESCRIPTION:

2304 duplex stainless is an enhanced duplex with high contents of chromium and nitrogen but low content of nickel. 2304 has similar corrosion resistance as 304/L and 316/L but has double the yield strength and better stress corrosion resistance than these austenitic grades. 2304 duplex should not be used in temperatures below -50°C or above 250°C due to the risk of embrittlement.

Some of the beneficial characteristics of 2304 include mechanical strength, machinability, weldability, corrosion resistance, ease of fabrication, reduced maintenance, and durability.

APPLICATIONS:

- Pulp and Paper
- Food Processing
- Mining
- Pressure Vessels

CHEMICAL COMPOSITION:

Carbon	0.03 max
Chromium	21.5 – 24.5
Nickel	3.0 – 3.5
Manganese	2.5 max
Silicon	1.0 max
Phosphorus	0.04 max
Molybdenum	0.05 – 0.60

MECHANICAL PROPERTIES:

Yield Strength	65 KSI min
Tensile Strength	110 KSI min
Elongation	30%
Hardness	293 Brinell Max

STAINLESS STRUCTURALS CAN PRODUCE THIS ALLOY IN BEAMS, CHANNELS, ANGLES, TEES AND CUSTOM SHAPES.

Disclaimer:

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2205

Duplex Grade

DESCRIPTION:

2205 duplex is the most commonly used duplex stainless steel. This grade of duplex provides a solution to chloride stress corrosion cracking issues with 304/L and 316/L stainless. With its higher chromium, molybdenum, and nitrogen this duplex provides improved corrosion resistance over 316/L and 317/L. 2205 duplex should not be used in temperatures over 300°C.

Some of the beneficial characteristics of 2205 include high yield strength, resistance to stress corrosion cracking, resistance to pitting, and good corrosion resistance in harsh environments.

APPLICATIONS:

- Food and Chemical Processing
- Pulp and Paper
- Oil and Gas
- Marine and High Chloride environments

CHEMICAL COMPOSITION:

Carbon	0.03 max
Chromium	22.0 – 23.0
Nickel	4.5 – 6.5
Manganese	2.0 max
Silicon	1.0 max
Phosphorus	0.03 max
Molybdenum	3.0 – 3.5

MECHANICAL PROPERTIES:

Yield Strength	65 KSI min
Tensile Strength	95 KSI min
Elongation	25%
Hardness	290 Brinell Max

STAINLESS STRUCTURALS CAN PRODUCE THIS ALLOY IN BEAMS, CHANNELS, ANGLES, TEES AND CUSTOM SHAPES.

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2507

Duplex Grade

DESCRIPTION:

2507 is a super duplex grade of stainless steel. It contains 25% chromium, 4% molybdenum and 7% nickel to provide excellent strength and corrosion resistance as well as excellent resistance to pitting and crevice. 2507 should not be used in applications above 300°C. Some of the beneficial characteristics of 2507 include high impact strength, resistance to chloride stress corrosion cracking, and resistance to intergranular corrosion.

APPLICATIONS:

- Chemical Processing
- Heat Exchangers
- Oil and Gas
- Desalination and Water processes
- Power and Energy systems

CHEMICAL COMPOSITION:

Carbon	0.03 max
Chromium	24.0 – 26.0
Nickel	6.0 – 8.0
Manganese	1.2 max
Silicon	0.80 max
Phosphorus	0.035 max
Molybdenum	3.0 – 3.5

MECHANICAL PROPERTIES:

Yield Strength	80 KSI min
Tensile Strength	116 KSI min
Elongatin	15%
Hardness	32 Rockwell C

STAINLESS STRUCTURALS CAN PRODUCE THIS ALLOY IN BEAMS, CHANNELS, ANGLES, TEES AND CUSTOM SHAPES.

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