

STEEL FABRICATION: A VERSATILE APPLICATION IN CONSTRUCTION

From agriculture to the aerospace industry, the process of fabricating steel products continues to evolve. Structural steel companies, like ours, are committed to constant improvement as new technology and increased demand emerges for structural steel fabrications. By 2030, the global steel fabrication market is expected to grow USD 15 billion, registering a CAGR of 4.54% increase from 2022. [5] With uses in so many industries, it is no wonder that this market will keep a steady growth rate.

Despite the constant evolving characteristics of steel fabrication, stainless steel remains a popular material choice within many industries. Steel fabrication is available in a variety of grades that are divided into several family groups based on metallurgical qualities. The stainless-steel families for fabricating steel products are:

- Austenitic
- Ferritic
- Martensitic
- Duplex
- Precipitation-hardened [1]

Benefits

Stainless steel is a low carbon steel. Though stainless steel has a great deal of high hardening rate and strength, it is very ductile, which allows for typical fabrication processes.

1. Corrosion resistance

All stainless steels have a high resistance to corrosion. Chromium gives stainless steel its corrosion resistant properties. Stainless steels that have higher chromium and nickel content offer a higher level of corrosion resistance. Some may even have nitrogen and molybdenum added.

2. High and low temperature resistance

Some grades will resist scaling and maintain high strength at exceedingly elevated temperatures, while others show exceptional toughness at cryogenic temperatures. Highly alloyed grades can resist corrosion in most alkaline solutions, acids, and chloride bearing environments despite elevated temperatures and pressures. Whereas low alloyed grades resist corrosion only in atmospheric conditions.

3. Ease of fabrication

Most stainless steel can be cut, welded, formed, machined, and fabricated readily.

4. Strength

The cold work hardening properties of many stainless steels can be designed to reduce material thicknesses, costs, and weight. Other stainless steels may be heat treated to create elevated strength components.

5. Aesthetic appeal

Easy to maintain, stainless steel is available in many surface finishes that result in a high quality, pleasing appearance.

6. Hygienic properties

The cleanability of stainless steel makes it an ideal choice for hospitals, kitchens, food, and pharmaceutical processing facilities.

7. Life cycle characteristics

Stainless steel has an almost endless life cycle. It is a durable, low maintenance material that is often the least expensive choice in a life cycle cost comparison.

8. 100% recyclable

Stainless steel is an excellent environmental performer with 100% recyclability. It is actively repurposed without significant loss of material quality and at least 60% of all new stainless steel is made from recycled material. [3]

Applications

Many industries require stainless steel fabricated products and custom steel plate fabrications for high-corrosion environments. Stainless steel composition is well-suited for projects where good strength, high fabrication rates, and resistance to corrosion are required. [1]

- High-rise buildings: strength, low weight, and faster construction
- Industrial buildings: create large spaces at low cost
- Warehouse buildings: lower cost of constructing large spaces
- Residential buildings in a technique called light gauge steel construction
- Temporary Structures: quick to set up and remove

Though many industries consider stainless steel ideal for projects where moisture has direct contact with a product, stainless steel is used in a wide variety of projects. Industries that utilize stainless steel fabricated products include: [2]

Architectural Building Products – buildings, stairs, plumbing systems, roofing, railings, escalators

Art and Design – sculptures, interior designs, park designs, monuments/memorials

Environment – drainage grates, water processing, garden tools

Food, Beverage and Pharmaceutical – breweries, wineries, dairy processing, meat processing

Infrastructure – bridges, construction equipment, boardwalks, guardrails

Marine – subsea hydraulic and control line applications, offshore drilling platforms

Process and Heavy Engineering – elution columns, hydro-turbine manufacturing, mining equipment

Residential and Commercial – bathroom walls, bed frames, hot water heaters, benches, swimming pools, cookware, appliances

Transport – tanker trucks, coal wagons, ships, buses, railcars, cars, airplanes [4]

With numerous material options, designs, and uses, stainless steel fabricated products and custom steel plate fabrications have never been easier to customize. Southeastern Construction holds AWS and AISC Certifications for the highest quality steel fabrication for any application. Our fabrication facilities utilize the latest CNC fabrication, BIM, and project management technologies for your custom steel plate fabrications and stainless steel fabricated products. Request your quote today!

Resources:

1. <https://www.thomasnet.com/articles/custom-manufacturing-fabricating/stainless-facing-materials/>
2. <https://www.thomasnet.com/articles/custom-manufacturing-fabricating/stainless-products/>
3. <https://www.assda.asn.au/benefits-of-stainless-steel>
4. <https://www.assda.asn.au/stainless-steel/applications>
5. https://www.marketresearchfuture.com/sample_request/10929