

METAL BASICS



Steel, stainless steel, aluminum, brass, copper, and iron are in our products. Pure iron metal is not often used in commercial applications, but is usually alloyed with carbon or other metals. The pure metal is very reactive chemically and rapidly corrodes, especially in moist air or at elevated temperatures. The most common metal we use is a carbon steel alloy.

Steel

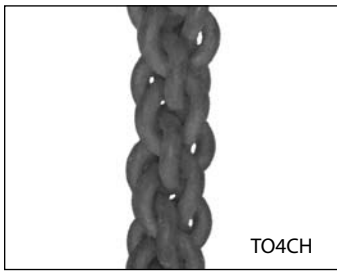
Carbon steel is a non-magnetic alloy of iron with small amounts of Manganese, Sulfur, Phosphorus, and Silicon. The foundry process for steel varies widely and many different steel products are available. Custom Iron uses American furniture grade steel and other plain carbon steels for the majority of our products.

Many of our forged balusters and newels begin with a basic square steel bar from ½ to 1".

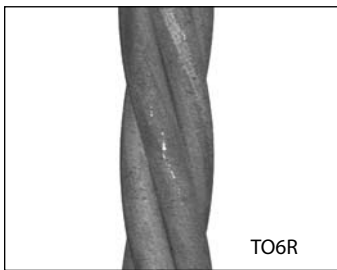
Other interesting alternative materials in steel are available such as these steel profiles (TO4CH, TO6R, TO8A), available in 20' lengths.

Stainless Steel

Stainless steels are corrosion resistant iron alloys. Stainless steel resists ordinary rusting in most architectural applications. The corrosion resistance of stainless steel arises from a "passive," chromium-rich, oxide film that forms naturally on the surface of the steel. Special care must be taken during the fabrication process to maintain corrosion resistant properties.



TO4CH



TO6R



TO8A

Aluminum

Aluminum is a lightweight non-ferrous metal. Spiral stairs use high grade aluminum alloys for our aluminum products. We offer aluminum for exterior installations.

Brass

Brass is a relatively soft alloy of copper and other metals. Brass alloys vary greatly and are sometimes referred to as a type of bronze. We use brass and bronze alloys that are highly similar in color to each other. We refer to all yellow-tinted copper alloys in the brass or bronze family as "brass". The price and availability of the alloys we use for our products might vary. If the specifications for these alloys are critical to your application, please inquire at the time you request your quote.

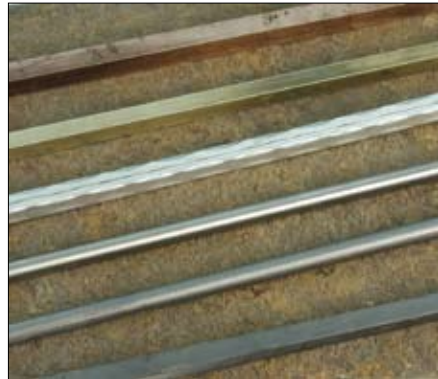
Copper

Copper is used in ornamentation such as embossed copper handrails or copper baskets on a steel baluster.

Cast Products

Cast metal products are special alloys that are liquefied and then poured into a mold or "cast." Cast products direct from the foundry exhibit imperfect surface texture

and visible casting lines. Many of our baluster ornaments (such as collars and medallions) and bases are a cast metal material.



DETAILS & PROCESSES

Material details

Surface variations in the metal are a natural result of metalworking. The surface texture, color, and uniformity affect the finished appearance of the metal piece that will also vary depending on the coating selection.

The three main categories of steel and iron material that we use in spirals are: hot-rolled steel, cold-rolled steel, and malleable iron.

Hot-rolled (or "mild") steel is formed in the foundry using heat and pressure. Hot-rolled steel is more easily bent than cold-rolled steel and therefore, many of our spiral's products use hot-rolled steel. When the hot-rolled steel used to create panels and railing systems arrives from the foundry, it is covered in mill scale, a scaly oxidized surface on the steel that results from heating and hot rolling. Additional handling at the factory (twisting, bending, heating, etc.) removes the mill scale from the handled areas, producing mill scale variations on the surface.

Cold-rolled steel is formed without heat, using intense pressure. Cold-rolled steel does not have mill scale and the material therefore has a smoother and more uniform surface. However, cold-rolled steel is not easily formed and it is not used for twists, scrolls, and other bent and embossed products that our spirals utilize.

Malleable iron is a sand cast annealed iron purchased from a casting foundry. The malleable iron alloy is melted and cast in forms. Once cast, malleable iron loses some of its malleable characteristics. Malleable cast iron is stronger and less brittle than traditional cast iron. We offer malleable iron balusters in custom lengths and with various levels of finish grades.

Metal processes

We offer embossed surface textures for most sizes of square bar, rectangular bar, square tubing, and round bar.



Hand-forged embossing is done the old-fashioned way with hammer and anvil. Hand-forging is a time consuming operation that produces the classic irregularities associated with traditional iron products.

Most product textures are produced with special dies. Embossing with a die produces fairly uniform patterns or textures in the raw material. The appearance of the embossing differs depending on the type, size, and shape of the raw material. Power hammering is an alternative to hand-forging and it most closely resembles hand-forged material. When power hammering, the hammer operator initiates the hammer drop with a foot pedal for the length of the bar.

For more information about embossing options, see the Options tab.

Polished surfaces reveal a brilliant glossy finish through a tumbled and mechanical process. Our brass baskets are most often polished in this way. Brushed surfaces have a matte finish that shows the "sanding" marks.



Mill scale on twist baluster

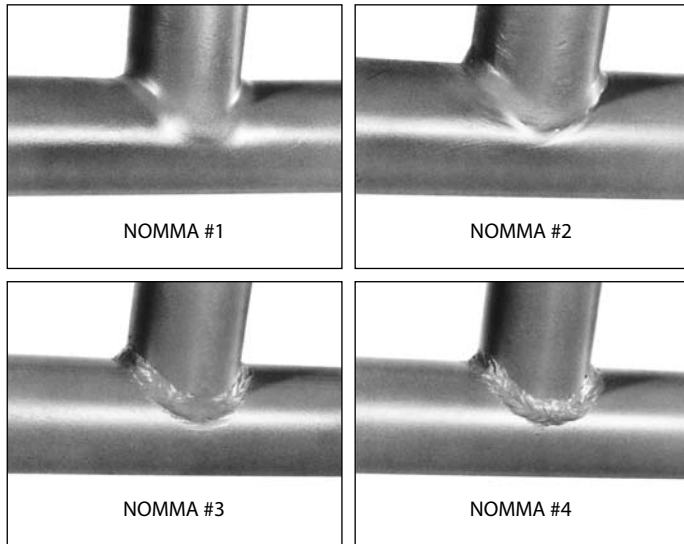


Hot rolled steel with one cold rolled round bar



Brushed and polished bases

DETAILS & PROCESSES



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Welds

The majority of our Spiral Stair products are fabricated to a NOMMA #3 weld standard. Please inquire about other weld standards.

Fabrication Finish Options for Malleable Iron

Malleable iron direct from the foundry has an irregular rough textured surface overall that reveals casting lines, voids, and other imperfections. As we work with the material to lengthen or add ornamentation for a specific job, we add marks to the piece

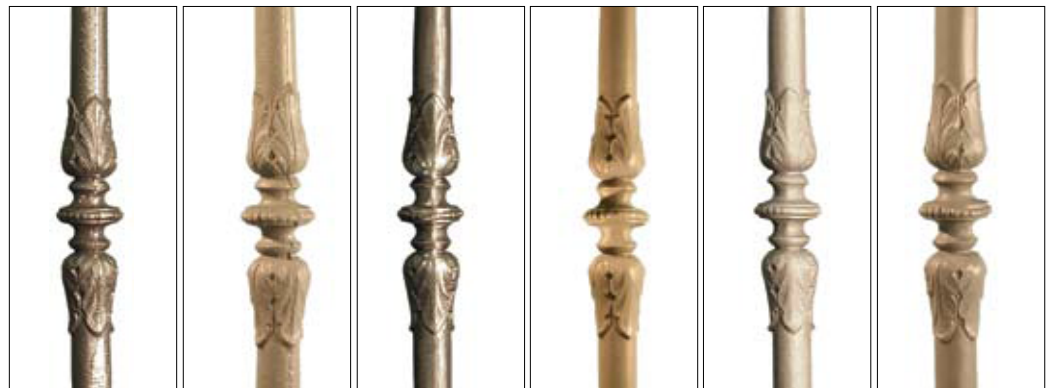
Lengthening a malleable iron baluster produces irregular flat or smooth areas on the piece. We offer three finish grades for our malleable iron products:

Foundry Grade (FG) – As received direct from the foundry. High level of surface texture variations and high level of variation from piece to piece. Not recommended for most applications.

Commercial Grade (CG) – Pieces from the foundry are selected for job uniformity and the largest variations are cleaned up. Cast lines are still evident.

Architectural Grade (AG) – Commercial grade malleable iron that is cleaned up to a higher degree and sandblasted to minimize the surface texture variations.

Because of the irregularities that will be evident with any of the finish grades, we recommend a painted finish for all malleable iron products. We take special care in handling sandblasted products. Any residue (such as skin oils or fabric threads) must be removed before the paint coating is applied.



Foundry grade

FG primed

Commercial grade

CG primed

Architectural grade

AG primed