

Stainless Steel Snapshot: Martensitic Steel

Stainless steel is made by adding varying amounts of chromium (Cr) and other alloying elements to iron and carbon. When chromium is added to steel, it forms chromium oxide, a corrosion-resistant product. Chromium is added in quantities ranging from 10.5 to 30%, depending on the application or environment in which the steel is to be used. There are five main grades of stainless steel: austenitic, ferritic, martensitic, duplex, and precipitation hardening.

Martensite stainless steels, named after German researcher Adolf Martens, contain high amounts of chromium but very little nickel or other alloying metal, and are strong but brittle. Here are a few things to know about martensitic stainless steels:

1



Martensitic steel is used to make knives, fasteners, surgical equipment, gears and ball bearings and turbine blades.

2



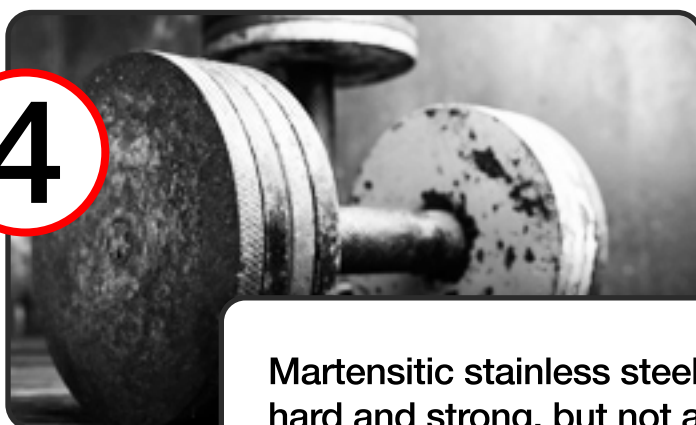
Martensitic steel can be hardened and strengthened by heat treatment and is normally used in a hardened and tempered condition.

3



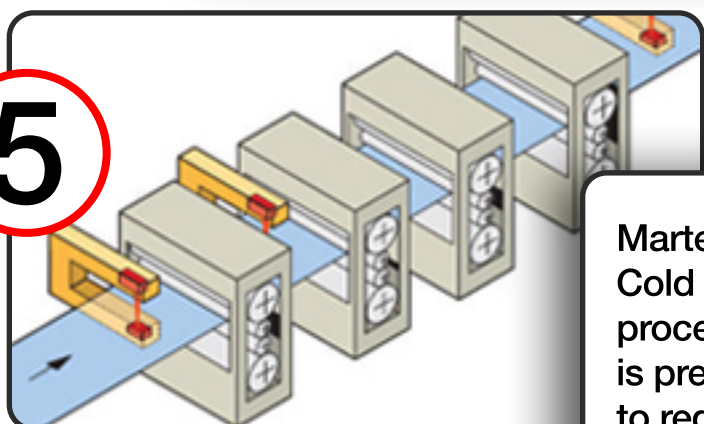
Martensitic steel contains approximately 13% chromium. Type 410 is a widely used, low-cost, general purpose steel used for applications where corrosion potential is moderate.

4



Martensitic stainless steel is very hard and strong, but not as corrosion-resistant as austenitic or ferritic grades. The martensitic grades are mainly used where hardness, strength, and wear resistance are required.

5



Martensitic steel is cold formed. Cold rolling is a metal forming process in which a sheet of metal is pressed through a pair of rolls to reduce thickness, increase strength and improve surface finish.

Get reliable elemental analysis for accurate steel grade identification and metal alloy verification for manufacturing quality assurance with a handheld X-ray fluorescence instrument.

