STAINLESS STEEL PRODUCTS

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GENERAL INFORMATION OF STAINLESS STEELS

RESISTANT TO CORROSION

Addition of the element chromium to steel enhances its resistance to corrosion and staining. Steels that contain a comparatively large amount of chromium are therefore called stainless steels.

Stainless steels have many areas of application, including household articles, building materials, rolling stock as well as chemical and petrochemical equipment. They are produced in a wide variety of types to suit specific end-uses.

ATTRACTIVENESS EXPANDS APPLICABILITY

Needless to say, the bulk of stainless steels are used where corrosion resistance is a basic requirement. Recently, however, their unique, attractive appearance has come to be widely appreciated, causing a sharp increase in their architectural applications.

HEAT AND LOW-TEMPERATURE RESISTANCE

Stainless steels retain high strength in elevated temperature service; the austenitic grades, in particular, have superior ductility at low temperatures.

SHEETS IN GREATEST DEMAND

While stainless steels are produced in various product forms such as sheets, shapes, rods, bars and tubes, those in sheet form presently register by far the fastest gain in market demand. This is because they have come to be used in large quantities as exterior and interior building materials, thus expanding a new market.

THREE BASIC CLASSES

There are many types of stainless steel. Although different in both mechanical properties and chemical composition, they may be generally grouped into three basic classes.

13 Cr CLASS (MARTENSITIC)

Generally, a group of steels with the carbon content of up to 0.2% and the chromium content ranging between 11.5% and 15.0%. These steels become martensitic in structure when heat treated. Since they are hardenable by heat treatment, steels of this class can be produced in many different degrees of hardness by varying heating conditions. Martensitic stainless steels are hardly corroded in air and are outstanding in hardness, although in weldability and workability they are inferior to the other two classes. Steels of this class are primarily used for the manufacture of cutlery.

18 Cr CLASS (FERRITIC)

Generally, steels having carbon up to 0.2% and chromium between 16.0% and 20.0%. Not hardenable by heat treatment, they are basically used in the annealed condition. These steels are more workable, more weldable, and more corrosion-resistant than martensitic steels. Ferritic steels have good mechanical and physical properties and effectively resist both atmospheric corrosion and strong oxidizing solutions. They are widely used in nitric acid-base chemical processing equipment as well as in buildings, kitchen sinks, and appliances.

18 Cr-8 Ni CLASS (AUSTENITIC)

Generally, steels containing a maximum of 0.15% carbon, a minimum of 16.0% chromium and a minimum of 6.0% nickel. In plain carbon steel, an austenitic structure is formed only at high temperatures. However, stainless steels of this class, because they retain a stable austenite form even at room temperature, are called austenitic stainless steels.

Of the three classes, this has the highest corrosion resistance. Steels of this class combine low yield point with high tensile strength and good elongation, thus offering the best cold-working properties. While it is not possible to change their mechanical properties by heat treatment, their tensile strength and hardness can be greatly enhanced by work hardening. Because of these characteristics, these steels are most extensively used in chemical plants and equipment.