

Physical Properties of Iron

- It rusts in damp air, but not in the dry air.
- It dissolves readily in dilute acids.
- At room temperature, this metal is in the form of ferrite or α -form.
- At 910°C, it changes to γ -iron, which is much softer in nature.
- It melts at 1536°C and boils at 2861°C.
- Being a metal is magnetic in nature.

Application of Iron (Fe)

Iron is used in various sectors such as electronics, manufacturing, automotive, and construction and building.

The following are the application areas of iron:

- As the main constituent of ferrous metals/alloys and steels
- Combine with carbon, nickel, chromium and various other elements to form cast iron or steel
- In magnets
- In fabricated metal products
- In industrial machinery
- In transportation equipment
- In instruments
- In toys and sport goods

Physical Properties Of Chromium

- Chromium burns when heated and the compound that it forms is a green chromic oxide.
- Chromium protects the metal below by immediately producing a thin oxide layer that is impermeable to oxygen.
- One of the important characteristics of chromium is that it won't get rusted easily, and thus this element is great for electroplating.

Application Of Chromium

- Electroplating – It is one of the important uses of chromium. Have you seen the shiny caps over the tires of a car? That shiny plating is made using chromium.
- Emeralds – A small amount of chromium is found in the crystal lattice structure of expensive gems like the emerald.
- New alloys – are formed using chromium. You might have seen chromium on the outside, but it is also mixed with metals to form alloys. Stainless steel and aluminium alloys use a small amount of chromium.
- Paints and Dyes – This useful element is also found in paint and dyes and chemical makeup that is used for fabrics.

Physical Properties of Tungsten

Tungsten is a light grey or silvery-white metal that constitutes one of the toughest metals can be found in nature.

The density of tungsten is significantly high, in fact, among the highest of all metals

In its raw form, tungsten is a hard steel-grey metal that is often brittle and hard to work.

If made very pure, tungsten retains its hardness (which exceeds that of many steels), and becomes malleable enough that it can be worked easily.

It is worked by forging, drawing, or extruding but it is more commonly formed by sintering.

Applications of Tungsten

Some of the applications of tungsten are as follows:

Tungsten is an economically important metal which is being widely used in the light-bulb filaments, electron and television tubes, several abrasives and special alloys just as steels tool.

- Hard metal is the most important usage of tungsten. Its main constituent is tungsten monocarbide (WC), which has a hardness close to diamond.
- Tungsten mill products are tungsten metal products such as lighting filaments, electrical and electronic contacts, wire, rods, etc.
- Other applications include chemical uses, mainly in the form of catalysts.
- Cemented carbide and high speed steel tools
- Television sets,
- Magnetrons for microwave ovens

Physical properties of Silver

- Silver (Ag) is a white, soft, lustrous, very ductile and malleable metal.
- It is a very good conductor of electricity and heat.
- It has the highest electrical conductivity of all metals, but the high cost of it has restricted us from using it in all electrical devices.

Silver is a very popular Metal too. Silver, like Gold, is a rare Metal and has great value, and is also traded in similar markets.

Application of Silver

Silver is also a common Metal with which to make jewelry owing to its scarcity and malevolence.

Silver has also been used in dentistry for some time, although it had to be mixed with mercury as it is not quite as malleable as Gold.

Gold is also a good conductor, and is used for galvanizing. It is also used in battery manufacturing and as a catalyst

- The principal use of this metal is precious, including jewellery and decorative items.

- Currency – still in some countries silver coins are used as currency.
- Jewellery and silverware
- It is used in the manufacturing of solar panels
- Air conditioning – It is used in the manufacturing of typical air conditioners
- Water purification – It is used in water purifiers to prevent the growth of algae and bacteria in filters
- Photography and electronic devices
- Used as an antibiotic coating on medical devices
- Thermal or infrared coatings use silver as it reflects some wavelengths better than aluminum.

Properties of Stainless Steel

Stainless steel has many desirable properties that contribute greatly to its widespread application in the making of parts and components across many industrial sectors.

Above all, because of its chromium content, it is extremely resistant to corrosion.

The 10.5% minimum content makes steel approximately 200 times more resistant to corrosion than steels without chromium.

Other favorable properties for consumers are its high strength and durability, its high and low temperature resistance, increased formability and easy fabrication, low maintenance, long lasting, attractive appearance and it is environmentally friendly and recyclable.

Once stainless steel is put into service, it does not need to be treated, coated or painted.

- Corrosion resistant
- High tensile strength
- Very durable
- Temperature resistant
- Easy formability and fabrication
- Low-maintenance (long lasting)
- Attractive appearance
- Environmentally friendly (recyclable)

Application of Stainless Steel

Most often, stainless steel is used for applications that require the unique properties of steel as well as corrosion resistance. You can find this alloy milled in coils, sheets, plates, rods, wire and tubes. It is the most commonly processed:

- Culinary uses: Kitchen sinks, Cutlery, Cookware
- Surgical tools and medical equipment: Hemostats, Surgical implants, Temporary crowns (dentistry)
- Architecture : Bridges, Monuments and sculptures, Airport roofs
- Automotive and aerospace applications: Autobodies, Rail cars, Aircraft