

7. Its brinell hardness number is 105.
8. It cannot be form permanent magnets, but can be temporary magnetized.
9. It is malleable and has high ductility.
10. It can rust more easily than cast iron.
11. It softens at about 1000°C and then it can be hammered to any desired shape.

### **Uses:**

1. It is used for making agricultural implements.
2. It is used for making rails, crane hooks and any article capable of withstand sudden loads.
3. Because it is extremely easy to weld, it is largely used in ornamental ironwork.
4. It is used as a raw material for the manufacture of steel.

### **3. Steel**

Steel is the most important material for engineering construction. It contain carbon from 0.15 % (very soft steel) to 1.5 % (very hard steel). It also contains small amount of other elements.

It contains from:

Iron = 99 %

Carbon content – 0.15 – 1.5 %

Phosphorus and Sulphur less than 0.1 %

Manganese up to 0.5 %

Silicon up to 0.3 %

The higher is the percentage of the carbon, the harder and tougher is the steel. Depending upon the percentage of carbon contents, Steel can be classified into different groups as under:

1. Very low carbon steel – having percentage of carbon below 0.15 %.
2. Low carbon steel or mild steel –Carbon contents 0.15 – 0.3 %.
3. Medium carbon steel–Carbon contents range from 0.3 – 0.6 %.
4. High carbon steel or hard steel–Carbon contents range from 0.6 – 1.5 %.

Low carbon steel – mild steel

The percentage of carbon in mild steel varies from 0.15 to 0.3, Sulphur, phosphorus, manganese, silicon are present only in minute quantities.

**Properties:**

1. It has a bright dark bluish color.
2. It has fibrous structure.
3. Its melting point is about 1400 °C.
4. It can withstand sudden shocks.
5. Its tensile strength is high.
6. Its specific gravity is 7.8.
7. It is malleable, ductile and elastic.
8. It can form permanent magnets.
9. It can rust easily and rapidly.
10. It can take a good amount of compression.
11. It can easily forge and welded.

**Uses:**

The chief uses of mild steel are:

1. It is used for making rolled structural steel sections like girders, angle sections, channel and T- sections... etc.
2. It is extensively used for making bars and rods which are used as a reinforcing material in reinforced concrete.
3. It is used for making refrigerators and air conditioners.
4. It is used for making plain and corrugated sheets.
5. Structural mild steel is most commonly used for general construction purposes of buildings, bridges, towers and industrial buildings.
6. It also used for making tubes.