

TYPES OF STRUCTURAL STEEL

Various types of structural steel sections and their technical specifications are as follows:

- **Angles**
- **Flats**

1.2.3 Steel Angle:

A steel angle is long steel with mutually vertical sides. The steel angles are the most basic formed steel. The most commonly found steel angles are formed at a 90 degree angle and has two legs of equal length. The sides are either equal or of different sizes.

There are certain variations in the steel angles depending on its basic construction. The variations are like; if one leg is longer than the other then it is known as L angle. If the steel angle is something different from 90 degrees then it is known as V angle. In some steel angles, double thickness is achieved by folding the legs inward. If the steel angle has same sides then it means that it has identical width. The steel angles are made according to the strength that is required for the different structures for construction purposes.

• **Applications**

the steel angle finds an application in a number of things, they are mentioned below:

- Used in framing
- Used in trims
- For reinforcement
- In brackets
- Used in transmission towers
- Bridges
- Lifting and transporting machinery
- Reactors
- Vessels
- Warehouses
- Industrial boilers
- Structural steel angles are used in rolling shutters for fabricating guides for strength and durability.

1.2.4 Steel Flats:

Flats are actually thin strips of mild steel having the thickness of the strip commonly varying from 12mm to 10mm but thicker flats than this are also available. Steel flats are produced by the utilization of relatively smooth, cylindrical rolls on rolling mills. Generally the width to thickness ratio of flat rolled products is fairly large. The steel flat bars are manufactured using advanced thickness control technology for controlled thicknesses. The hi-tech machineries enable the production of top grade steel flat bars with superlative flatness and controlled thickness. This product is highly customized and the specific sizes according to the client's requirement are produced. After production the flat steels are subjected to a variety of finishes like, painting and galvanizing. The flat carbon steel is a hot or cold rolled strip product also known as a plate product. These plate products have a size variation between 10mm to 200mm and the thin flat rolled flat rolled product's size varies from 1 mm to 10 mm.

Applications

The steel flats are used in a wide array of applications. The varied applications are listed below:

- Railway parts
- Ordnance factories
- Hand tools
- Engineering industries
- Auto components- two-wheeler, four-wheeler, commercial vehicles
- Domestic white goods products
- Office furniture's
- Heart pacemakers
- Tin cans
- Press working

1.3 Advantages of steel as a structural material:

Structural steel sections are usually used for construction of buildings, buildings, and transmission line towers (TLT), industrial sheds and structures etc. They also find in manufacturing of automotive vehicles, ships etc. Steel exhibits desirable physical properties that make it one of the most versatile structural materials in use.

Its great strength, uniformity, light weight, easy of use, and many other desirable properties makes it the material of choice for numerous structures such as steel bridges, high rise buildings, towers, and other structure.

Elasticity: steel follows hooks law very accurately.

Ductility: A very desirable of property of steel, in which steel can withstand extensive

deformation without failure under high tensile stresses, i.e., it gives warning before failure takes place.

Toughness: Steel has both strength and ductility.

Additions to existing structures: Example: new bays or even entire new wings can be added to existing frame buildings, and steel bridges may easily be widened.

1.4 Disadvantages of steel as a structural material:

Although steel has all this advantages as structural material, it also has many disadvantages that make reinforced concrete as a replacement for construction purposes. For example steel columns sometimes cannot provide the necessary strength because of buckling, where as RCC columns generally sturdy and massive, i.e., no buckling problem occurs.

Many disadvantages of steel can be summarized below:

Maintenance cost: Steel structures are susceptible to corrosion when exposed to air.

Fire proofing cost: steel is an incombustible material; however, its strength is reduced tremendously at high temperature due to common fires.

Fatigue: The strength of structural steel member can be reduced if this member is subjected to cyclic loading.

Brittle fracture: under certain conditions steel lose its ductility, and brittle fracture may occur at places of stress concentration. Fatigue type loadings and very low temperature trigger the situation.

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