What Is Thermo Mechanical Treatment In Steel?

Thermo mechanical treatment is a widely used process in metallurgy where a mechanical process of deforming an object (changing size and shape) is combined with thermal processes like heating, cooling, quenching, tempering etc. In this process various rates of heating and cooling are applied into a single process to achieve the desired result. The goal of the TMT process is to upgrade the properties of steel by refining its microstructure.

Thermo Mechanically Treated steel or TMT bars as they are widely known in the industry, is the ‘new generation’ steel and is produced by all the top steel manufacturers. The advantage that TMT bar manufacturers have over traditional steel bar manufacturers is that this kind of high strength steel is not obtained in any other process of steel-making.

The process of TMT production

TMT steel production is a highly technical process. In this, by using the Thermex technology, steel production is done by heating steel initially at 1200°C, which results in it getting

austenitized (conversion of ferrite materials in iron to austenites). Then it is taken through a process called quenching that allows rapid cooling and conversion of the outer layer to martensite.

Quenching is done for a specific period of time such that the surface is colder than the inner core which remains hot. This makes the heat flow from the inner core to the outer surface, causing tempering. This additional tempering of steel bars helps to impart a higher strength to the steel which passes through this treatment.

TMT process has revolutionized steel production and TMT steel companies are able to manufacture superior products with three varied microstructures in their cross section, having strong, tough, tempered martensite in the surface layer of the bar, an intermediate layer of martensite and bainite, and a refined, tough and ductile ferrite and pearlite core.

The real edge that **TMT steel bars manufacturers** bring with their TMT bars is the optimum balance between Toughness and Flexibility (Elongation).