

Thermomechanical Treatment -

To develop → High strength materials with good formability

TMT → refers to that treatment in which plastic deformation is carried out in such a way that phase transformation is affected by it.

Principle - Plastic deformation results in the production of various crystal defects such as vacancies, dislocations, sub grain boundaries and stacking faults.

These defects severely affect the phase transformation in metals and alloys by providing nucleation sites and aiding diffusion process.

These in turn affect the kinetics of phase transformation & morphology of phase(s) formed.

Therefore, the phase transformation should occur under conditions of increased lattice defects.

TMT - Overlapping of two processes

Heat treatment + mechanical deformation

Both processes may either proceed simultaneously or with a time gap.

TMT - are equally applicable to both

ferrous & non ferrous materials

TMT of Steels - consists of producing strained austenite & and its subsequent transformation to other phases

Lattice defects produced in austenite by deforming will thus be retained partially or completely in the transformed structure.