THE REASONS FOR DOING HEAT TREATMENT

Heat treatment of steel or components is usually intended to accomplish any one of the following objectives:

To obtain the desired properties within a given steel
To remove stresses in steel/components set up by cold working or to remove stresses set up by non-uniform cooling of hot metal objects.
To refine the grain structure. A coarse grain size may result in premature cracking when the component is put into use.
To decrease the hardness and increase the ductility.
To increase the hardness so as to increase resistance to wear.
To increase the toughness (the ability of a material to absorb energy & deform plastically before fracturing); that is to produce a steel or a component having both a high tensile strength and good ductility.
To improve the machinability.
To improve the electrical & magnetic properties.