

11.6 This question asks us to compare various aspects of gray and malleable cast irons.

(a) With respect to composition and heat treatment:

*Gray iron*--2.5 to 4.0 wt% C and 1.0 to 3.0 wt% Si. For most gray irons there is no heat treatment after solidification.

*Malleable iron*--2.5 to 4.0 wt% C and less than 1.0 wt% Si. White iron is heated in a nonoxidizing atmosphere and at a temperature between 800 and 900°C for an extended time period.

(b) With respect to microstructure:

*Gray iron*--Graphite flakes are embedded in a ferrite or pearlite matrix.

*Malleable iron*--Graphite clusters are embedded in a ferrite or pearlite matrix.

(c) With respect to mechanical characteristics:

*Gray iron*--Relatively weak and brittle in tension; good capacity for damping vibrations.

*Malleable iron*--Moderate strength and ductility.