

Unit Quiz - Heat Treating

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- ___ 1. Which of the following is not a common quenching media?
- a. Molten Salt
 - b. Water
 - c. Carbon
 - d. Air
- ___ 2. Which of the following is NOT used as a method of heating steel for heat treating?
- a. Controlled atmosphere furnace
 - b. Allotropism
 - c. Torch
 - d. Induction
- ___ 3. This hard, brittle structure is formed when a carbon-rich steel is quenched rapidly.
- a. Austenite
 - b. Martensite
 - c. Pearlite
 - d. Ferrite
- ___ 4. This is a lamellar (layered) structure of ferrite and cementite. It forms when a carbon-rich steel is cooled slowly.
- a. Austenite
 - b. Martensite
 - c. Pearlite
 - d. Ferrite
- ___ 5. This structure (also known as alpha iron) is soft and ductile.
- a. Austenite
 - b. Martensite
 - c. Pearlite
 - d. Ferrite
- ___ 6. This structure is FCC and easily absorbs carbon. It is the gamma phase on the iron-carbon phase diagram.
- a. Austenite
 - b. Martensite
 - c. Pearlite
 - d. Ferrite
- ___ 7. This is a procedure for determining how deeply a particular steel can be hardened.
- a. Rockwell C Scale
 - b. Jominy end-quench hardenability test
 - c. Charpy impact test
 - d. Izod impact test
- ___ 8. Which of the following are ways to harden only the surface of a component?
- a. Selective surface heating
 - b. Changing surface chemistry
 - c. Carburizing & Nitriding
 - d. All of the above
- ___ 9. This softening process is usually done immediately after quenching. It involves reheating the metal to transform martensite to ferrite and small particles of cementite. Helps restore toughness, and reduces the hardness.
- a. Allotropic expansion
 - b. Induction
 - c. Tempering (or drawing)
 - d. Annealing
- ___ 10. This softening process transforms cementite to spherical shapes. Makes the steel less prone to stress concentration. Increases toughness and allows cold working. It is accomplished by “soaking” a steel at a temperature just below the lower critical temperature (eutectoid temp) for an extended period of time.
- a. Annealing
 - b. Normalizing
 - c. Spheroidizing
 - d. Process annealing