

1. **alternating current** it gets its name from the way that the direction of electron flow changes or alternates; in this process the positive and negative charges at either end of the conductor switch positions which results in reversals of electron direction.
2. **aluminium** a metal and element, this substance is lightweight, corrosion resistant, ductile, malleable, machinable and has excellent castability
3. **annealing** the purpose of this process may be to remove stresses, soften, obtain a desired structure or improve machinability and cold working properties; it involves heating steel to and holding at a suitable temperature, followed by a relatively slow cooling
4. **austenite** a face centred cubic (FCC) phase in the iron-carbon equilibrium diagram, designated by the symbol gamma (γ), this is a non-magnetic solid solution of carbon in iron
5. **brass** an alloy of copper and up to 43% zinc
6. **bronze** an alloy of copper and up to 10% tin, known as tin bronze; alloys of copper and up to 10% aluminium are known as aluminium bronzes, while alloys of copper and up to 5% silicon are known as silicon bronzes
7. **case hardening** a process of surface hardening involving a change in the composition of the outer layer of a ferrous alloy; typical hardening processes are carburising, cyaniding, carbonating and nitriding
8. **cast iron** an alloy of iron and carbon in which carbon is an excess of the amount that can be retained in solid solution in austenite at the eutectic temperature; carbon is usually present in the range of approximately 2% to 4.5%; in addition, silicon, manganese, sulphur and phosphorus are contained in varying amounts
9. **cementite** a hard brittle iron carbide compound with formal Fe_3C , found in carbon
10. **cold working** involves changing the shape or size of metal by plastic deformation; carried out below the recrystallisation point, usually at room temperature; hardness and tensile strength are increased while ductility and impact values are lowered
11. **couple** a system of forces that exerts a resultant moment but no resultant force
12. **current** the rate of electrically charged particles measured in amperes
13. **direct current (DC)** provides a constant flow of electrons in a single direction from negative to positive
14. **dislocations** discontinuities in the crystal lattice of a metal; the movement of these under stress may be used to explain slip, creep, etc.
15. **ductility** the ease with which a material deforms plastically while undergoing tensile forces
16. **ferrite** body centred cubic (BCC) phase in the iron-carbon phase diagram; may exist in either a low temperature alpha or a high temperature delta form
17. **ferrous** those metals in which primary constituent is iron (Fe)
18. **heat treatment** applies to any one of several processes involving heating metals to controlled temperatures for specific period of time, and afterwards cooling them at controlled rates; these may be applied to soften work-hardened material but more generally they are used to strengthen alloys
19. **magnet** a piece of iron or other material exhibiting the properties of magnetism, i.e. it generates a force or magnetic field that attracts other ferromagnetic materials such as iron and attracts or repels other magnets