

60°C. The current efficiency is 8-12%. Pb-Sn or Pb-Sb alloy coated with PbO₂ is used as anode. The plating is used for corrosion resistance and decorative finish.

Thin film coatings

It is the process of depositing some materials over solid surfaces. Important process of this is Physical Vapour Deposition (PVD). This is a process of depositing some material by atom by atom or molecule by molecule or ion by ion. The important methods of PVD are thermal evaporation, sputtering and ion plating. All these processes are performed in vacuum systems. Out of these methods, thermal evaporation is the oldest and simplest process. In this method the metal to be coated is placed in a refractory metal boat or crucible. The boat is heated to melt the content or an electron beam is focused on the contents to melt. The contents after melting form an electron cloud in the shape of ice cream cone with the tip of the cone at the source. It coats all surfaces in the line of sight of the boat or crucible. This process is widely used to produce decorative coatings on plastic parts those are resembling shiny metal. Many automobile parts are plastic with a PVD coating of aluminium. A lacquer coating is applied over the decorative coating to provide corrosion protection.

This process is also used to apply relatively thick (1mm) coatings of heat resistant materials on jet engine parts. A special alloy of chromium, aluminium and yttrium is used for this type of coating. These coatings are not normally used by average machine designers. The thin coatings which are used for decorative purposes are too fragile for wear coatings and heavy thermal evaporation coatings. For decorative coatings or coatings on optics, thermal evaporation may be the best suitable for engineering processes.

High technology coatings such as ceramics, metal alloys and organic and inorganic compounds are applied by sputtering. The substance to be coated is connected to a high voltage dc power supply. When the vacuum chamber has been pumped down, a controlled amount of argon or another gas is introduced to establish a pressure of about 10^{-2} to 10^{-3} torr. On energizing current supply, plasma is established between the work and the material to be coated. The gas atoms are ionized, and they bombard the material to be coated.