Electroplating Encyclopedia Article

Electroplating

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Electroplating

Some metals are recognized for their strength and durability, while others are better known for their visual beauty. When both qualities are desired, it is possible to coat a stronger metal, such as iron, with a more attractive one, such as gold or silver. For example, jewelry is commonly gold-plated, and silverwear is usually a cheaper metal coated with silver.

The coating process, or gilding, was achieved in earlier times by direct pounding of the exterior metal to the base metal. Later a bonding method was developed in which both metals were joined while in a molten state. However, such coatings are often thicker than was necessary, wasting the valuable coating material.

Establishing a bond by use of an electrical current, or *electroplating*, was first developed in 1800 by the German physicist Johann Wilhelm Ritter (1776-1810). Within months of the invention of the electric battery by Alessandro Volta, Ritter was able to demonstrate how copper plates could be created by running an electrical current through copper sulfate. Positively charged copper ions in the copper sulfate would be attracted to the negatively-charged plate, which served as the electrode of the battery. These ions would then cover the plate. It would be another 40 years before this process would be used on a large scale.

In 1839 Germans Carl Jacobi and Ernst Werner von Siemens were granted patents for the electroplating process for gold- and silver-plating. In England the Elkingtons of Birmingham developed their own electroplating system in 1840. Gold or silver dissolved in cyanide would adhere to the item being plated as an electric current was passed through the solution. (Other metals commonly applied by electroplating are cadmium, chromium, and nickel.) By 1900 the Germans had established primacy in the electroplating industry.