



Resistors are passive components. This means they only consume power and cannot generate it.



Resistance limits the flow of electrons (and therefore current) through a circuit.



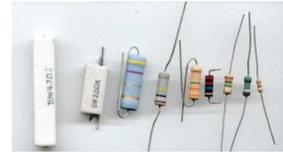
Metal oxide and metal film are now some of the most widely used forms of resistor. A wide range of values to a good degree of accuracy can be produced with both as well as with carbon film.

# Types of Resistors

Now that the basics have been covered it's time to take a more detailed look at the various electronic components, the different types, and their specific uses. As before, we start with the resistor.

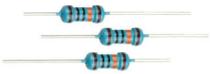
These fall into two major categories:

- **Fixed resistors** – the most widely used. There are many types of fixed resistor for use in different circumstances.
- **Variable resistors** – these consist of a fixed resistor element and a slider for tapping off a variable resistance.



## Fixed resistors

There are quite a number of different types of fixed resistor; here are some of the more common:

- **Carbon film** – this resistor type is formed by depositing carbon onto a ceramic former; the resistance value being set by cutting a helix or spiral into the carbon film. 
- **Metal film** – instead of a carbon film, this resistor type uses a metal film deposited on a ceramic rod. 
- **Metal oxide film** – very similar to the metal film resistor, but uses a metal oxide film (such as tin oxide) deposited on a ceramic rod. 
- **Wirewound** – generally used for high-power applications, these resistors are made using lengths of wire, called *resistance wire*, of which the exact resistance per length is known. The wire is wound round a former, and the resistor covered with a protective enamel coating. 
- **Carbon composition** – formed by mixing carbon granules with an adhesive binder that is then made into a small rod. Once very common, but now seldom used as it is not very accurate.
- **Thin film** – uses thin film technology and is used for manufacturing billions of the tiny surface mount types of resistor (SMT) in use today. 