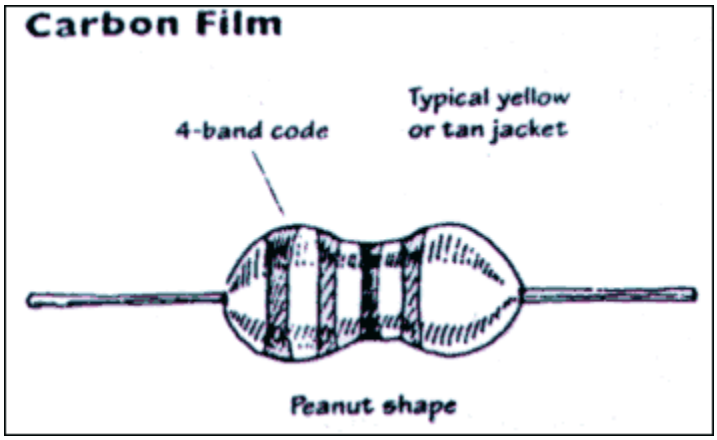
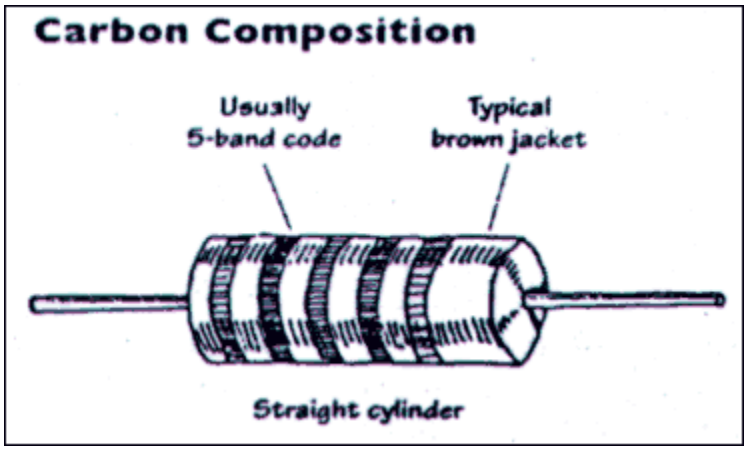
KIND OF RESISTORS

1. CARBON FILM



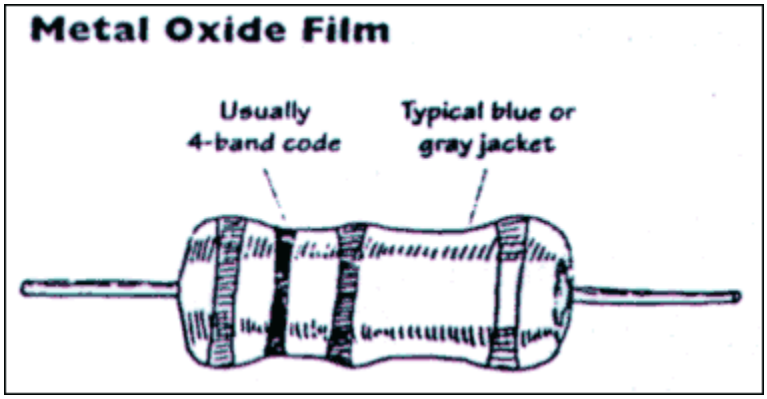
The most popular resistor type. This resistor made by depositing a carbon film onto a small ceramic cylinder. A small spiral groove cut into the film controls the amount of carbon between the leads, hence setting the resistance. Such resistors show excellent reliability, excellent solderability, noise stability, moisture stability, and heat stability. Typical power ratings range from 1/4 to 2 W. Resistances range from about 10 Ohm to 1 MOhm, with tolerances around 5 percent.

2. CARBON COMPOSITION



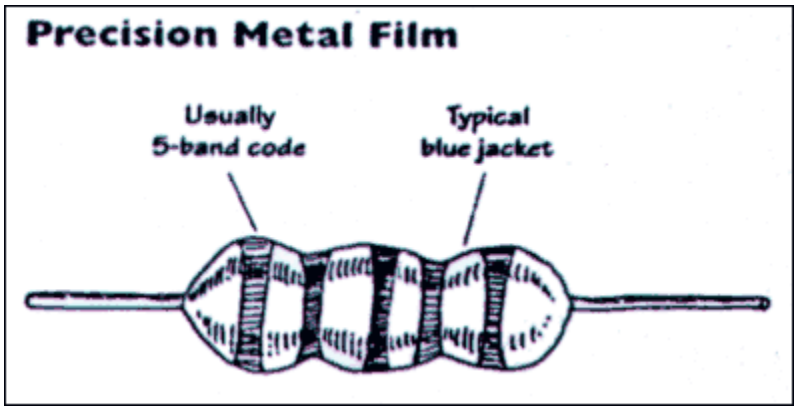
This type is also popular. Its made from a mixture of carbon powder and glue like binder. To increase the resistance, less carbon is added. These resistors show predictable performance, low inductance, and low capacitance. Power ratings range from about 1/4 to 2 W. Resistances range from 1 Ohm to about 100 MOhm, with tolerances around +/- 5 percent.

3. METAL OXIDE FILM



This type is general purpose resistor. It uses a ceramic core coated with a metal oxide film. These resistors are mechanically and electrically stable and readable during high temperature operation. They contain a special paint on their outer surfaces making them resistant to flames, solvents, heat, and humidity. Typical resistances range from 1 Ohm to 200 kOhm, with typical tolerances of +/- 5 percent.

4. PRECISION METAL FILM



This type is very accurate, ultra low noise resistor. It uses a ceramic substrate coated with a metal film, all encased in an epoxy shell. These resistors are used in precision devices, such as test instruments, digital and analog devices, and audio and video devices. Resistances range from about 10 Ohm to 2 MOhm, with power rating from 1/4 to about 1/2 W, and tolerances of +/- 1 percent.

5. FOIL RESISTORS

Foil resistors are similar in characteristics to metal film resistors. Their main advantages are better stability and lower temperature coefficient of resistance (TCR). They have excellent frequency response, low TCR, good stability, and are very accurate. They are manufactured by rolling the same wire materials as used in precision wire wound resistors to make thin strips of foil. This foil is then bonded to a ceramic substrate and etched to produce the value required. They can be trimmed further by abrasive processes, chemical machining, or heat treating to achieve the desired tolerance. Their main disadvantage is that the maximum value is less than metal film resistors. The accuracy is about the same as metal film resistors, the TCR and stability approaches precision wire wounds but are somewhat less because the rolling and packaging processes produce stresses in the foil. The resistive materials used in precision wire wound resistors is very sensitive to stresses, which result in instability and higher TCS. Any stresses on these materials will result in a change in the resistance value and TCR, the greater the stresses, the larger the change. This type can be used as strain gauges, strain being measured as a change in the resistance. When used as a strain gauge, the foil is bonded to a flexible substrate that can be mounted on a part where the stress is to be measured.

6. FILAMENT RESISTORS

Filament resistors are similar to bathtub or boat resistors except that they are not packaged in a ceramic shell (boat). The individual resistive element with the leads already crimped is coated with an insulating material, generally a high temperature varnish. They are used in applications where tolerance, TCR, and stability are not important but the cost is the governing consideration. The cost of this type is slightly higher that of carbon composition and the electrical characteristics are better.

7. POWER FILM

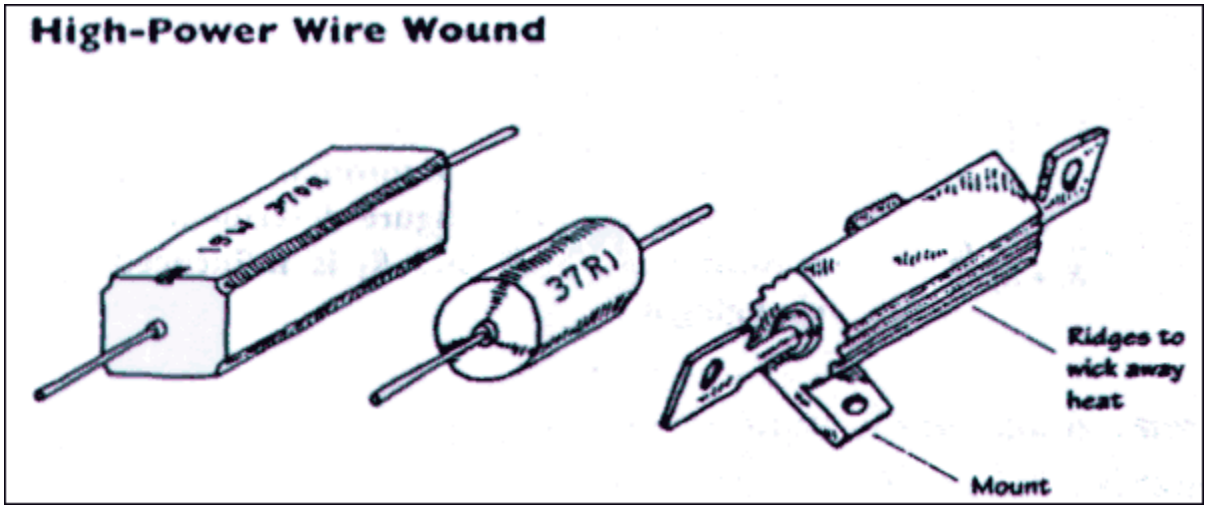
Power film resistors are similar in manufacture to metal film or carbon film resistors. They are manufactured and rated as power resistors, with the power rating being the most important characteristic. Power film resistors are available in higher maximum values than the power wire wound resistors and have a very good frequency response. They are generally used in applications requiring good frequency response and/or higher maximum values. Generally, for power applications the tolerance is wider. The temperature rating is changed so that under full load, the resistor will not exceed the maximum design temperature. The physical sizes are larger and, in some cases, the core may be made from a more head conductive material and

other means employed to help radiate heat.

8. PRECISION WIRE WOUND

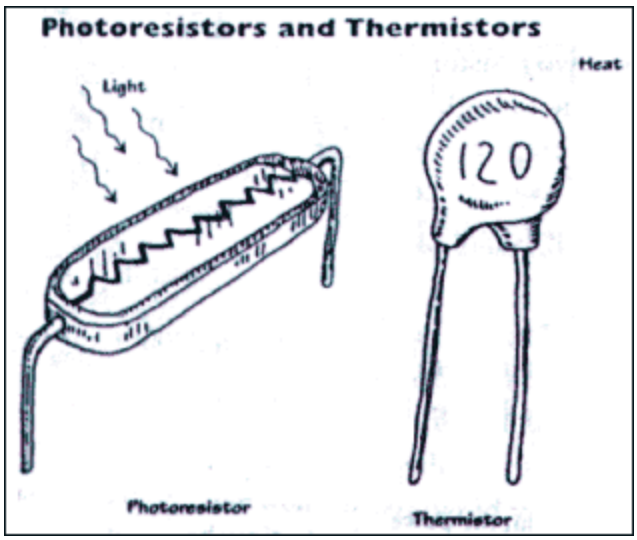
The precision wire wound resistor is a highly accurate resistor (within 0.005%) with a very low TCR. A TCR of as little as 3ppm/o C can be achieved. However these components are too expensive for general use and are normally used in highly accurate dc applications.

9. HIGH POWER WIRE WOUND



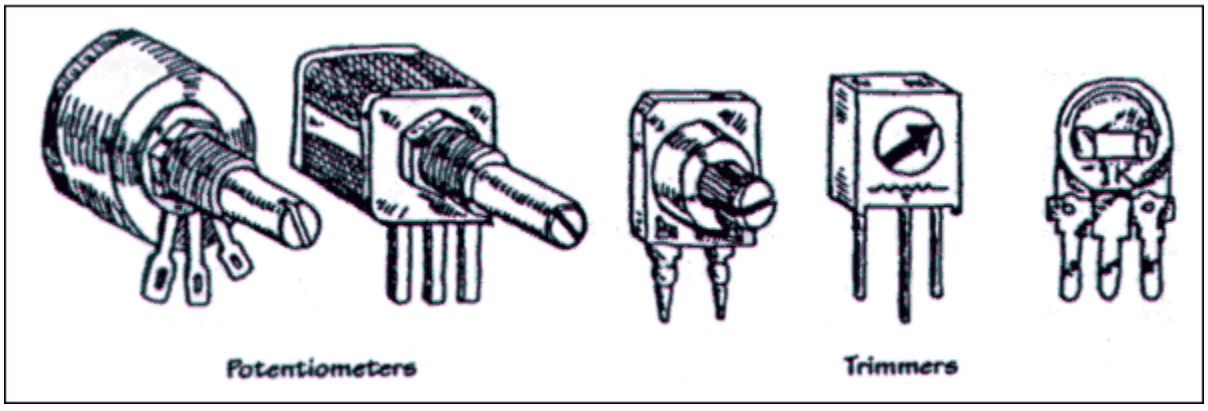
These resistors are used for high power applications. Types include vitreous enamel coated, cement, and aluminum housed wire wound resistors. Resistive elements are made from a resistive wire that is coiled around a ceramic cylinder. These are the most durable of the resistors, with high heat dissipation and high temperature stability. Resistances range from 0.1 Ohm to about 150 kOhm, with power ratings from around 2 W to as high as 500 W, or more.

11. PHOTORESISTORS AND THERMISTORS



These are special types of resistors that change resistance when heat or light is applied. Photo-resistors are made from semi-conductive materials, such as cadmium sulfide. Increasing the light level will decreases the resistance. This type also called LDR (Light Dependent Resistor). Thermistors are temperature sensitive resistors. Increasing the temperature will decreases the resistance (in most cases). This type also called Thermistor NTC (Negative Temperature Coefficient). The resiprocal type is Thermistor PTC (Positive Temperature Coefficient). Increasing the temperature will increases its resistance.

12. VARIABLE RESISTORS



Variable resistors provide varying degrees of resistance that can be set with the turn of a knob. Special kinds of variable resistors include potensiometers, rheostats, and trimmers. Potensiometers and rheostats are essentially the same thing, but rheostats are used specially for high power AC electricity, whereas potensiometers typically are used with lower level DC electricity. Both potensiometers and rheostats are designed for frequent adjustment. Trimmers, on the other hand, are miniature potensiometers that are adjusted infrequently and

usually come with pins that can be inserted into pcb. They are used for fine tuning circuits (eg. : fine tuning a circuit that goes astray as it ages), and they are usually hidden within a circuits enclosure box. Variable resistors come with 2 or 3 terminals. There are 2 kinds of taper, ie. : linear tapered and nonlinear tapered (logarithmic). The 'taper' describes the way in which the resistance changes as the control knob is twisted. Linear taper usually has coded as 'A' while nonlinear tapes has coded as 'B'.

Source : http://mediatoget.blogspot.in/2011/06/kind-of-resistors.html