A comparison of the most commonly used metals as conductors is given in Table below:

Types of materials used				
PROPERTIES	**Silver**	**Copper**	**Gold**	**Aluminium**
Ability to withdrawn into thin wire	Very good	Very good	Very good	Not good
Flexibility	Very good	Very good	Very good	Not good
Conductivity	Very good (100%)	Very Good (94%)	Good (67%)	Good (56%)
Receptivity in m at 200 C	1.6 x 10-8	1.7 x 10-8	2.4 x 10-8	2.85 x 10-8
Ability to withstand extreme atmospheric conditions	Good	Good	Very good	Bad
Cost	Expensive	Cheap	Expensive	Very cheap

Temperature coefficient of resistance

It is investigated that the resistance of a conductor varies with temperature. The effect of resistance due to change in the temperature is called as the Temperature Co-efficient of Resistance.

This is the relative change of a resistance when the temperature is changed by 1 deg K. It is represented by the Greek letter α.

Material	**Temperature Coefficient of Resistance, α**
Silver	0.0038
Copper	0.0039
Aluminium	0.0039

Consider a material having a resistance R_0 at 0^0C.

Let it have a resistance of R_1 at Θ_1, and R_2 at Θ_2.

If α is the temperature coefficient of resistance at 0^0C,

$R_1 = R_0 [1+ \alpha.\Theta_1)$

$R_2 = R_0 (1+ \alpha.\Theta_2)$

$R_1/R_2 = (1+ \alpha.\Theta_1)/ (1+ \alpha.\Theta_2)$

This can also be written as:

$R_2 = R_1 [l + \alpha (\Theta_2 - \Theta_1)]$

If the resistance of a coil is measured at the beginning and at the end of a test, the temperature rise of the coil can be determined.

The resistance of carbon, electrolytes and dielectrics decreases with increase of temperature. Hence the Temperature Co-efficient of Resistance does not apply in such materials.