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Thermocouples were invented in the year 1822 by the Estonian physician called Thomas Seebeck. He discovered that the intersection of two metals produces voltage that helps in calculating temperature.

Thermocouples (TC) follows the principle which says, that when two unlike metals are joined, a relative voltage is generated which is correlated to the difference in temperature between the calculating joint and the reference junction. Since thermocouples are easy to construct, they are widely used in the iron and steel industry. Though these are very useful in the industrial purpose, they have got their own merits and demerits in place:

Advantages of thermocouples -

1. These can be easily manufactured in the chemical lab or inside the factory

2. These devices are usually very strong in nature. So using in rough environment is very easy. They even work properly in harsh environment.

3. Works with self power, no external power is needed.

4. They can operate over large temperature range.

Disadvantages of thermocouples -

1. They lack accurate reading

2. They offer very little or insufficient output

3. This output is non-linear.

In spite of so many disadvantages, thermocouples are widely used due to their simplicity and efficiency of measuring large temperature range.

Different kinds of thermocouples -

Thermocouples are made up of the below mentioned combinations of metals and alloys, such as;

1. Type J - This kind is prepared from Iron and Constantan. They help in measuring temperature from 40 to 750 degree Centigrade.

2. Type K - Chromel and Alumel are combined to make this type. This is one of the most popular and highly used types as its range is wider and it is reasonably priced. It can measure temperature from -200 to 1200 degree C.

3. Type R â€“ is made by combining Platinum and Rhodium and used for measuring temperature from -59 C to 1600 C. The price of this type is high hence it is not popular among the users.

4. Type S - This is also made from Platinum and Rhodium and is used for measuring temperature from -50 to 1600 C.

5. Type B - This type of is also prepared from Platinum and Rhodium. It can be used for calculating temperature up to 1600 C.

6. Type E - This type is prepared by mixing Chromel and Constantan and is used for temperature - 270 C to 790 C.

7. Type N â€“ Type N is a combination of Nicrosil and Nisil and helps in measuring temperature from 260 to 1300 C. The price of this type N is low and therefore it is highly used in the industrial purpose.

In short thermocouples are made from combining two different metals preferably in wire form and the junction is done through welding process. When this junction is heated it immediately experiences a temperature rise which gets converted into voltage and this acts as a temperature indicator. And finally this device perfectly records the temperature variation between the two points. Some metal combination provides predictable results but some gives useful results which help in industrial applications.

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the author writes about the efficiency of heavy duty industrial equipment being increased by semi conductors and theory of a thermocouple.

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