

## 1. Temperature sensing principles

### 1.1 Bimetals



#### 1.1.1 BIMETAL STRIPS

The bimetal strip is formed by two co-laminated metal. One has a high coefficient of expansion, the other a lower or zero. When this strip is heated, it bends proportionally to the temperature. These bimetal blades are generally flat and fixed at one end. But they can be wound in a spiral shape, although this arrangement most often used in the construction of thermometers.

#### 1.1.2 DISCS AND DISCS VARIATIONS



In many applications, it is needed to produce a bimetal with a snap operation with a sudden change of shape at a given temperature. For this, a bimetal disc is bumped and formed into a dome. Temperature changes cause an accumulation of energy therein, which, at a specified temperature, snaps from the concave to the convex shape. A very rigorous selection of the composition, thickness, depths of stamping and heat treatment, is requested to obtaining accurate, stable and repetitive operating temperature.

Based on original round form, were developed rectangular shapes, ovals, etc..

The main difficulty is to obtain a small tolerance and a small differential on operating temperature.

But these snap action discs are the sensing device of most temperature limiters on the market.