# ANALOG THERMOMETER

A thermometer is an instrument that measures the temperature of a system in a quantitative way. By the word Analog thermometer we usually mean to say mercury thermometer due to the silvery white liquid “mercury” inside it. Mercury is one of the 92 naturally occurring elements that become liquid at room temperature and remains in liquid state throughout a wide range of temperature.

This article tries to explain every minutest part of the analog thermometer to describe the concept of temperature measurement. The explanation carries on with the images of broken thermometer from head to toe with every minute part of it.

There are basically two types of mercury thermometers that measures body temperature. These are:

• oral/rectal/baby thermometers, contains about 0.61 grams of mercury; and

• Basal temperature thermometers, contains about 2.25 grams of mercury.

These two differ in the fact that Basal thermometers are ultra sensitive thermometers because they can track body’s minutest temperature shift i.e. they can accurately measure the temperature shift by 0.1 degrees Fahrenheit while oral thermometers are precise upto 0.2 degrees Fahrenheit. Oral thermometers are used to measure the body temperature at the time of fever while basal thermometers are used by women to

chart their basal body temperature to predict their fertile
period or ovulation. But the basal thermometers can't be used in the place of oral thermometers because of the high mercury content which is toxic. The explanation will carry on with the oral thermometers.


The Glass Chamber is the top most part of the Thermometer called protection chamber. It is used to protect the whole body of thermometer containing capillary tube, scale and mercury from coming in contact with the outside world.

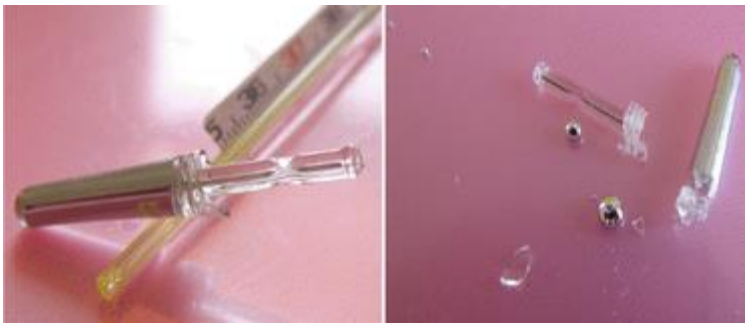

The top most part of the capillary tube is called the Expansion Chamber. It is hemispherical in shape to provide more space for the gases to expand. When the mercury rises with the increase in temperature in the tube, the gas or air present in the chamber moves upward in the expansion chamber. This space is also utilized by the

mercury to expand when the temperature exceeds the value mentioned on the scale. But this condition never arises in normal use.


Moving towards the lower part, a scale is found on which some readings are written. These reading denote the amount of rise in temperature. The height at which the mercury rests corresponds to calibrated marks on the side scale of the tube, allowing us to read the temperature.This scale may be in oC or oF or in both depending upon the manufacturing companies. The scale divisions are made according to the temperature scale. The normal scale ranges from 35 to 42 oC or 94 to 108 oF.


Capillary Tube is placed on the scale in which mercury rises and falls with temperature. It is also made up of glass which is in different colour in comparison to expansion chamber so that human eyes can differentiate between the two and correct reading can be taken easily. Its diameter is same throughout so that distribution of mercury is evenly done with rise in temperature and accurate reading can be measured.

Constriction is the narrow part of the thermometer which joints the mercury bulb with the rest of the thermometer. The constriction acts like a ‘valve’ similar to the valve in the heart to prevent the mercury from flowing back. The thermometers should be shaken well before use so that mercury which has been left above in the tube can fall down into the bulb through constriction before taking next reading.



The glass bulb is a reservoir filled with mercury which expands and rises with the rise in temperature. This part of thermometer is made up of stainless steel so that when kept ideal, mercury inside it remains below room temperature. It is the place which is kept under the arm, tongue etc where body temperature is to be measured. With the rise in temperature above the room temperature, the mercury starts expanding and starts rising. The mercury thread forces its way through the constriction, crossing it to be trapped after expansion. An accurate reading can still be obtained after it contracts because the constriction has trapped the mercury.

One important thing to be known about mercury thermometer is that although mercury is one of the 92 naturally occurring elements and because of which it is so cheap. It is very much harmful for the central nervous system of body. So it should be kept away from the reach of children and must be handled with great care.

Source : http://www.udaipurtalents.com/technical-learning/analog-thermometer