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Diploma in Pharmacy 1st Year
Pharmaceutics
Experiment

To demonstrate the diameter, size, shape and thickness tests of the tablets as per the monographs.

Aim:

To demonstrate the diameter, size, shape and thickness tests of the tablets as per the monographs.

Reference :

‘ Dr. Gupta G.D , Dr. Sharma Shailish , Dr. Sharma Neelam’ “Practical Manual of Pharmaceutics” Published by Nirali Prakashan, Page no 124 – 126

Apparatus and Materials Required :

Tablets, weighing balance, vernier calliper or micrometre callipers.

Theory :

The suitability of the goods or service to the determined qualifications is termed quality; and quality control involves product testing for defects and timely reporting to management making decision whether to investigate or deny the product or process.

Diameter, Size and Shape: The tablet diameter size and shape depends on the die and punches selected for making the tablets. The tablets of various sizes and shapes are prepared but generally they are circular with either flat or biconvex. faces. It can be dimensionally described and controlled. Tablet thickness is the only variable that can be measured by micrometre or by other devices Tablet thickness should be controlled within a ±5% variation of standard value.

Thickness: The tablet thickness can vary without any change in its weight. This is generally due to the difference of density of granules, pressure applied for compression, and the compression speed. The thickness of a tablet is determined with the help of micrometre or vernier callipers. The thickness variation limits allowed are ±5% of the size of the tablet. The variation in thickness leads to counting and packing problems.
Following callipers can be used for testing the thickness of tablets:
Vernier Calliper: It is a high-precision measuring tool that can be used for a variety of applications. For pipes, it can measure thickness, diameter, and even interior diameter. It has two jaws for measuring thickness and two smaller jaws for measuring inner diameters, as well as a scaled handle. The bottom smaller jaw is attached to the lower thickness measuring jaw, and there is another scale on the entire piece. When the jaws of the vernier calliper are opened to perform a measurement, the ensemble glides on the handle, and the combination of the two scales gives the correct measurement. The reading inaccuracy of vernier callipers is 0.05 mm.

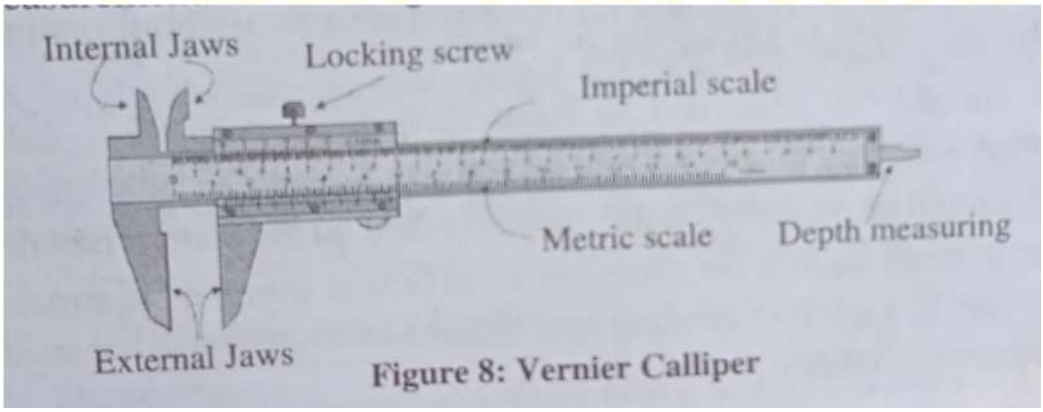

Figure 8: Vernier Calliper

Least Count of Vernier Calliper

The least count of the Vernier is the difference between the value of one main scale division and the value of one Vernier scale division.

$$\text{Least count} = \frac{\text{Value of one main scale division}}{\text{Total number of division on vernier scale}}$$

Let us assume= $\frac{1}{10}$ = 0.1mm is least count 10

The smallest value that we can measure using a vernier calliper is the least count. The value of one main scale division divided by the total number of divisions on the vernier scale is used to compute the least count of vernier calliper.

Micrometer Calliper: It is the most accurate mechanical measuring tool available. It is made up of a thimble on one end with a rotating screw and a frame on the other. The rotation of the screw drives a spindle inside the thimble.

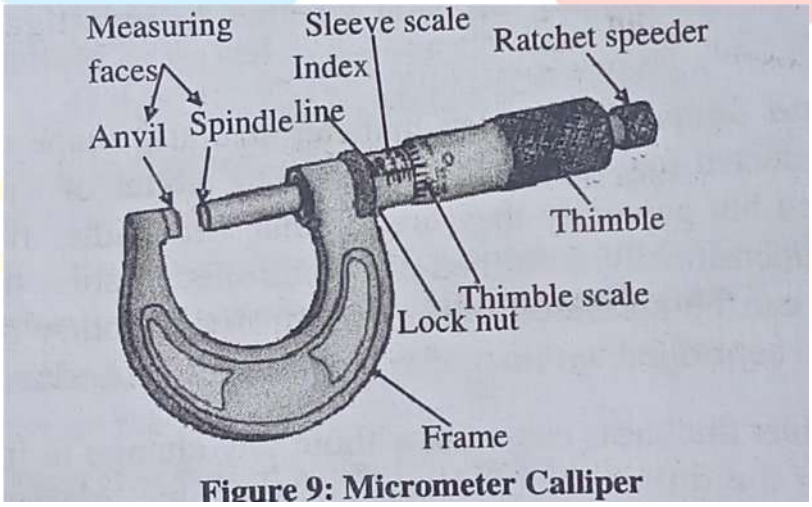

Figure 9: Micrometer Calliper

Procedure :

Using a Vernier Calliper

Toothpastes can be prepared by any of the following two methods:

1) Both the part and the calliper should be cleaned completely so that it is free from burrs and other obstacles.
2) Clamping screws should be loosen on both sliding jaws and the sliding jaw should be set slightly larger than measurable features.
3) Clamp nut should be carried to the beam. Instead of locking the clamping screw on the movable jaw, it should be snugged up.
4) The fixed jaw should be placed in contact with the reference point of the part feature.

5) The beam of the calliper should be aligned in both planes to be almost parallel to the line of measurements as much as possible.
6) Adjusting nut should be turned so that movable jaw just touches the part.
7) Clamp screw should he tightened on the movable jaw without disturbing the feel between the calliper and the part.
8) The place should be observed without disturbing part of a calliper, if possible, otherwisethe calliper should be removed.
9) The reading should be recorded on the paper, marked on the part, or part drawing.
10) Measurement steps should be repeated a sufficient number of times to rule out any obviously incorrect reading and should average the other reading for the accurate measurement.
11) Both the clamps should be loosen and slides movable jaw should be opened and work should be removed.
12) The instruments should be cleaned, lubricated, and replaced in their box.
13) Then the reading should be analysed for finding the errors that may remain in the measurement.

Using a Micrometer Caliper

1. To take a measurement on the micrometer the object should be gently pinched between the anvil and spindle.
2. Once a very gentle pinch has occurred, the ratchet should be twisted until it clicks once or twice.
3. This ensures that the right amount of tension should be applied.
4. The object should be held firm enough to not fall out of the micrometer under its own weight yet gentle enough that it can easily slip away if grasped.
5. If necessary, the lock nut should be applied to prevent the spindle from tightening or loosening while interpreting the measurement
6. Then the lines should be observed on the spindle and found which markings are aligned with the datum line.

Result :

The size, shape and thickness test of the tablets as per the monographs were performed.