Spherometer

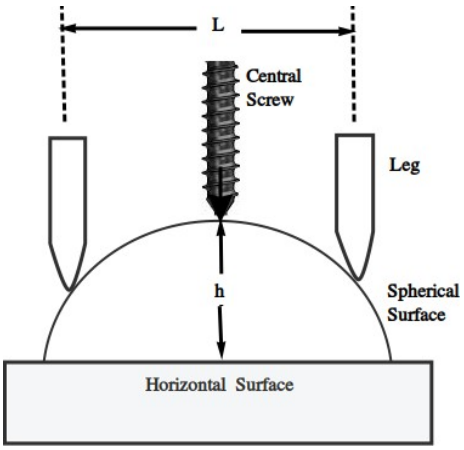
Aim : To find the radius of curvature of the spherical surface (concave/convex) using Spherometer

Apparatus:
Spherical (Convex/Concave) surface, Base plate, Spherometer etc

Principal

Radius of Curvature of the Spherical surface is given by

$$R = \frac{L^2}{6h} + \frac{h}{2}$$



where **L i**s the average distance between the legs of the spherometer and **h** is the height or depression of the spherical surfaces

The height/depression can be measured using the Spherometer

Total reading (h) = PSR + (CSR x LC)

Where PSR – Pitch Scale Reading
CSR – Circular Scale reading

If N is the total no. of divisions on the circular scale

$$Least\ Count\ (L.C.)\ of\ the\ spherometer = \frac{\text{Pitch}\ of\ the\ spherometer\ screw}{Number\ of\ divisions\ on\ the\ circular\ scale} = \frac{p}{N}$$

Where pitch (P) is the vertical distance moved by the central screw in one complete rotation of the circular disc

$$Pitch = \frac{Distance\ moved}{Number\ of\ rotations}$$

Observations

1. To find the average distance between the legs of the spherometer

Distance between the legs of the Spherometer (cm)			Mean L (cm)

L = cm = m

2. To find the height / depression of the Spherical surfaces

Value of smallest division on the vertical pitch scale = mm

$$Pitch = \frac{Distance\ moved}{Number\ of\ rotations} =$$ mm = mm

Total no. of divisions on the circular scale (N) =

$$LC = \frac{Pitch}{N} =$$ mm = mm

Spherometer placed on	**Sl No**	**PSR mm**	**CSR div**	**Total Reading PSR+(CSRxLC)**	**Mean mm**
Horizontal Plane Surface	1 2 3 4 5				r=
Spherical Surface	1 2 3 4 5				r_1 =

Height **h = r_1 – r** = mm= m

Calculations

Radius of Curvature of the Spherical surface

$$\boldsymbol{R = \frac{L^2}{6h} + \frac{h}{2}}$$ = m

= m

Result:

Radius of Curvature of the Convex/Concave Surface = m