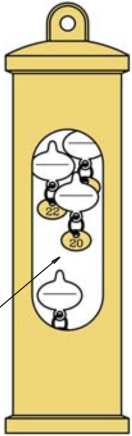
Galileiglass

“Measure what can be measured and make measurable what cannot be measured...”

Galileo Galilei (1564-1642)

On this principle Galilei revolutionized the old world order, which in the 1600s led to the classical mechanics of Isaac Newton (1642-1727). Newton’s publication of Philosophiae Naturalis Principia Mathematica in 1686 is one of the books that changed the world. But even before this, Galileo Galilei had discovered that the volume of a liquid changes with temperature. This is the principle that E.S.Sørensen exploits in the Galileiglass.
This volume expansion causes the density of the liquid to decrease, whereas the volume of the glass balls will not change appreciably. With the buoyancy of the four balls dependent on the density of the displaced amount of water, (remember Archimedes?) the uplift of the liquid on the balls will reduce with rising temperature.
Full advantage of the Galilei principle is taken by using balls which differ in mass by a few milligrams. The heaviest ball will sink first indicating the lowest temperature. The other three lighter balls each show higher temperatures.
The four glass balls of the Galileiglass are marked 18, 20, 22 and 24°C (or 64, 68, 72 and 76F in the Fahrenheit version). At 19°C (66F) precisely the 18°C (64F) ball floats. When 19°C (66F) is exceeded, the ball will sink and the 20°C (68F) ball appears (as drawing shows). Further temperature rise passing 21°C (70F) will make the 20°C (68F) ball sink, revealing the 22°C (72F) ball and so forth with the remaining balls.
In short, you read the temperature by the lowest of the topmost balls



An interesting phenomenon is seen when the temperature is climbing: A ball can be observed sinking extremely slowly. Why is this? On warming, the ascending liquid tends to stratify into layers of differing temperatures with the warmest in the uppermost level and the coldest in the bottom layer of the instrument. Convection currents keep these temperature differences in the layers very small.

E.S.SØRENSEN KØBENHAVN DANMARK

Happy cruising!

www.essorensen.com

June 2006