

IAPSO Standard Seawater and the Practical Salinity Scale

IAPSO Standard Seawater is the only internationally recognised calibration standard for the measurement of Practical Salinity as approved by all the major oceanographic bodies (ICES, IOC Unesco, SCOR, etc) and is endorsed by the International Association for Physical Sciences of the Ocean (IAPSO).

The current definition for Practical Salinity states: a seawater of Practical Salinity 35 has a conductivity ratio of unity at 15 degrees Centigrade (and 1 atmosphere pressure) with a potassium chloride (KCl) solution containing a mass of 32.4356 grams of KCl per kilogram of solution.

Measurements were made on weight diluted and weight evaporated Atlantic seawater to establish the Practical Salinity Scale 1978 (PSS78) which is still in use today. At that time the following points were also made...

Although the basis of the conductivity ratio is the conductivity of a defined KCl solution, in practice it is necessary to use a seawater calibrated against the KCl standard. (i.e. IAPSO standard Seawater).

Therefore, the primary standard for Practical Salinity is the defined KCl solution and the transfer standard is IAPSO Standard Seawater which is prepared only by OSIL. OSIL are ISO9002 accredited for the preparation and calibration of salinity standards, therefore all the measurements of mass, resistance and temperature are traceable to national and international standards.

It is worth noting that when the Practical Salinity Scale was introduced in 1978 the link with chlorinity was broken and salinity became a dimensionless quantity thereby eliminating any units (part per thousand etc.). The more recently introduced PSU (Practical Salinity Unit) is also invalid.

Also, all temperature measurements on the Practical Salinity Scale were made on the International Practical Temperature Scale of 1968 (IPTS68) and this remains even though a new international temperature scale was introduced in January 1990 (ITS90). There is some argument that the current definition of salinity should be changed to reflect the new temperature scale and even though the equations have been calculated by scientists from OSIL and one or two institutes, this remains unimplemented.