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TRACEABILITY

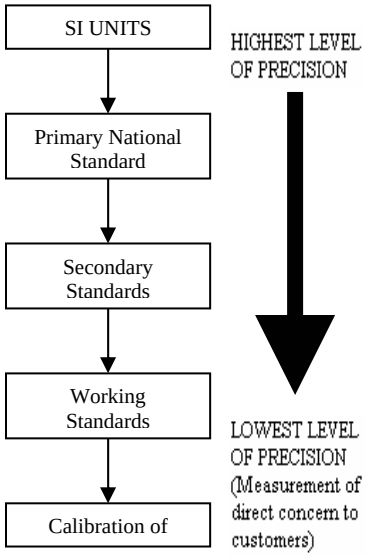
What is Traceability?

Traceability is the property of the result of a measurement whereby it can be related to appropriate measurement *standards*, generally international or national standards, through an unbroken chain of comparisons (traceability chain) in which all uncertainties are indicated. *It should be noted that the instrument itself is not traceable, but the result produced by the instrument is!* Traceability applies to both physical and chemical measurements. The *standard* referred to is a material measure, measuring instrument, reference material or measuring system that define, realize, conserve or reproduce a unit, or one or more values of a quantity to serve as a reference.

Traceability to national standards

Representatives of seventeen nations signed the *Metre Convention* treaty which provided the foundation for the establishment of the **International System (SI) Units**. Since then, national standards laboratories have cooperated in the development of measurement standards that are traceable to the SI.

The units of measurement with the highest accuracy are realized by international measurement standards. The value of the international standard is usually determined by comparison of national standards of the highest quality, or in the case of the kilogram by the mass of the International Prototype. National measurement standards, maintained in a National Metrology Institute (NMI) are compared with these international standards before they are used as a reference for calibration of standards of lower precision. Therefore it is possible to demonstrate an unbroken chain of comparisons that ends at a national standards body.



What is the traceability chain?

It is a series of comparisons between the device under test to a reference. The final comparison in the chain is made using the International System (SI) units as a reference. Each comparison is a link in the chain and the uncertainty of each comparison (link) must be known and documented. NMIs provide the ultimate measurement references for their country. The intent of all NMIs is to realize the SI units as closely as possible so that traceability to the SI can be established by comparing to an NMI that in turn compares its references to the SI.

Benefits of Traceability:

- Allows you to be competitive and operate in the global environment thus reducing technical barriers to trade
- It provides another way of guaranteeing a measurement's accuracy.
- It is an essential element of quality control systems
- It links people, organizations, documents, techniques and measurements within a large and diverse measurement community