Metrology and Standardization as nanotechnology legislation support

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Abstract

Metrology is the science of measurements and its applications. It includes all theoretical and practical aspects of the measurement. The most relevant benefits of metrology are its potential to improve scientific understanding. Metrology is also linked to the concepts of quality control and conformity assessment.

Nanometrology is part of metrology that relates to measurements at the nanoscale, $10^{-9}$ of the unit (nm). Concepts such as metrological traceability, measurement uncertainty, method validation and calibration are the same when we talk about nanometrology.

Nanotechnology uses techniques for manipulating matter on an atom scale so it's require the development of new instrumentations, metrology methods to support nanoscale traceability to the basic and derived SI units and standards.

In Europe, the standards are developed and agreed by the CEN, the CENELEC and the ETSI. CEN and CENELEC also cooperate with the ISO and the IEC to reach agreements on common standards that can be applied throughout the whole world. Nowadays the ISO/TC 229 has published 40 standards covering several aspects of nanotechnologies and 6 of them were prepared by the CEN/TC 352 and published by CEN.

Standards are not freely available to the generic public, but much legislation mandate compliance with certain standards and are often referred to in international and national laws and regulations.

In conclusion, the Portuguese Institute for Quality as the National Standardization Body and the National Metrology Institution, with the collaboration of experts appointed by the nanotechnology stakeholders, will play an important role in the development of support documents for nanotechnology legislation.

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