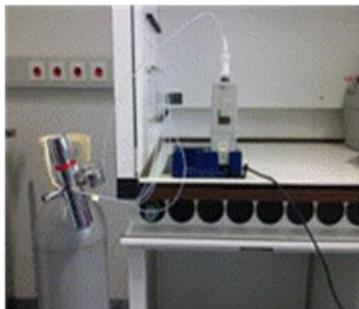


FIELD OF ACTIVITY



Breath Analyzer Calibration



Breath Analyzers



Metrological Control of Breath Analyzers

In Portugal, the metrological control of evidential breath analysers is regulated according to the Recommendation OIML R126, which contains a regulatory framework that defines the maximum permissible errors (EMA) for the metrological checks. The Ordinance No. 1556/2007, December 10, approved the new rules of metrological control of breath analysers.

The verification procedure is based on the comparison method by which the instrument reading is compared with the conventionally true value of the reference gas that had been subjected to analysis in the respective breath analyzer, thereby simulating the exhaled air. The reference gas, known as Certified Reference Material (CRM) consists of binary mixtures of ethanol in nitrogen and comes in five different concentrations, covering the measuring range of breath analysers in check. For each concentration level repeatability tests are carried out, with determination of the standard deviation, error and associated uncertainty.

The breath analysers in the scope of calibration are used by police, hospital and industrial entities. This type of breath tester allows quick and practical use and is not subject to metrological control. It should, however, be subjected to periodic calibration. Calibration is done using the comparison method and the measurements are carried out in the range of 0 g / L to 3 g / L BAC, with 1 to 5 concentrations, depending on the application instrument and customer choice. Certified reference materials (CRM) of gas mixtures of ethanol in nitrogen are used. These mixtures have traceability to primary standards produced in IPQ. The molar fractions of these reference mixtures in mol/mol units are processed in g / L using an equation that uses the molar mass of ethanol, the molar mass of nitrogen, the density of nitrogen, and a conversion factor specific for each type of breath analyser.

SI UNIT

International System Base Unit of Amount of Substance:

mole (mol):

The mole, symbol mol is the SI unit of amount of substance. One mole contains exactly $6\,022\,140\,76 \times 10^{23}$ elementary entities. This number is the fixed numerical value of the Avogadro constant, N_A when expressed in the unit mol^{-1} and is called the Avogadro number.

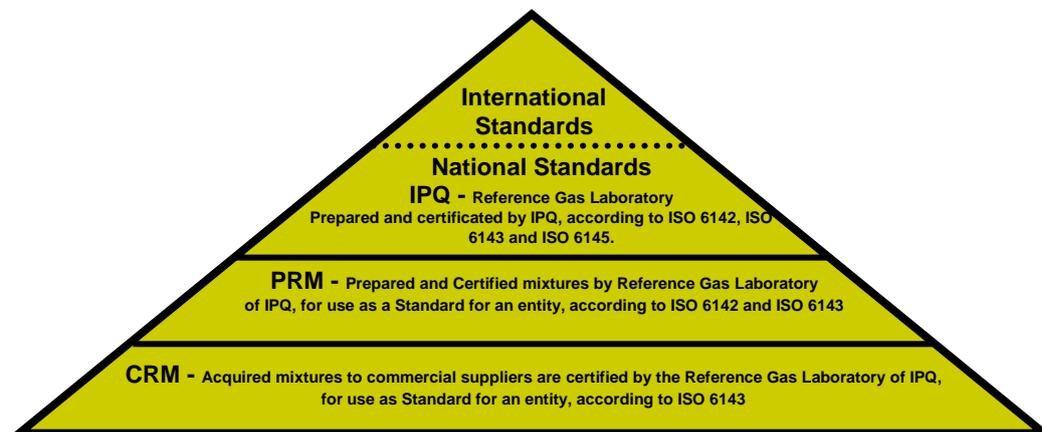
The amount of substance, symbol n of a system is a measure of the number of specified elementary entities. An elementary entity may be an atom, a molecule, an ion, an electron, any other particle or specified group of particles.

TRACEABILITY

Amount of Substance

The measurements traceability is to national and international standards, guaranteed through the use of traceable equipment to the SI units and by the adoption of preparation and certification of gas mixtures methods in agreement with the applicable international standards.

The accuracy of the measurements made is proven through the participation in projects and in international comparisons, and it is demonstrated by the acceptance and inclusion in the Capacities of Measurement and Calibration (CMC) BIPM database for IPQ gas mixtures.



AVAILABLE SERVICES

Calibrations

EQUIPMENT	RANGE	UNCERTAINTY
Breath Analyzer	0 to 3 g/L TAS	(0,01 a 0,03) g/L

Metrological Control

EQUIPMENT	TESTS	Laws
Evidential Breath Analyzer	Type Approval Initial Verification Periodic Verification	Portaria 1556/2007 OIML R 126

CONTACT

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