

Evaluation of Hypoxic QC™

a QC material with a physiological oxygen saturation curve, for the verification of accuracy and precision of low pO_2 measurements

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Introduction

Existing Quality Control (QC) materials have a poor oxygen buffering. Thus, QC measurements at extremely low pO_2 values tend to have large ranges of variation.

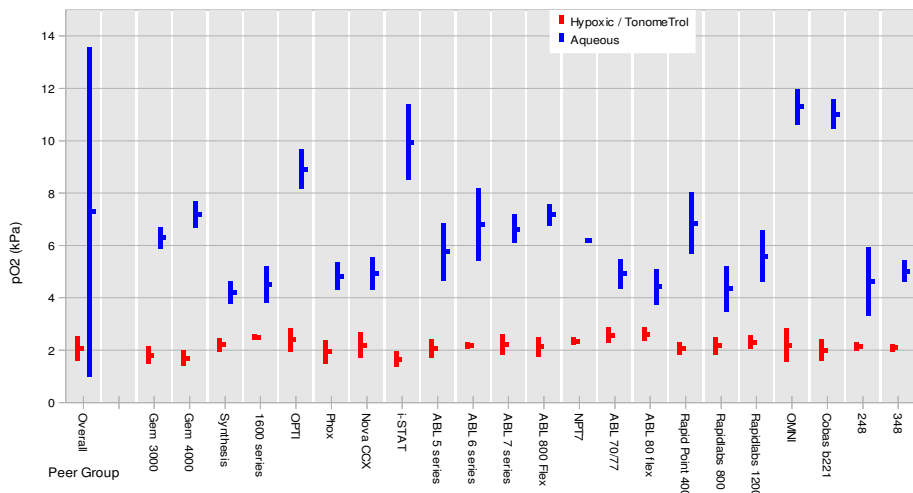
This study details the performance characteristics of Hypoxic QC™, a ready-to-use pre-tonometered quality control that allows verification of pO_2 measurement methods at levels of 15 to 35 mmHg (2.0 to 4.5 kPa).



Performance and commutability

Hypoxic (under the name of TonomeTrol) has been utilized by the Wales External Quality Assessment Scheme (WEQAS) in their program. Results of 1457 participants are represented below (in red). For comparison, results of 1432 participants with a traditional aqueous material are represented (in blue). Bars represent 1 standard deviation.

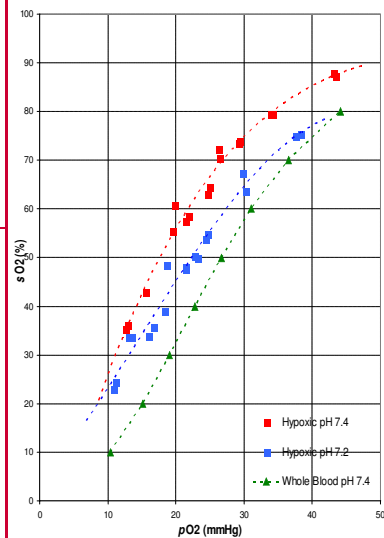
Hypoxic clearly demonstrates superior performance overall as well as per analyser. Moreover, Hypoxic provides high commutability.



Saturation Curve

Hypoxic QC was compared against whole blood tonometry (Zijlstra et al., 2000) for recovery of partial pressure of oxygen (pO_2) and oxygen saturation (sO_2) values.

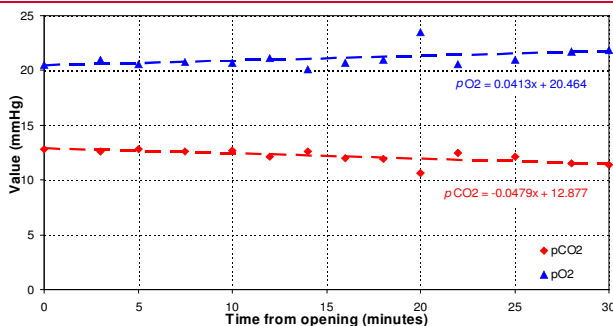
- pO_2 was measured on a Siemens RapidLab 855 blood gas analyzer.
- sO_2 was measured on Ciba-Corning Model 270 CO-Oximeter.
- Saturation data on fresh whole blood were adopted from Zijlstra et al, 2000.



Open ampoule stability

Ampoules were opened and left open on the table prior to measurement on a ABL510. Time interval varied from 0 to 30 minutes.

pO_2 values were stable for well over 10 minutes.



Reference: Zijlstra, Buursma and Van Assendelft: Visible and Near Infrared Absorption spectra of human and animal Haemoglobin. VSP, Utrecht, NL

Conclusions

- Hypoxic / TonomeTrol properties similar to fresh patient samples
- ideal to assess pO_2 accuracy
- down to 15 mmHg (2.0 kPa)
- ready-to-use on most common BGE analyzers
- highly stable pO_2 values after opening

