
BreathTracker Proficiency Testing with QuinTron Evacuated Glass Tubes

Abstract

More and more hospitals and clinics are encouraged to certify their programs through different accreditation reviews. Accreditation programs evaluate health care facilities and personnel for compliance with various regulations for the betterment of health care for the public. As part of these reviews, laboratory equipment must be validated as working according to the manufacturer's specifications. Personnel should also provide documentation that they have been trained to use the laboratory equipment properly. In anticipation of the growing number of facilities conforming to new regulatory guidelines, QuinTron Instrument Company offers proficiency testing kits that can be used for laboratory accreditation or staff training.

Introduction

When bacteria digest (or ferment) food substances, they produce acids, water and gases. The major gases produced by bacteria include, primarily, hydrogen (H₂), methane (CH₄), carbon dioxide (CO₂) and small concentrations of aromatic gases.¹ These gases are absorbed into the blood circulating near the site of digestion and are carried to lungs, where they are equilibrated with the air in the alveoli. When a patient exhales, gases contained in alveolar air can be captured and measured.

QuinTron manufactures instruments and accessories which are designed to capture and analyze the contents of a patient's breath sample. Specifically, our instrumentation measures concentrations of breath hydrogen (H₂) and methane (CH₄) in parts per million (ppm) and the percentage of exhaled carbon dioxide (CO₂). For years QuinTron has provided accurate and reliable means of collecting and storing patient breath samples. One of the sample collection techniques QuinTron offers is the EasySampler kit, which uses evacuated glass tubes to capture and store a patient's breath sample. These kits are preferred by clinics and laboratories which analyze samples collected elsewhere and are mailed in for analysis. Hydrogen, being the smallest element, can easily diffuse through many materials; one exception to this being glass. The stability of the sample, the ability to hold a sample for up to two weeks, and the easy handling of the tube make it ideal for off-site collection and analysis. QuinTron Application Note #7 discusses the EasySampler kits in detail.

Many hospitals and clinics are being encouraged to conform to new guidelines set forth by different accreditation review boards. Laboratory equipment must be validated both as working according to manufacturer's specifications and show that hospital and clinic personnel are appropriately trained to use it.

The purpose of this application note is to describe different testing kits QuinTron can provide to hospitals or clinics to perform proficiency testing for laboratory accreditation or staff training.

Materials/Method

QuinTron BreathTracker instruments use a three point calibration: a “full” calibration with original gas from calibration tank, a “1/2” calibration with calibration gas that has been diluted by 50% and a zero baseline. During factory check out, the instrument’s linear range is tested to confirm the sensors are working properly. Your facility can perform its own linear range check with your calibration gas tank. However, most facilities require that unknown gas concentrations are used when validating the operation of the instrument. QuinTron can provide custom, made-to-order kits which contain unknown (to the customer) gas concentrations in four labeled evacuated glass tubes.

The tubes can be emptied using a model from the SampIXtractor series. The SampIXtractor is an accessory to the BreathTracker instrument which empties the contents of a test tube directly into the BreathTracker with minimal sample dilution. Customers who do not own a SampIXtractor may receive a loaner model from QuinTron.

Once your facility has analyzed the tubes, then you may call or fax the results to QuinTron to compare them with the measurements taken earlier when the tubes were filled. Customers using Model SC, H2+ or CH4+ models should record both original and corrected values during testing.

Customers that have instruments that do not utilize CO₂ correction need to be aware of differences in readings that may occur. It is important that you contact QuinTron to see if they can be corrected based on the measurements taken when the tubes were filled.

Conclusion

QuinTron’s EasySampler kits can be used by hospitals or clinics for accreditation review or staff training. Contact QuinTron to discuss the appropriate materials needed for your site’s activities related to proficiency testing.

For further information on the history and science of breath-testing, sample protocols and collection techniques please reference [Breath-Tests & Gastroenterology, 1998 edition](#), written by Lyle Hamilton Ph.D. or request information from QuinTron directly.

References

1. Bond, J.H., Levitt, M.D. Quantitative measurement of lactose absorption. *Gastroenterol.* 1976; 70(6):1058-62