

CO₂ Sensor Sniffs Out Human Smugglers

Santa Barbara

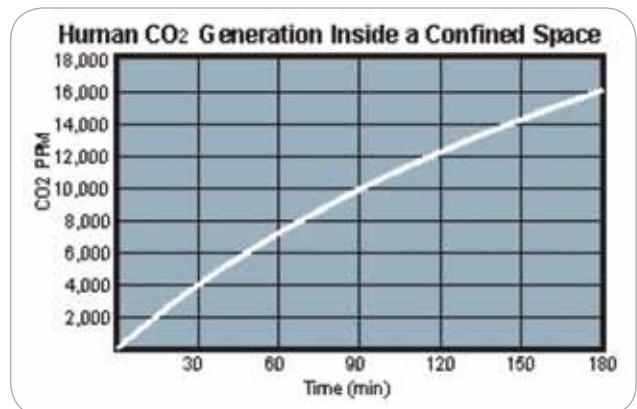
A simple tool made by a Santa Barbara Company for measuring indoor air quality and ventilation in buildings is now being used to quickly identify if shipping containers are carrying a hidden human cargo. This new approach allows a container or truck to be quickly checked by measuring for CO₂ exhaled by human occupants without having to open or enter the container. Working in cooperation with Environmental Care Ltd. of Hong Kong and the Hong Kong Customs Department, Telaire modified its hand held CO₂ sensor to sample shipping containers. Since January, Hong Kong Customs has used the sensor to check over 33,800 outbound shipping containers. In October of this year they found their first illegal human cargo. Over two million containers originate in Hong Kong annually.



How CO₂ Sniffs Out Smugglers

All people inhale oxygen and breath out CO₂. If no people are present in a container, levels inside the container should be similar to outside levels, typically 400 to 500 ppm (parts per million). If people are present, levels can rise to many times the outdoor level in a very short period of time. The graph in Figure 1 shows how quickly CO₂ levels rise if a person is seated in a 10 ft by 10 ft space. To inspect a container for potential human occupancy, a small air-sampling probe is inserted between the rubber seals on the container door. The probe pumps a sample of the container air to a hand held CO₂ Sensor. After 60 to 90 seconds, the presence of human cargo will be indicated if CO₂ concentrations are a few hundred ppm over outside levels. Officials can then safely prepare for opening and inspecting the container.

Prior to the availability of this approach, the only method of determining if containers contained smuggled human cargo was to physically open and inspect every part of a container. This process is dangerous and time consuming and could only be applied to a limited sample of containers. Using CO₂ as a method of screening containers for human occupancy, 100 percent of containers could easily be checked either by immigration officials or shipping companies themselves. This could put an end to this dangerous method of human smuggling. This detection technique can also be used to identify people hidden in confined spaces in trucks, automobiles and boats.



CO₂ Sensor Sniffs Out Human Smugglers/Shipping Containers

The Product

A Santa Barbara based company called our manufacturer of the Telaire CO₂ sensor and pump used for this smuggler detection system. The company has established a cost breakthrough in the infrared measurement of gases that has reduced typical sensor cost by a factor of 10 or more. Once only used in high end scientific and medical applications infrared gas sensing is now being applied as a low cost sensor for industrial health and safety, as well as building ventilation and appliance control.



The Telaire Model 7001 hand held sensor can measure up to 10,000 ppm. The 7001 hand held monitor is compatible with any portable pump with an inlet and outlet that can deliver 80 to 100 cc/minute of air.

Building owners and contractors have traditionally used Telaire's hand held sensor to measure levels of fresh air ventilation in buildings. In these applications, high levels of CO₂ in buildings can indicate a low level of ventilation for the number of people in a space. Low levels of ventilation can contribute to poor indoor air quality, increased spread of viruses and bacteria and potentially lower worker productivity. If a space is found to be under ventilated (high CO₂), or over ventilated (low CO₂ levels) with the hand held sensor, permanent wall mount sensors can be installed to control ventilation much like a thermostat control temperature. In many buildings energy can be saved by controlling ventilation precisely to ensure fresh air ventilation for the actual number of occupants within a space. Carrier Corporation one of the world's leading heating and cooling manufacturers has just introduced a wall mounted combined CO₂ and temperature sensor made by Telaire that will be used on all its commercial projects. In the next few years CO₂ sensing in buildings will be as common as thermostats are today.

Amphenol
Advanced Sensors

www.telaire.com

www.amphenol-sensors.com

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