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Increasing legislation in the area of CO₂ control

The Growing Need for CO₂ Measurements

Vaisala offers accurate, stable and cost-effective instruments for measuring carbon dioxide. Thanks to Vaisala's dedication to product development, these products will maintain their technological edge for years of trouble-free use.

In fields where the properties of carbon dioxide are known, its importance is growing as people become more aware of their environment – be it indoors or outdoors. This trend is underlined by increasing legislation.

Although we cannot see, smell or taste it, carbon dioxide is one of the most common gases in the atmosphere. In normal conditions we breathe and produce it all the time. In higher concentrations, CO₂ affects the well-being and health of people, animals and plants.

Diverse CO₂ applications

There is a growing need for reliable measurement of carbon dioxide in environments as diverse as bottling plants and greenhouses, and classrooms. The lack of small, reliable and inexpensive instruments has made CO₂ measurement difficult and costly.

Furthermore, carbon dioxide is used in many industrial processes, from refining sugar to hardening molds in foundries.

Carbon dioxide can enhance plant growth in greenhouses.

Optimum CO₂ levels can considerably lengthen the shelf life of fruit and vegetables.

PHOTO COURTESY: KESKO, FINLAND



Carbon dioxide is an inert and relatively inexpensive gas, commonly available and quite easy to handle. Inert gases are used to displace oxygen e.g. in process and packing industries. For instance fires and explosions can be prevented by carbon dioxide enveloping.

Potential safety hazards

CO₂ can be a safety hazard. When the concentration of carbon dioxide rises, people start to feel tired and listless and have trouble concentrating. With further increases, CO₂ begins to act as an asphyxiant. Carbon dioxide which is an odorless, colorless gas, displaces air and oxygen in it. CO₂ is denser than air, and high concentrations can occur in open pits and other areas below ground level. Exposure to very high concentrations of carbon dioxide results in unconsciousness or even death.

As high concentrations of CO₂ are clearly hazardous, most countries have set exposure limits in the workplace. In Great Britain, for instance, the weighted average exposure limit for an eight hour working

day is 5,000 parts per million (ppm). A higher limit of 15,000 ppm is applied to exposures of up to ten minutes.

Occupations where carbon dioxide can rise to dangerous levels include the brewing and carbonated drink industries, the freezing of food with dry ice, cold storage, cargo ships, and of course plants where CO₂ or dry ice is produced or handled.

Beneficial effects in greenhouses

On the positive side, carbon dioxide can enhance plant growth. In greenhouses, the growth rate and development of plants, ranging from tomatoes and cucumbers to the most luxurious roses, can be improved by controlling the concentration of carbon dioxide. This raises the productivity and quality of the crops.

To reduce the carbon dioxide consumption and to maximize the productivity, the CO₂ level is typically monitored and measured. If the carbon dioxide level rises too high, the plants can be damaged and their growth stunted. ■

PHOTO COURTESY: VR COMPANY, FINLAND



If the concentration of carbon dioxide rises, people start to feel tired and listless.

More chicks, better chicks from

Carbon Dioxide

Buckeye International Ltd. in the UK is today one of world's leading incubator manufacturers. Building on more than 100 years of experience, a striving for excellence and a willingness to innovate, the company has been responsible for many revolutionary advances in the history of commercial incubation. One such advance involves the routine use of Vaisala's GMD20 carbon dioxide transmitters in its incubators to give precise control of the gaseous environment of the eggs. As a result, the hatching rate has been boosted by up to 3-4 per cent.

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Buckeye International Ltd. has its head office and factory in Somerset in the UK, and is served by a network of offices and agents throughout the world.

Importance of carbon dioxide

The humble brooding hen, sitting tight on a clutch of eggs in the nest, may not be too aware of the concentration of carbon dioxide around them. But, by keeping the eggs close together under her wings, she is not only providing the correct temperature, but also creating a level of carbon dioxide about ten times that of fresh air.

Researchers have known about this for nearly one hundred years, but could not use this information in the design and construction of artificial incubators as there was no way to measure carbon dioxide accurately.

Vaisala's transmitters for CO₂ monitoring

That is, until the Vaisala GMD20 carbon dioxide transmitters came along. Now Buckeye International, an incubator manufacturer since 1881, routinely uses the GMD20 units in its incubators to give precise control of the gaseous environ-