quantum air technology

controlling your environment

In-the-Field PCR Developed for the Military now Available to the Commercial Sector

This case study describes an operational vehicle based system for in-the-field biological/chemical analysis and identification. Although developed for the military, the technology and equipment is ideally suited to civilian applications.

The PCI (Portable Compliant Isolator) has been in operational CBRN (Chemical, Biological, Radiological and Nuclear) use with NATO forces for over one year. It is part of the equipment carried on a specially modified vehicle designed to rapidly respond to biochemical threat situations. A typical NATO CBRN mobile response unit would comprise an eight man team, Para and Commando trained which can deploy and fight alongside the expeditionary forces to conduct their specialist operations. They would provide Detection, Identification, Monitoring, Analysis and Decontamination and provide advice to the commander on the ground. Operating from specially modified 6 x 6 vehicles, the equipment is organised so they can deploy forward to cover every eventuality from vehicle mounted to fully man portable tasks.

One part of the analytical sequence is a process named PCR (Polymerase Chain Reaction). The virtue of PCR is that it allows very small amounts of DNA to be quickly magnified until there is a large enough quantity for subsequent analysis. For the quickest response this requires to be done in the field, however, a very clean and contained environment is needed if contamination of the suspect DNA is to be avoided. It is also essential from a forensisc aspect to keep any evidence intact and free from background contamination.

This clean and contained environment is provided by the PCI. As its name suggests it provides the mobile clean air and contained environment for carrying out the PCR procedures. It is light enough for crew members to offload from the vehicle and can operate using internal batteries for several hours. Whilst the PCI can automatically operate in several pressure modes, it is usual to run the isolator at super-negative or Class 3 containment pressure for this application. This ensures a high integrity of containment whilst also providing a high class of clean air internally. If necessary, the PCI can be used to safely return samples to an analytical laboratory for subsequent detailed analysis.

Graham Miles Partner at Quantum Air Technology said:

"We are pleased that we were able to help our military customers. The use of PCR in-the-field gives the advantages of rapid diagnosis and reduced contamination to samples. These are benefits that may also be useful to non-military users. Specific examples might be gathering forensic evidence at a crime scene or investigating the spread of disease in cattle. This technology is now available to the commercial sector and is cost effective to implement as virtually all the equipment required is off-the-shelf"

Quantum Air Technology provide a wide range of clean air and containment products and services across Healthcare, Biotechnology and Defence market sectors and would be delighted to discuss your requirements. Contact us:

Quantum Air Technology Ltd. Unit 1 Victoria Way, Rawtenstall, Rossendale, Lancashire, BB4 7NY
Tel: +44 (0) 1706 835 135 Fax: +44 (0) 1706 836 100 Email: info@quantumairtech.com Web: www.quantumairtech.com