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Measurement of Rebreathed Carbon Dioxide in Airfed Suits

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The European standard method of measuring rebreathed carbon dioxide in respiratory protective equipment uses a dummy head or torso. For respiratory protective equipment that seals above the waist, this is not a problem, but for airfed suits, which completely enclose the wearer, the dummy torso may be impractical. A method of test using human subjects was therefore considered as an alternative, and tested in a preliminary study.

Measurement of rebreathed carbon dioxide was carried out using the European standard test and a non-standard test using human subjects on three full face masks and two airfed suits. Additionally, a non-standard breath-by-breath breathing machine method was used to assess the full face masks.

Comparing the methods used showed significant differences between the standard method and the breath-by-breath method used for the full face masks. The standard method and the human subject method showed enough comparability to warrant further study.