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The Development and Performance of a Dual Cavity Respirator

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The dual cavity respirator has been developed in the UK in collaboration with DTRA. Its design isolates the positive/negative pressure transients encountered during a breathing cycle, within an inner oro-nasal mask. By decoupling the respiration from the main body of the respirator it allows the ocular region of the mask to remain at a constant positive pressure through the supply of small quantities of air through an inbuilt blower, which substantially reduces the risk of inward leakage through the face seal. Initial testing has shown that by integrating the dual cavity technology into a standard negative pressure respirator unprecedented levels of protection are achieved, even when the volunteer purposely breaches the face seal for one. The pressure within the eye space, and hence protection, can be monitored using Real Time Fit pressure sensor which alerts the user to a breach in the face or oronasal seal, creating a high level of user confidence in the respirator.