

Performance of Breath-Synchronized PAPR (2)

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ABSTRACT

Breath-Synchronized Blower Mask (BL-50) has a mechanism that supply air synchronized with wearer's breathing pattern flow from a fan installed in the half mask. To evaluate the efficacy of BL-50 in the real life, performance evaluation of BL-50 was carried out using actual breathing pattern of worker at a dusty workplace. Breathing pattern of the worker was recorded in Data Recorder through laminar flow meter. Then, the obtained data was passed to a breathing machine in the laboratory to replicate the breathing pattern of worker. Responsibility against the actual breathing pattern and protection performance of BL-50 were examined using this flow condition.

The study was conducted about blower's ability to trace varying breathing patterns as well as about blower's ability to prevent inward leakages.

As a result, it was confirmed that the BL-50 synchronizes with irregular breathing patterns, and that excessive exhaust resistance has been lessened.

At the same time, inward leakage has been tested in a same manner. BL-50 was set on the dummy head to simulate inward leakage due to poor face seal when blower is not activated. Then, with blower on, there found almost no inward leakage. This shows BL-50 controls internal mask pressure, and is considered to give a high protection performance. The results of this study suggest that BL-50 not only improves the disadvantage of conventional blower masks but also has high protection performance in comparison with negative pressure particulate respirators.