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Historical Data on Breathing Rates

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ABSTRACT

Current RPE filter tests are based on the assumption that wearers' minute volumes will be about 30 litres/min and with peak inhalation rates of about 95 litres/min.

The historical literature was examined to determine the validity of this assumption.
Typical results from these data are shown below. In 1919 it was recognised that a man exercising violently breathed about 60 litres/min, giving a peak inhalation rate of about 100 litres/min. Consequently, the gas capacity of filters for use against ammonia was tested at 85 litres/min to take account of high work rates (Perrott (1919)). Chenoweth (1938) cited data showing that minute volumes of 65-100 litres/min occurred during maximum exertion. Cotes (1948) recognised that high breathing rates could occur and proposed that permissible breathing resistances should reduced where high breathing rates were likely. Bentley and Bostock (1981) reported breathing rates of 45-102 litres/min in men carrying out an escape exercise when wearing air-fed equipment. WPF data suggest that peak inhalation rates during asbestos removal were likely to have exceeded about 200 litres/min, Howie et al (1996).

The historical data confirm that higher minute volumes that assumed by current tests can occur.