

ISRP 2000 abstract

Presenter/author	Title	Abstract
Bien, Ching-tsen LAO Consulting, Inc., Crofton, MD, USA	Cartridge Service Life Data — a Comparison between Models and Test Data	<p>The OSHA revised respiratory protection standard requires the employer to develop a cartridge/canister change schedule based on available information and data describing the service life of the sorbent elements against the contaminant present in the employer's workplace, 29 CFR 1910.134 (d)(3)(iii).</p> <p>As a result of this requirement, many respirator manufacturers have developed computer software that predicts the service life of their own chemical cartridges/canisters against known air contaminants that exist in the workplace. These software programs are based on models developed by Gary Nelson or Gerry Wood. The user provides input parameters, such as contaminant concentration, temperature, humidity, work rate, and the desired breakthrough rate. The software program then calculates the breakthrough time at a given concentration.</p> <p>Many studies indicate that the humidity, work rate, and boiling point of a chemical can have a significant effect on the service life of cartridges or canisters. This study examines the difference between the experimental breakthrough data and the model-based breakthrough time. Software programs developed by various manufacturers are selected for evaluation. Varying concentrations, humidity levels, and chemicals with low, medium, and high boiling points are selected for comparison.</p> <p>These comparisons indicate that there are differences among experimental and calculated breakthrough data from different programs, and these differences are more pronounced for low boiling point compounds. Humidity also affects the accuracy of calculated values.</p>