Hydrogen Peroxide

End users often ask about respiratory protection for Hydrogen Peroxide (H₂O₂). In the past 3M has always recommended Supplied Air Systems as the appropriate approach. Recent laboratory studies, however, have adjusted this thinking.

It has been demonstrated by the 3M Research Labs in St Paul, Minnesota that a 3M™ organic vapour respirator cartridge is effective against H₂O₂ vapour at concentrations up to ~90 ppm. The current ASCC Exposure standard for hydrogen peroxide is 1 ppm, so an A type filter (e.g. 6051, 6057, 6075, 6059) on a half facemask is suitable for use with H₂O₂ exposure concentrations up to 10 ppm. Using a full facemask with an A1 filter will give a 50 times protection factor ie for use up to 50 ppm of H₂O₂. If there is also an H₂O₂ mist or aerosols present, a 5925 particle filter and 501 retainer must be included with the gas filter. For higher level protection, the 3M 6099 A2B2E2K2P3 filter on a full facemask will provide protection for H₂O₂ levels up to 100 ppm ¹.

Peracetic Acid

Peracetic acid (or peroxyacetic acid) is being used more and more as a broad spectrum biocide in medical and industrial applications. It is a powerful oxidizing agent that penetrates the cell walls of microorganisms and kills them. It is even effective against anthrax spores. Peracetic acid is produced by reacting acetic acid and hydrogen peroxide.

This creates an equilibrium mixture of acetic acid, hydrogen peroxide and peracetic acid. The vapour above a peracetic acid solution contains all three of these compounds. So a cartridge for use against peracetic acid must be capable of removing all three compounds. Both acetic acid and peracetic acid are removed very effectively from air by any 3M organic vapour/acid gas or multigas filter – e.g. 6057, 6059 or 6099.

¹ AS/NZS1715 “Selection, use and maintenance of respiratory protective devices”. Table 6.3.
Cautions:

(1) These oxidants are all potent eye irritants so a full face respirator or suitable other eye protection should be worn.

(2) The filters should not be allowed to come into direct contact with concentrated solutions of peracetic acid or hydrogen peroxide.

(3) Filters should not be used to scrub peracetic acid or hydrogen peroxide from the exhaust of sterilizers or decontamination units. The very high vapour phase concentrations that can occur in these applications could potentially cause ignition of the carbon sorbent if enough peroxides can accumulate on the carbon bed.