Technical Bulletin

December 2019

Respiratory Protection for
Chlorine Dioxide (CAS: 10049-04-4)

Background Information

Chlorine Dioxide (ClO_2) may be used in a wide variety of industrial, oil and gas, food and beverage, and medical industries as an antimicrobial agent for equipment or surface sterilization. It is specifically used to treat water and helps to eliminate Legionella bacteria in hospitals when used at appropriate concentrations. Inhalation of chlorine dioxide gas may cause symptoms such as coughing, sore throat, severe headaches, lung edema and/or bronchospasm. Chronic exposure to chlorine dioxide may cause bronchitis. The recommended exposure limit (REL) by NIOSH for Chlorine Dioxide is 0.1 ppm (parts per million). Therefore, a Bullard PAPRFC4 or PAPRFC5 cartridge should be used in PAPRs (Powered Air-Purifying Respirators) to protect against exposure of chlorine dioxide.

Cartridge Test Details

The Bullard PAPRFC5 cartridge was tested by an independent test lab against 110 ppm Chlorine Dioxide at a flow rate of 170 L/min, 50% RH, and 25°C. Service life was at least five (5) hours for a 0.1 ppm breakthrough. A subset of Bullard PAPRFC5 cartridges were tested against a lower concentration of 25 ppm Chlorine Dioxide at a flow rate of 170 L/min, 50% RH, and 25°C. Service life was at least twenty (20) hours for a 0.1 ppm breakthrough.

The Bullard PAPRFC4 cartridge was tested by an independent test lab against 70 ppm Chlorine Dioxide at a flow rate of 170 L/min, 50% RH, and 25°C. Service life was at least four (4) hours for a 0.1 ppm breakthrough. A subset of Bullard PAPRFC5 cartridges were tested against a lower concentration of 10 ppm Chlorine Dioxide at a flow rate of 170 L/min, 50% RH, and 25°C. Service life was at least twenty-six (26) hours for a 0.1 ppm breakthrough.

Summary

Based on the test results provided by the independent test lab, Bullard cartridges PAPRFC4 and PAPRFC5, which include a NIOSH (National Institute of Occupational Safety & Health) “organic vapor” approval, can filter Chlorine Dioxide up to the levels described above. The maximum use concentration (MUC) for respirators is whichever is lower between the assigned protection factor (APF) and the exposure limit of the hazardous substance or the exposure concentration that is considered immediately dangerous to life or health (IDLH). The Bullard cartridges were tested at 170 L/min to mimic NIOSH criteria. Nominal flow rates for the Bullard EVA and EVAHL Powered Air-Purifying Respirators are approximately 198 / 240 L/min (low / high speed). Therefore, the cartridge service life may be slightly shorter when used with these PAPRs.

Warning ⚠

Respirators help reduce exposures to certain airborne contaminants. Before use, the wearer must read and understand the User Manual provided as a part of the product packaging. Misuse may result in sickness or death. For correct use, consult the User Manual, or contact Bullard at www.bullard.com.

Bullard Center
2421 Fortune Drive
Lexington, KY 04509 • USA
USA: 877-BULLARD (285-5273)
Tel: +1-859-234-6616

Americas Operation
1898 Safety Way
Cynthiana, KY 41031 • USA
USA: 877-BULLARD (285-5273)
Tel: +1-859-234-6616

Bullard GMBH
Dieselstrasse 8a
53424 Remagen • Germany
Tel: +49-2642-999980

Bullard Asia Pacific Pte.Ltd.
LHK Building
701, Sims Drive, #04-03
Singapore 387383
Tel: +65-6745-0556

www.bullard.com