ENVIRONMENT, HEALTH & SAFETY
UNIVERSITY OF MICHIGAN

Calculated Cartridge Life Expectancies

Revision Date: 10/12/21

Cartridge life expectancy for those chemicals and activities that have been identified as respirator required tasks should be estimated whenever possible using calculators provided by respirator manufacturers that have been made available through the manufacturer's website. The following manufacturers of respirators used at the University have made life expectancy calculators available at the following links:

- North/Honeywell® – Respiratory and hand protection selection guide that includes a respirator cartridge life expectancy calculator. (Must **create an account to download**.): https://sps-support.honeywell.com/s/article/Service-Life-of-North-Chemical-Cartridges-Service-Life-Estimator

- OSHA also has also developed a mathematical model for calculating change out schedules: http://www.osha.gov/SLTC/etools/respiratory/change_schedule.html

Formaldehyde

The Michigan Occupational Safety and Health Administration's (MIOSHA's) General Industry Health Standard for Formaldehyde (MIOSHA Part 306) has specific cartridge change-out requirements located specifically at Part 306, R 325.51461 "Respirator Program", Rule 11. Therefore, a cartridge change-out calculation is not calculated and the requirements of the standard are followed when cartridge respirators are used. Engineering measures such as closed processes, local exhaust ventilation, or chemical substitution will be used as the primary means of controlling air contaminants. The requirements of this program will be followed when engineering controls are not adequate, or during implementation of engineering controls.

Formaldehyde cartridge change-outs will be done after 3-hours of use or at the end of the work shift, whichever occurs first, unless the cartridge contains a NIOSH approved end-of-service-life indicator (ESLI) to show when break through occurs.

See following page for an example m-xylene SURVIVAIR® End-of-Service-Life Calculator print-out.

Example SURVIVAIR® Cartridge End-of-Service-Life Calculator Report: m-Xylene

Survivair® Respirator Cartridge Service Life Estimate

Employee Information

EMPLOYEE NAME:	**JANE DOE**
Date:	09/20/2011
Employee Number:	N/A
Job Title/Job Description:	EHS Representative
Employer:	University of Michigan – EHS
Employer Location/Address:	1239 Kipke Dr. – CSSB, Ann Arbor, MI 48109-1010
Comments:	This is an EXAMPLE Cartridge Service Life Estimate Calculation for DISPLAY PURPOSES ONLY.

Estimated Cartridge Service Life

SURVIVAIR® CARTRIDGE MODEL:	**NO. 1051 (ORGANIC VAPOR / P100)**
Estimated Service Life:	9.17 Hours (550.41 Minutes)

Contaminant Information

CONTAMINANT NAME:	**M-XYLENE (SYNONYMS: M-XYLOL & 1,3-DIMETHYLBENZENE)**
Contaminant CAS Number:	108-38-3
Permissible Exposure Limits:	100 ppm (OSHA PEL-TWA, NIOSH REL-TWA, ACGIH TLV) 150 ppm (OSHA STEL, NIOSH STEL, ACGIH STEL) 900 ppm (NIOSH IDLH)

Work Site Parameters

CONTAMINANT CONCENTRATION:	**250 PPM**
Temperature:	26.7 °C (80.1 °F)
Relative Humidity:	66% – 80%
Work Rate:	Moderate – continuous movement (50 liters/minute)
Safety Factor:	None