Calculated Cartridge Life Expectancies

Revision: October 13, 2026

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:

- OSHA has developed a mathematical model for calculating change out schedules:

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.

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 Kipe 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	
Contaminate 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