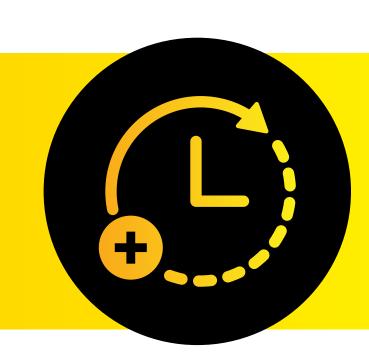


Wear time: Get the most out of your protective equipment



PPE can only do its job when it is worn properly, 100% of the time.

What does wear time mean?

Wear time is the percentage of time a worker actually wears their required PPE vs. the amount of time they should wear it to achieve the Assigned Protection Factor (APF). Used to help select respiratory PPE, APF assumes that workers use their required PPE properly 100% of the time they may be exposed while on the job. Effective Protection Factor (EPF) is the actual protection rate factor according to the wear time for each worker.

Impact on respiratory protection EPF

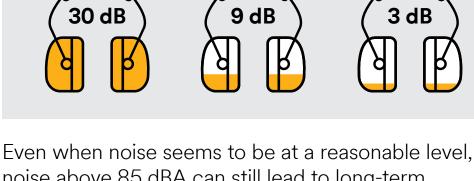
, , , ,				
Respirator Type	APF	Percent of Time Respirator Worn & Associated EPF		
		100%	95%	80%
Half-face respirator	10	10	7	3.6
Full-face respirator	50	50	14.5	4.6
Powered & Supplied Air	1000	1000	20	5
SCBA SCBA	10,000	10,000	20	5

1. Colton, Craig. "Respiratory Protection." Fundamentals of Industrial Hygiene. Ed. Barbara Plog. Itasca: National Safety Council, 2012. 678-679.I

Impact on hearing protection

Effective protection drops when hearing protectors are not worn. Worn 8 hours 1 hour not worn 4 hours not worn





noise above 85 dBA can still lead to long-term damage. Noise-induced hearing loss is caused by the damage and eventual death of sensory cells in your ears, called hair cells. Unlike some other cells, human ear hair cells never grow back.1 ¹ Based on 95 dBA TWA exposure and using NIOSH Recommended Exposure Limit of

85 dBA and 3 dB exchange rate.



Potential reasons why workers may not wear their PPE

- **Discomfort:** heat, humidity, lack of breathability
- **Performance:** fogging eyewear, inability to communicate clearly
- Compatibility: eye protection worn under earmuffs may impact hearing protection
- **Communication:** workers may remove PPE to communicate

Potential result: **lower wear time** and negative impact on worker health and safety.



The potential impact of low wear time

- Increased instances of occupational illness, e.g. silicosis/pneumoconiosis
- Increased instances of noise-induced hearing loss Increase in workplace accident rates
- Increase in Lifetime Injury Frequency Rate (LTIFR)
- Increase in worker fatalities Negative impact on welfare of workers
- and their communities
- Negative impact on business reputation
- Negative impact on Total Cost of Operation (TCO)



What can improved wear time do for you?

Maximize Effective Protection Factor (EPF)

- Reduce time of exposure
- Reduce probability of accidents and occupational diseases
- Improve health and social welfare of mining communities

(LTIFR)

Improve Lifetime Injury Frequency Rate



Fit: select PPE optimized for wearability, validate with fit testing

Communication: make it easier to speak and hear without removing PPE

Three keys to improving wear time

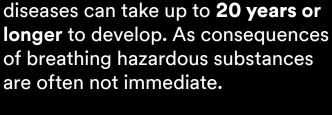
- Compatibility: choose integrated and compatible PPE designed to be worn together

Mine workers that are unprotected from the hazards encountered today, can often lead to significant long-term injuries and illness. Understanding the near- and long-term risks

of common mining tasks—and how the proper use of PPE can help reduce them—is

The impacts of everyday work hazards

essential to keeping workers safe today and tomorrow. Respiratory Hazards



of breathing hazardous substances

Silicosis: a devastating and life altering illness ► USA: more than 23% of reported

Some fatal occupational respiratory

silicosis deaths attributable to mining.1 ► Latin America: silicosis prevalence rate of 37% among miners, and up to 50% among miners over age 50.2

► Australia: silicosis 350 cases rose

► Worldwide: one of the most

common work-related injuries

to 350 in 2019.3

- is pneumoconiosis, specifically caused by exposure to Respirable Crystalline Silica (RCS)4
- 1. NIOSH. 2022. Mining Topic: Respiratory Diseases. (https://www.cdc.gov/niosh/mining/topics/ respiratorydiseases.html)
- 2. CODELCO. Fight against silicosis: A battle that Codelco is determined to win. (https://www. codelco.com/sustentabilidad/publicaciones/ informe-sustentable/una-batalla-que-codelcoesta-decidida-a-ganar)
- 3. NCBI. 2021. Early Detection Methods for Silicosis in Australia and Internationally. (https://www.ncbi. nlm.nih.gov/pmc/articles/PMC8345652/) 4. NCBI. 2010. Silicosis due to Denim Sandblasting in

Young People: MDCT Findings. (https://pubmed.

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in the world are exposed to noise levels above 85 dB. (WHO)

(WHO, 2017)

The annual cost of unprevented hearing loss is in the range of

► More than **120 million** workers

\$750–790 billion globally.

Noise-induced hearing loss

is one of the most common

occupational injuries, and the

second most self-reported occupational disorder. (NIOSH)

Occupational hearing

loss: is permanent and

100% preventable ► USA: estimated 90% of miners have developed hearing

impairment by age 50.1 ► Peru: 48.4% of workers suffer some illness due to noise

exposure.²

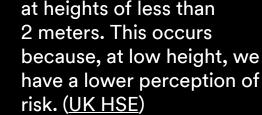
- 1. Kan Sun and A. S. Azman. Evaluating hearing loss risks in the mining industry

through MSHA citations. J. Occup

2. Sub-bulletin Feb. 28, 2019, Energy &

Environ Hyg. 2018 Mar; 15(3):246-262.

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have a lower perception of

Falls are the second leading cause of unintentional injury and death worldwide. (WHO)

68% of accidents occur

Falls from height: can cause disabling injury or death

► Chile: falls are the

of death in the mining industry.1 ► **USA:** Falls are the second leading cause of workplace injuries in

second leading cause

18% of all injuries.²

2020, responsible for

fastfacts.html

articles-590749_archive_01.pdf

2. https://www.cdc.gov/niosh/injury/

1. https://www.susesu.cl/607/

ncbi.nlm.nih.gov/25610113/) Mines Ministry. Government of Peru.



Personal Safety Division 3M Center, Building 235

St. Paul, MN 55144-1000

For more information in the U.S. Technical Assistance 1-800-243-4630 Customer Service 1-800-328-1667

3M.com/workersafety

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