



RITZ SAFETY

Learning Guide:

The Importance of Keeping PPE Current in Mining Environments



Mining is among the most demanding of industries, requiring workers to navigate confined spaces, extreme conditions and heavy machinery. So, what happens when the gear designed to protect workers, helmets, gloves, boots and clothing, fails to offer the protection it should? Personal Protective Equipment (PPE) that's expended, outdated or non-compliant with current standards can be just as dangerous as having no protection at all.

While automation and digital technologies are making mining operations safer and more efficient, they are also introducing new risks that demand modernized PPE. The question is: how do you know when your protective equipment is past its prime, and what should you do about it?



From Oil Lamps to Autonomous Vehicles - The Evolving Risks in Mining

For decades, mining PPE addressed traditional hazards like cave-ins, falling debris and exposure to dust and chemicals. However, as autonomous vehicles, automated drilling systems and intelligent sensors have become more prevalent, new challenges have emerged.

Take for example, the Canadian government's initiative to automate a northern mine by 2050. The shift to remote-controlled operations performed with the use of satellite imaging will undoubtedly reduce human exposure to high-risk zones.

Additionally, the U.S. mining industry has seen significant investment in automation to improve efficiency and worker safety. In states like Nevada and West Virginia, major mining operations are integrating autonomous haul trucks and remote-controlled drilling systems. While these advancements reduce direct human exposure to high-risk areas, workers responsible for equipment maintenance, inspections and oversight still require specialized PPE tailored to the environment, such as dielectric gloves to prevent electrical shock and high-visibility clothing designed for machine detection. However, workers in the field specializing in maintenance, inspection and oversight will still require PPE.

Furthermore, it will be a priority that worker equipment is kept up to date and regularly inspected for damage and malfunction. Expired PPE doesn't just increase the risk of injury or accidents from unexpected failure; it can slow workers down, cause unnecessary fatigue and fail to meet the safety standards required in today's demanding mining environments.



When to Upgrade Your Equipment

Not all PPE needs replacing at the same time, but upgrading it before it fails is essential. Here are key moments to update your gear:

- **After significant wear and tear:** If an item no longer provides full protection, don't wait, replace it.
- **When safety standards change:** If regulations introduce new requirements, your PPE needs to comply.
- **When introducing new technology:** If automation changes the risks on-site, workers may need upgraded PPE to address those hazards.
- **As new, more effective materials become available:** Innovations in PPE design can offer greater comfort, durability and protection.

How to Check if Your PPE is Still Safe

Staying ahead of PPE expiration isn't difficult, but it does require vigilance. Here's how you can ensure your protective gear is still doing its job:

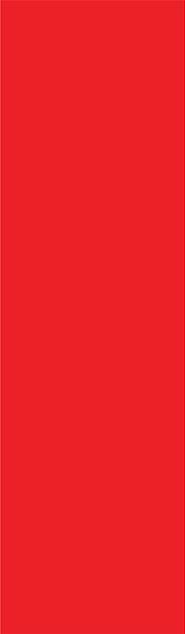
- **Regular Inspections:** Look for signs of wear, fading and damage. Cracks in helmets, frayed gloves and worn-out soles on boots are red flags. Keep garments clean and well-maintained.
- **Check Expiration Dates:** PPE, like harnesses, gloves and dielectric boots, come with manufacturer-recommended lifespans.
- **Stay Up to Date with Regulations:** Safety standards evolve, so check if your current PPE meets the latest industry guidelines.
- **Get Worker Feedback:** Those using PPE daily often notice issues first. If workers report discomfort or signs of degradation, it's time to replace gear.

Why You Can't Ignore Expired PPE

PPE wears out over time. Although outdated gear may look intact, it can fail when it's needed most. Worn-out PPE increases the risk of electrical shocks, burns and arc flash injuries, while faded visibility gear makes workers harder to detect, raising the likelihood of accidents. Beyond safety concerns, companies using non-compliant PPE risk fines, legal liabilities and reputational damage.

The Right PPE for the Job

To keep up with the evolving landscape, PPE must do more than just meet minimum safety requirements. It needs to enhance both protection and performance.



Head Protection

Respiratory Protection

Hearing Protection

Hand Protection

Protective Workwear and Footwear

Head Protection

Modern mines demand impact protection from all directions, not just the top. ANSI Type II safety helmets provide advanced protection, meaning they guard against both top and lateral impacts. However, for sites that require a minimum of Type I protection, come with features like lamp brackets and reflective stickers and have built-in eye protection options available to optimize worker safety.

Replace or upgrade when:

- The shell shows cracks, dents or signs of UV degradation
- The suspension system is worn, stretched or no longer fits securely
- The helmet is over 5 years old or has sustained a significant impact
- The jobsite requires Type II certification, and the current gear is only Type I

Respiratory Protection

Airborne contaminants like silica dust, diesel exhaust and particulates from drilling or blasting make respiratory PPE a top priority.

Replace or upgrade when:

- Disposable respirators should be replaced daily or sooner if breathing becomes difficult or the mask is visibly soiled
- Filters for reusable respirators, such as P100 filters, should be changed out per the organization's replacement plan based on exposure times and company guidelines. When breathing resistance increases, or after exposure to high concentrations of hazardous substances, look to replace the filters.

Upgrade when site conditions worsen or when additional protection is required.

Hearing Protection

In high-decibel zones near heavy machinery and blasting sites, long-term hearing damage is a real risk. Ritz Safety offers disposable ear plugs, reusable ear plugs and ear muffs depending on the noise levels and duration of exposure.

Replace or upgrade when:

- Disposable ear plugs become dirty, deformed or lose elasticity (typically after one shift)
- Reusable earplugs show signs of wear, cracking or no longer seal well
- Ear muffs have worn cushions or damaged headbands that reduce noise-blocking performance

For higher NRR or when exposure levels increase, disposable plugs can be paired with ear muffs for added protection.

Hand Protection

Miners handle heavy equipment and work with sharp tools, making hand injuries a common risk, with up to 30% of injuries attributed to improper fit or wearing the wrong type of glove. Cut and impact resistant gloves are often required, featuring advanced materials that typically provide a specified A5 protection against cuts and a minimum ANSI 138 Level 2 impact protection.

Replace or upgrade when:

- Gloves show holes, tears or fraying
- Coating shows wear and/or there is a loss of grip
- Gloves stiffen or lose their flexibility
- There is an unpleasant odor even after washing

Upgrade to longer-lasting, high-performance glove options for greater comfort, durability and protection.

Protective Workwear and Footwear

Protective clothing and footwear should shield against environmental hazards while allowing workers to stay mobile and comfortable.

Replace or upgrade when:

- Workwear shows rips, holes or faded hi-vis and/or reflective striping
- AR/FR gear has been compromised by exposure to heat or chemicals
- Waterproofing or insulation fails, or garments are no longer comfortable
- Footwear has worn treads, damaged toe caps or fails to meet updated safety standards

Upgrade for longer-lasting, high-performance options to reduce frequency of replacements and to help lower overall PPE costs.

Future-Proofing Worker Safety

Automation and digital technologies are bringing greater safety and efficiency to the mining industry. Yet, human expertise remains invaluable in complex scenarios. By embracing innovations in materials science and aligning PPE with industry trends, manufacturers and mining companies can enhance worker protection, compliance and productivity.

