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What are the Top 3 Considerations for Thin Mil Glove Selection?

Protection, Comfort and Sustainability

By Manish Raval, Associate Director, Global Gloves Category, Kimberly-Clark Professional Global PPE Business

Gloves are one of the most critical elements of Personal Protective Equipment (PPE) in a lab environment. Not only do they protect scientists and researchers from known and unknown risks, they also protect the scientific process or application.

Consider these statistics:

- Wearing gloves has been proven to reduce the relative risk of injury by 60%.[1]
- 70% of workers who experienced a hand injury were not wearing gloves.[2]
- Another 30% were wearing gloves, but they were damaged or inadequate for the task.[3]
- The median number of workdays missed from a hand injury is five.[4]
- Worker's compensation costs for hand, finger or wrist injuries averaged over $25,000.[5]
- Even the most carefully manicured person generates particles from their skin every day. Gloves provide barrier protection, which helps minimize the risk of submicron particles from the hand contaminating the product, process or equipment.[6]
- Poor quality gloves can contaminate the scientific process or application by introducing glove powder or residual surfactants, which can interfere with laboratory testing and lead to false results.[7]

Why hands are so vulnerable to injury

The anatomy of the hand is complicated. With bones, tendons, nerve fibers and blood vessels protected by a thin layer of muscle and fat, hands are especially vulnerable to injury. This makes the task of selecting the correct glove both important and challenging. According to Health & Safety International, "even small deficiencies in glove design may reduce grip, strength and manual dexterity." The glove must also be well-suited for the intended purpose without compromising protection or comfort.

For example, thicker gloves may provide the right level of chemical protection, but they can reduce dexterity and impact the user's ability to perform a specific task. As a result, scientists may select thinner alternatives, providing adequate dexterity but compromising on protection or even requiring more frequent replacements. Worse still, they may choose to not wear gloves at all, risking injury or chemical exposure.

Glove Selection Criteria

On first inspection, many choosers of hand protection solutions might find it difficult to distinguish between the myriad of options available.

Not all gloves can protect the integrity of your science and the safety of your scientists. Appearances can be deceiving, which makes it crucial to perform an adequate risk assessment prior to selecting the desired solution.

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The Top 3 considerations for glove selection are critical, but sometimes challenging to realize through a single hand protection solution:

- **Protection.** Laboratory workers are regularly exposed to a range of chemical agents. In fact, according to a 2021 study cited by Lab Manager, exposure to toxic and hazardous substances is a laboratory's third most prominent cause of injury.[8] In another study, 25-38% of lab personnel surveyed said they had been involved in a lab accident or injury that was not reported to a supervisor or principal investigator. And, in a laboratory PPE poll, 85%[9] of respondents said that compliance – getting people to protect themselves from exposure to chemicals or bloodborne pathogens – was their biggest challenge. This highlights the important role[10] that protection plays in glove selection. But protection is not a one-size-fits-all solution. You also need to determine the level of protection required based on the use case.

Here are some questions to ask:

- Is protection against a wide range of lab chemicals required, including cytotoxic and other hazardous drugs?
- Do the gloves need to offer chemical splash protection or full immersion protection?
- Are tasks requiring high levels of durability performed?
- Are the gloves tested for elongation and tensile strength to ensure they can stretch and remain intact during a variety of movements while using a wide range of laboratory equipment and instrumentation?
- Do they have a low AQL for pinholes to ensure manufacturing quality and glove integrity?

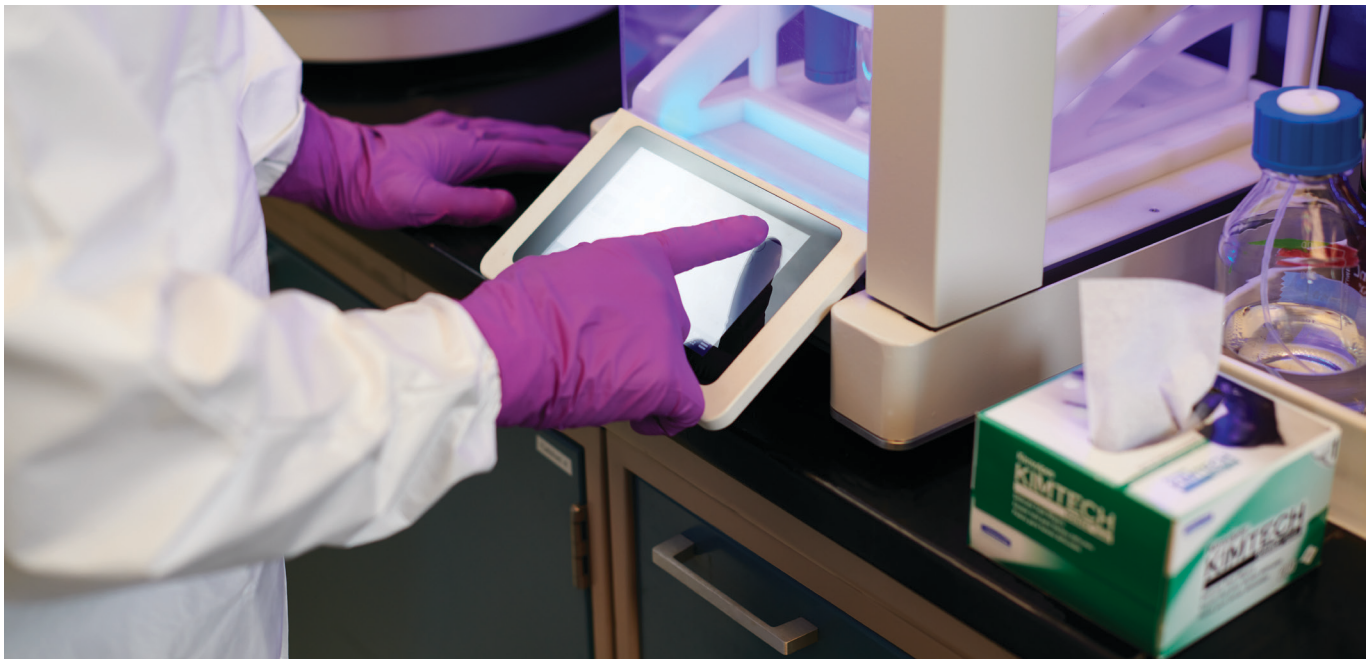
In addition to these use-case scenario questions, you should ask the following more general questions:

- Are the gloves manufactured using materials that reduce the risk of allergic reaction?
- Have they undergone rigorous physical testing to ensure that they can protect scientists and researchers from dangerous substances?
- Are the gloves strong enough to withstand laboratory use conditions?

If the answer to any of these questions is "no," continue your search. If the answer to all is "yes," you can check the protection box. Now, it's time to move on to other key considerations such as comfort and ergonomics.

- **Comfort.** Glove discomfort has bee linked to reduced compliance and increased risk of injury. According to an article in Health & Safety International, "uncomfortable glove materials may reduce blood circulation, cause numbness, limit finger and hand motion, cause muscle fatigue and reduce work performance." Therefore, it becomes essential to consider a glove solution that applies ergonomic principles during the design stage, based on the needs and characteristics of the intended use.[11]
- **Ergonomics.** Good ergonomics are crucial for glove performance and meeting user needs. Routine laboratory procedures such as pipetting, working with microscopes, operating microtomes, and using cell counters and video display terminals can put researchers at risk for repetitive motion injuries. These injuries develop over time and occur when muscles and joints are stressed, tendons are inflamed, and nerves are pinched, and blood flow restricted.[12]

Gloves that provide good grip can help prevent repetitive-type injuries such as tendonitis by requiring less force from the fingers to do the task.[13] That's why it's essential to select gloves that reduce the risk of muscle fatigue and injury and promote good wet and dry grip. For a lab environment, look for gloves that are protective and certified by a reputable third-party agency such as US Ergonomics to ensure that they provide measurable ergonomic benefits to the user. Also look for tactile sensitivity and enhanced dexterity through features such as textured fingertips.



Sustainability

Finally, sustainability and waste reduction should be factored into the glove selection process. Because of their prevalence in labs and the fact that workers can use several pairs over the course of a day, gloves can be a significant contributor to a lab's solid waste stream. If a lab worker changes gloves three times per day, that equates to 30 gloves per week or over 1,500 gloves per person per year, an amount equal to about 17 pounds. If a worker is double-gloving, that figure is even higher – over 30 pounds of gloves per worker, per year – an amount of waste that can really add up.

For example:

- An audit conducted by the University of Washington found that 22% of its research waste consisted of nitrile gloves.
- A University of California Santa Cruz laboratory waste assessment found that nitrile glove waste was a major contributor of laboratory waste destined for the landfill.

The good news? There are solutions to help address this. Look for a manufacturer-led, auditable program that diverts used, non-hazardous lab and cleanroom PPE waste. RightCycle by Kimberly-Clark Professional® is one such programme. Since 2011, it has helped thousands of customers divert over 2,000 metric tons of PPE waste from the trash and landfills. Originating in the U.S., it is now available in 11 countries with customers that include universities and research institutions, pharmaceutical and biotech companies as well as other businesses.

With a programme like this, safety and sustainability truly do go hand-in-hand.

For more information about choosing hand protection that checks all the boxes for protection, comfort and sustainability, visit www.kimtech.eu.

[1]U.S. Bureau of Labor Statistics

[2]U.S. Bureau of Labor Statistics

[3]U.S. Bureau of Labor Statistics

[4]MedExpress.com, U.S. Department of Labor: Bureau of Labor Statistics. Case and Demographic Characteristics for Work-related Injuries and Illnesses Involving Days Away from Work. Last updated November 8, 2018.

[5]National Safety Council, Injury Facts, 2019-2020 data

[6]2013 University of Las Vegas SEB Cleanroom Users Protocol

[7]Gloves | Environmental Health & Safety | Michigan State University (msu.edu)

[8]Lab Manager, December 22, 2022

[9]Nature, November 18, 2019, as reported by Lab Safety

[10]Dan the Lab Safety Man, The PPE Compliance Conundrum 2019

[11]Health & Safety International

[12]OSHA

[13]Workplace Safety North (WSN)

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