



Hand protection: More than a matter of sizing

Determine function, fiber and fit

By JOSEPH D. MCGARRY

Selecting a protective glove is not as easy as just picking the right size. There are a vast number of options and product innovations currently available in hand protection, such as leather work gloves, terycloth, string knit, cotton, disposable, general purpose canvas gloves, women's gloves, and cold weather gloves. Material blends can include, for example, acryl/poly/cotton with latex dipped palm and fingers, or a seamless nylon glove with a patent-pending sponge nitrile flat-dip. This article focuses on one type of glove — coated gloves.

There are four basic components that make up coated gloves: coating, fiber, coating coverage and overall fit. To select the right coated glove, the task or function performed with the glove on is probably the single most important determinate of which coated glove to choose. Does the glove need to be waterproof or just water resistant? Chemical resistant? Anti-static? Cut resistant? Oil resistant? Grease resistant? Perhaps it needs to provide better gripping for added safety? The protection and performance level expected from the glove should determine the coating and fiber selection.

Coatings

In the structured glove, or form fitting, category of gloves, there are three basic coated choices — nitrile rubber, polyurethane and latex rubber.

*Nitrile Rubber (NBR)** resists grease, oil or other petroleum-based products, and, of course, is water resistant or waterproof (if fully coated). The coating is applied

to the glove as either a foam coating or a solid-finish coating. The variation allows for increased gripping in the foam version, making this coated glove a good choice for tasks that require a high degree of dexterity and sensitivity, especially where a grip is important, such as handling small oily or wet parts. The more economical solid coating finish does provide additional gripping because of its tacky feel, but is better suited for handling larger materials.

Polyurethane or PU gloves, due to the polymer strength, provide extra abrasion resistance and extended wear. Manufactured from a cleaner polymer, they offer a softer feel. In addition, the polymer can be harder to puncture, providing increased protection. The coating does provide waterproof protection, but only limited chemical resistance. The combination of strength and cleanliness make these gloves ideal for high-tech and electronic assembly work, inspection, and quality control. Similar in price to nitrile rubber gloves, PU gloves are a better choice for use in critical environments.

Latex Rubber is a low-tech glove that works. While it is waterproof, it will, however, blister and delaminate when in contact with petroleum-based products. The nature of latex allows for the gloves to be manufactured with a crinkled or exaggerated texture to increase the gripping surface. Some applications to use a latex-coated glove include construction, general assembly, material handling, landscaping and gardening.

Glove linings

Once the coating is determined based

on function to be performed, the fiber lining (also called glove shell or body) is a key component to ensure both the performance, fit and feel of the glove. Seamless fabrics include cotton, cotton/polyester blends, nylon, aramid (Kevlar® brand) fiber blends, and Dyneema® brand fiber and other cut-resistant blends sometimes referred to as engineered yarns.

Cotton and Cotton/Polyester blends in this application should not be confused with your kids' knit cotton gloves. The cotton fibers used in this application are long staple fibers that are wrapped with a stronger continuous polyester fiber, making the shell extremely durable with excellent abrasion resistance. And because the shell is a cotton blend, it is comfortable and washable.

Textured Nylon is also very durable and comfortable like cotton/polyester blended shells; and like cotton/polyester blends, it is also a very economical choice for a glove lining. Nylon is, however, lint- and dust-free, which makes it a sure choice for some applications.

Aramid (such as Kevlar) shells are made with Dupont® Kevlar fibers, which are engineered with a high tensile strength and are five times stronger than steel. These gloves are cut resistant.

Dyneema is a brand of polyethylene fibers, engineered to be 10 to 15 times stronger than steel. And depending on the coating coverage, the glove is either waterproof, if the glove is fully coated, or water resistant, if the glove is only palm coated or less. Dyneema is also resistant to chemicals and ultraviolet light. And when blended with other fibers such as

Lycra®, it can be very form fitting.**

High-performance, cut-resistant fiber technology keeps evolving, and glove vendors can keep you abreast of developments. Some of these gloves use space age engineered fibers for enhanced cut-resistance, comfort and durability. Others use stainless steel wrapped in soft nylon, for instance.

Coating coverage

Once the coating and fiber are selected, the final decision is coating coverage. Coated gloves are manufactured with the coated surface coverage in three manners — full-coated coverage; palm, finger and fingertip coverage; and palm, fingertip and knuckle coverage. The latter two provide for a breathable glove, which makes the glove more comfortable and ideal for extended wear. Full-coated coverage gloves create a waterproof glove and are best suit-

ed when hands need to be protected from chemicals or water.

Fit and feel

As noted above, fiber is a key component in the performance of a glove. It is also the key component of a good fit and nice feel. For safety reasons as well as comfortable fit, gloves should be purchased in the proper size to ensure a proper fit.

Normal wear and tear can compromise the integrity of the glove coatings and fibers. Gloves should be checked and monitored frequently and replaced when necessary.

To determine glove size, measure the dominant hand by wrapping a tape measure around the hand just below the index finger. Glove sizes are measured in inches. The way a glove feels on is as essential as the glove

itself because, ultimately, the glove must be worn to be effective.

*A synthetic rubber copolymer of acrylonitrile (ACN) and butadiene also known as acrylonitrile butadiene rubber (NBR)

**Some blended versions of Dyneema offer less cut resistance.

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