Cut Resistant Glove Selection and Use

Cut-resistant gloves are designed to protect hands from direct contact with sharp edges such as glass, metal, ceramics, and other materials. Cut resistance is a function of a glove's material composition and thickness. You can increase your cut protection by increasing material weight (i.e., ounces per square yard), using high-performance materials such as Spectra, Kevlar, etc., or by using composite yarns made with varying combinations of stainless steel, fiberglass, synthetic yarns, and high-performance yarns.

Performance characteristics can also be affected by a materials weight and coatings applied to the outside surface. Lighter weight styles are typically more flexible, resulting in less hand fatigue, while their heavier counterparts will generally provide the wearer with more cut and abrasion protection. Coated gloves enhance grip, especially on slippery surfaces. However, some coated gloves may not be appropriate for food handling applications.

Characteristics, Applications and Glove Selection for Cut Resistant Fibers and Materials

Spectra Fiber Ultrahigh molecular-weight polyethylene fiber that offers high cut-resistance, even when wet. Its 10 times stronger than steel per unit weight.

Spectra gloves are cut and abrasion resistant, often lightweight, flexible and used for food processing, appliance assembly, food service, automotive assembly and the paper industry.

Dyneema is a super strong polyethylene fiber that offers maximum strength combined with minimum weight. It is up to 15 times stronger than quality steel and up to 40% stronger than aramid fibers, both on weight for weight basis. Dyneema floats on water and is extremely durable and resistant to moisture, UV light and chemicals.

Kevlar Aramid Fiber five times stronger than steel per unit weight. Inherently flame resistant it begins to char at 800F (427C). The thread made of Kevlar fiber is used to sew seams on temperature-resistant gloves.

Kevlar gloves offer cut- and heat-resistance. Typically, a lightweight flexible material that is used for many applications relating to automotive assembly, sheet metal handling and glass handling.

Fiber-Metal Blends many durable, abrasion-resistant gloves are made of a woven fabric blend of Spectra, Kevlar and stainless steel.

Metal Mesh interlocked stainless steel mesh offers superior cut and puncture protection due to its strength.

Metal Mesh gloves are very cut- and abrasion-resistant and are used often in meat/poultry applications.

SuperFabric Combinations of the number of layers, thickness, substrates, surface coatings, etc., lead to fabrics which have varying levels of puncture, cut and abrasion

resistance, grip and flexibility. Tactile surface offers improved grip of wet and oily surfaces.

Steel Core gloves are cut- and abrasion-resistant and are often used for meat/poultry processing, glass handling, metal fabrication, automotive manufacturing as well as being used in the paper industry

Vectran: Gloves made from the Vectran fiber materials are cut- and abrasion-resistant, flexible and offer mid level heat protection. This glove material is often used in the rubber industry as well as plastic manufacturing and metal handling.

There are many different glove materials in the market that have a variety of performance characteristic and are used for many different applications.

Although the above materials are known to provide excellent cut-resistance, any glove material will provide some measure of cut-resistance. DUPONT manufacturing performed a cut-resistance test called a Cut Protection Performance Test (CPPT) comparing leather, cotton, standard Kevlar and Kevlar Plus materials. They found that the Kevlar Plus outperformed the standard Kevlar, cotton and leather materials. The results showed that standard Kevlar had the next best results followed by cotton and then leather pertaining to these specific materials.

Hand Protection and Loss Control

According to statistics found from glove manufacturer, Ansell Edmont, manufacturing website AnsellPro.com:

- The average indemnity compensation for OSHA recordable hand finger injuries is approximately $3856.00
- The average medical payment is approximately $2600.00
- There are approximately 439,000 disabling yearly hand and finger injuries which equates to a cumulative cost into the millions each year

Although there are no OSHA regulations specific to cut resistant gloves, OSHA 1910.138(a) and 1910.138 (b) does pertain to hand protection:

1910.138(a)

General requirements. Employers shall select and require employees to use appropriate hand protection when employees' hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures; chemical burns; thermal burns; and harmful temperature extremes.

1910.138(b)

Selection. Employers shall base the selection of the appropriate hand protection on an evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use, and the hazards and potential hazards identified.

Commonly Asked Questions

Q. ***Do cut-resistant gloves offer good puncture-resistance?***

A. Many cut resistant gloves are manufactured to provide protection from a SLASH from sharp items like knives/blades. However, they may provide very little, if any, puncture-resistance from a pointed item like a needle.

Q. ***Should cut-resistant gloves be used to protect one from cuts from powered/mechanical equipment like powered saws and drills?***

Most all manufacturers of cut-resistant gloves will not suggest the use of cut-resistant gloves for protection against powered devices. Gloves are typically tested for use with non-powered blades and sharps only.

A. The use of a glove with powered equipment could potentially harm an individual. If the moving blade catches the glove, it could result in a person getting pulled into moving machinery. Moving machine parts have the potential for causing severe workplace injuries, such as crushed fingers or hands, amputations, burns, or blindness. Safeguards are essential for protecting workers from these needless and preventable injuries. Any machine part, function, or process that may cause injury must be safeguarded, especially when the operation of a machine or accidental contact with it can injure the operator or others in the vicinity. These hazards must be either eliminated or controlled.

Sources for More Information

Hazard Assessment Form

Standards and Trends in the Glove Industry, By Donald F. Groce, September 2003