

CUT RESISTANT GLOVE MATERIAL 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®/Dyneema®, Para-Aramid fibers such as Kevlar®, Twyron, 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.

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

CHARACTERISTICS OF CUT RESISTANT FIBERS AND MATERIALS

- **Dyneema® or Spectra® Fiber**—Ultrahigh molecular-weight polyethylene fiber that offers high cut-resistance, even when wet. It's 10 times stronger than steel per unit weight. Excellent fiber for cut resistant gloves in food use.
- **Para-Aramids: Kevlar®, Twyron Aramid Fiber**—five times stronger than steel per unit weight. Inherently flame resistant, Kevlar® begins to char at 800°F (427°C). The thread made of Kevlar fiber is used to sew seams on temperature-resistant gloves. Not approved for food use in spun yarn form.
- **Fiber-Metal Blends**—Blending of old and new technology there are several styles of cut & abrasion-resistant gloves made of a woven fabric blend of Spectra, Kevlar and stainless steel. Spectra® and stainless steel core gloves are excellent for cut protection in food preparation operations.
- **Metal Mesh**—interlocking, welded stainless steel ring mesh gloves offer superior cut and puncture protection due to their strength. Excellent glove for slaughterhouse and processing operations. Can also be used in textile manufacturing and food service applications.
- **SuperFabric®**—Combinations of the number of layers, thickness, substrates, surface coatings, etc., lead to fabrics which have varying levels



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

APPLICATIONS AND GLOVE SELECTION

- **Gloves made with Dyneema[®] or Spectra[®] fibers** are highly cut and abrasion resistant, very lightweight and extremely flexible. **Gloves made with Dyneema[®] or Spectra[®] fibers** are most commonly used in food processing, restaurant/food service and the paper industry. These gloves are Inexpensive, washable, lightweight with excellent dexterity, comfort and touch sensitivity, all providing for greater user acceptance and compliance.
- **Stainless Steel Wire Core** gloves are cut and abrasion resistant and are often used for restaurant/food service, meat/poultry processing, glass handling, metal fabrication, automotive manufacturing as well as being used in the paper industry. Typically combined with **Dyneema[®] or Spectra[®] Spectra Guard[™]** these gloves are Inexpensive and washable. Great user acceptance. Lightweight with excellent dexterity, comfort and touch sensitivity.
- **Metal Mesh** gloves are very cut and abrasion resistant and are used in meat/poultry applications, apparel manufacturing and the fishing industry. These gloves are relatively expensive; links can break but can be repaired.
- **Kevlar[®] and other Para-Aramid fiber** gloves offer cut and heat-resistance. Typically a medium weight flexible material that is used for many applications relating to automotive assembly, sheet metal handling and glass handling. Kevlar gloves of spun Kevlar yarns are not approved for use in food handling operations.

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



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containing Dyneema® or Spectra® provide the highest levels of cut protection when tested against Kevlar® and the gloves styles listed above.

Hand Protection and Loss Control

According to statistics found from 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 450,000 disabling hand and finger injuries yearly which equates to a cumulative cost into the 10's of millions of dollars 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.”

Please Note: The information contained in this article is intended for general information purposes only. This information is not a substitute for review of the applicable government regulations and standards, and should not be construed as legal advice or opinion. Readers with specific questions should refer to the cited regulation, the glove manufacture or consult with an attorney.



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