PROTECTIVE INDUSTRIAL PRODUCTS

CUT PROTECTION

PROVEN & TRUSTED

PROTECTION. PERFORMANCE. VALUE.

G-Tek®
PolyKor™

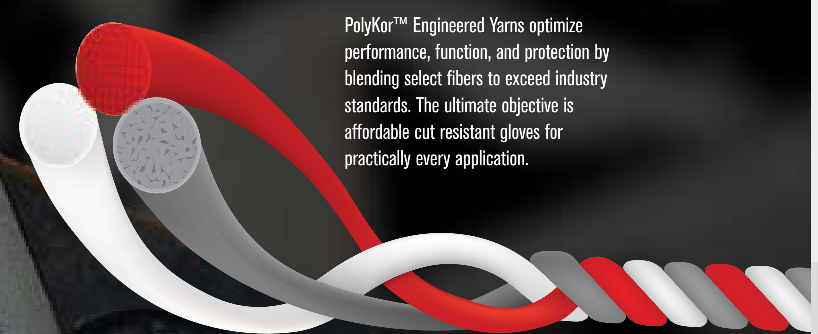
G-Tek® PolyKor™

PROTECTION. PERFORMANCE. VALUE.

CONFIDENCE TO DO THE JOB

GENERAL PURPOSE OR CUT PROTECTION: WHICH DO YOU WANT TO WEAR?

Most would agree that we wear work gloves to protect from the most obvious risks – cuts and abrasions. So why buy lower performing General Purpose gloves that offer minimal protection.



PolyKor™ Engineered Yarns optimize performance, function, and protection by blending select fibers to exceed industry standards. The ultimate objective is affordable cut resistant gloves for practically every application.

WHAT IS POLYKOR™ TECHNOLOGY?

PolyKor™ makes use of PIP's proprietary fibers and engineered yarns to produce cut resistant gloves that surpass everyday performance standards. PolyKor™ technology is optimized for the type of protection and comfort required by today's plant and field workers.

PROTECTION

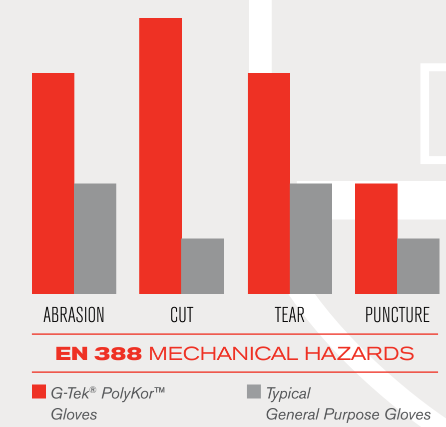
AGAINST CUTS & SCRAPES

Nylon coated knit gloves offer dexterity and grip, but not enough protection. Leather is a naturally tough and resilient material, but it slices easily with sharp objects. When tested side by side with G-Tek® PolyKor™, they don't stand a chance.

PERFORMANCE

DESIGNED TO REDUCE INJURIES

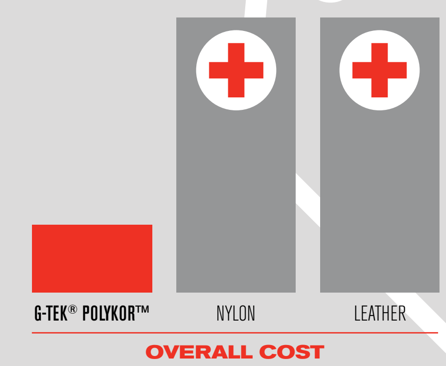
G-Tek® PolyKor™ elevates protection to help reduce injuries while maintaining the dexterity, tactility, and comfort workers need to perform their job efficiently. Protection and increased compliance give workers more confidence while improving productivity.



VALUE

ENGINEERED TO DELIVER

U.S. Bureau of Labor Statistics reports that 30 percent of injured workers were wearing the wrong type glove and the average hand injury claims now exceeds $6,000. G-Tek® PolyKor™ delivers value by providing Safety Managers with an affordable, high level cut resistant alternative that will help to reduce hand injuries. G-Tek® PolyKor™ is engineered to deliver the protection Safety Manager's require, and the fit and function workers prefer – **ALL AT AN EXCEPTIONAL VALUE.**



16-560

16-570

16-150

16-530

16-D622

16-340LG

16-340OR

16-350

16-343LG

16-343OR

16-334

16-330

16-355

16-815

16-820

16-813

G-Tek® PolyKor™

THE MOST COMPREHENSIVE LINE OF

AFFORDABLE CUT RESISTANT HAND PROTECTION

PRODUCT	EN 388	OLD ANSI SCORE			NEW ANSI SCORE			POLYMER COATING			GRIP					COVERAGE		COATING COLOR			SHELL COLOR						CUFF		APPLICATIONS				SIZES
		2	3	4	A2	A3	A4	Latex	Nitrile	Polyurethane	Double-Dipped	Micro Surface	Crinkle	Foam	Flat	Palm & Fingers	Full Finger & Knuckle	Black	Gray	Yellow	White	Blue	Gray	Salt & Pepper	Hi-Vis Oragne	Hi-Vis Lime	Standard	Extended	Slightly Wet	Dry	Slightly Oily	Cold	
G-TEK® POLYKOR™		ASTM F1790-05			ASTM F2992-15																												
16-560	4543																																XS - XXL
16-570	4542																																XS - XXL
16-150	4342																																XS - XXXL
16-530	4343																																XS - XXL
16-D622	4342																																XS - XXL
16-340LG	4543																																S - XXL
16-340OR	4543																																S - XXL
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16-355	4343																																XS - XXL
16-815	3543																																S - XXL
16-820	2543																																S - XXL
16-813	3343																																XS - XXL

ELEVATE

YOUR PROTECTION WITH POLYKOR™

OPTIMIZE PERFORMANCE WITH G-TEK® POLYKOR™ GLOVES

CURRENT GLOVES USED	DISADVANTAGES	EN CUT 3	COATING	EN CUT 5	COATING
COATED SEAMLESS KNITS NYLON OR **COATED POLYESTER**	• Similar fit and feel to cut resistant gloves, but **MINIMAL CUT PROTECTION**	16-334	Nitrile Foam	16-350	Nitrile MicroSurface
		16-530	Polyurethane	16-560	Polyurethane
LEATHER	• Bulky fit, lack of dexterity and tactility leads to workers removing gloves • Will not resist cuts from sharp objects • Limited grip	16-813	Latex Crinkle	16-815	Latex MicroSurface
		16-330	Nitrile MicroSurface	16-350	Nitrile MicroSurface
FABRIC DIPPED	• Bulky fit, lack of dexterity and tactility leads to workers removing gloves • Abrasion resistant, but does not resist cuts from sharp objects • Limited grip	16-330	Nitrile MicroSurface	16-350	Nitrile MicroSurface
		16-813	Latex Crinkle	16-815	Latex MicroSurface
BROWN JERSEY AND **COTTON CANVAS**	• Little-to-no cut protection • Limited grip • General lack of dexterity and tactility	16-334	Nitrile Foam	16-350	Nitrile MicroSurface
		16-D622	Polyurethane	16-560	Polyurethane
STRING KNITS	• Little-to-no cut protection • Limited grip • Lack of tactile sensitivity	16-355	Nitrile Foam	16-350	Nitrile MicroSurface
		16-150	Polyurethane	16-570	Polyurethane

NITRILE MICROSURFACE COATING
EXCELLENT GRIP
in dry and slightly oily conditions

NITRILE FOAM COATING
EXCELLENT GRIP
in dry and slightly oily conditions

LATEX MICROSURFACE COATING
EXCELLENT GRIP
in dry and slightly wet, non-oily conditions

LATEX CRINKLE COATING
SUPERIOR GRIP
in dry and wet, non-oily conditions

POLYURETHANE COATING
GOOD GRIP
in dry, slightly wet, and slightly oily conditions


PROTECTIVE INDUSTRIAL PRODUCTS
G-Tek
PolyKor
REDEFINING
HAND PROTECTION
WORK SAFELY. WORK SECURELY. WORK CONFIDENTLY.

A NEW APPROACH BASED ON REAL LIFE USE AND RISK

Over the years, the industry has struggled to equate cut resistance with actual risk. The recent updates to the ANSI 105 and EN 388 will provide a more uniformed approach to assessing the cut resistant performance of gloves across the globe. While this will make the cut scores more comparable, it will not help safety managers determine which cut score is best suited for the job.

Regardless of these changes in test methods and cut score scales, customers will still ask: “What glove and what cut level should I be using?” When customers don’t get a clear answer, they typically err on the side of caution and select the glove offering the maximum cut score, only to discover that the high cost is unacceptable and unsustainable.

The ultimate objective is for customers to choose the right glove for the right job and that means equating glove specifications to something realistic, like risk of injury. It is the intent of this article to outline a new and unique approach to assessing cut risk, which takes a comprehensive look at all factors involved. Before going further, it is important that we take some time to review the basic fundamentals related to cut resistant fibers and types of grip coatings.

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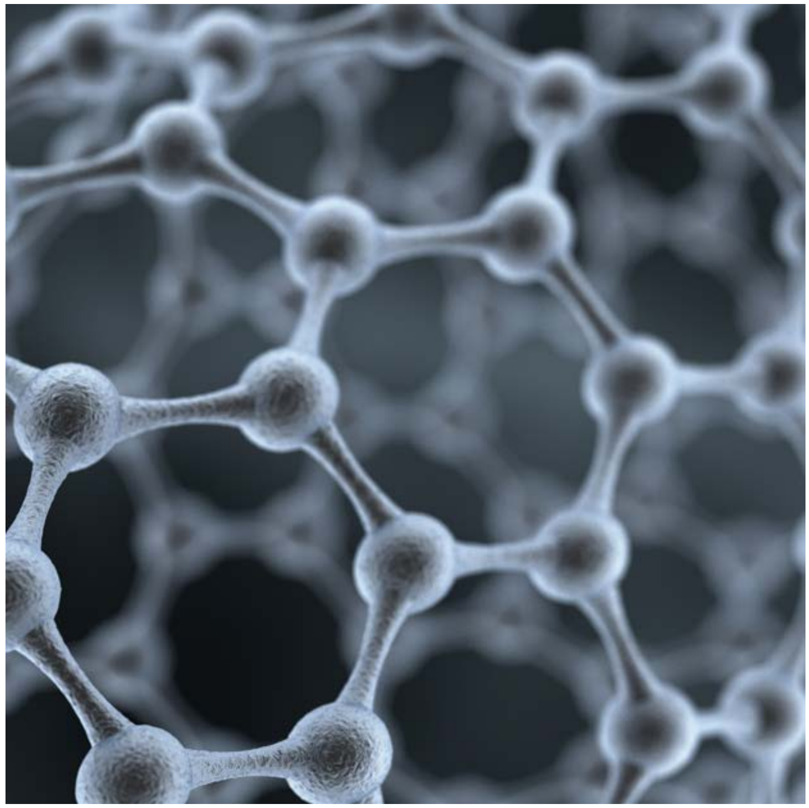
MATERIAL BASICS AND PERFORMANCE

Steel and glass were among the first technologies used in cut resistant apparel. Both are naturally hard materials and can be easily formed into sheets or even very thin fibers. Stiffness typically relates to how hard something is, and the greater the stiffness, the greater the possibility of breakage, especially when repeatedly flexing very thin fibers or yarns. This is the reason why steel and glass-based gloves were predominantly replaced with more advanced materials that yielded better performance in flexing. Having said that, glass and steel continue to be used today but are now engineered with more advanced materials such as HPPE (High Performance Polyethylene, such as DSM Dyneema®) and Aramids (such as DuPont® Kevlar®) to produce cut resistant gloves and sleeves that are more comfortable and flexible. Depending on the blend of materials and structure of yarn, we can easily go from a very inexpensive blend (predominantly glass) offering very high initial cut scores, to more expensive engineered yarns that make use of fully encapsulated glass, steel or mineralized materials for ultra-high cut resistance and all-round performance. It is important to highlight that gloves made from predominantly glass fibers achieve high initial cut scores simply by dulling the test blade. However, the inherent stiffness and brittle nature of glass fibers cause it to fibrillate quickly, resulting in possible skin irritation, fatigue and premature wear.

The issues described above has led to the proliferation of High Performance Polyethylene or HPPE, as it's more commonly known, and Aramids such as Kevlar® to become the fibers of choice in providing superior cut protection in gloves and sleeves. Both materials are inherently strong with HPPE offering coolness and comfort, while aramids provide, depending on thickness, light to medium heat protection. Until most recently this superior comfort and performance could only be gained by using higher quality HPPE and aramid-based fibers blended with spandex or nylon for extra flexibility and performance levels.



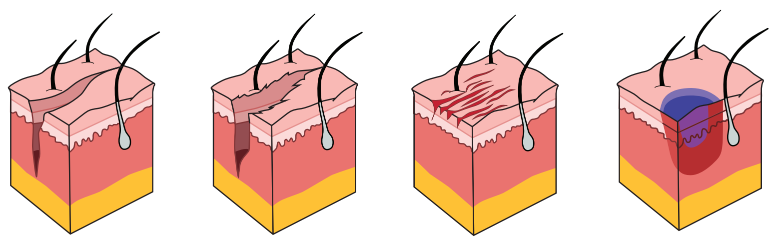
Advancement in nanotechnology is allowing us to work with incredibly strong materials, previously thought to be too thick or too stiff

But all that is changing. Today, the approach by leading glove suppliers is to develop proprietary engineered yarns, using HPPE or aramids, along with novel technology that embeds, encapsulates or blends multiple strong fibers such as glass, steel or mineral-based materials that, until recently, could not even be imagined – let alone mass produced. Advancement in nanotechnology is allowing us to work with incredibly strong materials, previously thought to be too thick or too stiff. These natural materials can now be formed into nano-thin, highly flexible fibers that when blended or encapsulated with HPPE or aramids, produce a whole new generation of gloves and sleeves that offer sustainable performance and dexterity. The overall benefit to the user is lower cost, higher cut resistance, improved flexibility and outstanding wear performance. That's innovation in today's world.

CHOOSING THE RIGHT PROTECTION

With the advancement in materials as described above, we can feel confident that gloves and sleeves produced today are among the best we've ever seen. However, making the right selection only gets harder with more choices. As mentioned at the beginning of this article, we made a point that cut scores cannot be relied upon as the sole indicator of performance because if it were, then cheap, glass blended gloves with very high initial cut scores would be the glove of choice for everyone. We went on to explain that there has to be more to glove and sleeve selection than simply cut score. In fact, we would argue that we must consider factors in real working applications like the force applied and sharpness of the edge threat, and equate that to the risk of injury.

Understanding the severity and type of cut injuries related to working with one's hands is crucial



INCISION
Cut caused by razor sharp edge – wound is "neat" and edges of the skin are smooth

LACERATION
Cut caused by jagged or rough edge – wound is torn open

ABRASION
Wound in which skin is scraped or rubbed off by a flat rough edge

CONTUSION
Wound where skin is not penetrated, blood vessels under skin are broken. Typically caused by impact

With the exception of contusions, most skin injuries are a result of contact with a sharp edge or even a burred, rough edge on fragile skin. Using a glove or sleeve layer helps reduce the likelihood of damage to the skin. We say "reduce the likelihood of damage to the skin" because it is understood that nothing is truly cut proof. With enough force energy, driven either by motion or weight, almost anything is penetrable.

The extra layer offered by a technical glove today consists of a knitted or fabric liner, coated with a natural or synthetic rubber polymer. Traditional gloves made of thick leather may seem to offer comparable protection, but this is not the case. While leather may offer some abrasion protection, it slices effortlessly when in contact with a sharp edge making it no match for gloves using the latest technology, cut resistant fibers and yarns.

CRH MATRIX©

We deemed it necessary to develop a unique approach to help determine the risk and possible severity of an injury

In the case of coating, thicker, tougher coatings will offer extra protection especially when contact with burred, rough edges is a necessary part of the task. An example of this would be handling heavy sheet metal or working with castings. The coating grip also plays an important part in preventing a sharp part or knife from slipping and allowing its blade or cutting edge from making direct contact with the gloved hand or arm.

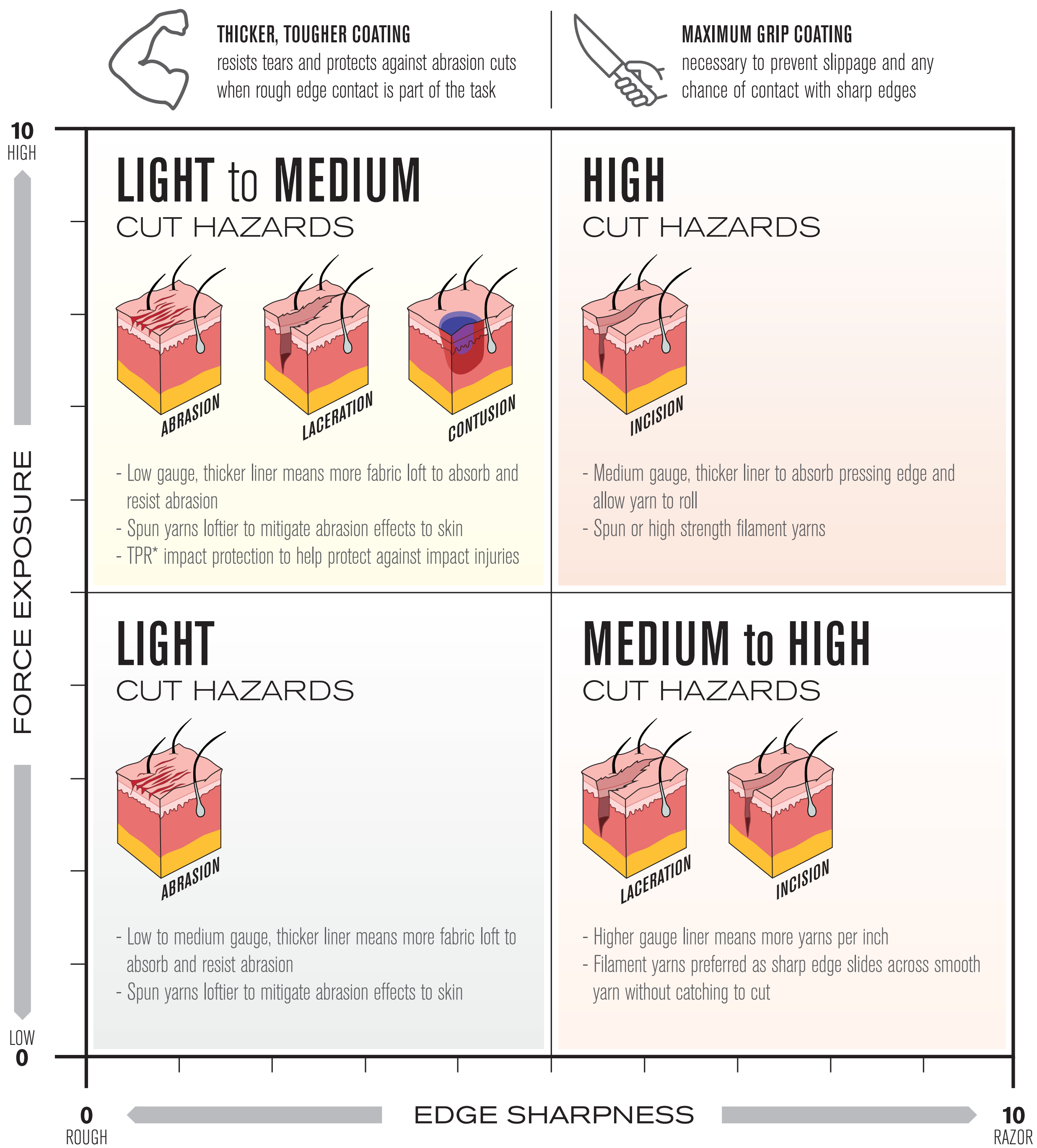
It can be argued that a cut resistant liner should act as the last line of defense for protecting skin and that avoiding any direct contact with sharp edges. Edge sharpness and force of contact are critical factors in determining whether the glove or sleeve material type will be able to defend against contact with the underlying skin. Proper selection is multi-factorial and for this reason we deemed it necessary to develop a unique approach to help determine the risk and possible severity of an injury.

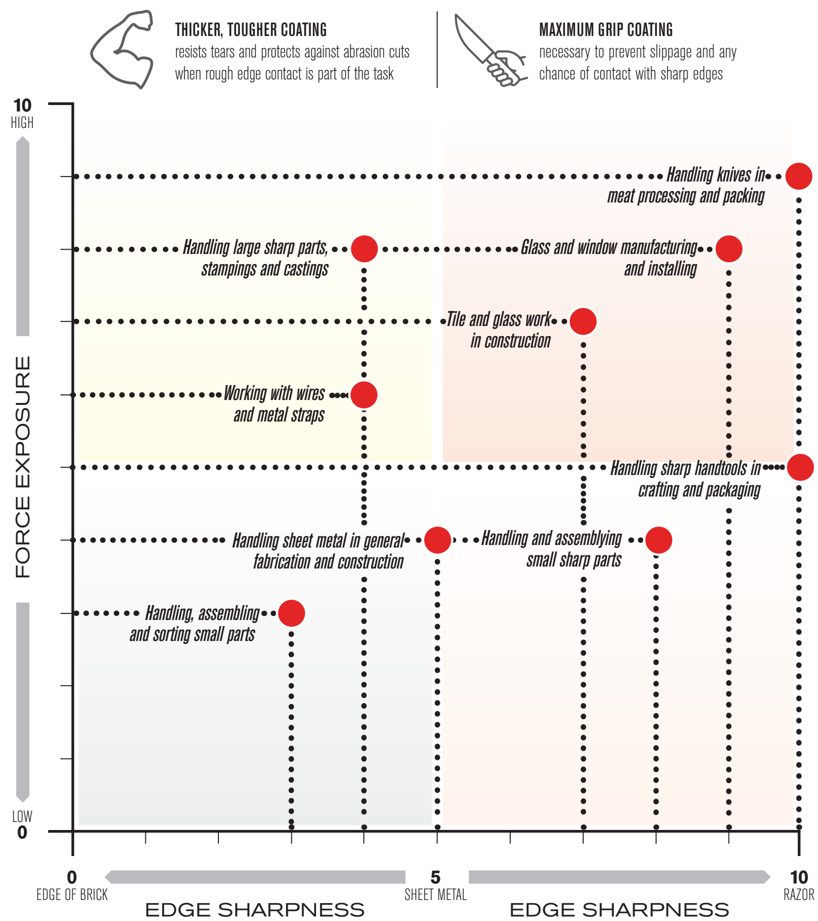
WE INTRODUCE TO YOU THE CUT RISK HAZARD MATRIX™

The **CUT Risk Hazard Matrix™** is a unique and logical method to guide users in selecting a glove or sleeve with the right cut resistant material and score. Once a safety manager can identify where their application fits on the **CUT Risk Hazard Matrix™**, they can more confidently correlate the task to the glove or sleeve best suited for their job.

CUT RISK HAZARD MATRIX™

The illustration of the CUT Risk Hazard Matrix™ below demonstrates the factors involved in determining applications for cut resistant gloves or sleeves.



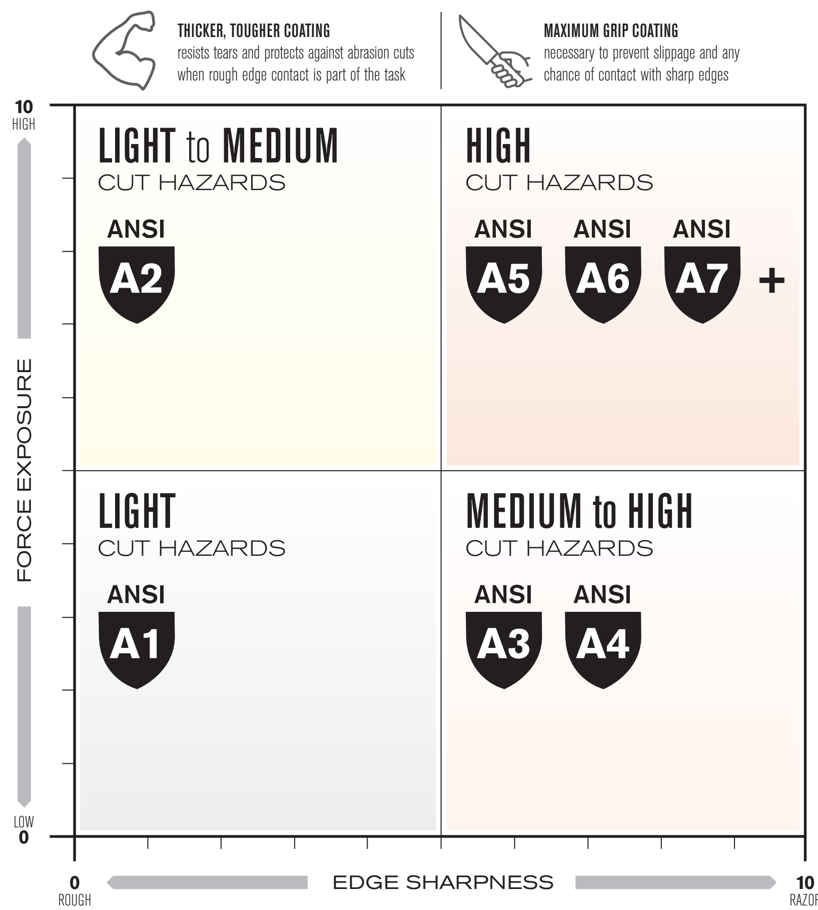


CRH: FACTOR	TASK
9:10	HANDLING KNIVES IN MEAT PROCESSING AND PACKING
8:9	GLASS AND WINDOW MANUFACTURING AND INSTALLING
7:7	TILE AND GLASS WORK IN CONSTRUCTION
8:4	HANDLING LARGE SHARP PARTS, STAMPINGS AND CASTINGS
6:4	WORKING WITH WIRES AND METAL STRAPS
5:10	HANDLING SHARP HANDTOOLS IN CRAFTING AND PACKING
4:8	HANDLING AND ASSEMBLING SMALL SHARP PARTS
4:5	HANDLING SHEET METAL IN GENERAL FABRICATION AND CONSTRUCTION
3:3	HANDLING, ASSEMBLING AND SORTING SMALL PARTS

Above, we've equated cut score factors with real world tasks and applications as examples

By plotting the tasks and applications, we determine a **CUT Risk Hazard Factor**™ (CRH: Factor™) as outlined on the right side. The CRH: Factor™ is a comparative indicator that helps safety managers determine the level of potential hazard related to the task or application. To explain further, the Force Exposure vertical axis tries to relatively quantify how much possible force may be applied if there is edge contact with the glove or sleeve. It is obvious that a higher force will occur when handling heavier or moving parts. The Edge Sharpness axis on the bottom correlates to the sharpness of the cut threat with 10 being a razor-sharp blade and 0 representing a rough edge, such as that of a brick or masonry block.

Correlating these two important factors is essential to determine the possible severity and type of trauma they will produce. Let's use a worker who is handling box cutters in a repacking operation as an example. The force required to open tape on boxes may be determined to be at a level 5, while the edge of the blade is no doubt razor sharp, placing it about 10 on the Edge Scale – altogether we'd express this as a CRH: Factor™ 5:10. Correlating the CRH: Factor™ 5:10 on the CUT Risk Hazard Matrix™ is easily equated to the ANSI Cut Scores, as can be seen in the matrix below.



CONCLUSION

Selecting Cut Resistant gloves or sleeves is not a linear science and choosing the highest cut level is not necessarily the best protection or best product for dexterity and productivity. We can see that proper glove selection is multifactorial and based on understanding the fundamentals of risk and task while carefully assessing the needs. We all seek a one product, one level solution but that is just not the best solution – even with today's advanced fiber materials and engineered yarns. Our goal is to work within the industry to help everyone become better acquainted with proper glove and sleeve selection. We believe that the CRH: Factor™ values help to more confidently assess the requirement and better correlate to EN and ANSI cut scores, while serving as a guide for product selection to meet price points and conditions. As a leading provider of hand and arm protection, PIP believes it is incumbent upon us to help safety managers and workers make confident glove and sleeve selections.