CUT GLOVE FAST FACTS
Speaking of Safety: A Few Fun Facts about Hands

Did you know? Each hand contains:

- 29 major and minor bones (many people have a few more)
- 29 major joints
- At least 123 named ligaments
- 35 muscles which move the fingers and thumb
  - 17 in the palm of the hand, and
  - 18 in the forearm
- 48 named nerves
- 3 major nerves
- 24 named sensory branches
- 21 named muscular branches
- 30 named arteries and nearly as many smaller named branches
- The bones in your fingers are no stronger than a lead pencil
The Cost of Unsafe Hands

Here are some hand statistics from the CDC and OSHA:

If all workers, from medical to industrial and everything in between, would just wear gloves, then more than 1 million hospital emergency visits by U.S. workers per year could be avoided (according to the Centers for Disease Control and Prevention).

• Hand Injuries have cost employers over $740 Million dollars in the US last year (lost time, settlements, etc).

• Non-compliance of PPE hand protection is among one of the most common OSHA citations to date, costing employers on average $6,000 per citation.

OSHA 1910.132(h)(1) requires that protective equipment, including PPE, shall be provided by the employer at no cost to the employees. It's not a one shot deal- as a business owner, you have to be compliant every hour of every day. Safety has to be top of mind, comfort leads to compliance. Don't let your workers become a statistic!

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STANDARDS & TESTING

Standardized testing of gloves ensures that the proper glove can be selected based on the hazards present. Testing includes ratings for abrasion, cut, tear, and puncture. New versions of the EN388 and ANSI/ISEA 107 standards improve cut testing to rate much higher cut levels, align cut test results between ANSI and EN cut test methods, and add ratings for impact resistance.

UNDERSTANDING THE NEW ANSI/ISEA 105

4 Revisions to the new Cut Level Standards you need to know.

1. The reason for these changes is to give users a more accurate picture as to the cut resistance level of their gloves. The addition of four new designations allow for greater clarification for higher cut level gloves.

2. While these changes have recently taken effect, no direct time line has been specified to have gloves tested to the new standard. However, in order to have the A# designation, previously rated gloves must be retested.

3. Although previous ANSI tests were done on a different machine, the TDM100 (depicted to the right) will be used in ANSI/ISEA 105-2016 tests. This leads to more accurate test results.

4. ANSI cut levels have increased from five to nine. In addition to the old numerical designation (1-5), the new standards incorporate the alphabetical designation (A1-A9). See the chart below for a graphic depiction of these levels.

ANSI/ISEA 105-2016

* Material sample from glove palm
# Cut Level Ratings

There are many kinds of cut hazards, and each one requires a different level of protection. Use the table below to help determine the cut level rating necessary for your work environment.

<table>
<thead>
<tr>
<th>Cut Level</th>
<th>Description</th>
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<tbody>
<tr>
<td>A1</td>
<td>Nuisance Cuts: Paper cuts, automotive maintenance, parts assembly, material handling.</td>
</tr>
<tr>
<td>A2</td>
<td>Low Cut Hazards: Construction, automotive assembly, packaging, some masonry applications.</td>
</tr>
<tr>
<td>A3</td>
<td>Moderate Cut Hazards: Light metal stamping, light-duty glass handling applications.</td>
</tr>
<tr>
<td>A4</td>
<td></td>
</tr>
<tr>
<td>A5</td>
<td>High Cut Hazards: Metal stamping &amp; casting, sheet metal, window &amp; tile handling, meat &amp; poultry.</td>
</tr>
</tbody>
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**EN388**

EN388 ratings are also noted on Radians hand protection. EN388 includes more specific information about the resistance to particular types of hazards you may encounter on the job. There are four numbers listed which indicate the level of resistance to puncture, tearing, blade cut and abrasion. Look at the diagram to the left to reference which number corresponds to which hazard.

- Puncture Resistance
- Tear Resistance
- Blade Cut Resistance
- Abrasion Resistance
Glove Materials & Applications

Glove Shells

Glove shells are knitted on a flat head knitting machine and are measured by the gauge (ga) of the shell. The gauge of the shell identifies how many needles are used per linear inch on a knitting machine. A 15-gauge shell, for example, is knitted on a machine with 15 needles per linear inch. The smaller the gauge, the thicker the shell. 7 ga is the thickest shell and 18 ga is the thinnest, lightest weight shell.

Shells can be made of many different types of materials. The most common materials are listed below:

POLYESTER
A monofilament yarn has just one, single polyester fiber that is usually not twisted. Spun yarns are produced in much the same way as a cotton or wool yarn is produced.

NYLON
A man-made yarn that is durable, has a high elongation, and provides excellent abrasion resistance. Nylon varies in its luster and can be very lustrous, semi lustrous or dull. It is very resilient. (Nylon fabrics are heat-set.)

HPPE
(High Performance Polyethylene) same as HDPE (High-Density Polyethylene) or UHMwPE (Ultra-High Molecular Weight Polyethylene.) Most of these yarns are made in China and are popular because of their low cost and their similar properties to Dyneema® yarn. Gloves with this yarn offer cut protection at A2-A3 levels.

HPPE WITH FIBERGLASS
Same high performance polyethylene with fiberglass that increases hand protection to levels above A3.

HPPE WITH STAINLESS STEEL
High performance polyethylene that is intertwined with stainless steel. This combination yields excellent cut protection up to A5 or higher.

DYNEEMA®
A super-strong Ultra-High Molecular Weight Polyethylene (UHMwPE) fiber that is sold only to licensed factories and licensed glove companies. Gloves made of Dyneema are cooler, cost-efficient, and provide superior cut protection without adding fiberglass or stainless steel. They are very comfortable for all-day wear.

DYNEEMA® DIAMOND TECHNOLOGY
Embedded micro-particles strengthen fibers by up to two times, for higher cut scores. Dyneema Diamond Technology yarn will outperform HPPE gloves and is more durable plus it offers greater abrasion resistance than gloves with fiberglass or other aramids.

ARAMID
An engineered yarn that is the generic version of Kevlar but does not require a license to sell. Aramids have similar properties to Kevlar.

KEVLAR®
An engineered yarn by DuPont®. Gloves made of this yarn are fire resistant and offer high cut protection levels. This yarn can be easily identified because of its distinct yellow color.

KEVLAR® WITH LYCRA
Offers better stretch for the glove. The percentage of Lycra in the glove affects the cut protection level of the glove. If the percentage of Lycra is higher than the percentage of Kevlar, the cut protection of the glove will be lower.

POLYESTER
NYLON
HPPE
HPPE WITH FIBERGLASS
HPPE WITH STAINLESS STEEL
DYNEEMA®
DYNEEMA® DIAMOND TECHNOLOGY
ARAMID
KEVLAR®
KEVLAR® WITH LYCRA
Palm Coatings

To address specific work-related hand protection issues, Radians uses several different types of palm coatings: smooth nitrile, foam nitrile, sandy foam nitrile, foam latex, sandy foam latex, crinkle latex, and PU polyurethane. Palm coatings allow for better gripping capabilities and tactile sensation without losing dexterity.

**Definitions/Applications:**

| **SMOOTH NITRILE** | Smooth/Flat gloves do not have any texture on the surface of the glove. They provide excellent resistance to abrasion, snags, and perforation. Made of synthetic rubber, they are latex-free with no natural rubber proteins. Excellent puncture resistance, tactile sensitivity, and flexible grip. |
| **FOAM NITRILE** | Micro texture is the most common and lightest form of texturing for nitrile gloves. This texture is suitable for gripping small objects or tools in wet or dry applications. Breathable, flexible and porous, foam nitrile will channel oil and water away from surface quickly. Excellent resistance to abrasion, snags and perforation. Made of synthetic rubber, foam nitrile gloves are latex-free with no natural rubber proteins. |
| **SANDY FOAM NITRILE** | Micro roughened texture finish. The sandy-like finish on these gloves increases abrasion resistance and improve grip. They are good for wet, dry or oily applications. Made of synthetic rubber, these gloves are latex-free with no natural rubber proteins. |
| **FOAM LATEX** | Micro texture for better breathability and comfort. Excellent flexibility and resistant to tears and cuts. Good for wet or dry applications. |
| **SANDY FOAM LATEX** | Micro roughened texture for better breathability and comfort. Excellent flexibility and resistant to tears and cuts. |
| **CRINKLE LATEX** | Rough textured for better grip and abrasion. Latex gloves are natural material, made out of rubber. They offer excellent flexibility and protection from tears and cuts. |
| **PU (POLYURETHANE)** | Semi-smooth texture is extremely flexible and provides superior dexterity and sensitivity. A PU coating can be silicone free and has a low-particulate shed, which reduces risk of contamination from the dip itself. The coating “strikes through” onto the inside of the glove, which can lead to heat retention and sweating. Not as durable as nitrile or latex, PU gloves can be used for inside light duty, detailed assembly, inspection, light fabrication, and box/small parts handling. |

**Which coating do I need for dry and oil grip applications?**

Polyurethane and Nitrile coatings offer the best options when you need both dry and oil grip applications. Both polyurethane and nitrile are flexible, which allows for improved gripping and dexterity during use. Plus, nitrile has good water permeability, absorbing liquids in just seconds to provide a good grip in wet applications.

Foam nitrile is a very thin, tacky coating with good durability. Although it has less abrasion resistance than flat nitrile coating, foam nitrile coating offers excellent grip with dry, wet, and oily applications. Flexible and porous, foam nitrile will channel oil and water away from the surface quickly.

**Why use smooth nitrile vs. polyurethane coating?**

If you need a glove with high resistance to abrasion, then smooth nitrile is the type of glove to use. A smooth nitrile coated glove is non-porous, less flexible and not breathable.

If you need a flexible and breathable glove with excellent grip in dry, wet, or oily applications, then a polyurethane coated glove is the best choice. It is also porous and abrasion-resistant.

**What are the benefits of a latex coating?**

Latex coating is the most economical coating type. Its strengths are good flexibility and tensile strength. Tensile strength is the resistance to stretch or deformation of a glove over time. Latex is non-porous but offers good elasticity and comfort. On the downside, latex can be sensitive to heat and is not good for oily applications. Latex may also cause allergic reactions.
CUT GLOVE
FAST FACTS