TerranearPMC Safety Share

Robert Brounstein

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The U.S. Bureau of Labor and Statistics reported that 70 percent of workers who experienced hand injuries in 2015 were not wearing gloves. The remaining 30 percent of hand injuries did involve employees wearing gloves, but but the gloves were inadequate, damaged or the wrong type for the hazards that were present. This is especially true when we want gloves that will protect our hands from lacerations and cuts. Yet, when it comes to selecting proper hand protection, cut-resistant gloves seem to be one of the most confusing topics.

To begin with, the concept of cut-proof gloves is a myth. The fact is, gloves can only be cut-resistant. Cut-resistant gloves are not designed to stop a pair of scissors (or any other sharp object). However, by wearing a cut-resistant glove, it is very likely that a cut that would typically require stitches may be reduced to a cut that only needs a band-aid.

The OSHA regulation for hand protection, 29 CFR 1910.138, states that the employer shall select and require employees to use the appropriate hand protection and that the selection shall be based upon an evaluation of the hazards for which employees may be exposures. Yet, when it comes to hand lacerations, OSHA does not specify proper cut resistant levels to ensure workers are properly protected.

In general, gloves are rated for their ability to mitigate cuts and are tested and classified by the American National Standards Institute's (ANSI), and the American Society for Testing and Materials, ASTM F2992 cut test. The science behind the ANSI test method is to measure the cut resistance of a material against a razor blade under a specified load on a machine known as the TDM-100 (aka Tomodynamometer). This test uses a new blade each time the test is run, thereby removing bias for each test with regards to blade sharpness.

Many cut resistant gloves are manufactured to protect hands from being slashed by sharp objects like knives/blades. However, they may provide very little or no puncture resistance from a pointed item, such as a needle. International testing organizations have acknowledged this deficiency and are adapting standards to meet this deficiency. Two examples are the Canadian research organization IRRST and the ASTM F23 Standards committee; both organizations working together to design a standard that uses the same test procedures.

The fact is our skin can be cut very easily, so having cut-resistant gloves can be a significant factor for protecting our hands. Many times, we use leather work gloves as a method to control hand injuries; and under many circumstances, this is an effective control. Nevertheless, without being subjected to testing protocol, quantification of a gloves' ability to protect against cuts, the user will have no guarantee that a glove will truly protect him/her from cuts while working with sharp edges. As a general rule, cut-resistant gloves need to provide 360-degree protection -and may incorporate high performance yarns like Kevlar® or HPPE (High Performance Polyethylene). These yarns give five to ten times the cut protection of leather and are considerably stronger than steel on an equal-weight basis. A coating will increase the glove's cut resistance slightly but only in the area where the coating is applied (usually the palm, unless the glove is fully coated).

In 2011, the International Safety Equipment Association (ISEA) established a quantification rating system to measure cut resistance (ISEA 105-2011) and included five levels, from 1-5: 1 being the least cut-resistant while 5 being the most protective. This rating system has now been modified by ANSI/ISEA 105-2016 which has nine separate cut-resistant levels, A1 – A9. These ratings are presented in the table below, showing cut-resistant levels and the weight (in grams) needed to cut through material with 20 mm blade travel and typical tasks where that protection level should be considered.

Cut Resistance Level	Weight (grams) needed to cut through material with 20 mm blade travel	Typical Task
A1	200 – 499 grams	Assembly, Maintenance, Material Handling, and Shipping and Receiving
A2	500 – 999 grams	Assembly, Appliance Manufacturing, Automotive, Construction, Maintenance, Material Handling, and Metal Handling
A3	1000 – 1499 grams	Assembly, Appliance Manufacturing, Automotive, Construction, Maintenance, Material Handling, and Metal Handling
A4	1500 – 2199 grams	Appliance Manufacturing, Automotive, Construction, Glass Handling, Machining, Metal Handling, Metal Stamping and Paper Production
A5	2200 – 2999 grams	Appliance Manufacturing, Automotive, Construction, Glass Handling, Machining, Metal Handling, Metal Stamping and Paper Production
A6	3000 – 3999 grams	Appliance Manufacturing, Automotive, Construction, Glass Handling, Machining, Metal Handling, Metal Stamping and Paper Production
A7	4000 – 4999 grams	Assembly or movement of large, bulky or heavy objects with sharp edges. Also recommended for Assembly or movement of items that are difficult to grip
A8	5000 – 5999 grams	Assembly or movement of large, bulky or heavy objects with sharp edges. Also recommended for

		Assembly or movement of items that are difficult to grip
A9	6000+ grams	Assembly or movement of large, bulky or heavy objects with sharp edges. Also recommended for Assembly or movement of items that are difficult to grip

It is important to understand that PPE by itself may not be enough to protect workers from hand lacerations. Such is the case when working with rotary blades or machines with moving parts. For instance, if a moving blade catches a 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, or burns. Therefore, engineering controls, including guards, are essential for protecting workers from such serious – yet preventable - injuries. Any machine part, function, or process that may cause injury must be safeguarded with physical barriers or electronic sensors that automatically shut off a machine when an object (i.e. hand) is detected near the point-of-operation.

An action committed in anger is an action doomed to failure

Genghis Khan