PROTECTING THE OTHER SIDE OF THE HAND

AN ERGODYNE WHITE PAPER

INTRODUCTION

Is there any doubt? Hands are crucial for our lives and work.

The ability to grasp, hold and manipulate tools and objects with strength and dexterity is critical to our everyday lives, and especially to our work. It is, we are told, what sets us apart from most other creatures. And common phrases referring to "manual labor" or "being handy" recognize the central place our hands play in work.

But because of their vital role in our working lives, hands are also vulnerable to injury. In fact, the Bureau of Labor Statistics estimates that hand and finger injuries cause about 110,000 workers to lose days from work each year, a rate second only to back strain and sprain.

Thus it's not surprising that protecting hands from injury is a fundamental part of most workplace safety programs.

Too often, though, these efforts focus primarily on the palm side of the hand. Less attention is paid to protecting the back (or dorsal) side, which is critical for our hands to operate effectively.

This becomes even more important in extreme environments where dorsal side injuries are more common. Think oil and gas drilling, extraction, and refining; mining; heavy construction; demolition; cargo handling; and other industrial settings.

LET'S TAKE A LOOK AT OUR HANDS

We say that we are familiar with something when we "know it like the back of our hand." However, hands are complex. There is a lot to know.

Start with the bones. Each hand is comprised of 27: 14 in the fingers, eight in each wrist, and five in the metacarpus or palm. Movement of these bones is controlled by forearm muscles which are connected to the bones via tendons.

In some ways, it's helpful to think of our hands as marionettes. Muscles pull strings (tendons) on the bottom side of our forearms which cause our fingers to grip (a movement known as flexion). Muscles on the back side of our forearms cause fingers to open (a movement called extension). Both are critical for work; you do need to let go of things after all.

The smaller hand muscles allow for delicate movements and work with the nerves and blood vessels to allow feeling and for using our hands effectively.

PROTECTING OUR HANDS

Injuries to these bones, tendons or muscles are often caused by an impact, a pinch, or a blow. And these injuries can be significant. Damage to just one hand component can make a worker less effective or even prevent them from performing their duties completely.

Natural protection for the palmar side of the hand is provided by thicker skin and numerous cell layers. These layers can be enhanced with calluses, essentially thickened pads of dead skin cells built up from work. Still more padding is provided by muscles and fat cells.

The vast majority of hand protection solutions (i.e. gloves) focus on the palm side of the hand. Gloves designed to protect against cuts, abrasion, burns, impact, or vibration do so with special padding, thick leather, or other heavy materials.

Most often, these gloves address the dorsal side with a thinner material offering minimal protection. This "other side of the hand," with its thinner skin and fewer muscles is less naturallly protected from injuries. And that makes wearing gloves that focus only on the palm side of the hand like wearing sandals—fine for a walk on the beach, but not appropriate for work environments where both sides are at risk.

PROTECTIVE APPROACHES

Engineering controls are always the preferred method of hand injury prevention. Designing work environments, equipment, and tasks so that workers' hands are never placed in jeopardy is the best approach. However, this is not always realistic, especially when workers are engaged in construction, assembly, disassembly or repair-type tasks that require hand tools or extreme handling.

Training, work practices, and administrative controls are also effective in keeping workers' hands out of danger zones. They can prevent impact, pinch, or blow injuries when working around moving parts, equipment, or large loads. Examples include tag lines, tools, and reach poles. However, the success of this type of 'hands-off' policy requires that it be effectively promoted and enforced.

Some tool manufacturers have designed their hand and power tools to protect the dorsal side of the hand in a way similar to sword hilts. This can be seen in the brush guard on most modern chainsaws. Unfortunately these types of guards are sometimes "clunky" and limited in their effectiveness.

Similarly, hockey and boxing have produced unique gloves offering substantial dorsal protection—but obviously unsuitable for work applications. The padded bulk of the boxing glove only works with a fist while the dorsal padding on a goalie glove prevents the wearer from grasping anything more delicate than a hockey stick.

Thickly padded gloves also raise concerns in work applications. Where hand clearances are already limited, bulky gloves can interfere with access to parts or fasteners, making fine work more difficult. Bulky gloves also increase the chance of getting caught in moving parts when working around moving equipment or machinery. Of course, in warm climates and hot environments thickly padded gloves can be uncomfortable. All of the above may lead to workers choosing not to wear the glove, leaving their hands exposed and more vulnerable to injury.

THE CHALLENGE OF KNUCKLE-BUSTER JOBS

So how do you protect both sides of the hand while still allowing workers to do their job?

In addition to engineering controls, training, and work practices, there are certain specialized gloves that have been designed to address this issue. These gloves balance protection, dexterity, and fit in order to be effective. As with most other PPE selection, choices must evaluate the specific hazards and task demands faced.

If impact and injuries caused by blows are a concern, then dense padding may be appropriate to distribute the force across a greater portion of the hand and to protect the bony back side and knuckles. In addition, strategically placed molded rubber, both on knuckles and fingers, may further serve mitigate the affects of an impact, a pinch, or a blow.

Abrasion protection must surround the entire hand to be effective. If the goal is to prevent incidental contact between the dorsal side and a rough or sharp surface, narrow hold-off strips can be effective at distancing the hand from the surface while allowing easy finger movement.

Rugged technical materials such as Armortex and Kevlar should also be considered for abrasion protection.

While impact and abrasion protection are important, they should not come at the expense of worker motion. Using padding or other materials that are too thick or too bulky will compromise dexterity and make the glove more a hindrance than a help.

Finally, the protective glove must fit comfortably and correctly. A comfortable and secure fit ensures the glove will be worn and therefore able to provide the intended protection.

SUMMARY

Hands, movement, gripping, and dexterity are critical to our life—on the job and off. If the back of the hand gets injured, the entire hand may be rendered useless, perhaps for an extended period.

Follow the hierarchy of controls to eliminate or reduce risk as much as reasonably possible. Where you can't use engineering or administrative controls, use effective hand protection PPE like ProFlex® Gloves from Ergodyne. Proper selection of hand protection PPE requires looking at the worker, the task, and both sides of the hands.

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