ROCKFORD SYSTEMS, LLC

GOT GUARD OPENING SCALES? GET SAFEGUARDING!

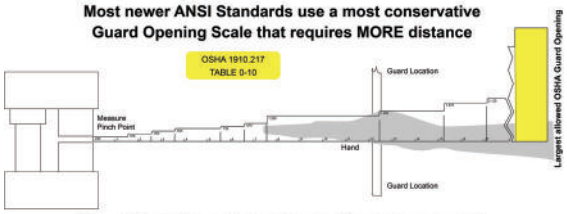
HOW TO USE A GUARD OPENING SCALE

Point-of-operation barrier guards are essential safeguarding equipment for hazardous industrial processes and machinery such as presses, pumps, motors and drills. When properly installed the barriers prevent a person from placing any part of their body into the point of operation by reaching through, over, under or around the guards to access a hazard. However, because barrier guards are typically constructed out of materials such as wire mesh, expanded metal, rods, or hairpins, most have openings that present the potential for injuries if a person reached through them. As a result, whether the guard is fixed, adjustable, movable, or interlocked, **any openings must be measured for compliance with Table O-10 of OSHA 29 CFR 1910.217 (Mechanical Power Presses), current ANSI/CSA standards, or International standard ISO 13857 to determine the safe distance from the hazard.**

The critical role of measuring barrier openings falls on a simple but often misunderstood tool: the Guard Opening Scale. Also known as "gotcha sticks," Guard Opening Scales mimic the human hand and forearm. **Over the past 70 years they've proven to be the most accurate means of ensuring any opening in a barrier guard will not allow a hazardous zone to be accessed.**

HISTORY OF THE GUARD OPENING SCALE

The history of the Guard Opening Scale dates back to 1948. It was then that Liberty Mutual Insurance, joined with the Writing Committee for the ANSI B11.1 Safety Standard on Mechanical Power Presses, engineered a stair-step shaped measurement tool to determine guard-opening size vs. guard distance to the nearest Point of Operation hazard. A rash of injuries to mechanical power press operators who reached through barriers and suffered lacerations, amputations and crushed limbs prompted Liberty Mutual's actions. Although Guard Opening Scales were first designed for point of operation guards on mechanical power presses, they are now often used on other machines as well.



A guard opening scale can be used to measure guard openings and distances from the P.O.O.

Originally, the recommended dimensions used for the scale were based upon "average-size hands," which at the time were a woman's size 6 glove. ANSI incorporated these dimensions from Liberty Mutual into its 1971 revision of the ANSI B11.1 safety standard for mechanical power presses. In 1995, however, a study entitled "A Review of Machine-Guarding Recommendations" was conducted by Donald Vaillancourt and Stover Snook of Liberty Mutual Research to establish whether the 1948 drawings were consistent with current hand size data, in particular as the data relates to women and minorities who have become more prevalent in manufacturing. Vaillancourt and Snook suggested several important modifications including moving the glove size from a woman's size 6 to a size 4. Drawings from the study have been adopted in several current ANSI B11-series safety standards for machine tools as well as in the ANSI/zz R15.06 safety standard for industrial robots and robot systems. OSHA in Table O-10 of OSHA 29 CFR 1910.217 did not, on the other hand, officially adopt the drawings.

OSHA VS. ANSI GUARD OPENING SCALES

OSHA Compliance Officers are usually limited to using OSHA's own scale, which is referenced by CFR 1910.217, Table O-10. The ANSI scale is more likely to be used by Insurance Loss Control Engineers in manufacturing plants where smaller hand sizes tend to dominate the employee population. Let's look at the differences in the two designs:

Double-hinged design to allow folding into thirds

Note that the OSHA scale locks on the 3rd stair-step on the entrance side, and that the tip of the scale does not reach the die, meaning the test is "passed" for that opening size at that distance away. Also note that the ANSI scale locks on the last stair-step on the entrance side, and that the tip of the scale goes past the die, meaning that the test is "failed" for that opening size at that distance away. That problem can be fixed in one of two ways; move the guard a little further away from the die, or make the adjustable guard opening a little smaller, or some combination of those two.

USING A GUARD OPENING SCALE

A Guard Opening Scale is a two-dimensional representative of an average sized finger, hand and arm. Of course, the human body is not two-dimensional but three-dimensional, thus making its correct use critically important. Follow these simple instructions for proper measurements.

Guard Opening Scale Comparison

First, place the scaled side perpendicular to the smallest dimension in a hole in the barrier guard material and attempt to insert it towards the hazard. If properly designed, the barrier guard will stop the tip from accessing the hazard area. When multiple openings of various sizes exist in a barrier guard, each must be tested with the tool. The maximum guard opening that OSHA allows is a 6-inch opening at 31.5 inches away. For most people that's armpit to fingertip. Also, the openings should always be measured empty, not with any material in place. This is based on the logic that personnel may put a hand through the guard opening without material taking up a portion of the space. Remember that Safety Inspectors won't cut a plant operator any slack because the guard happens to be adjustable. Adjustable guard openings must be measured the same as fixed guard openings.

Please call 1-800-922-7533 or visit rockfordsystems.com for more information.