

EPIC FAILS



HERE'S MUD IN YOUR EYE, GOOD LUCK GETTING IT OUT

Anyone who has worked long enough as an ammonia refrigeration operator has had to flush parts of their body with water due to a liquid ammonia exposure. Hopefully, it was simply a minor burn on a finger or wrist. However, far too often, it is an exposure that requires flushing the eyes and face, often because the operator was not wearing a full face respirator mask, or at least chemical goggles and a face shield when opening the system, or draining oil.



To help minimize the injury, the International Institute of Ammonia Refrigeration (IIAR) requires that eyewash/showers be installed inside and outside of the machinery room. Specifically, Section 6.7.1 of IIAR-2014, Addendum A, states: "A machinery room shall have a minimum of one eyewash/safety shower unit, which shall be located inside the machinery room. A minimum of one eyewash/safety shower unit shall be located outside of the machinery room." So, this section sets a minimum number of eyewash/shower units in and around the machinery room at two.

Section 6.7.2 sets path of travel requirements that may increase the number of required eyewash/shower units. It states: "The path of travel within the machinery room to at least one eyewash/safety shower unit shall be unobstructed and shall not include intervening doors. Additional eyewash/safety shower units shall be installed such that the path of travel in the machinery room is no more than 55 ft to an eyewash/safety shower unit. The path of travel to at least one eyewash/safety shower unit located outside of the machinery room shall be within 55 ft of the principal machinery room door. The path of travel shall be unobstructed and shall not include



SO WHAT DOES Z358.1 REQUIRE?
HERE IS A SUMMARY OF THE
REQUIREMENTS:

SHOWERS

- A means shall be provided to ensure that a controlled flow of flushing fluid is provided at a velocity low enough to be non-injurious to the user.
- Emergency showers shall be capable of delivering flushing fluid at a minimum of 20 gallons per minute for a minimum of 15 minutes. If shut off valves are installed in the supply line for maintenance purposes, provisions shall be made to prevent unauthorized shut off.
- Emergency showers shall provide a flushing fluid column that is at least 82 inches and not more than 96 inches in height from the surface on which the user stands.
- The spray pattern shall have a minimum diameter of 20 inches at 60 inches above the surface on which the user stands, and the center of the spray pattern shall be located at least 16 inches from any obstruction. The flushing fluid shall be substantially dispersed throughout the pattern.
- Emergency showers shall be designed, manufactured and installed in such a manner that, once activated, they can be used without requiring the use of the operator's hands.
- Emergency showers shall be constructed of materials that will not corrode in the presence of the flushing fluid. Stored flushing fluid shall be protected against airborne contaminants.

intervening doors." The most obvious criteria in this section that may increase the required number of eyewash/shower units in the machinery room is the maximum travel distance being 55 feet. However, let's look a little more closely at this requirement. First, let's say that we have a machinery room that is 55 feet on each side. If the eyewash/shower is installed in one corner of the machinery room, then the minimum path of travel from the other corner would be 77.8 feet, over the maximum distance of 55 feet. Let's say for argument's sake, that the maximum straight line path corner to corner is 55 feet, which would apply for a

room about 38.9 feet on each side. We are good, right? Maximum path of travel is 55 feet or less, so no worries, right? The key is that the path must be UNOBSTRUCTED. If equipment stands between the person and the eyewash/shower, then the path is not unobstructed and hence does not meet the requirements of IAR2. When placing eyewash/showers distance and obstructions must be evaluated. Once we have our selected placements, IAR2 goes on to state requirements for the eyewash/shower installations. Section 6.7.3 states that "Emergency eyewash/safety shower unit installations shall comply with ANSI/ ISEA Z358.1."

EYEWASH

- A means shall be provided to ensure that a controlled flow of flushing fluid is provided to both eyes simultaneously at a velocity low enough to be non-injurious to the user.
- Eyewashes shall be capable of delivering flushing fluid to the eyes not less than 0.4 gallons per minute for 15 minutes. If shut off valves are installed in the supply line for maintenance purposes, provisions shall be made to prevent unauthorized shut off.
- Be arranged such that the flushing fluid flow pattern as described below is not less than 33 inches and no greater than 53 inches from the surface on which the user stands and 6 inches minimum from the wall or the nearest obstruction.
- Eyewashes shall provide flushing fluid to both eyes simultaneously. A test gauge for making determination of a suitable eyewash pattern shall be a minimum 4 inches in length with two sets of parallel lines equidistant from the center. The interior set of lines shall be 1.25 inches apart and the exterior lines shall be 3.25 inches apart. Place the gauge in the stream of the eyewash. The flushing fluid shall cover the areas between the interior and exterior lines of the gauge at some point less than 8 inches above the eyewash nozzle(s).
- Eyewashes shall be designed, manufactured and installed in such a manner that, once activated, they can be used without requiring the use of the operator's hands.
- Eyewashes shall be constructed of materials that will not corrode in the presence of the flushing fluid.
- Deliver tepid flushing fluid... Definition: A flushing fluid temperature conducive to promoting a minimum 15 minute irrigation period. A suitable range is 60 -100° F.
- Nozzles and flushing fluid units shall be protected from airborne contaminants. Whatever means is used to afford such



protection, its removal shall not require a separate motion by the operator when activating the unit.

- The eyewash shall be designed and positioned in such a way as to pose no hazard to the user.
- Eyewashes shall be designed to provide enough room to allow the eyelids to be held open with the hands while the eyes are in the flushing fluid stream.

NOW, DO YOU THINK THAT THESE MEASURE UP?

If you have photos of an Epic Fail please pass them on to nh3isB2L@gmail.com.

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