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Emergency Washing Facilities

Date: July 15, 2011

I. Purpose

This directive establishes DOSH enforcement policy related to the emergency washing requirements contained in WAC 296-800-150, First Aid, and Chapter 296-307 WAC, Part B, Accident Prevention Program, First-Aid Requirements.

II. Scope and Application

This directive applies to DOSH operations statewide. It replaces all previous instructions on this issue, whether formal or informal. It does not supersede any emergency washing requirements contained in other standards, such as Chapter 296-856 WAC, Formaldehyde.

III. Definitions

Emergency Washing Facilities – Are emergency showers, eyewashes, eye/face washes, hand-held drench hoses, or other similar units.

Corrosive - A substance that, upon contact, causes destruction of living tissue by chemical action, including acids with a pH of 2.5 or below, or caustics with a pH of 11.0 or above.

Strong irritant - A substance that will induce a local inflammatory reaction upon immediate, prolonged, or repeated contact with normal living tissue. It is **not** corrosive, but causes a reversible inflammatory effect on living tissue by chemical action at the contact site.

Toxic Substance - A chemical that has the inherent capacity to produce personal injury or illness to individuals by absorption through any body surface.

Tepid – Temperatures between 60 and 100 degrees Fahrenheit.

IV. References

- WAC 296-800-15030 through 15040, Emergency Washing
- Chapter 296-307 WAC, Part B, Accident Prevention Program, First-Aid Requirements
- Chapter 296-839 WAC, MSDS and Label Preparation
- WAC 296-800-160, Personal Protective Equipment
- DOSH Compliance Manual
- DOSH Consultation Manual
- ANSI Z358.1-1998, Emergency Eyewash and Shower Equipment
- ANSI Z358.1-2009, Emergency Eyewash and Shower Equipment
- 29 CFR 1910.151(c), OSHA Emergency Washing Requirements

V. Background

The Emergency Washing rule (WAC 296-800-15030), requires employers to provide emergency washing facilities for employees exposed to corrosives, strong irritants, or toxic chemicals. The DOSH Emergency Washing requirements are based on the requirements of the American National Standards Institute (ANSI) publication Z358.1-1998. Emergency washing facilities that are designed to meet the requirements of ANSI Z358.1-1998, also meet the requirements of WAC 296-800-15030. The DOSH Emergency Washing requirements are more specific and more inclusive than the Federal OSHA requirements.

A large variety of emergency washing equipment is commercially available, but only some of it meets DOSH requirements. For example, in addition to the flow requirements of WAC 296-800-15030, there are specifications on the time required to activate the emergency wash, and how it performs when activated. This Directive specifies how DOSH will enforce the emergency washing requirements.

The presence of an emergency washing facility does not preclude or eliminate the need for proper personal protective equipment (PPE) such as eye protection. **It is an essential requirement that adequate eye and body protection is used when exposed to hazardous materials.**

VI. Enforcement Policy

A. **Emergency Washing Facilities.**

When there is potential for an employee's eyes and/or major portions of the body to contact corrosives, strong irritants, or toxic chemicals, the employer must provide emergency washing facilities. The emphasis is often placed on emergency eyewash requirements, but the need for an emergency shower must also be evaluated. If major portions of an employee's body could be exposed to hazardous substances, then emergency showers **and** emergency eyewashes must be provided.

The emergency washing requirements apply to both emergency showers **and** emergency eyewashes, unless otherwise stated in the rule, and this Directive.

The Compliance Safety & Health Officer (CSHO) should be mindful of the presence of hazardous substances on all inspections. The list of hazardous

chemicals required as part of the written Chemical Hazard Communication (HazCom) program should be thoroughly reviewed and compared to chemicals found during the walk-around inspection.

To determine if emergency washing facilities are required, consider the following:

- Health effects, emergency first aid procedures and other information on the Material Safety Data Sheet (MSDS) – (see Section B below)
- Warnings and statements on the product label - (see Section C below)
- Information from the product manufacturer
- Other information, such as relevant chemical/product data – (see Section D below)

B. Material Safety Data Sheet (MSDS)

1. The best way to determine whether chemicals in the workplace require emergency washing facilities is by referring to the Material Safety Data Sheet (MSDS) or similar documents. Look for specific references to the material being corrosive, a strong irritant, or toxic.

Many MSDSs contain a first-aid statement about flushing the skin or eyes with water for 15 minutes after contact with the material. This first-aid statement does not always mean that DOSH would require emergency washing facilities. However, emergency washing facilities are required when the MSDS specifically states the material is corrosive, a strong irritant, or toxic (skin notation for example), **and** employees are exposed. Examples of such statements on the MSDS are:

- Corrosive to the eyes
 - May cause permanent eye damage if not treated
 - Do not get in eyes
 - Eyewash required
 - May cause burns to skin and eyes
 - May cause severe eye irritation
2. A material is considered toxic if it produces serious injury or illness when absorbed through any body surface. If the MSDS does not specifically state that the material is toxic, look at each listed chemical component separately. Look for what is called a “skin notation” or “skin” or “s” by the chemicals listed on the MSDS. Chemicals with a “skin notation” should be considered toxic.
 - A **skin notation** means that the American Conference of Governmental Industrial Hygienists (ACGIH) has listed the chemical as having potential significant exposure by the cutaneous route, including mucous membranes and the eyes.

Be aware that **not all** MSDSs contain accurate information. Most MSDSs contain reliable information and often err on the safe side, but occasionally there will be missing or misleading information. If the employer follows the MSDS in good

faith, but the CSHO discovers there is missing or misleading information, any violations related to the MSDS should be considered de minimis, and the correct information will be given to the employer in a message on the Citation & Notice (C&N).

After the employer has been notified of the correct chemical hazard information (by a message on the C&N), any related violation in the future can be cited.

To report significant MSDS errors or omissions, call the DOSH Technical Services Chemical Right-To-Know Specialist at (360) 902-5436.

C. Product Label.

The CSHO should check to see if the product label states that the material is corrosive, a strong irritant, or toxic. Even if the word “corrosive” is not present it may be considered corrosive if the universal symbol of a hand partially eaten away with liquid dripping on it is displayed. If it does not specifically state on the label or MSDS that the material is toxic, look for the skin notation for the specific chemical components listed on the MSDS. Materials labeled as corrosive, strong irritant, or toxic, require appropriate emergency washing facilities for exposed employees.



D. Additional Information.

If a chemical is suspected of being corrosive, a strong irritant, or toxic, and the MSDS does not provide sufficient data, then further research is needed. The CSHO should look for information on the specifications and individual components of the product. The specific name of the hazardous chemical components should be recorded for more in-depth research if necessary.

The internet can be a valuable tool in conducting this research, but care needs to be taken to ensure that only reliable sources of information are referenced. Good reference materials include:

- Toxicology of the Eye, by Grant and Schuman
- NIOSH Pocket Guide to Chemical Hazards
- Threshold Limit Value (TLV) booklet by ACGIH
- Peer reviewed toxicological studies

The CSHO should look for specific documentation that the material is hazardous to the skin and eyes. Information like the pH can be helpful, but of more value would be documented case studies of human and animal exposure. The CSHO should contact DOSH Technical Services with any questions.

The employer and employees may be able to provide valuable information. Ask them if they think an emergency washing facility is required. If they are not aware of the hazards, there may be additional HazCom issues that need to be pursued. Employer and employee information is particularly important if the product is being made or imported by an employer and a MSDS is not available.

If a Safety CSHO does not feel he or she has adequate background or training to do an in-depth evaluation of the material, he or she should consult or make a referral to Industrial Hygiene.

E. Indication of pH.

A good indicator of corrosivity of a material is when it has a pH below 2.5 or above 11.0, **however pH in and of itself is not definitive**. The definition of *corrosive* found in Chapter 296-800 WAC is: *A substance that, upon contact, causes destruction of living tissue by chemical action, including acids with a pH of 2.5 or below or caustics with a pH of 11.0 or above*. The emphasis should be placed on the substance being “destructive to living tissue”.

There are a small number of materials with a pH below 2.5 or above 11.0 which are not considered corrosive and the manufacturer or importer of these materials must prove that these substances are not corrosive in order to eliminate the requirement for emergency washing facilities. The generally accepted proof is by *in-vivo* toxicology testing using EPA accepted procedure. If the irritation score indicates it is a moderate irritant or less, the emergency washing is not required.

Note: Some corrosive material may not have a pH because it is not water soluble.

F. Employee Exposure.

Employees are considered to be exposed to corrosive, strong irritant, or toxic chemicals, if there is a reasonable likelihood that the material can get on their skin or into their eyes at a concentration that would be harmful, regardless of the use of personal protective equipment. For example, even if a small drop of hazardous chemical could be flicked or splashed into an employee’s eyes, the employee would be considered to have exposure to this material, and an emergency eyewash would be required.

An emergency shower is required when there is potential for major portions of an employee’s body to contact corrosive, strong irritant, or toxic substances. If the exposed body part cannot be easily rinsed in the available facilities, an emergency shower is required.

Employee exposure includes, but is not limited to:

- Working with concentrated chemicals
- Diluting chemicals
- Adding or removing a chemical pickup tube (wand)
- Attaching dispensing valves
- Cleaning up spills and other similar activities.

If the hazardous material is completely contained in a closed loop system and only “non-drip” connectors are used, the employee would **not** be considered exposed. An eyewash will be required for the employee exposed to diluted chemicals that are still concentrated enough to be corrosive, strong irritant or toxic.

G. Location of the Emergency Washing Facilities.

WAC 296-800-15030 requires the emergency washing facility to be located so that it takes no more than 10 seconds to reach and the travel distance should be no more than 50 feet. It also states that the emergency washing facility must be kept free of obstacles blocking their use. An employee must be able to reach the emergency eyewash facility even when material in the eyes causes temporary blindness and confusion.

A door between the exposure area and the emergency wash is considered an obstacle. A door held open by a door stop is considered an obstacle because there is no positive control that the door will always be open during an emergency. The exception is when a door has a “panic bar” on the exposure side and can easily be pushed open in the direction of the eyewash. Items such as mop buckets and boxes which block the path to the emergency washing unit should be cited as obstacles to the unit. Protective covers such as plastic caps and shower caps are only considered obstacles if the water pressure will not easily push the cover out of the way once the unit has been activated.

If possible, the emergency washing facility should not be located so close to the exposure area that the employee could continue being contaminated during the washing procedure.

H. Penalties.

The penalty severity and probability of emergency washing violations will vary depending on the chemical and the conditions of the exposure. In calculating the severity, the CSHO should look at the nature of the chemical, strength of the chemical, and any other injury causing characteristics of the chemical. A chemical like household bleach would have a low severity because it is not very corrosive, whereas a strong acid or caustic would have a high severity. The probability is determined by the frequency and likelihood of being injured by the chemical. Pouring one cap full of bleach into a bottle of water each day will have a very low probability whereas working all day with a caustic dip tank would have a very high probability.

I. Eyewash and Shower Equipment that Meet DOSH Requirements.

The recommended emergency washing equipment is a stand alone, plumbed or portable unit. The emergency eyewash device must be capable of being activated in one second or less with an active stream, and remain on without user assistance. If the equipment meets the requirements of ANSI Z358.1-1998, it is acceptable to DOSH. Portable eyewash units, like the plumbed units, must meet the minimum flow requirements of 0.4 gallons of water per minute for 15 minutes or more. Hand held squeeze bottles, some drench hoses, and many faucet-mounted devices do not meet the minimum requirements, and are only considered supplementary equipment.

Faucet-mounted eyewash devices that require emergency activation of two or more valves do not meet the minimum requirements. The two-valve activation cannot easily be done in one second or less. Additionally, ANSI Z358.1- 1998 requires the valve operation to be “simple” to activate, and a multiple-valve activation process is not considered simple. The affected person must be able to quickly activate the eyewash when distressed and temporally blinded with chemicals in both eyes.

There are faucet-mounted or faucet replacement eyewash devices that meet ANSI requirements, and are acceptable to DOSH. With regard to faucet mounted devices, ANSI indicates that they will accept the findings of an independent testing lab if the Z358.1 test procedures are followed. If the manufacturer claims that the device meets the ANSI requirements they must have documentation that it has been tested.

Acceptable devices include the type that uses a two-channel faucet pipe or gooseneck where the normal faucet water and the emergency eyewash water are each delivered through a separate channel (see Figure 3, Example 1). Another acceptable type, if tested to ensure it meets ANSI Z358.1 requirements, is a device with two valves attached to the end of the faucet pipe (in addition to the normal faucet valve). On this device one valve (sometimes called an eliminator valve) moves side-to-side to provide water to the sink and the other valve when pulled or pushed will activate the emergency eyewash feature (see Figure 3, Examples 2 and 3). The emergency wash valve overrides the other valve to provide a single valve operation. Figure 3 includes an example of an eliminator valve. Normally the two-valve type device requires a written procedure and training to ensure the unit is ready to go when needed.

The written procedure and training are required for the ANSI compliant, faucet mounted device when the normal faucet valve (counter-mounted valve) could inadvertently be turned or adjusted. A written procedure may not be needed where the counter-mounted faucet handles are removed after presetting the proper temperature and flow rate for the hot and cold water (see Figure 3, Example 3). The written procedures may not be required if the hot water supply has been disconnected as recommended by some manufacturers.

The written procedures and training must cover the information required to ensure the emergency washing device is fully functional when needed. For example, if the emergency eyewash is only needed every 2 weeks when the corrosive material is diluted, the written procedures must include the steps that need to be taken to ensure the eyewash is fully functional. These steps include presetting of the water temperature and water flow in addition to what precautions are required to ensure that no one disturbs the settings until after the dilution procedure is complete.

The required temperature for flushing fluid is not specifically stated in the WISHA rule. The WISHA rule requires the quality and quantity of water that is satisfactory for emergency washing purposes. Non-potable water is allowed if it is not harmful to the employee and is labeled as “not fit for drinking”. It is recommended by ANSI Z358.1 that the flushing fluid be tepid within a range of 60 to 100 degrees F. The CSHO should cite WAC 296-800-15030 if the washing fluid is above 100 degrees F, but not for fluid temperatures below 60 degrees F.

The emergency washing nozzles must be protected from contaminants. Whatever means is used to afford such protection, its removal shall not require a separate motion by the operator when activating the unit. If the protection, such as a dust cover, does not automatically come off when the device is activated, it should be cited as an obstacle blocking the use of the emergency washing device.

J. Examples of Eyewash Requirements for Specific Materials.

- Bleach, household (3 to 6 % sodium hypochlorite) – Annually, there are significant worker compensation claims for eye injuries associated with bleach. An emergency eyewash is normally required based on statements in the MSDS. Most, but not all, bleach manufacturers list their product as corrosive. However, because of the potential for eye injury, an emergency eyewash is required when there is potential for an employee’s eyes to be exposed to bleach. Documentation should include the specific wording from the MSDS
- Sodium Hydroxide - An example of a corrosive base or caustic that always requires an emergency eyewash. Solutions as low as 1% are considered corrosive and are often listed with a pH of 14. Solid sodium hydroxide pellets are extremely corrosive and an emergency eyewash is required when working with the solid sodium hydroxide material.
- Sulfuric acid (battery acid or electrolyte) - An example of a corrosive acid that always requires an emergency eyewash. Even solutions as diluted as 1% are considered corrosive (pH as low as 0.3). Maintenance free batteries do not require an emergency eyewash if no electrolyte or water is added to the battery.
- Soft drinks (soda pop) - No emergency eyewash required. The normal pH of soda pop can be as low as 2.8.

- Formaldehyde - Corrosive to the eyes, even in low concentrations and requires an eyewash.
- Methyl ethyl ketone peroxide (MEKP) - Very corrosive and requires an emergency eyewash.
- Non-corrosive outside of pH limit - Some proprietary formulations have been shown to be non-corrosive through the use of approved *in-vivo* testing. This includes one product with a reported pH of 1.1. Documentation must include specific reference to the toxicological study.
- Glutaraldehyde - Corrosive to the eyes and requires an emergency eyewash
- Carbaryl (Sevin) – ACGIH “Skin notation”, toxic product requiring an emergency eyewash.

K. Technical Assistance.

For technical assistance, call the Emergency Washing Specialist in DOSH Technical Services at (360) 902-5436.

Approved:



Michael Silverstein, MD., Assistant Director
Division of Occupational Safety and Health
Department of Labor and Industries

[Figures 1 through 6 are attached to this Directive]

For more information about this or other DOSH directives, contact the Division of Occupational Safety and Health at P.O. Box 44610, Olympia, WA 98504-4610, or call 360-902-5436. To review policy information on the DOSH website, go to: <http://www.lni.wa.gov/Safety>.

Figure 1

Example of Squeeze Bottles That Do Not Meet the Requirement for an Eyewash



Figure 2

Example of Approved Emergency Eyewash Equipment



Figure 3
Three Examples of
Faucet-Mounted Devices That Meet the Requirements for Emergency Eyewash

(Example 1)



(1) This is essentially two devices in one with separate water channels for the faucet and the eyewash. The eyewash can be activated by the black bar marked “PULL” whether the faucet is on or off and thus meets ANSI Z358.1 requirements.

Figure 3 (Example 2)



(2) This is an example of a faucet mounted device with two valves on the device, only one of which must be engaged to activate the eyewash. A written procedure and training are important with this type of device to ensure safe emergency washing is available when needed.

Figure 3 (Example 3)



(3) Normal faucet valve handles preset for flow and temperature before being removed. Single activation valve on gooseneck allows this unit to meet ANSI Z358.1-1998 requirements.

Figure 4

Example of a Counter-Mounted Eyewash That Meets DOSH Requirements



Figure 5

Example of a Drench Hose That Meets DOSH and ANSI Z358.1 Requirements



Figure 6

Examples of Portable Eyewash Units That Meet ANSI Z358.1 Requirements

