

DO I NEED THIS EYEWASH STATION?

Eyewash Regulations are you in compliance?

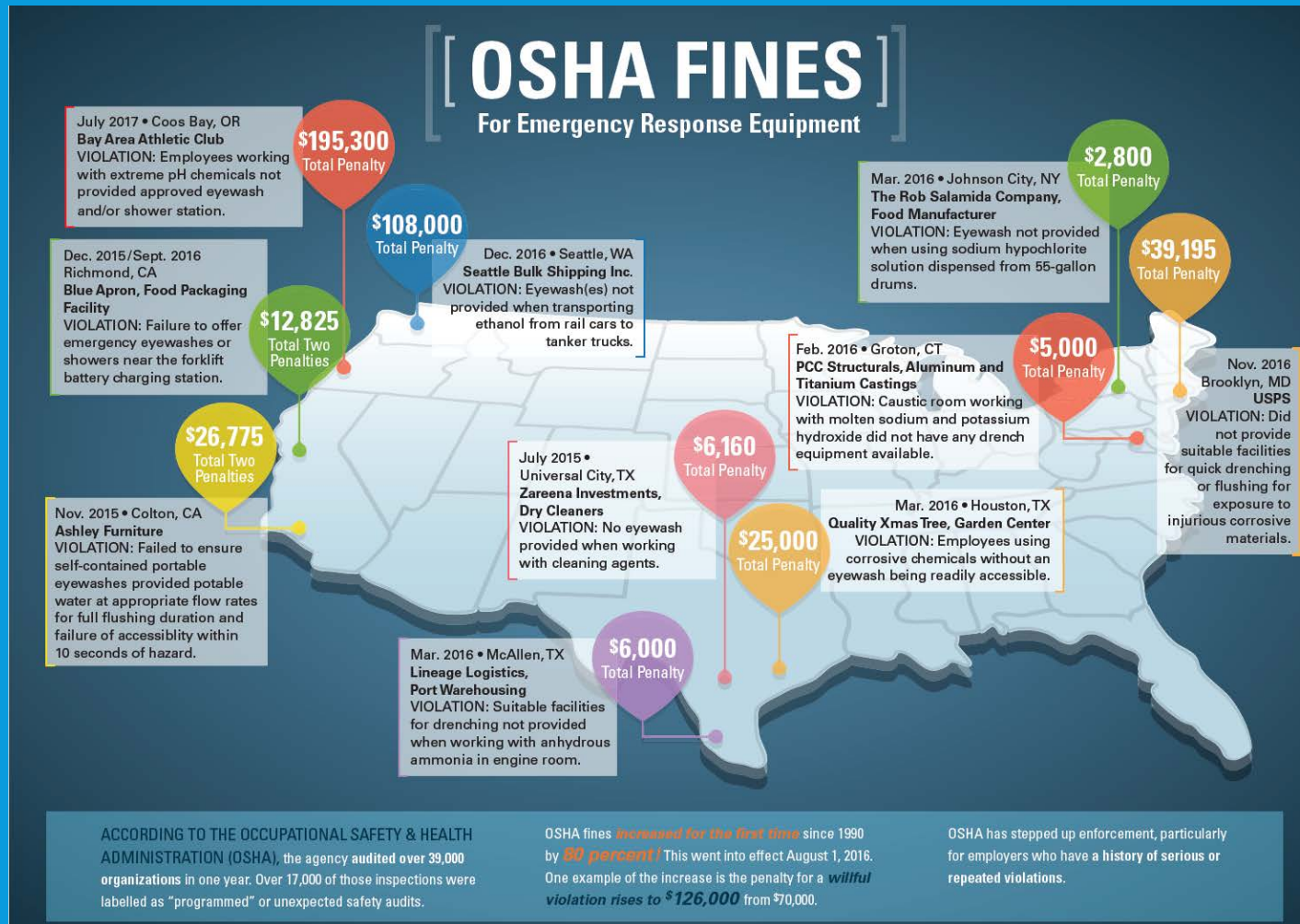




AGENDA

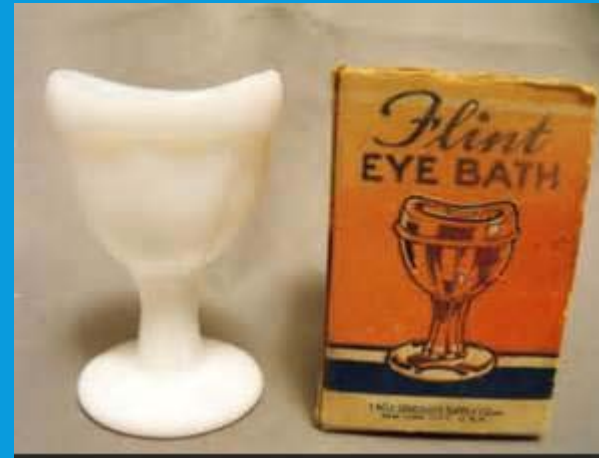
- History
- Current regulations
- Inspections
- What is considered hazardous, caustic and corrosive
- Review of SDS sheets
- Examples

OSHA FINES



BRIEF HISTORY AND FACTS

- A 1920 Clear-Glass-8- Panel-Eyewash-Cup glass appears to be the oldest form of an eyewash.
- Eyewash equipment has changed over time.
- In 1970 OSHA was created, and authorized to adopt safety standards and regulations to fulfill the mandate of improving worker safety.



EMERGENCY EYE IRRIGATION

In the early 1900s, it was said that a well-known energy company created the first emergency eyewash by taking two bubbler heads from drinking fountains and mounting them on opposite sides of a sink facing each other with plumbing running to both of the heads. When activated, the water streams formed a double arch that directed water from the outer perimeter of the sink to the center. An injured victim would place their face into the double streams and irrigate both eyes simultaneously. It was a great concept, and one that took the safety industry to a new level over the subsequent years.

LOW COST PPE



HISTORY CONTINUED

- OSHA has adopted several regulations that refer to the use of emergency eyewash and shower equipment. The primary regulation contained in the 29 CFR 1910.151. (c) states that “Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.
- In addition, adopted in 1981 with additional versions produced in 1990, 1998 and 2004, it is essential to reference the American National Standard Institute (ANSI) Z358.1-2009 for “Emergency Eyewash and Shower Equipment” which outlines the specific requirements for emergency eyewash and shower equipment, installation, testing, performance, maintenance, training and use. This standard is referenced in the International Plumbing Code (IPC) for conformance with this code.
- Newer versions of ANSI are available in use today, 2014 and potentially 2019.

JOINT COMMISSION EC AND HOSPITALS EYEWASH STATION & EMERGENCY SHOWERS DESIGN CRITERIA

What is the design and operational criteria for eyewash stations and emergency showers?

- The Joint Commission references ANSI Z358-1 as a basis for evaluating eyewash station and emergency shower design configurations and functionality.
- The need is based on the corrosive level noted for the material being handled, and the risk of exposure.
- A proactive, defensible documented risk assessment process that may deviate from Z358.1 is acceptable provided OSHA criteria is not compromised.
- Eyewash bottles are acceptable as supplemental devices to eyewash stations (cannot replace), and should be employed through the risk assessment process for applicability.

DEFINING A CORROSIVE SUBSTANCE

A **corrosive substance** is one that will damage or destroy other substances with which it comes into contact by means of a chemical reaction.

Etymology

The word *corrosive* is derived from the Latin verb *corrodere*, which means to ***gnaw***, indicating how these substances seem to "**gnaw**" **their way through flesh or other materials**.

Chemical Term

The word ***corrosive*** refers to any chemical that will dissolve the structure of an object. They can be acids, oxidizers, or bases. When they come in contact with a surface, the surface deteriorates. The deterioration can happen in minutes, e.g. concentrated muriatic acid spilled on skin; or slowly over days or years, e.g. the rusting of iron in a bridge.

DEFINING A CORROSIVE SUBSTANCE CONT.

- Sometimes the word *caustic* is used as a synonym for *corrosive*, but *caustic* refers only to strong bases, particularly alkalis, and not to acids, oxidizers, or other non-alkaline corrosives.
- At low concentrations, a corrosive substance is called an *irritant*, and its effect on living tissue is called irritation. At high concentrations, a corrosive substance causes a *chemical burn*, a distinct type of tissue damage.
- Corrosives are different from *poisons* in that corrosives are immediately dangerous to the tissues they contact, whereas poisons may have systemic toxic effects that require time to become evident. Colloquially, corrosives may be called *poisons* but the concepts are technically distinct. However, there is nothing which precludes a corrosive from being a poison; there are substances that are both corrosives and poisons.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

OSHA regulates U.S. safety standards and laws, while the American National Standards Institute (ANSI) develops product performance standards for safety equipment.

It's important to note that OSHA has developed a vague safety standard for eyewash equipment needs, but commonly adopts the ANSI Z358.1-2014 Eyewash standard for the enforcement of safety laws.



ANSI/ISEA

Z358.1-2014

American National Standard
for Emergency Eyewash and
Shower Equipment

ANSI/ISEA Z358.1 2014
Revision of
ANSI/ISEA Z358.1 2009

**American National Standard for
Emergency Eyewash and Shower Equipment**

Secretariat
International Safety Equipment Association

Approved January 8, 2015
American National Standards Institute, Inc.

**American
National
Standard**

Approval of an American National Standard requires verification by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer. Consensus is established when, in the judgment of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made toward their resolution. The use of American National Standards is completely voluntary; their existence does not in any respect preclude anyone, whether he/she has approved the standards or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards. The American National Standards Institute does not develop standards and will in no circumstance give an interpretation of any American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute. Requests for interpretation should be addressed to the secretariat or sponsor whose name appears on the title page of this standard.

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Foreword (This Foreword is not part of American National Standard ANSI/ISEA Z358.12014)

This revision updates ANSI Z358.12009 and was prepared by the Emergency Eyewash and Shower Group of the International Safety Equipment Association, whose members are thoroughly knowledgeable in the design, installation, and use of this important safety equipment. The following companies were members of the group at the time of the approval of the standard: Bradley Corporation, Encon Safety Products, FSI International, Guardian Equipment, Honeywell Safety Products, Hughes Safety Showers, Prevor, Inc., Sellstrom Manufacturing, Speakman Company, and VisionAid.

Updates to the 2009 version of the standard are reflected in this document, including improvement in language to emphasize that the location of the fluid flow and pattern delivery for emergency eyewashes and eye/face washes is the critical aspect in designing and installing these devices, rather than the positioning of the nozzles themselves. Additionally, illustrations have been updated to reflect contemporary design configurations that are known to meet the criteria in standard.

Suggestions for the improvement of this standard are welcome. They should be sent to the ISEA, 1901 N. Moore Street, Suite 808, Arlington, VA 22209 or isea@safetyequipment.org.

This standard was processed and approved using consensus procedures prescribed by the American National Standards Institute. The following organizations were contacted prior to the approval of this standard. Inclusion in this list does not necessarily imply that the organization concurred with the submittal of the proposed standard to ANSI.

Acorn Safety
APPA, Leadership in Educational Facilities
Alabama Power Company
Arts, Crafts & Theater Safety Inc.
Atlantic Health
Atlas Industrial Contractors, LLC
BASF Corporation
Baylor Scott & White Health
CalOSHA
Cardinal Health
County of Sacramento
Erdman
Green Conversion Systems
Haws Corporation
International Safety Equipment Association
Intertek

Lawler Manufacturing
Natural Resources Canada
North Carolina Department of Labor
Safety Equipment Institute
Special Graphic Imaging Association
State of Ohio Public Employment Risk Reduction Program
Syracuse Utilities
UL LLC
University of Georgia
University of Michigan
US Department of the Army
US Department of the Navy
Williams Energy

AMERICAN NATIONAL STANDARDS INSTITUTE

Private Non-Profit Organization

The American National Standards Institute is a private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the United States. The organization also coordinates U.S. standards with international standards so that American products can be used worldwide.

ANSI accredits standards that are developed by representatives of other standards organizations, government agencies, consumer groups, companies, and others. These standards ensure that the characteristics and performance of products are consistent, that people use the same definitions and terms, and that products are tested the same way. ANSI also accredits organizations that carry out product or personnel certification in accordance with requirements defined in international standards.^[4]

*ISEA International Safety Equipment Association –Updated every 5 years

OSHA EMERGENCY EYEWASH AND SHOWERS

29 CFR PART 1910.151 (C)

This General Regulation Is As Follows:

"Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use."

OSHA 1910 OCCUPATIONAL SAFETY AND HEALTH STANDARDS SUBPART TITLE - MEDICAL AND FIRST AID

1910.151(a)

The employer shall ensure the ready availability of medical personnel for advice and consultation on matters of plant health.

1910.151(b)

In the absence of an infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid. Adequate first aid supplies shall be readily available.

1910.151(c)

Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.

[63 FR 33450, June 18, 1998]

INTERPRETATIONS OF 1910.151 (C)

Standard Interpretations

- | | |
|----|--|
| 1 | 2013 - 03/04/2013 - Controlling Employee Exposure To Caustic Battery Acid In Battery Charging Areas |
| 2 | 2009 - 06/01/2009 - Requirements for eyewash and shower facilities. |
| 3 | 2007 - 02/27/2007 - Requirement to provide accessible quick drenching and flushing facilities where there is exposure to corrosive materials. |
| 4 | 2004 - 05/05/2004 - Requirements for providing eyewashes/showers near spray finishing operations. |
| 5 | 2002 - 11/01/2002 - Additional clarification of using ANSI Z358.1 as guidance to comply with 1910.151(c). |
| 6 | 2002 - 04/18/2002 - ANSI Z358.1 guidance for complying with 1910.151(c) citation policy for eyewashes and showers. |
| 7 | 2002 - 03/28/2002 - Using ANSI Z358.1 as guidance to comply with 1910.151(c) |
| 8 | 2002 - 03/08/2002 - Clarification of PIT requirements covering: fall protection and safety platforms, seatbelts, LP-gas storage, smoking, and eye wash stations. |
| 9 | 1999 - 02/22/1999 - CPR/first aid training and "working alone" provisions of 1910.269. |
| 10 | 1997 - 04/18/1997 - Lack of public awareness of the limitations of eyewashes; review of new product, The Eye Irrigator(TM). |
| 11 | 1989 - 07/10/1989 - First Aid. |
| 12 | 1982 - 08/06/1982 - Eyewash equipment is not an acceptable substitute for protective eyewear. |

INTERPRETATION #2

Question 1: Is there a requirement for an emergency eyewash in the immediate work area for anything other than injurious corrosive chemicals (including chemicals which the SDS clearly indicates that the product is a severe irritant, but not corrosive to eyes or skin) under 1910.151(c)?

Are there any other Federal OSHA regulations that would require provision of eye flushing facilities for use of chemicals other than corrosives?

REPLY 1 FROM OSHA

- While not having the force of a regulation under the OSH Act, the current ANSI standard addressing emergency eyewash and shower equipment (ANSI [Z]358.1-2004) provides for eyewash and shower equipment in appropriate situations when employees are exposed to hazardous materials.
- **ANSI's definition of a "hazardous material" would include caustics, as well as additional substances and compounds that have the capability of producing adverse effects on the health and safety of humans.**
- ANSI's standard also provides detail with respect to the location, installation, nature and maintenance of eyewash and shower equipment.
- You also may wish to consult additional recognized references such as W. Morton Grant's *Toxicology of the Eye* (Charles C Thomas Pub. Ltd., 4th edition, August 1993) when considering potential chemical exposures to the eye and the appropriateness of installing eyewash facilities to protect employees against hazards associated with particular chemicals and substances.

TOXICOLOGY OF THE EYE

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CONTINUATION OF THE REPLY 1A FROM OSHA

- The employer must determine if employees can or will be exposed during the course of their duties to hazardous materials in such a way that the protections of an eyewash or emergency shower would be necessary.
- If hazardous materials are present at a worksite in such a way that exposure could not occur (for example, in sealed containers that will not be opened, or caustic materials in building piping), then an eyewash or emergency shower would not be necessary.
- However, if the building piping containing caustic materials has, at certain locations, a spigot or tap from which the contents are to be sampled or withdrawn and employees are expected to perform such tasks, then, certainly, an eyewash and/or emergency shower would be needed where this task is to occur.

INTERPRETATION QUESTION AND ANSWER

Question 5: Is there a quantity of corrosive chemical that triggers the requirements of 29 CFR 1910.151(c)?

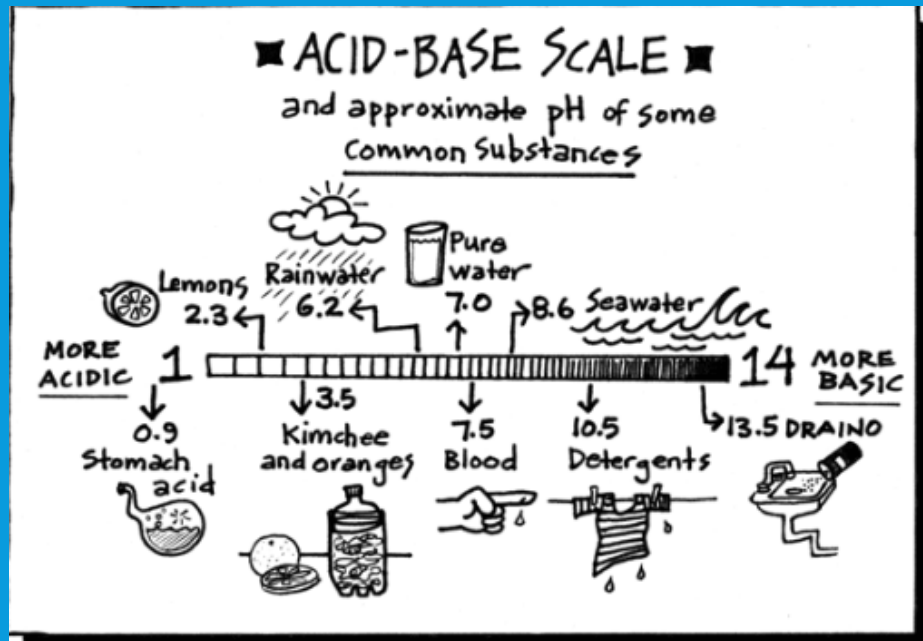
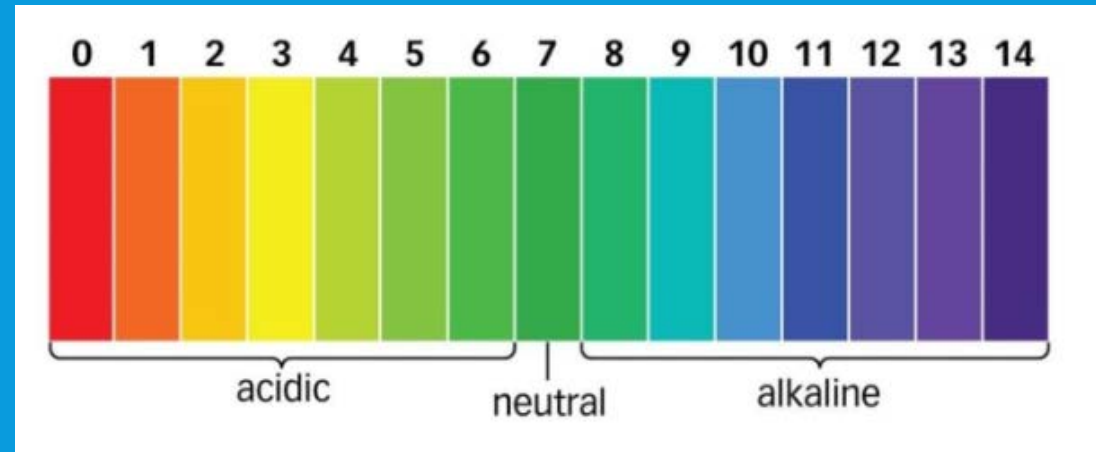
Response: No, there is no threshold quantity of corrosive material that triggers the requirement. The determining factor for the application of the standard is the possible exposure of an employee to injury from contact with a corrosive material.

For example - think about the quantity of formalin used in surgery or LDR!

PH SCALE

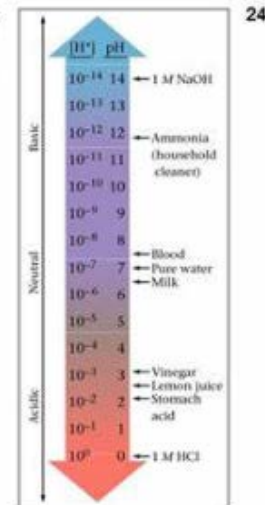
- pH stands for the “power of hydrogen” or “potential of hydrogen,” and is the measurement of how concentrated hydrogen ions are in a solution. In simpler terms, it measures how “acidic” or “basic” a substance is in comparison to distilled water which has a “neutral” pH of 7.0. (1)
- Anything below a pH of 7.0 is considered an acid, and anything above a pH of 7.0 is considered an alkaline or “basic.” Generally speaking, acids taste sour and bases taste bitter.

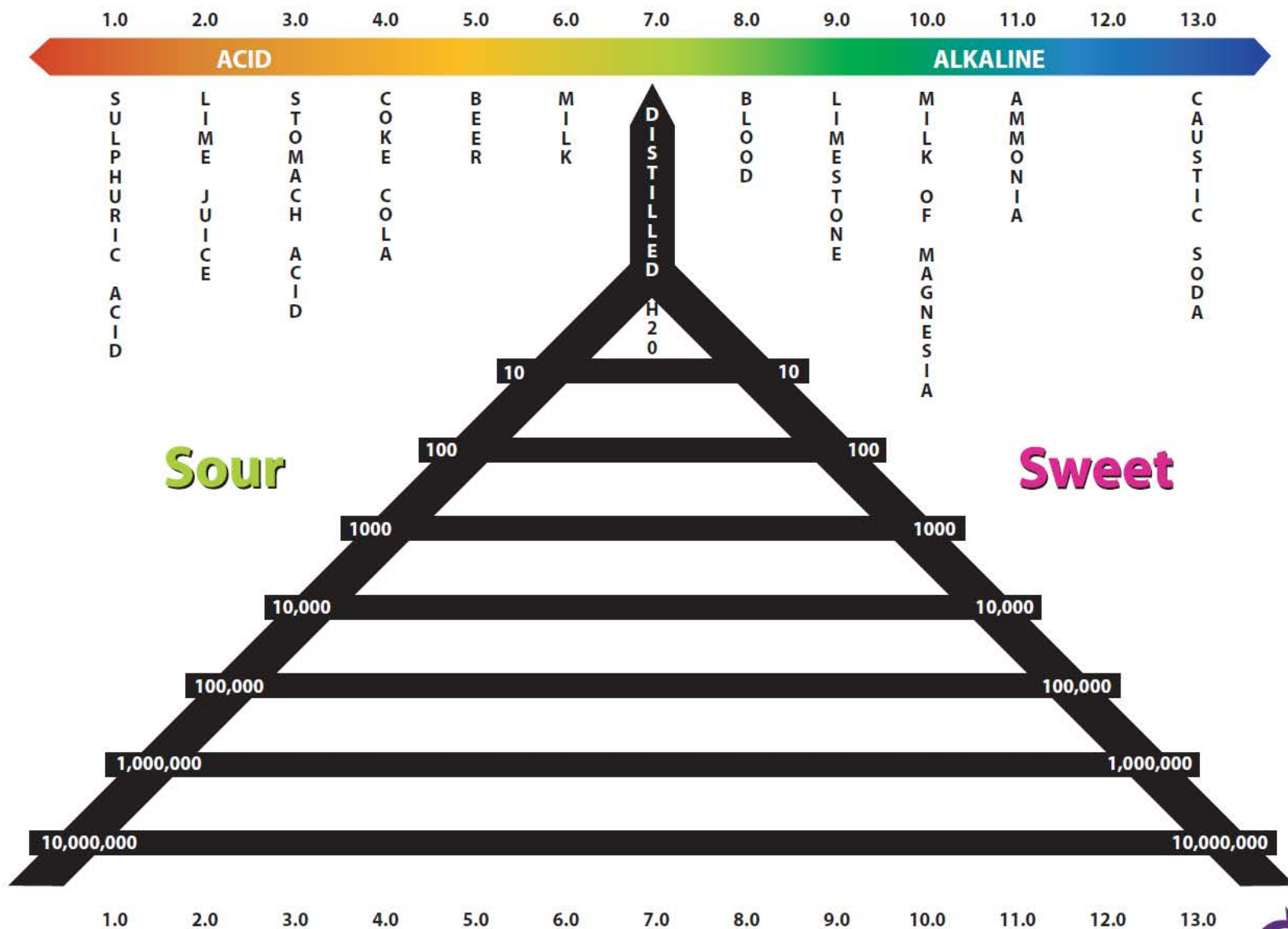
PH SCALE



The **pH scale** is a way of expressing the strength of acids and bases. Instead of using very small numbers, we just use the **NEGATIVE** power of 10 on the Molarity of the H^+ (or OH^-) ion.

Under 7 = acid
7 = neutral
Over 7 = base





pH	CLEANING CHEMICALS
1	<ul style="list-style-type: none"> • Bowl Cleaners - Hydrochloric Acid • Coil/Aluminum Cleaners • Bowl Cleaner - Phosphoric
2	<ul style="list-style-type: none"> • Anti-Browning Agent - Citric Acid • Sulfamic Acid
3	<ul style="list-style-type: none"> • Anti-Static Treatment - Citric Acid
4	
5	<ul style="list-style-type: none"> • Carpet & Fabric Protector
6	<ul style="list-style-type: none"> • Sanitizing Handsoap
7	<ul style="list-style-type: none"> • Floor Finish • Defoamer • Dish Detergent • Enzymes • Neutral Disinfectant Cleaners
8	<ul style="list-style-type: none"> • Floor Sealer/Spray Buff • Laundry Detergent • Shampoo • Mop On Restorer
9	<ul style="list-style-type: none"> • Carpet & Rug Shampoo • Spotter • Carpet Extraction Cleaner • Creme Cleanser • Glass Cleaner
10	<ul style="list-style-type: none"> • Air Freshener • Hand Soap • All Purpose Detergent
11	<ul style="list-style-type: none"> • Non-Acid Bowl Cleaner • Ammonia • Citrus Degreasers
12	<ul style="list-style-type: none"> • Disinfectants • Floor Strippers • All Purpose Cleaners • Sanitizing Extraction Cleaners
13	<ul style="list-style-type: none"> • Heavy Duty Floor Strippers
14	<ul style="list-style-type: none"> • Heavy Duty Degreasers • Caustic Drain Opener • Grill Cleaner

WHY DOES PH MATTER FOR SKINCARE? A CONNECTION

- Because the pH of skin influences several factors contributing to its overall health. It's been demonstrated that skin with pH values below 5.0 are healthier, more hydrated, and have a stronger barrier function than those above 5.0. (2)
- Our skin is protected by something called the “acid mantle.” It is a small film on the surface of the stratum corneum composed of fatty acids, lactic acid, pyrrolidine carboxylic acid, amino acids, and a bunch of other sciencey terms and stuff that can be a little overwhelming. Let me translate that to English for normal people.
- We have an acid mantle and it kicks BOOTY. Acid mantle = protective barrier on surface of skin composed of sweat, skin oils, and dead skin cells.
- This acid mantle is what gives our skin its pH, and ranges anywhere from 4.0 to 7.0, with the average being 4.7. (3) It protects our skin from bacteria, fungi, viruses, environmental pollutants, makes skin soft and supple — it does everything!
- Disrupting this lovely skin protector can have adverse effects and lead to stuff like inflammation, atopic dermatitis, dehydrated skin (skin that is both dry and oily at the same time), dry skin, skin sensitivity, acne, malassezia folliculitis etc. (4)
- Of equal importance, is the acid mantle's ability to maintain the integrity of our skin's moisture barrier and microbiome (i.e. the healthy bacteria that live on our skin).
- Just like the bacteria and yeast in our gut that keep us safe from stuff like crohn's, food sensitivities, autoimmune diseases etc., our skin flora keeps us safe from diseases like acne, rosacea, psoriasis, and dermatitis. (5, 6, 7) Research has shown there is a very close relationship between the pH of skin and having healthy skin bacterium. (8, 9)

WHAT DISRUPTS OUR SKIN'S PH & ACID MANTLE?

- Pollutants, pathogens, excessive occlusion, detergents, soaps, cleansers, heck — even water! I can hear you already, “what WATER?!” Now that you’re utterly terrified, let me calm you down and explain.
- Here’s a general rule of thumb: the higher the pH of something, the more disrupting it is to the acid mantle and therefore moisture barrier. So while water isn’t bad per se, “hard water” is. Hard water is simply tap water with a high mineral content causing it to have a pH of 8.5 or more.
- **Fun-fact:** this is why micellar water was invented! Back in the 90s, France was notorious for having “hard water,” so an awesome chemist formulated micellar water so poor French women could clean their faces without nuking their acid mantle.
- If you have no idea what micellar water is or want to know how it works, check out this awesome article by the lovely LabMuffin. Cute illustrations included! Let’s continue....
- The biggest acid mantle overkill you need to be worrying about is cleanser. You know that super squeaky feeling you get after using one? Yeah, that isn’t good! It’s an indication that your acid mantle has been disrupted. You should be avoiding that super squeaky feeling at all costs!
- Baking soda has a pH of 9! Far too alkalizing. Contrary to popular belief, it is often the extremely alkaline substances that cause “chemical burns.” Well, that wasn’t an acid: it’s lye (a.k.a. sodium hydroxide). Lye has a pH of 14! It isn’t an acid at all, but a compound on the highest end of the alkalinity scale.

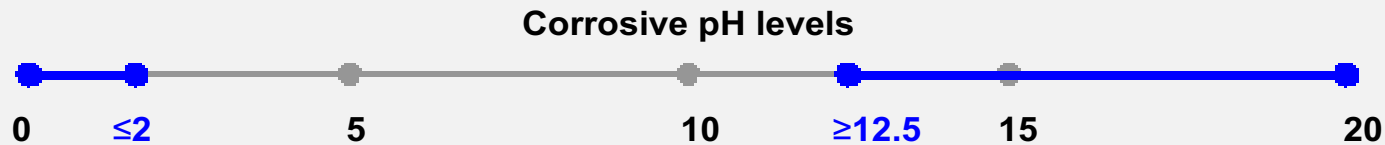
CORROSIVE WASTES

Corrosive wastes are acidic or alkaline (basic) wastes that can readily corrode or dissolve materials they come into contact with.

We measure corrosivity by either pH or the rate of steel corrosion:

pH

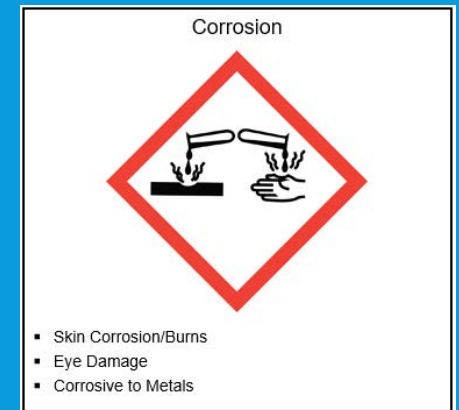
When aqueous solution has a pH less than or equal to 2, or more than or equal to 12.5 it is considered corrosive.



When a non-aqueous solution mixed with an equal weight of water has a pH of less than 2 or greater than 12.

CORROSIVE OR CAUSTIC - START CONNECTING TO THE SDS

- Corrosive refers to a substance that has the power to cause irreversible damage or destroy another substance by contact. A corrosive substance may attack a wide variety of materials, but the term is usually applied to chemicals that can cause chemical burns upon contact with living tissue. A corrosive substance may be a solid, liquid, or gas.
- The term "corrosive" comes from the Latin verb *corrodere*, which means "to gnaw".
- At low concentrations, corrosive chemicals are typically irritants.
- The hazard symbol used to identify either a chemical capable of metal corrosion or skin corrosion shows a chemical poured onto a material and a hand, eating into the surface.
- Also Known As: Corrosive chemicals may also be referred to as "caustic", although the term caustic usually applies to strong bases and not acids or oxidizers.



EXAMPLES OF CORROSIVE SUBSTANCES

Strong acids and bases are commonly corrosive, although there are some acids (e.g., the carborane acids) that are very powerful, yet not corrosive. Weak acids and bases may be corrosive if they are concentrated. Classes of corrosive substances include:

- strong acids - Examples include nitric acid, sulfuric acid, and hydrochloric acid
- concentrated weak acids - Examples include concentrated acetic acid and formic acid.
- strong Lewis acids - These include boron trifluoride and aluminum chloride
- strong bases - These are also known as alkalis. Examples include potassium hydroxide, sodium hydroxide, and calcium hydroxide.
- alkali metals - These metals and the hydrides of the alkali and alkaline earth metals act as strong bases. Examples include sodium and potassium metal.
- dehydrating agents - Examples include calcium oxide and phosphorus pentoxide.
- strong oxidizers - A good example is hydrogen peroxide.
- halogens - Examples include elemental fluorine and chlorine. The halide ions are not corrosive, except for fluoride.
- organic halides - An example is acetyl chloride.
- alkylating agents - An example is dimethyl sulfate.
- certain organics - An example is phenol or carboric acid.

HOW CORROSION WORKS

- Usually a corrosive chemical that attacks human skin denatures proteins or performs amide hydrolysis or ester hydrolysis. Amide hydrolysis damages proteins, which contain amide bonds. Lipids contain ester bonds and are attacked by ester hydrolysis.
- A corrosive agent may participate in chemical reactions that dehydrate skin and/or produce heat. For example, sulfuric acid dehydrates carbohydrates in skin and releases heat, sometimes sufficient to cause a thermal burn in addition to the chemical burn.
- Corrosive substances that attack other materials, such as metals, may produce rapid oxidation of the surface.

Protein breaking down

- **Hydrolysis** (/haɪˈdrɒlɪsɪs/; from Ancient Greek *hydro-*, meaning 'water', and *lysis*, meaning 'to unbind') is any chemical reaction in which a molecule of water ruptures one or more chemical bonds
- Amide and ester are both organic compounds where hydrogen
- Ester-a compound produced by the reaction between an acid and an alcohol with the elimination of a molecule of water, as ethyl acetate, $C_4H_8O_2$, or dimethyl sulfate, $C_2H_6SO_4$.

- Liquid corrosive chemicals are those with a pH of 4.0 or lower, or a pH of 9 or higher. Solid chemicals are considered corrosive when in solution; they fall in the above pH range.
- A highly corrosive chemical has a pH of 2 or lower or a pH of 12.5 or higher.
- Corrosive chemicals are substances that cause visible destruction or permanent changes in human skin tissue at the site of contact, or are highly corrosive to steel. Corrosive chemicals can be liquids, solids, or gases and can affect the eyes, skin, and respiratory tract. The major classes of corrosives include strong acids, bases, and dehydrating agents.
- Liquid corrosive chemicals are those with a pH of 4.0 or lower or a pH of 9 or higher. Solid chemicals are considered corrosive when in solution; they fall in the above pH range.
- A highly corrosive chemical has a pH of 2 or lower or a pH of 12.5 or higher. Injurious chemicals cause tissue destruction at the site of contact.

CLEANING PRODUCTS

- **The basics of pH**

pH is a measure of how acidic or basic a solution is. Water based solutions range from a pH of zero to a pH of 14. The mid point of the pH scale, 7.0, is considered neutral. Pure water is neutral.

- **Low pH = Acidic**

If a solution has a pH that is lower than 7, that solution is considered **acidic**. Acids are usually sour or bitter – coffee, cola, and lemon juice all have an acidic pH. When used in cleaning products, acids help to break down difficult stains like rust or mineral deposits.

COMMON CLEANING PRODUCTS WITH AN ACIDIC PH

Some common cleaning products that have an acidic pH are:

- Hard water/mineral deposit removers
- Toilet bowl cleaners
- Rust stain removers
- Tub and tile cleaners
- Mold removers

Acidic cleaners attack and dissolve these types of stains, breaking them down and making them easier to remove.

- High pH = Basic (alkaline)
- A solution with a pH that is higher than 7 is **basic** (sometimes referred to as **alkaline**). Products with basic pH values are useful for removing fatty and oily soils from surfaces – including your hands! Your average bottle of hand soap has a pH of 9 or 10. Bleach, which is useful for cleaning and disinfecting surfaces in your home, has a pH of 12.5.
- Oven cleaner
- All purpose cleaners
- Laundry detergents

COMMON HAZARD LOCATIONS THAT HAVE THE POTENTIAL FOR AN EYEWASH

- Battery Charging Stations
- Blood Bank
- Boiler Room
- Buildings & Grounds
- Carpenter's Shop/Maintenance Shop
- Chemotherapy
- Cytology
- Dialysis Patient Areas/Prep Room
- Dialysis Wastewater Treatment
- Endoscopy
- Emergency Room
- Hematology
- Histology
- HVAC Shop
- ICU
- Janitors/Houskeeping Closets
- Kitchen
- Laboratory
- Laundry
- Loading Dock
- Machine Shop
- Microbiology
- Morgue
- Nuclear Med
- Nurses Station-1 Per Floor/Wing
- Paint Shop
- Pathology
- Pharmacy
- Radiology-Film Processing
- Soiled Utility Areas
- Sterile Processing

COMMON HAZARDS

- Particulates such as dust, dirt, wood chips, sand, powder, salt and Cardboard
- Metal shavings, concrete, cement chips, filings
- Smoke, flammable or poisonous gasses
- Pesticides, insecticides, herbicides, fumigants
- Solvents, stains, paints, paint thinner, acetone
- Bloodborne pathogens, blood, bodily fluids, remains
- Caustic water treatment chemicals
- Gasoline, diesel fuel, cleaning solvents, anti-freeze
- Laboratory chemicals
- Bleach, chlorine, ammonia
- Battery acid, starter fluid, oils, hydraulic fluid
- Bacteria, germs, biohazards
- Glass
- Acids, bases, solvents, lime
- Flammable liquids

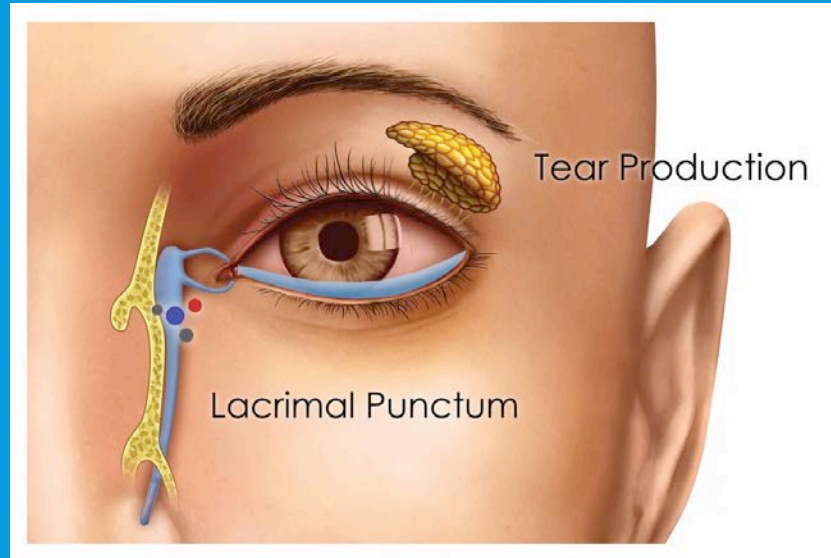
THE EYEWASH PROCESS HASN'T CHANGED MUCH...

As medical advancements continued to evolve, the eye irrigation process in emergency situations did not follow suite.

By irrigating with water streams that contact the eye at its outer corner, or canthus, and flow inward toward the nose is diametrically opposed to the way medical professionals irrigate eyes.

Think about how you use eye drops, general practice is to tilt the head back and place the dropper near the inner corner for the drops to drain to the outside of the eye and down the outside of your cheek, thus following medical protocols.

THE LACRIMAL SYSTEM



To comprehend the logic behind how the medical community treats eye contamination situations you should first understand the eye's lacrimal system.

THE LACRIMAL SYSTEM CONT.

The human eye is equipped with an automatic lubricating and cleansing mechanism called the lacrimal system. It consists of the lacrimal gland which produces tears, the ducts that channel tears from the lacrimal gland to the ocular surface, and the lacrimal puncta which are drains that channel excess fluids out of the ocular surface. Importantly, the lacrimal puncta drain excess fluids directly into the nasal cavity. This process is the reason why your nose runs when you cry.

The eyelid also plays a key role. As we blink, the eyelid wipes the cornea pushing contaminants and excess fluids toward the lacrimal puncta – or the ocular surface's drains. If a hazardous substance is introduced into the eye, nature's own cleansing mechanism can serve to force the contaminant into the nasal cavity, where it can be breathed into the lungs or swallowed.

THE LACRIMAL SYSTEM CONT.

Accordingly, the medical profession teaches and practices irrigating eyes by introducing the flushing fluid at the inner corner of the eye – adjacent to the nose – and letting it run across the eye to the outer edge. In effect, irrigation is performed by moving the fluid away from the lacrimal puncta. This is opposite the flow direction of traditional eyewash products that flow water from the outside-in, pushing contaminants toward the inner corners of the eyes where these susceptible tear ducts, glands and canals are located. Pushing contaminants toward the nose not only risks introducing them into the nasal cavity, but also can allow the same contaminant to be introduced into the other eye.

EYE IRRIGATION

The ideal method of irrigating eyes is by using products that mirror approved medical protocols. Eyewash streams that are inverted contact the eyes at the inner canthus, or corner, adjacent to the bridge of the nose. Contaminants are thus swept away from the lacrimal system to the outside of the eye where gravity takes over and runs them into the eyewash bowl. This irrigation method aids in protection to valuable internal organs and can help reduce unnecessary exacerbation of injuries.

- If an employee gets foreign particles or chemicals in his/her eyes, then an emergency eye wash station or deluge shower is the first step of first aid treatment. If it is an actual chemical burn to the eye, then your emergency will be much more urgent. The employee should be immediately escorted to an eye wash station or deluge shower if:

1. The Safety Data Sheet (SDS) identifies the chemical being used is toxic, caustic, or corrosive.

2. The SDS indicates that serious eye injuries will result if the condition is not treated immediately.

3. Container labels have warnings such as "Causes Chemical Burns" or "Causes Permanent Eye Damage."

SAFETY DATA SHEETS - SDS



SDS SECTIONS

- Section 1 – Identification identifies the chemical on the SDS as well as the recommended uses. It also provides the essential contact information of the supplier.
- Section 2 – Hazard(s) identification includes the hazards of the chemical and the appropriate warning information associated with those hazards.
- Section 3 – Composition/information on ingredients identifies the ingredient(s) contained in the product indicated on the SDS, including impurities and stabilizing additives. This section includes information on substances, mixtures, and all chemicals where a trade secret is claimed.
- Section 4 – First-aid measures describes the initial care that should be given by untrained responders to an individual who has been exposed to the chemical.

SDS SECTIONS

- Section 5 – Fire-fighting measures lists recommendations for fighting a fire caused by the chemical, including suitable extinguishing techniques, equipment, and chemical hazards from fire.
- Section 6 – Accidental release measures provides recommendations on the appropriate response to spills, leaks, or releases, including containment and cleanup practices to prevent or minimize exposure to people, properties, or the environment. It may also include recommendations distinguishing between responses for large and small spills where the spill volume has a significant impact on the hazard.
- Section 7 – Handling and storage provides guidance on the safe handling practices and conditions for safe storage of chemicals, including incompatibilities.
- Section 8 – Exposure controls/personal protection indicates the exposure limits, engineering controls, and personal protective equipment (PPE) measures that can be used to minimize worker exposure.

SDS SECTIONS

- Section 9 – Physical and chemical properties identifies physical and chemical properties associated with the substance or mixture.
- Section 10 – Stability and reactivity describes the reactivity hazards of the chemical and the chemical stability information. This section is broken into 3 parts: reactivity, chemical stability, and other.
- Section 11 – Toxicological information identifies toxicological and health effects information or indicates that such data are not available. This includes routes of exposure, related symptoms, acute and chronic effects, and numerical measures of toxicity.
- Section 12 – Ecological information provides information to evaluate the environmental impact of the chemical(s) if it were released to the environment.

SDS SECTIONS

- Section 13 – Disposal considerations provides guidance on proper disposal practices, recycling or reclamation of the chemical(s) or its container, and safe handling practices. To minimize exposure, this section should also refer the reader to Section 8 (Exposure Controls/Personal Protection) of the SDS.
- Section 14 – Transport information includes guidance on classification information for shipping and transporting of hazardous chemical(s) by road, air, rail, or sea.
- Section 15 – Regulatory information identifies the safety, health, and environmental regulations specific for the product that is not indicated anywhere else on the SDS.
- Section 16 – Other information indicates when the SDS was prepared or when the last known revision was made. The SDS may also state where the changes have been made to the previous version. You may wish to contact the supplier for an explanation of the changes. Other useful information also may be included here.

GHS PICTOGRAM GUIDE - 9 TOTAL

GHS Pictogram Guide

GHS pictograms are symbols with red diamond borders that are designed to provide hazard information to handlers of chemicals universally at a glance. There are 9 different pictograms that identify risks in three different categories including: chemical/physical, health or environmental.



Chemical / Physical Risk



Health Risk



Environmental Risk

CORROSIVE



Corrosive

(Corrosion Pictogram)

Identifies chemicals with the following hazards:

- Skin corrosion
- Eye damage
- Corrosive metals

[Shop Corrosive Labels](#)

Corrosive



Substances and preparations which, may on contact with living tissues, destroy them.

1. Wear suitable gloves and eye / face protection.
2. Take off all contaminated clothing immediately.
3. In case of contact with skin, wash immediately with plenty of water.
4. In case of contact with eyes, rinse immediately (for 15 minutes) with plenty of water and seek medical advice.

EXCLAMATION MARK



Acute Toxic

(Exclamation Mark Pictogram)

Identifies chemicals with the following hazards:

- Irritant (skin & eye)
- Skin sensitizer
- Acute toxicity (harmful)
- Narcotic effects
- Respiratory tract infection
- Hazardous ozone layer (non mandatory)

[Shop Acute Toxic Labels](#)

EXCLAMATION

Irritant



May cause inflammation of the skin or mucous membrane through immediate, prolonged or repeated contact.

1. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
2. In case of contact with skin, wash immediately with plenty of water.
3. Do not breathe vapour / spray / dust.
4. Avoid contact with skin.

Toxic



Acute (Cat 1-3)



Acute (Cat 4)

Cause death or acute or chronic damage to health when inhaled, swallowed or absorbed via the skin.

1. Wear suitable protective clothing, gloves and eye / face protection.
2. After contact with skin wash immediately with plenty of water.
3. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
4. In case of accident or you feel unwell, seek medical advice immediately.

Harmful



Acute (Cat 1-3)



Acute (Cat 4)

May cause death or acute or chronic damage to health when inhaled, swallowed or absorbed via the skin.

1. Do not breathe vapour / spray / dust.
2. Avoid contact with skin.
3. Wash thoroughly before you eat, drink or smoke.
4. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Sensitising



Respiratory



Dermal

Substances and preparations which, if they are inhaled or if they penetrate the skin, are capable of eliciting a reaction by hyper-sensitisation such that on further exposure to the substance or preparation characteristic adverse effects are produced.

1. Wear suitable protective clothing, gloves and eye / face protection.
2. Avoid contact with skin. In case of contact with skin, wash immediately with plenty of water.
3. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
4. In case of accident or you feel unwell, seek medical advice immediately.

HEALTH HAZARD



Health Hazard

(Health Hazard Pictogram)

Identifies chemicals with the following hazards:

- Carcinogen
- Mutagenicity
- Reproductive toxicity
- Respiratory sensitizer
- Target organ toxicity
- Aspiration toxicity

[Shop Health Hazard Labels](#)

HEALTH HAZARD

Carcinogenic



May induce cancer or increase its incidence if inhaled, ingested or if it penetrates the skin.

1. Wear suitable protective clothing, gloves and eye / face protection.
2. Avoid contact with skin. In case of contact with skin, wash immediately with plenty of water.
3. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
4. In case of accident or you feel unwell, seek medical advice immediately.

Mutagenic



May induce heritable genetic defects or increase their incidence if inhaled, ingested or if it penetrates the skin.

1. Wear suitable protective clothing, gloves and eye / face protection.
2. Avoid contact with skin. In case of contact with skin, wash immediately with plenty of water.
3. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
4. In case of accident or you feel unwell, seek medical advice immediately.

Toxic for Reproduction



Substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may produce or increase the incidence of non-heritable adverse effects in the progeny and/or an impairment of male or female reproductive functions or capacity.

1. Wear suitable protective clothing, gloves and eye / face protection.
2. Avoid contact with skin. In case of contact with skin, wash immediately with plenty of water.
3. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
4. In case of accident or you feel unwell, seek medical advice immediately.

Sensitising



Respiratory

Dermal

Substances and preparations which, if they are inhaled or if they penetrate the skin, are capable of eliciting a reaction by hyper-sensitisation such that on further exposure to the substance or preparation characteristic adverse effects are produced.

1. Wear suitable protective clothing, gloves and eye / face protection.
2. Avoid contact with skin. In case of contact with skin, wash immediately with plenty of water.
3. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
4. In case of accident or you feel unwell, seek medical advice immediately.

SEVERE TOXIC



Severe Toxic

(Skull & Cross Bones Pictogram)

Identifies chemicals with the following hazards:

- Acute toxicity (fatal or toxic)*

[Shop Severe Toxic Labels](#)

*GHS Acute Toxic symbol is used for less severe toxicity

Toxic



Acute (Cat 1-3) Acute (Cat 4)

Cause death or acute or chronic damage to health when inhaled, swallowed or absorbed via the skin.

1. Wear suitable protective clothing, gloves and eye / face protection.
2. After contact with skin wash immediately with plenty of water.
3. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
4. In case of accident or you feel unwell, seek medical advice immediately.

Harmful



Acute (Cat 1-3) Acute (Cat 4)

May cause death or acute or chronic damage to health when inhaled, swallowed or absorbed via the skin.

1. Do not breathe vapour / spray / dust.
2. Avoid contact with skin.
3. Wash thoroughly before you eat, drink or smoke.
4. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

HEALTH HAZARD CATEGORIES

Hazard Class	Associated Hazard Category
Acute toxicity	Categories 1-4 (w/ 1 being the most dangerous)
Skin corrosion	Categories 1A, 1B, 1C and 2
Skin irritation	Categories 1A, 1B, 1C and 2
Eye effects	Categories 1, 2A and 2B
Sensitization (skin or eye)	Category 1A and 1B
Germ cell mutagenicity	Categories 1A, 1B and 2
Carcinogenicity	Categories 1A, 1B and 2
Reproductive toxicity	Categories 1A, 1B, 2 and additional category for effects on or via lactation
Target organ systemic toxicity: single and repeated exposure	Single: Categories 1-3 Repeated: Categories 1 and 2
Aspiration toxicity	Category 1 and 2

NEXT SEVERAL SLIDES ARE DIRECT FROM OSHA

SKIN CORROSION

3.2.2 Skin Corrosion

Skin corrosion means the production of irreversible damage to the skin following the application of a test substance for up to 4 hours. Substances and mixtures in this hazard class are assigned to a single harmonized corrosion category. For Competent Authorities, such as transport packing groups, needing more than one designation for corrosivity, up to three subcategories are provided within the corrosive category. See the Skin Corrosion/Irritation Table 3.9.

Several factors should be considered in determining the corrosion potential before testing is initiated:

- Human experience showing irreversible damage to the skin;
- Structure/activity or structure property relationship to a substance or mixture already classified as corrosive;
- pH extremes of ≤ 2 and ≥ 11.5 including acid/alkali reserve capacity.

SKIN IRRITATION

3.2.3 Skin Irritation

Skin irritation means the production of reversible damage to the skin following the application of a test substance for up to 4 hours. Substances and mixtures in this hazard class are assigned to a single irritant category. For those authorities, such as pesticide regulators, wanting more than one designation for skin irritation, an additional mild irritant category is provided. See the Skin

Corrosion/Irritation Table 3.9.

Several factors should be considered in determining the irritation potential before testing is initiated:

- Human experience or data showing reversible damage to the skin following exposure of up to 4 hours;
- Structure/activity or structure property relationship to a substance or mixture already classified as an irritant.

EYE EFFECTS

3.2.4 Eye Effects

Several factors should be considered in determining the *serious eye damage* or *eye irritation* potential before testing is initiated:

- Accumulated human and animal experience;
- Structure/activity or structure property relationship to a substance or mixture already classified;
- pH extremes like ≤ 2 and ≥ 11.5 that may produce serious eye damage.

Serious eye damage means the production of tissue damage in the eye, or serious physical decay of vision, following application of a test substance to the front surface of the eye, which is not fully reversible within 21 days of application. Substances and mixtures in this hazard class are assigned to a single harmonized category.

Eye irritation means changes in the eye following the application of a test substance to the front surface of the eye, which are fully reversible within 21 days of application. Substances and mixtures in this hazard class are assigned to a single harmonized hazard category. For authorities, such as pesticide regulators, wanting more than one designation for eye irritation, one of two subcategories can be selected, depending on whether the effects are reversible in 21 or 7 days.

3.2.5 Sensitization

Respiratory sensitizer means a substance that induces hypersensitivity of the airways following inhalation of the substance. Substances and mixtures in this hazard class are assigned to one hazard category.

Skin sensitizer means a substance that will induce an allergic response following skin contact.

The definition for “skin sensitizer” is equivalent to “contact sensitizer”. Substances and mixtures in this hazard class are assigned to one hazard category. Consideration should be given to classifying substances which cause immunological contact urticaria (an allergic disorder) as contact sensitizers.

RISK ASSESSMENT EXAMPLES

Eyewash Station Risk Assessment		
Risk ranking 0-5		
	Risk of splashing, or other accidental spills	History of accidents
Transport of product	0	0
Install of product into equipment, if applicable	0	0
Use of product, by operation of equip or manual	1	0
Removal of product from equipment, if applicable	1	0
Removal and disposal of product	0	0
Sub-totals	2	0
Greater than a "5" risk score requires a eyewash station	2	
No products are outside of the pH threshold.		
If the product has a pH level of <2 or 11.5> a eyewash station is required		
Risk Scoring Guideline		
No risk	0	Product , process, procedure provides no risk
Low risk	1	*Minimal risk if process and procedures are followed
Medium risk	3	*Slightly elevated risk even if procedures, and processes are followed
High risk	5	*Product, procedure or process is susceptible
*Proper PPE must be always be utilized		
Eyewash must be readily available within 55' or 10 seconds, and travel path to eyewash can not be impeded by an additional door. Weekly testing will be required. All other ANSI Z358.1-2014 requirements will apply.		

EYEWASH LOCATION RISK ASSESSMENT

Location: Rehab

Reviewer(s): Ron Henley

Date: 7-20-2016

ISSUE	YES	NO	N/A
Are hazardous chemicals (corrosives, acids, alkalis, toxics, flammables, or poisons) poured or handled in an open system?		x	
Are biohazardous liquids (blood or other body fluids) poured or handled in large quantities?		x	
Is there a significant risk of splashing blood, body fluids, or chemical materials during disposal or elimination?		x	
Have eye injuries been reported from this area in the past?		x	

If any of the above questions are answered "Yes", then proceed to the table below in order to find the score. If all questions are answered "No" or "N/A", then no eyewash is required.

Probability Estimate

- Estimate A:** Likely to occur immediately.
Estimate B: Probably will occur in time.
Estimate C: May occur in time.
Estimate D: Unlikely to occur.

Severity Classification

- Class I:** Catastrophic (may cause death or permanently disabling injury).
Class II: Critical (may cause severe injury or severe occupational illness).
Class III: Marginal (may cause minor occupational injury or illness).
Class IV: Negligible (probably would not affect personnel safety or health).

Severity Class		Probability Estimate			
		A	B	C	D
Severity Class	I	1	1	2	3
	II	1	2	3	4
	III	2	3	4	5
	IV	3	4	5	6

If the results of the evaluation determine that the risk assessment code is one (1) or two (2), an eyewash is required. If the results of the evaluation determine that the risk assessment code is four (4), five (5), or six (6), an eyewash is not required. A risk assessment code of three (3) indicates that the eyewash is optional.

Score:

Eyewash Needed (Yes/No)?

Note: 29 CFR 1910.151(c) states: *Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.*

References: 29 CFR 1910.151(c)
 American National Standard for Emergency Eyewash and Shower Equipment, Z358.1-2014,
 International Safety Equipment Association, 2014.

EMERGENCY EYEWASH AND SAFETY SHOWER HAZARD ASSESSMENT FORM

Building		A. Issue:			
Location-Department: Cancer Center Pharmacy	*Are hazardous chemicals (corrosives, alkalis, toxics, flammable, or poisons) poured or handled in an open system? yes, no, or n/a	*Are biohazardous liquids (blood or other body fluids) poured or handled in large quantities? yes, no, or n/a			
Manager/Director:	*Is there a significant risk of splashing blood, body fluids, or chemical materials? Have eye injuries been reported from this area in the past? yes, no, or n/a				
ASSESSMENT DATE:	If any of the questions above are answered "yes", proceed to tables below to find the score. If all are "no" then no eyewash is required.				
Primary Investigator:					
A. INVESTIGATION					
1. CHEMICALS/Hazards IN AREA:	2. CONDITIONS OF USE AND DISTANCE TO NEAREST STATION:				
B. RISK ASSESSMENT CODE (RAC)					
1. SEVERITY CLASSIFICATION:	2. PROBABILITY ESTIMATE:				
<input type="checkbox"/> Class I - Catastrophic - Marginal (may cause death or permanently disabling injury). <input type="checkbox"/> Class II - Critical (may cause severe injury or severe occupational illness). <input type="checkbox"/> Class III - Marginal (may cause minor occupational injury or illness). <input type="checkbox"/> Class IV - Negligible (probably would not affect personnel safety or health).	<input type="checkbox"/> Estimate A - Likely to occur immediately. <input type="checkbox"/> Estimate B - Probably will occur in time. <input type="checkbox"/> Estimate C - May occur in time. <input type="checkbox"/> Estimate D - Unlikely to occur.				
3. RAC DETERMINATION:					
		Probability Estimate			
		A	B	C	D
Severity Class	I	1	1	2	3
	II	1	2	3	4
	III	2	3	4	5
	IV	3	4	5	6
If the results of the evaluation determine that the RAC is 1 or 2, an eyewash or shower is required. If the results of the evaluation determine that the RAC is 4, 5 or 6, an eyewash or shower is not required. A RAC of 3 indicates that the eyewash or shower is optional.					
C. FINDING					
<input type="checkbox"/> REQUIRED <input type="checkbox"/> OPTIONAL <input type="checkbox"/> NOT REQUIRED Applicable					
Assessment Criteria- Regulations/Standards					
<ul style="list-style-type: none"> • OSHA 1910.1048(i)(3) : <i>If there is any possibility that an employee's eyes may be splashed with solutions containing 0.1 percent or greater formaldehyde, the employer shall provide acceptable eyewash facilities within the immediate work area for emergency use. (Recommended Standard Practices)</i> • OSHA 29 CFR 1910.151(c) <i>Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. (Recommended Standard Practices)</i> • Center for Disease and Control and Prevention, <i>Biosafety in Microbiological and Biomedical Laboratories (BMBL) 5th Edition, 2007</i> • American National Standards Institute (ANSI) Z358.1-2014 					

Surveyor Signature

EXCEPTION WITH AN EXCEPTION

B5. Placement of Emergency Eyewash and Shower Equipment

Emergency eyewash and shower equipment should be available for immediate use, but in no instance should it take an individual longer than 10 seconds to reach the nearest facility. There are several factors that might influence the location of emergency facilities. It is recognized that the average person covers a distance of approximately 55 ft. (1 6.8 m) in 10 seconds when walking at a normal pace. The physical and emotional state of a potential victim (visually impaired, with some level of discomfort/pain, and possibly in a state of panic) should be considered along with the likelihood of personnel in the immediate area to assist. The installer should also consider other potential hazards that may be adjacent to the path of travel that might cause further injury. A single step up into an enclosure where the equipment can be accessed is not considered to be an obstruction. Additionally, installers should allow for adequate overhead clearance to accommodate the presence of cabinets over counter- or faucet- mounted emergency eyewashes, so as not to create an additional hazard that could be countered when using the device.

A door is considered to be an obstruction. Where the hazard is not corrosive, one intervening door can be present so long as it opens in the *same direction* of travel as the person attempting to reach the emergency eyewash and shower equipment and the door is equipped with a closing mechanism that cannot be locked to impede access to the equipment.

SDS REVIEW OF REVITAL-OX 2XCONCENTRATE ENZYMATIC DETERGENT





Revital-Ox™ 2X Concentrate Enzymatic Detergent

Safety Data Sheet

according to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

Date of issue: 08/25/2014

Version: 1.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture
Trade name : Revital-Ox™ 2X Concentrate Enzymatic Detergent
Product code : 2D99

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Enzymatic Detergent

1.3. Details of the supplier of the safety data sheet

Manufacturer:

STERIS Corporation
P. O. Box 147, St. Louis, MO 63166, US
Telephone Number for Information: 1-800-444-9009 (Customer Service-Scientific Products)
US Emergency Telephone No.1-314-635-1395 (STERIS); 1-800-424-9300 (CHEMTREC)

1.4. Emergency telephone number

Emergency number : +44 (0) 1895 622 639

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Skin Irrit. 2 H315
Eye Dam. 2B H320
Resp. Sens. 1 H334
STOT (SE) 3 H335
Acute Tox Oral 5 H303
Acute Tox Derm 5 H313
Acute Tox Inhalation 5 H333

2.2. Label elements

GHS-US labelling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : H303 - May be harmful if swallowed
H313 - May be harmful in contact with skin
H315 - Causes skin irritation
H320 - Causes eye irritation
H333 - May be harmful if inhaled
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335 - May cause respiratory irritation

Precautionary statements (GHS-US) : P261 - Avoid breathing mist, spray, vapours
P264 - Wash hands thoroughly after handling
P271 - Use in a well-ventilated area
P280 - Wear protective gloves/protective clothing and eye/face protection
P284 - Wear respiratory protection
P302+P352 - IF ON SKIN: Wash with plenty of soap and water
P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P312 - Call a POISON CENTER/doctor if you feel unwell
P332+P313 - If skin irritation occurs: Get medical advice/attention
P337+P313 - If irritation persists: Get medical advice/attention
P362+P364 - Take off contaminated clothing and wash it before reuse
P501 - Dispose of contents/container to comply with applicable local, national and international regulation

Revital-Ox™ 2X Concentrate Enzymatic Detergent

Safety Data Sheet

according to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

Full text of H-phrases: see section 16

3.2. Mixture

Name	Product identifier	%	GHS-US classification
Citric acid	(CAS No) 77-92-9	1 - 5	Eye Irrit. 2A, H319
Triethanolamine	(CAS No) 102-71-6	1 - 5	Eye Irrit. 2A, H319
Ethanolamine	(CAS No) 141-43-5	1 - 5	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation), H332 Skin Corr. 1B, H314 STOT SE 3, H335
Ethoxylated coconut oil alkyl amine	(CAS No) 61791-14-8	1 - 5	Not classified
N,N-Dimethyloctadecylamine oxide	(CAS No) 2571-88-2	1 - 2	Skin Irrit. 2, H315 Eye Dam. 1, H318
Subtilisins (proteolytic enzymes)	(CAS No) 9014-01-1	0.1 - 1	Skin Irrit. 2, H315 Eye Dam. 1, H318 Resp. Sens. 1, H334 STOT SE 3, H335
Glycerine	(CAS No) 56-81-5	1 - 5	Not classified

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible)
First-aid measures after inhalation	: Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. Get medical attention
First-aid measures after skin contact	: Immediately flush skin with plenty of water for at least 15 minutes. Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Get medical advice/attention
First-aid measures after eye contact	: In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately get medical attention
First-aid measures after ingestion	: If victim completely conscious/alert. Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/physician. Give water or milk if the person is fully conscious

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries	: Causes eye irritation. May be harmful if inhaled
Symptoms/injuries after inhalation	: In case of repeated or prolonged exposure : May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause respiratory irritation
Symptoms/injuries after skin contact	: Causes skin irritation
Symptoms/injuries after eye contact	: Causes eye irritation
Symptoms/injuries after ingestion	: Can occur: gastrointestinal disturbance

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire

5.2. Special hazards arising from the substance or mixture

No additional information available

5.3. Advice for firefighters

Firefighting instructions	: Exercise caution when fighting any chemical fire
Protective equipment for firefighters	: Use self-contained breathing apparatus. Do not enter fire area without proper protective equipment, including respiratory protection. Wear a self contained breathing apparatus
Other information	: Hazardous decomposition products may be released during prolonged heating like smokes, carbon monoxide and dioxide, nitrogen oxides (NOx)

Revital-Ox™ 2X Concentrate Enzymatic Detergent

Safety Data Sheet

according to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Do not breathe fumes, vapors. Avoid contact with skin, eyes and clothes

6.1.1. For non-emergency personnel

Protective equipment : Wear protective gloves and eye/face protection. For further information refer to section 8: "Exposure controls/personal protection"

Emergency procedures : Stop leak if safe to do so. Evacuate unnecessary personnel

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection

Emergency procedures : Ventilate area

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Comply with applicable local, national and international regulation. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials. Residue may be washed down with water. Product may be flushed to a sanitary sewer with copious amounts of water, if in accordance with local, state or national legislation

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Product for hospital and professional use only. Read label before use. Provide good ventilation in process area to prevent formation of vapour. Avoid all eye and skin contact and do not breathe vapour and mist. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work

Hygiene measures : Take care for general good hygiene and housekeeping. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Provide adequate ventilation. A washing facility/water for eye and skin cleaning purposes should be present

Storage conditions : Keep only in the original container in a cool, well ventilated place. Keep container closed when not in use

Incompatible materials : Strong oxidizing agents

Storage temperature : < 32 °C (< 90 °F)

Storage area : Store in dry, cool, well-ventilated area

Special rules on packaging : Correctly labelled

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Triethanolamine (102-71-6)		
USA ACGIH	ACGIH TWA (mg/m ³)	5 mg/m ³
Ethanolamine (141-43-5)		
USA ACGIH	ACGIH TWA (ppm)	3 ppm
USA ACGIH	ACGIH STEL (ppm)	6 ppm
USA OSHA	OSHA PEL (TWA) (mg/m ³)	6 mg/m ³
USA OSHA	OSHA PEL (TWA) (ppm)	3 ppm
Subtilisins (proteolytic enzymes) (9014-01-1)		
USA ACGIH	ACGIH Ceiling (mg/m ³)	0.00006 mg/m ³

8.2. Exposure controls

Appropriate engineering controls : Ensure adequate ventilation. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure

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Safety Data Sheet

according to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

Personal protective equipment : Avoid all unnecessary exposure. Personal protective equipment should be selected based upon the conditions under which this product is handled or used. Protective clothing. Gloves. Protective goggles



Hand protection : Wear rubber gloves or latex-free gloves
Eye protection : Safety glasses
Skin and body protection : Wear suitable protective clothing
Respiratory protection : Work in well-ventilated zones or use proper respiratory protection
Other information : Do not eat, drink or smoke during use

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid
Appearance : Slightly hazy
Colour : Yellow to amber
Odour : Floral odor
Odour threshold : No data available
pH : 7,5 – 8,1
pH solution : 7 - 9 (1% Solution)
Relative evaporation rate (butylacetate=1) : No data available
Melting point : No data available
Freezing point : No data available
Boiling point : No data available
Flash point : No data available
Self ignition temperature : No data available
Decomposition temperature : No data available
Flammability (solid, gas) : No data available
Vapour pressure : No data available
Relative vapour density at 20 °C : No data available
Relative density : No data available
Density : 1.059 g/ml Specific Gravity
Solubility : Water: completely soluble
Log Pow : No data available
Log Kow : No data available
Viscosity, kinematic : No data available
Viscosity, dynamic : No data available
Explosive properties : No data available
Oxidising properties : No data available
Explosive limits : No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable under normal conditions of use

10.3. Possibility of hazardous reactions

Hazardous polymerization will not occur

10.4. Conditions to avoid

Heat. Light

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Safety Data Sheet

according to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

10.5. Incompatible materials

Strong oxidizers

10.6. Hazardous decomposition products

Hazardous decomposition products may be released during prolonged heating like smokes, carbon monoxide and dioxide. Nitrogen oxides (NOx)

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Revital-Ox™ 2X Concentrate Enzymatic Detergent	
LD50 oral rat	> 5000 mg/kg
LD50 dermal rat	> 5000 mg/kg
Triethanolamine (102-71-6)	
LD50 oral rat	4190 mg/kg
LD50 dermal rabbit	> 20 ml/kg
ATE (oral)	4190,000 mg/kg bodyweight
Ethoxylated coconut oil alkyl amine (61791-14-8)	
ATE (oral)	500,000 mg/kg bodyweight
Ethanolamine (141-43-5)	
LD50 oral rat	1720 mg/kg
LD50 dermal rabbit	1 ml/kg
ATE (oral)	500,000 mg/kg bodyweight
ATE (dermal)	1100,000 mg/kg bodyweight
ATE (dust,mist)	1,500 mg/l/4h
Tolyltriazole, sodium salt (64665-57-2)	
ATE (oral)	500,000 mg/kg bodyweight
1-Octadecanamine, N,N-dimethyl- (124-28-7)	
LD50 oral rat	2116 mg/kg
LD50 dermal rabbit	4.29 ml/kg
ATE (oral)	500,000 mg/kg bodyweight

Skin corrosion/irritation : Causes skin irritation
pH: 7.5 – 8.1

Serious eye damage/irritation : Causes serious eye damage
pH: 7.5 – 8.1

Respiratory or skin sensitisation : May cause allergy or asthma symptoms or breathing difficulties if inhaled

Germ cell mutagenicity : Not classified

Based on available data, the classification criteria are not met

Carcinogenicity : Not classified

Based on available data, the classification criteria are not met

Triethanolamine (102-71-6)	
IARC group	3 - Not classifiable
National Toxicology Program (NTP) Status	1 - Evidence of Carcinogenicity

Reproductive toxicity : Not classified
Based on available data, the classification criteria are not met

Specific target organ toxicity (single exposure) : Not classified
Based on available data, the classification criteria are not met

Specific target organ toxicity (repeated exposure) : Not classified
Based on available data, the classification criteria are not met

Ethanolamine (141-43-5)	
NOAEL (oral,rat,90 days)	>= mg/kg bodyweight/day

Aspiration hazard : Not classified
Based on available data, the classification criteria are not met

Potential Adverse human health effects and symptoms : Harmful if swallowed

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Symptoms/injuries after inhalation	: In case of repeated or prolonged exposure : May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause respiratory irritation
Symptoms/injuries after skin contact	: Irritating to eyes and skin
Symptoms/injuries after eye contact	: Causes eye irritation
Symptoms/injuries after ingestion	: Can occur: gastrointestinal disturbance

SECTION 12: Ecological information

12.1. Toxicity

Citric acid (77-92-9)	
LC50 fishes 1	1516 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [Static])
EC50 Daphnia 1	120 mg/l (Exposure time: 72 h - Species: Daphnia magna)
Triethanolamine (102-71-6)	
LC50 fishes 1	10600 - 13000 mg/l (Exposure time: 96 h - Species: Pimephales promelas [Flow-through])
EC50 other aquatic organisms 1	216 mg/l (Exposure time: 72 h - Species: Desmodesmus subspicatus)
LC50 fish 2	> 1000 mg/l (Exposure time: 96 h - Species: Pimephales promelas [Static])
EC50 other aquatic organisms 2	169 mg/l (Exposure time: 96 h - Species: Desmodesmus subspicatus)
Ethanolamine (141-43-5)	
LC50 fishes 1	227 mg/l (Exposure time: 96 h - Species: Pimephales promelas [Flow-through])
EC50 Daphnia 1	65 mg/l (Exposure time: 48 h - Species: Daphnia magna)
EC50 other aquatic organisms 1	15 mg/l (Exposure time: 72 h - Species: Desmodesmus subspicatus)
LC50 fish 2	3684 mg/l (Exposure time: 96 h - Species: Brachydanio rerio [Static])

12.2. Persistence and degradability

Revital-Ox™ 2X Concentrate Enzymatic Detergent	
Persistence and degradability	The surfactant(s) contained in this preparation complies (comply) with the biodegradability criteria as laid down in Regulation (EC) No. 648/2004 on detergents. Data to support this assertion are held at the disposal of the competent authorities of the Member States and will be made available to them, at their direct request or at the request of a detergent manufacturer

12.3. Bioaccumulative potential

Revital-Ox™ 2X Concentrate Enzymatic Detergent	
Bioaccumulative potential	Not established
Citric acid (77-92-9)	
Log Pow	-1.72 (at 20 °C)
Triethanolamine (102-71-6)	
BCF fish 1	< 3.9
Log Pow	-2.53
Ethanolamine (141-43-5)	
Log Pow	-1.91 (at 25 °C)

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Other information : Avoid release to the environment

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations	: Dispose in a safe manner in accordance with local/national regulations. Do not re-use empty containers
Additional information	: Empty containers should be thoroughly rinsed with large quantities of clean water. Empty containers should be taken for recycling, recovery or waste in accordance with local regulation. Ensure all national/local regulations are observed
Ecology - waste materials	: Avoid release to the environment

SECTION 14: Transport information

In accordance with DOT

No dangerous good in sense of transport regulations

Additional information

Other information : No supplementary information available

Revital-Ox™ 2X Concentrate Enzymatic Detergent

Safety Data Sheet

according to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

ADR

Transport document description : In accordance with DOT
No dangerous good in sense of transport regulations

Transport by sea

In accordance with DOT
No dangerous good in sense of transport regulations

Air transport

In accordance with DOT
No dangerous good in sense of transport regulations

SECTION 15: Regulatory information

15.1. US Federal regulations

Citric acid (77-92-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Triethanolamine (102-71-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ethoxylated coconut oil alkyl amine (61791-14-8)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ethanolamine (141-43-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Subtilisins (proteolytic enzymes) (9014-01-1)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Glycerine (56-81-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.3. US State regulations

This product contains a chemical known to the State of California to cause cancer.

SECTION 16: Other information

Other information : None

Full text of H-phrases: see section 16:

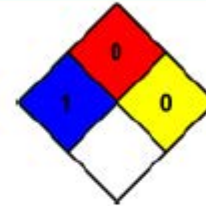
Acute Tox. 4 (Dermal)	Acute toxicity (dermal), Category 4
Acute Tox. 4 (Inhalation)	Acute toxicity (inhalation), Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Eye Irrit. 2A	Serious eye damage/eye irritation, Category 2A
Flam. Liq. 4	Flammable liquids, Category 4
Resp. Sens. 1	Sensitisation — Respiratory, Category 1
Skin Corr. 1A	Skin corrosion/irritation, Category 1A
Skin Corr. 1B	Skin corrosion/irritation, Category 1B
Skin Irrit. 2	Skin corrosion/irritation, Category 2
STOT SE 3	Specific target organ toxicity (single exposure), Category 3
H302	Harmful if swallowed
H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H318	Causes serious eye damage
H319	Causes serious eye irritation
H332	Harmful if inhaled
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335	May cause respiratory irritation

Revital-Ox™ 2X Concentrate Enzymatic Detergent

Safety Data Sheet

according to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

NFPA health hazard	: 1 - Exposure could cause irritation but only minor residual injury even if no treatment is given
NFPA fire hazard	: 0 - Materials that will not burn
NFPA reactivity	: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water



SDS US (GHS HazCom 2012)

The information on this sheet is not a specification and does not guarantee specific properties. The information is intended to provide general knowledge as to health and safety based upon our knowledge of the handling, storage and use of the product. It is not applicable to unusual or non-standard uses of the product or where instruction or recommendations are not followed.

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name Clorox Healthcare® Bleach Germicidal Cleaner

Other means of identification

Synonyms None

EPA Pesticide registration number 56392-7

Recommended use of the chemical and restrictions on use

Recommended Use Disinfectant - Non-Aerosol

Uses advised against No information available

Details of the supplier of the safety data sheet

Supplier The Clorox Company

Supplier Address 1221 Broadway
Oakland
CA
94612
US

Telephone 1-510-271-7000

Emergency telephone number

Emergency Telephone Number For Medical Emergencies call: 1-800-446-1014. Transportation Emergencies, call Chemtrec: 1-800-424-9300

2. HAZARDS IDENTIFICATION

Classification

This product is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

GHS Label elements, including precautionary statements

Emergency Overview

The product contains no substances which at their given concentration, are considered to be hazardous to health.

Physical state Liquid

Odor Fruity, Floral, Bleach

Precautionary Statements - Prevention

Not applicable

Precautionary Statements - Response

None

Precautionary Statements - Storage

None

Precautionary Statements - Disposal
None

Hazards not otherwise classified (HNOC)
Not applicable

Unknown Toxicity
0.03 % of the mixture consists of ingredient(s) of unknown toxicity

Other information
No information available

Interactions with Other Chemicals
No information available.

Interactions with Other Chemicals
May react with bleach-containing products or other household cleaners to produce hazardous gases.

3. COMPOSITION/INFORMATION ON INGREDIENTS

The product contains no substances which at their given concentration, are considered to be hazardous to health.

4. FIRST AID MEASURES

First aid measures

General Advice

Show this safety data sheet to the doctor in attendance.

Eye contact

Rinse thoroughly with water as necessary. If symptoms persist, call a physician.

Skin contact

Wash with soap and water. If skin irritation persists, call a physician.

Inhalation

Remove to fresh air. If breathing is difficult, (trained personnel should) give oxygen. If symptoms persist, call a physician.

Ingestion

Drink 1 or 2 glasses of water. Get medical attention if symptoms occur.

Most important symptoms and effects, both acute and delayed

Most Important Symptoms and Effects None known.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment

Unsuitable extinguishing media

CAUTION: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the chemical

No information available.

Hazardous Combustion Products

Carbon oxides.

Explosion Data

Sensitivity to Mechanical Impact No.

Sensitivity to Static Discharge No.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with eyes.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Keep containers tightly closed in a dry, cool and well-ventilated place.

Incompatible products None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies

Other Exposure Guidelines See section 15 for national exposure control parameters

Appropriate engineering controls

Engineering Measures Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/face protection No special protective equipment required.

Skin and body protection No special protective equipment required.

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

Physical state	Liquid		
Odor	Fruity Floral Bleach	Color	No information available
Odor Threshold	No information available		

<u>Property</u>	<u>Values</u>	<u>Remarks</u>	<u>Method</u>
pH	11.8 - 12.2	None known	
Melting / freezing point	No data available	None known	
Boiling point / boiling range	No data available	None known	
Flash Point	No data available	None known	
Evaporation Rate	No data available	None known	
Flammability (solid, gas)	No data available	None known	
Flammability Limit in Air			
Upper flammability limit	No data available		
Lower flammability limit	No data available		
Vapor pressure	No data available	None known	
Vapor density	No data available	None known	
Specific Gravity	~1.0	None known	
Water Solubility	Completely soluble	None known	
Solubility in other solvents	No data available	None known	
Partition coefficient: n-octanol/water	0	None known	
Autoignition temperature	No data available	None known	
Decomposition temperature	No data available	None known	
Kinematic viscosity	No data available	None known	
Dynamic viscosity	No data available	None known	
Explosive properties	No data available		
Oxidizing properties	No data available		

Other Information

Softening Point	No data available
VOC Content (%)	No data available
Particle Size	No data available
Particle Size Distribution	No data available

10. STABILITY AND REACTIVITY

Reactivity

No data available

Chemical stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to avoid

None known based on information supplied.

Incompatible materials

Ammonia Acids

Hazardous Decomposition Products

None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Inhalation	May cause irritation of respiratory tract.
Eye contact	May cause slight irritation.
Skin contact	Substance may cause slight skin irritation.
Ingestion	Ingestion may cause irritation to mucous membranes. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Component Information

Information on toxicological effects

Symptoms May cause redness and tearing of the eyes.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization No information available.

Mutagenic Effects No information available.

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.
IARC (International Agency for Research on Cancer)
Group 3 - Not Classifiable as to Carcinogenicity in Humans

Reproductive toxicity No information available.

STOT - single exposure No information available.

STOT - repeated exposure No information available.

Chronic Toxicity No known effect based on information supplied.

Target Organ Effects Skin. Eyes. Respiratory system. Reproductive System.

Aspiration Hazard No information available.

Numerical measures of toxicity Product Information

The following values are calculated based on chapter 3.1 of the GHS document

No information available

12. ECOLOGICAL INFORMATION

Ecotoxicity

None known.

Persistence and Degradability

No information available.

Bioaccumulation

No information available

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal methods

Dispose of in accordance with federal, state and local regulations.

Contaminated Packaging

Do not reuse empty containers. Dispose of in accordance with federal, state and local regulations.

California Waste Codes 232

This product contains one or more substances that are listed with the State of California as a hazardous waste.

14. TRANSPORT INFORMATION

DOT NOT REGULATED

TDG Not regulated

ICAO Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

TSCA

All components are listed on the TSCA Inventory

DSL

All components are listed either on the DSL or NDSL.

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level

pertaining to releases of this material

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

This product does not contain any substances above threshold limits that are regulated by state right-to-know.

EPA Pesticide Registration No. 56392-7

EPA Statement

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

EPA Pesticide label

CAUTION: Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling.

International Regulations

National occupational exposure limits

Mexico - Occupational Exposure Limits - Carcinogens

A3 - Confirmed Animal Carcinogen

Canada

WHMIS Hazard Class

Not determined

16. OTHER INFORMATION

NFPA	Health Hazards 0	Flammability 0	Instability 0	Physical and Chemical Hazards N/A
HMIS	Health Hazards 0	Flammability 0	Physical Hazard 0	Personal Protection A

Prepared By	Product Stewardship 23 British American Blvd. Latham, NY 12110 1-800-572-6501
Issuing Date	10-Jan-2017
Revision Date	15-Jan-2019
Revision Note	No information available

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text





SAFETY DATA SHEET

Issuing Date January 5, 2015

Revision Date July 24, 2018

Revision Number 2

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name Clorox® Germicidal Bleach

Other means of identification

EPA Registration Number 67619-32

Recommended use of the chemical and restrictions on use

Recommended use Institutional hard surface disinfecting and sanitizing bleach

Uses advised against No information available

Details of the supplier of the safety data sheet

Supplier Address

The Clorox Company
1221 Broadway
Oakland, CA 94612

Phone: 1-510-271-7000

Emergency telephone number

Emergency Phone Numbers For Medical Emergencies, call: 1-800-446-1014
For Transportation Emergencies, call Chemtrec: 1-800-424-9300

Unknown Toxicity

Not applicable.

Other information

Very toxic to aquatic life with long lasting effects.

Interactions with Other Chemicals

Reacts with other household chemicals such as toilet bowl cleaners, rust removers, acids, or products containing ammonia to produce hazardous irritating gases, such as chlorine and other chlorinated compounds.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Weight %	Trade Secret
Sodium hypochlorite	7681-52-9	5 - 10	*

*The exact percentage (concentration) of composition has been withheld as a trade secret.

4. FIRST AID MEASURES**First aid measures****General Advice**

Call a poison control center or doctor immediately for treatment advice. Show this safety data sheet to the doctor in attendance.

Eye Contact

Hold eye open and rinse slowly and gently with water for 15 - 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

Skin Contact

Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

Inhalation

Move to fresh air. If breathing is affected, call a doctor.

Ingestion

Have person sip a glassful of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person. Call a poison control center or doctor immediately for treatment advice.

Protection of First-aiders

Avoid contact with skin, eyes, and clothing. Use personal protective equipment as required. Wear personal protective clothing (see section 8).

Most important symptoms and effects, both acute and delayed**Most Important Symptoms and Effects**

Burning of eyes and skin.

Indication of any immediate medical attention and special treatment needed**Notes to Physician**

Treat symptomatically. Probable mucosal damage may contraindicate the use of gastric lavage.

2. HAZARDS IDENTIFICATION


Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1

GHS Label elements, including precautionary statements

Emergency Overview

Signal word	Danger		
Hazard Statements	Causes severe skin burns and eye damage Causes serious eye damage		
			
Appearance	Clear, pale yellow	Physical State	Thin liquid
		Odor	Bleach

Precautionary Statements - Prevention

Wash face, hands and any exposed skin thoroughly after handling.
 Wear protective gloves, protective clothing, face protection, and eye protection such as safety glasses.

Precautionary Statements - Response

Immediately call a poison center or doctor.
 If swallowed: Rinse mouth. Do NOT induce vomiting.
 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
 Wash contaminated clothing before reuse.
 If inhaled: Remove person to fresh air and keep comfortable for breathing.
 Specific treatment (see supplemental first aid instructions on this label).
 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Precautionary Statements - Storage

Store locked up.

Precautionary Statements - Disposal

Dispose of contents in accordance with all applicable federal, state, and local regulations.

Hazards not otherwise classified (HNOC)

Although not expected, heart conditions or chronic respiratory problems such as asthma, chronic bronchitis, or obstructive lung disease may be aggravated by exposure to high concentrations of vapor or mist.

Product contains a strong oxidizer. Always flush drains before and after use.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media

CAUTION: Use of water spray when fighting fire may be inefficient.

Specific Hazards Arising from the Chemical

This product causes burns to eyes, skin, and mucous membranes. Thermal decomposition can release sodium chlorate and irritating gases and vapors.

Explosion Data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions

Avoid contact with eyes, skin, and clothing. Ensure adequate ventilation. Use personal protective equipment as required. For spills of multiple products, responders should evaluate the MSDSs of the products for incompatibility with sodium hypochlorite. Breathing protection should be worn in enclosed and/or poorly-ventilated areas until hazard assessment is complete.

Other Information

Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental Precautions

This product is toxic to fish, aquatic invertebrates, oysters, and shrimp. Do not allow product to enter storm drains, lakes, or streams. See Section 12 for ecological information.

Methods and material for containment and cleaning up

Methods for Containment

Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up

Absorb and containerize. Wash residual down to sanitary sewer. Contact the sanitary treatment facility in advance to assure ability to process washed-down material.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes, and clothing. Do not eat, drink, or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Store away from children. Reclose cap tightly after each use. Store this product upright in a cool, dry area, away from direct sunlight and heat to avoid deterioration. Do not contaminate food or feed by storage of this product.

Incompatible Products Toilet bowl cleaners, rust removers, acids, and products containing ammonia.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sodium hypochlorite 7681-52-9	None	None	None

ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value. OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits. NIOSH IDLH: Immediately Dangerous to Life or Health.

Appropriate engineering controls

Engineering Measures Showers
Eyewash stations
Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/Face Protection If splashes are likely to occur: Wear safety glasses with side shields (or goggles) or face shield.

Skin and Body Protection Wear rubber or neoprene gloves and protective clothing such as long-sleeved shirt.

Respiratory Protection If irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice. Wash hands after direct contact. Do not wear product-contaminated clothing for prolonged periods. Remove and wash contaminated clothing before re-use. Do not eat, drink, or smoke when using this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

Physical State	Thin liquid	Odor	Bleach
Appearance	Clear	Odor Threshold	No information available
Color	Pale yellow		

<u>Property</u>	<u>Values</u>	<u>Remarks/ Method</u>
pH	~12	None known
Melting/freezing point	No data available	None known
Boiling point / boiling range	No data available	None known
Flash Point	Not flammable	None known
Evaporation rate	No data available	None known
Flammability (solid, gas)	No data available	None known
Flammability Limits in Air		
Upper flammability limit	No data available	None known
Lower flammability limit	No data available	None known
Vapor pressure	No data available	None known
Vapor density	No data available	None known
Specific Gravity	~1.1	None known
Water Solubility	Soluble	None known
Solubility in other solvents	No data available	None known
Partition coefficient: n-octanol/water	No data available	None known
Autoignition temperature	No data available	None known
Decomposition temperature	No data available	None known
Kinematic viscosity	No data available	None known
Dynamic viscosity	No data available	None known
Explosive Properties	Not explosive	
Oxidizing Properties	No data available	

Other Information

Softening Point	No data available
VOC Content (%)	No data available
Particle Size	No data available
Particle Size Distribution	No data available

10. STABILITY AND REACTIVITY

Reactivity

Reacts with other household chemicals such as toilet bowl cleaners, rust removers, acids, or products containing ammonia to produce hazardous irritating gases, such as chlorine and other chlorinated compounds.

Chemical stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to avoid

None known based on information supplied.

Incompatible materials

Toilet bowl cleaners, rust removers, acids, and products containing ammonia.

Hazardous Decomposition Products

None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Inhalation	Exposure to vapor or mist may irritate respiratory tract and cause coughing. Inhalation of high concentrations may cause pulmonary edema.
Eye Contact	Corrosive. May cause severe damage to eyes.
Skin Contact	May cause severe irritation to skin. Prolonged contact may cause burns to skin.
Ingestion	Ingestion may cause burns to gastrointestinal tract and respiratory tract, nausea, vomiting, and diarrhea.

Component Information

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sodium hypochlorite 7681-52-9	8200 mg/kg (Rat)	>10000 mg/kg (Rabbit)	-

Information on toxicological effects

Symptoms	May cause redness and tearing of the eyes. May cause burns to eyes. May cause redness or burns to skin. Inhalation may cause coughing.
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Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization	No information available.
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Mutagenic Effects	No information available.
--------------------------	---------------------------

Carcinogenicity	The table below indicates whether each agency has listed any ingredient as a carcinogen.
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Chemical Name	ACGIH	IARC	NTP	OSHA
Sodium hypochlorite 7681-52-9	-	Group 3	-	-

*IARC (International Agency for Research on Cancer)
Group 3 - Not Classifiable as to Carcinogenicity in Humans*

Reproductive Toxicity	No information available.
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STOT - single exposure	No information available.
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STOT - repeated exposure	No information available.
Chronic Toxicity	Carcinogenic potential is unknown.
Target Organ Effects	Respiratory system, eyes, skin, gastrointestinal tract (GI).

Aspiration Hazard	No information available.
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Numerical measures of toxicity - Product Information

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)
54 g/kg
ATEmix (inhalation-dust/mist)
58 mg/L

SECTIONS 12,13,14 LIMITED VALUE IN DETERMINING EYEWASH/SHOWER

Clorox® Germicidal Bleach

Revision Date July 24, 2018

12. ECOLOGICAL INFORMATION

Ecotoxicity

Very toxic to aquatic life with long lasting effects.

This product is toxic to fish, aquatic invertebrates, oysters, and shrimp. Do not allow product to enter storm drains, lakes, or streams.

Persistence and Degradability

No information available.

Bioaccumulation

No information available.

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Disposal methods

Dispose of in accordance with all applicable federal, state, and local regulations. Do not contaminate food or feed by disposal of this product.

Contaminated Packaging

Do not reuse empty containers. Dispose of in accordance with all applicable federal, state, and local regulations.

14. TRANSPORT INFORMATION

<u>DOT</u>	Not restricted.
<u>TDG</u>	Not restricted for road or rail.
<u>ICAO</u>	Not restricted, as per Special Provision A197, Environmentally Hazardous Substance exception.
<u>IATA</u>	Not restricted, as per Special Provision A197, Environmentally Hazardous Substance exception.
<u>IMDG/IMO</u>	Not restricted, as per IMDG Code 2.10.2.7, Marine Pollutant exception.

15. REGULATORY INFORMATION

Chemical Inventories

TSCA All components of this product are either on the TSCA 8(b) Inventory or otherwise exempt from listing.

DSL/NDSL All components are on the DSL or NDSL.

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

U.S. Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium hypochlorite 7681-52-9	100 lb			X

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	RQ
Sodium hypochlorite 7681-52-9	100 lb	-	RQ 100 lb final RQ RQ 45.4 kg final RQ

EPA Statement

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

DANGER: CORROSIVE. Causes irreversible eye damage and skin burns. Harmful if swallowed. Do not get in eyes, on skin, or on clothing. Wear protective eyewear and rubber gloves when handling this product. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the restroom. Avoid breathing vapors and use only in a well-ventilated area.

US State Regulations**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania	Rhode Island	Illinois
Sodium hypochlorite 7681-52-9	X	X	X	X	
Sodium chlorate 7775-09-9	X	X	X		

International Regulations**Canada****WHMIS Hazard Class**

E - Corrosive material

**16. OTHER INFORMATION**

NFPA Health Hazard 3 Flammability 0 Instability 0 Physical and Chemical Hazards -

HMS Health Hazard 3 Flammability 0 Physical Hazard 0 Personal Protection B

Prepared By Product Stewardship
23 British American Blvd.
Latham, NY 12110
1-800-572-6501

Revision Date July 24, 2018

Revision Note Revised Section 1.

Reference 1064453/166081.094

General Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

FORMALDEHYDE

1910.1048(a) *Scope and application.* This standard applies to all occupational exposures to formaldehyde, i.e. from formaldehyde gas, its solutions, and materials that release formaldehyde.

- 1910.1048(i)(2) If employees' skin may become splashed with solutions containing 1 percent or greater formaldehyde, for example, because of equipment failure or improper work practices, the employer shall provide conveniently located quick drench showers and assure that affected employees use these facilities immediately.
- 1910.1048(i)(3) If there is any possibility that an employee's eyes may be splashed with solutions containing 0.1 percent or greater formaldehyde, the employer shall provide acceptable eyewash facilities within the immediate work area for emergency use.
- 1910.1048(j) *Housekeeping.* For operations involving formaldehyde liquids or gas, the employer shall conduct a program to detect leaks and spills, including regular visual inspections.
- 1910.1048(j)(1) Preventative maintenance of equipment, including surveys for leaks, shall be undertaken at regular intervals.

I HAVE HEARD ABOUT ASSE 1071. WHAT IS IT?

- The American Society of Sanitary Engineering (ASSE) standard 1071 sets performance requirements for temperature activated mixing valves used in conjunction with emergency equipment. Local plumbing codes may require mixing valves be compliant with ASSE 1071.

EYEWASH AND EYEWASH/FACE REQUIRED FLOW RATES

Eyewash/Face					Eyewash					
Flow rate for 3 gpm					Flow Rate for 0.4 gpm					
Oz per gal		Oz for 3 gal		Min oz per second for 3 gal rate	Time in Seconds	Oz per gal	Oz for .4 gal		Min oz per second for .4 gal rate	Time in Seconds
128	3	384	60	6.4	1	128	51.2	60	0.85	1
				12.8	2				1.71	2
				19.2	3				2.56	3
				25.6	4				3.41	4
				32	5				4.27	5
				38.4	6				5.12	6
				44.8	7				5.97	7
				51.2	8				6.83	8
				57.6	9				7.68	9
				64	10				8.53	10

SHOWER TESTING

Testing Drench Shower/ flow rate and time			
Ounces	Gallons		Time in seconds
			5
			10
640	5		15
			20
			25
1280	10		30
			35
			40
1920	15		45
			50
			55
2560	20		60
1 Gallon every 3 seconds			

THANK YOU

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Baptist Health Paducah

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American National Standard for Emergency Eyewash and Shower Equipment

1. Scope

This standard establishes minimum performance and use requirements for eyewash and shower equipment for the emergency treatment of the eyes or body of a person who has been exposed to hazardous materials. It covers the following types of equipment: emergency showers, eyewashes, eye/face washes, and combination units.

This standard also includes performance and use requirements for personal wash units and drench hoses, which are considered supplemental to emergency eyewash and shower equipment.

2. Purpose

This standard is intended to provide uniform minimum requirements for the performance, use, installation, test procedures, maintenance and training of emergency eyewash and shower equipment.

3. Definitions

For the purpose of this standard, the following terms apply as defined:

certified: A system whereby a certification organization determines that a manufacturer has demonstrated the ability to produce a product that complies with the requirements of this standard, authorizes the manufacturer to use a label on listed products that comply with the requirements of this standard, and establishes a Follow up program conducted by the certification organization as a check on the methods the manufacturer uses to determine continued compliance of labelled and listed products with the requirements of this standard.

certification organization: An independent third party organization that determines product compliance with the requirements of this standard with a labeling/listing/followup program.

combination unit: An interconnected assembly of emergency equipment supplied by a single source of flushing fluid.

drench hose: A supplemental device consisting of a flexible hose connected to a flushing fluid supply and used to provide fluid to irrigate and flush face and body areas.

emergency shower: A device specifically designed and intended to deliver flushing fluid in sufficient volume to cause that fluid to cascade over the entire body.

eye/face wash: A device used to provide fluid to irrigate and flush both the face and the eyes simultaneously.

eyewash: A device used to provide fluid to irrigate and flush the eyes.

flow pressure: The pressure in the water supply pipe near the water outlet while the faucet or outlet is fully open and flowing.

flushing fluid: Potable water, preserved water, preserved buffered saline solution or other medically acceptable solution manufactured and labeled in accordance with applicable government regulations.

flushing fluid column: The dispersion pattern of flushing fluid which is created by an emergency shower and meets the standard's prescribed coverage requirements. This pattern can be achieved by a variety of design configurations.

freeze protected equipment: Equipment designed to allow the emergency device to operate under freezing conditions.

freeze protection: A means to protect flushing fluid in an apparatus from freezing and rendering it inoperable. This can be achieved through several means including mechanical valves and electrical heat tracing.

hazardous material: Any substance or compound that has the capability of producing

adverse effects on the health and safety of humans.

personal wash: A supplementary device that supports plumbed and/or self-contained units, by delivering immediate flushing fluid to the eyes or body.

plumbed: A term used to describe equipment that is connected to a continual source of potable water.

potable water: Water that is suitable for drinking.

selfclosing valve: A valve that closes automatically when released by the user.

selfcontained: A term used to describe a standalone device containing flushing fluid.

tepid: A flushing fluid temperature conducive to promoting a minimum 15 minute irrigation period. A suitable range is 16 - 38° C (60 -100° F). (See Appendix B6).

valve actuator: A device connected to the valve to facilitate its operation.

4. Emergency Showers (See Illustrations 1, 2, 3)

4.1 Performance of Emergency Showers

4.1.1 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.

4.1.2 Emergency showers shall be capable of delivering flushing fluid at a minimum of 75.7 liters per minute (20 gpm) 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.

4.1.3 Emergency showers shall provide a flushing fluid column that is at least 208.3 cm (82 in.) and not more than 243.8 cm (96 in.) in height from the surface on which the user stands.

4.1.4 The spray pattern shall have a minimum diameter of 50.8 cm (20 in.) at 152.4 cm (60 in.) above the surface on which the user stands, and the center of the spray pattern shall be located at

least 40.6 cm (16 in.) from any obstruction. The flushing fluid shall be substantially dispersed throughout the pattern.

4.1.5 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.

4.1.6 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.

4.2 Performance of Control Valve

The valve shall remain open without the use of the operator's hands until intentionally closed. The valve shall be simple to operate and shall go from "off" to "on" in 1 second or less. The valve shall be resistant to corrosion. Manual or automatic actuators shall be easy to locate and readily accessible to the user. Valve actuators shall be located not more than 173.3 cm (69 in.) above the level on which the user stands.

4.3 Emergency Shower Enclosures

If used, enclosures shall provide for a minimum unobstructed area of 86.4 cm (34 in.) in diameter.

4.4 Testing Procedures for Certification

4.4.1 Plumbed Emergency Showers

Plumbed emergency showers shall be certified as follows:

(1) Connect a flowmeter to the unit to be tested or provide other means of measuring flushing fluid flow.

(2) Connect the unit per the manufacturer's specifications to a flushing fluid supply at a flow pressure of 207 kPa +3.4 kPa 0 kPa (30 psi +0.5 psi 0 psi).

(3) Open the valve on the unit and verify that it fully opens in one second or less and that it stays open.

(4) Determine that flushing fluid is substantially dispersed throughout the pattern. The flushing fluid column pattern

ANSI/ISEA Z358.12014

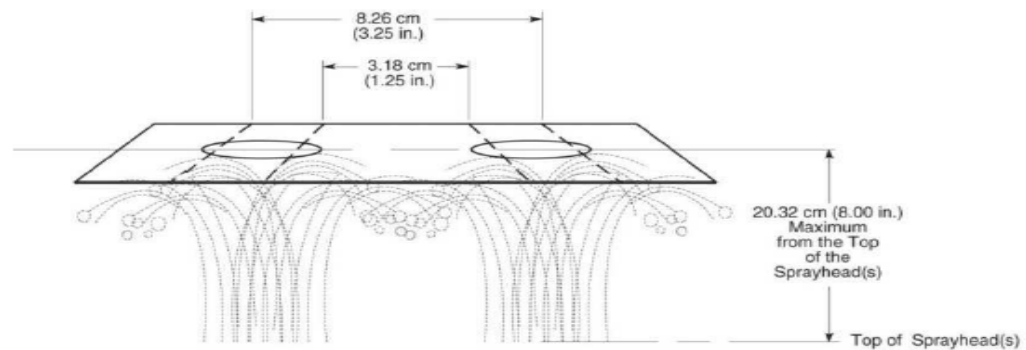


Illustration 7
Typical Eyewash Gauge

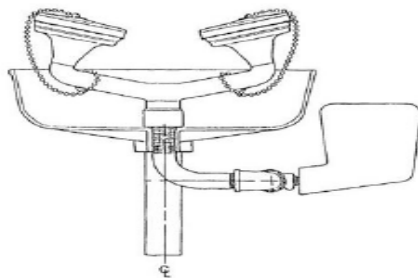


Illustration 8
Eye/Face Wash

Appendices (The appendices are not part of ANSI/SEA Z358.12014, but are included for information only.)

APPENDIX A – SAFETY CONSIDERATIONS

A1. Personal Wash Unit

The first seconds following an eye injury are often critical to keeping eye injury to a minimum. A personal wash unit may be kept in the immediate vicinity of employees working in a potentially hazardous area. The main purpose of these units is to supply immediate flushing. With this accomplished, the injured individual should then proceed to a plumbed or self-contained eyewash and flush the eyes for the required 15-minute period.

A2. First Aid Practices

A physician or other appropriate professional should provide guidance on specific workplace hazards and should provide instruction on the use of emergency eyewash and shower equipment.

A3. Waste Disposal

Consideration should be given to the proper disposal of waste flushing fluids from operating emergency eyewash and shower equipment. Freezing temperatures, drainage, elevated showers and pollutants are some, but not all, of the considerations. Consult authorities for assistance with applicable local, state and federal regulations.

A4. Personal Protective Equipment

Emergency eyewash and shower equipment is not a substitute for proper primary protective devices. As a defense against flying solid particles and splashing injurious liquids, workers should wear personal protective equipment as needed.

APPENDIX B – INSTALLATION CONSIDERATIONS

B1. Supply Lines

Installation procedures should be in accordance with proper plumbing practices and supply piping adequately sized to meet flow requirements.

B2. Water Capacity

The ANSI/ISEA Z358.1201x standard includes reference to a flow pressure of 207 kPa (30 psi) only in the certification-related sections for plumbed equipment. This is to ensure that the testing for certification purposes is consistent and that reproducible results can be generated regardless of the laboratory conducting the testing. It is the responsibility of the designer and owner to ensure proper flushing fluid delivery at possible low points of pressure in the plumbing system and to ensure that the plumbed equipment is installed in accordance with the flushing fluid delivery requirements specified by the equipment manufacturer. The weekly activation of plumbed emergency eyewash and shower equipment is to be conducted at normal facility operating pressures. Excess flow pressure can deliver water to the equipment at velocities that could injure the user or render the equipment inoperable. Caution should be exercised with flow pressures over 0.552 kPa (80 psi).

B3. Valve Operation

In the interest of safety, a control valve remaining open is most desirable to allow the user the use of both hands for disrobing or holding the eyes open. However, a selfclosing valve may be permitted in a school laboratory situation as a limited exception only where the enforcing authority is of the opinion that the hazard posed is not a serious threat.

B4. Alarm Devices

In addition to the equipment identification required by ANSI/ISEA Z358.12014, users may also want to use audible alarms or warning lights to indicate that the unit is in operation. These are particularly important in remote areas. Many companies connect valves electrically to warning lights or buzzers in central dispatch areas to alert the appropriate authorities when the unit is in use.

B5. Placement of Emergency Eyewash and Shower Equipment

Emergency eyewash and shower equipment should be available for immediate use, but in no instance should it take an individual longer than 10 seconds to reach the nearest facility.

There are several factors that might influence the location of emergency facilities. It is recognized that the average person covers a distance of approximately 55 ft. (16.8 m) in 10 seconds when walking at a normal pace. The physical and emotional state of a potential victim (visually impaired, with some level of discomfort/pain, and possibly in a state of panic) should be considered along with the likelihood of personnel in the immediate area to assist. The installer should also consider other potential hazards that may be adjacent to the path of travel that might cause further injury. A single step up into an enclosure where the equipment can be accessed is not considered to be an obstruction. Additionally, installers should allow for adequate overhead clearance to accommodate the presence of cabinets over counter- or faucet- mounted emergency eyewashes, so as not to create an additional hazard that could be encountered when using the device.

A door is considered to be an obstruction. Where the hazard is not corrosive, one intervening door can be present so long as it opens in the same direction of travel as the person attempting to reach the emergency eyewash and shower equipment and the door is equipped with a closing mechanism that cannot be locked to impede access to the equipment.

(2) Open the valve to the full open position. The valve shall remain open without requiring further use of the operator's hands.

(3) With the valve in the fully open position, make sure that both eyes will be washed simultaneously at a velocity low enough to be noninjurious to the user.

(4) Using the flowmeter or other means, determine that the rate of flow is at least 1.5 liters per minute (0.4 gpm). A test gauge similar to the one pictured in Illustration 7 can be used to verify minimum flow characteristics.

(5) Using a temperature gauge or other means, determine that the flushing fluid is tepid.

5.4.8 When the selfcontained eyewash is installed, its installation shall be verified in accordance with manufacturer's instructions.

5.5 Maintenance and Training

5.5.1 Manufacturers shall provide operation, inspection and maintenance instructions with eyewashes. Instructions shall be readily accessible to maintenance and inspection personnel.

5.5.2 Plumbed eyewashes shall be activated weekly for a period long enough to verify operation and ensure that flushing fluid is available. (See Appendix B7)

5.5.3 Selfcontained eyewashes shall be visually checked weekly to determine if flushing fluid needs to be changed or supplemented. Such inspection shall be conducted in accordance with manufacturer's instructions.

5.5.4 Employees who may be exposed to hazardous materials shall be instructed in the location and proper use of emergency eyewashes.

5.5.5 All eyewashes shall be inspected annually to assure conformance with Section 5.4 requirements of this standard.

6. Eye/Face Wash Equipment (See Illustration 8)

6.1 Performance of Eye/Face Washes

6.1.1 A means shall be provided to ensure that a controlled flow of flushing fluid is provided to both eyes and face simultaneously at a velocity low enough to be noninjurious to the user.

6.1.2 Eye/face washes shall be designed and positioned in such a way as to pose no hazard to the user.

6.1.3 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.

6.1.4 Eye/face washes 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.

6.1.5 Eye/face washes shall be constructed of materials that will not corrode in the presence of the flushing fluid.

6.1.6 Eye/face washes shall be capable of delivering flushing fluid to the eyes and face not less than 11.4 liters per minute (3.0 gpm) for 15 minutes. If shut off valves are installed in the line for maintenance purposes, provisions shall be made to prevent unauthorized shut off.

6.1.7 Eye/face washes shall be designed to provide enough room to allow the eyelids to be held open with the hands while the eyes and face are in the flushing fluid stream.

6.1.8 Eye/face washes shall provide flushing fluid to both eyes simultaneously. A test gauge for making determination of a suitable eyewash pattern shall be a minimum 10.16 cm (4 in.) in length with two sets of parallel lines equidistant from the center (See Illustration 7). The interior set of lines shall be 3.18 cm (1.25 in.) apart and the exterior lines shall be 8.26 cm (3.25 in.) 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 20.3 cm (8 in.) above the eye/face wash nozzle(s).