Guidance Document for the
School Laboratory Self-Certification Checklist

2018
Purpose of this Guidance

This document is intended as general guidance for schools that operate a science laboratory and may generate hazardous waste through their chemistry programs, assisting them in complying with environmental health and hazardous waste regulations. This document gives line-by-line guidance and instruction on how to complete the school self-certification checklist. The guidance is not meant to modify or replace the promulgated regulations, which undergo periodic revisions. In the event of a conflict between this guidance and promulgated regulations, the regulations govern. Some portions of the hazardous waste regulations are complex and this guidance does not go into the details of these complex situations.
Section A - Laboratories and Storerooms General

QUESTION A-1

Have you conducted an inventory of chemicals in your science laboratories and storeroom in the last 12 months?
6 CCR 1010-6, section 6.12.3(F)

Having an accurate and up-to-date chemical inventory is fundamental to properly manage chemicals and control hazards. All chemicals, solvents, and hazardous substances must be inventoried by the school a minimum of once a year. When inventorying chemicals, be sure to identify prohibited and restricted chemicals, assess which chemicals are not used and should be disposed of, and ensure that chemicals have not deteriorated. The inventory should include all chemicals, compounds, products and wastes that are used in science activities and stored in your storeroom.

Plan before you start. You should not work alone unless you are competent and your inventory is in good shape. Do not involve students unless they are fully supervised and their actions structured and controlled. Always wear appropriate personal protective equipment.

Old chemicals may be unstable. Some chemicals form explosive compounds as they age. If in doubt, call for help.

The inventory must include:
- name of the compound;
- amount of the chemical;
- identification of restricted or prohibited chemicals; and
- date the chemical entered the school.

Other recommended information includes:
- the materials CAS number;
- the manufacturer’s name;
- the size and type of container;
- characterization of the contents (i.e., percent solid/liquid, presence of crystals);
- shelf life characterization;
- storage location;
- compatible family designations; and

Note: Although the scope of this self-certification checklist is that of school laboratories and associated storerooms, the chemical inventory requirement covers arts, crafts, industrial arts, physical sciences, vocational, educational, maintenance and any activities where hazardous chemicals, hazardous devices or hazardous equipment are used.

QUESTION A-2

Are hard copies of the inventory maintained with one copy in the storeroom and one copy at a location away from the storeroom (e.g. Front office)?
6 CCR 1010-6, section 6.12.3(F)
A copy of the inventory should be kept in the storeroom, available for reference. A copy must be kept on file in a location away from the areas where the materials are stored such as the front office. This remote copy allows emergency response teams access to the inventory in case of a fire, explosion, or release at the storeroom. A copy of the inventory shall be provided to the local fire department and local emergency planning committee upon request.

QUESTION A-3

Have you labeled all your laboratory chemicals properly?
6 CCR 1010-6, section 6.12.3(B)

Whenever feasible, store chemicals in the containers in which they were received and retain the vendor’s labels. Containers of chemicals, poisons, corrosive substances and flammable liquids must be clearly labeled with:
- chemical name;
- original quantity of the material;
- the date the material entered the school; and
- restricted chemicals should be labeled “restricted” or otherwise identified.

Other label information should include:
- necessary handling and hazard information; and
- shelf life (or expiration date).

Secondary containers and/or prepared solutions intended for storage must have labels that include:
- chemical name;
- concentration;
- if applicable, the formula (including solvent);
- date of preparation; and
- disposal date.

Other secondary container labeling information should include:
- necessary handling and hazard information;
- name of the person who prepared the solution;

When chemicals are spent, expired, or no longer used, they become waste. Colorado Hazardous Waste Regulations recommend that containers that contain hazardous waste be labeled with the words “hazardous waste”.

When hazardous wastes are offered for shipment through a registered hazardous waste transport company, Department of Transportation labeling requirements must also be followed. Your hazardous waste transport company usually handles these naming requirements for you.

QUESTION A-4

Have you organized required Safety Data Sheets (SDSs) in an easy-to-use manner and in a location known to personnel?
6 CCR 1010-6, section 6.12.1(C)

SDSs contain information on a chemical’s physical data (melting point, boiling point, flash point, etc.), toxicity, health effects, first aid, reactivity, and compatibility. An SDS will also contain
information of proper disposal, personal protective equipment (PPE), and spill-handling procedures.

Ensure that all required safety controls as outlined in the SDS such as using mechanical ventilation and PPE are available and implemented before using the chemical. Information regarding chemical safety measures can be found primarily in Section 8 of the SDS: “Exposure Controls, Personal Protection”. Do not use a hazardous chemical unless all safety measures as directed by the SDS can be followed.

A current SDS must be maintained and accessible onsite for all poisonous, toxic, and hazardous substances. SDSs are intended to provide school personnel and emergency personnel with procedures for handling and disposing of a substance in a safe manner.

The collection of SDSs for all chemicals used in the classroom should be provided in an organized and easily searchable format (e.g., alphabetically filed). Using alphabetical index tabs is recommended as a convenient way to ensure that SDSs can be found quickly in the event of an emergency. They are only useful if they are up-to-date and readily available for those who use them.

Printed copies of SDSs should also be kept on file in a location away from chemical storage (the front office, for example). Digital or electronic versions of SDSs may be approved only at the discretion of the local fire authority. Documentation evidencing approval for electronic maintenance of SDSs must also be kept on file for review.

To obtain a copy of a SDS, contact the chemical manufacturer or visit their website. Many SDSs can also be found online at websites such as Siri MSDS Index. Links to online resources are included below:

- Siri MSDS Index (http://hazard.com/msds/)
- MSDS.COM (http://msds.com)

QUESTION A-5

Have you ensured that chemicals in your laboratories are not stored with incompatible chemicals or in potentially incompatible configurations?

6 CCR 1010-6, sections 6.12.1(D) and 6.12.3(A)

Some chemicals in a laboratory setting are incompatible with each other, and undergo potentially dangerous chemical reactions when mixed. Incompatible chemical reactions may cause an imminent threat to health and safety through an explosion, fire, or formation of toxic materials. Common incompatible storage scenarios include storing bases next to acids, or flammable materials next to oxidizers.

All chemicals and hazardous wastes in your laboratory and storeroom must be separated by reactive groups. Chemical storage shelves should be labeled with the name of the group. Information on reactivity and compatibility issues can be found on a chemical’s SDS, and may also be labeled on the chemicals container. Attachment A provides basic compatibility groups.

QUESTION A-6

Have you specifically addressed all restricted chemicals in the school’s Chemical Hygiene Plan and limited amounts to the allowed quantities where specified?

6 CCR 1010-6, sections 6.12.3(D), 6.12.3(E), and 6.12.1(E)
Restricted chemicals are those chemicals in schools with a hazardous nature, but that may have potential educational utility. Restricted chemicals are restricted by use, and/or specific quantities. If a chemical is restricted by a specific quantity, the chemical name will be followed by the maximum allowed amount in parentheses. The quantity of all restricted chemicals must be limited to an amount that can be used within one calendar year from the date of purchase unless otherwise approved through a variance. Safer and less hazardous alternatives should be purchased and used in place of restricted chemicals whenever feasible.

Chemicals listed as “Demonstration use only” are a subclass in the restricted chemical list that are limited to instructor demonstration. Students may not participate in the handling or preparation of restricted chemicals as part of a demonstration.

Restricted chemicals are listed in the Rules and Regulations Governing Schools in the State of Colorado and are also available here: https://www.colorado.gov/cdphe/school-chemical-management-resources.

The risk associated with the use of restricted chemicals in school laboratories is greatly reduced when effective restricted chemical management practices are implemented including plans for procurement, storage, handling, disposal, and spill response. These chemical management practices must be specifically addressed in the Chemical Hygiene Plan (CHP) for all restricted chemicals present in the school.

A chemical hygiene plan is a document that explains the policies and procedures that will promote the safe operation of the school laboratory. The plan provides specific laboratory practices designed to minimize the exposure of employees and students to hazardous substances. The full list of requirements may be found in the guidance for QUESTION C-1: Chemical Hygiene Plan Requirements.

To address the specific restricted chemical management practices described above, it is recommended that Standard Operating Procedures (SOPs) be prepared for restricted chemicals and included within the CHP. An individual SOP is not required for every restricted chemical used; SOPs can be written in a comprehensive manner that encompasses the same hazards. For example, if a procedure in the lab requires the use of acetone and ethyl acetate, both of which are restricted flammable liquids, one SOP on flammable liquids can be created rather than a separate SOP for both acetone and ethyl acetate. SOP templates for restricted chemicals with the same hazards (e.g., toxic, corrosive, flammable, combustible, water reactive) are available at the following link:

- Restricted Chemical SOP Templates (https://www.colorado.gov/cdphe/schools). Instructions for using the templates are provided at the top of each template. The restricted chemical SOP templates are organized by the general chemical class or the type of hazard(s) associated with the individual restricted chemical. The specific hazard(s) associated with each restricted chemical can be found in the “Hazard**” column next to the restricted chemical located in Appendix B of the school regulations.

QUESTION A-7

Have you ensured that there are no chemicals in your laboratories on the prohibited chemicals list?
6 CCR 1010-6, sections 6.12.3(C) and 6.12.1(F)

Prohibited chemicals are those chemicals that pose an inherent, immediate and potentially life threatening risk to students and staff due to their toxicity or other chemical properties. These
Chemicals are prohibited from use and/or storage at the school and the school is prohibited from purchasing or accepting donations of such chemicals.

Prohibited chemicals are listed in the Rules and Regulations Governing Schools in the State of Colorado and are also available here: [https://www.colorado.gov/cdphe/schools](https://www.colorado.gov/cdphe/schools).

Prohibited chemicals stored onsite at a school are considered wastes because the school is prohibited from using and storing them. Schools must therefore make a hazardous waste determination on these chemicals to determine if they fall under the Colorado Hazardous Waste Regulations. Not all prohibited chemicals meet the criteria of hazardous wastes. In addition, many wastes not found on the prohibited list do meet hazardous waste criteria. It is your school’s responsibility to identify what wastes are hazardous.

A waste can be considered hazardous waste if it meets certain physical characteristics such as ignitability or corrosivity, or if it is listed in hazardous waste regulations. Attachment C of this guidance provides some basic principles of how to make a hazardous waste determination. For more information on how to identify hazardous waste, visit the hazardous waste division’s website at: [https://www.colorado.gov/cdphe/hm](https://www.colorado.gov/cdphe/hm)

The Colorado Hazardous Waste Regulations lay out the requirements for hazardous waste management and disposal in 6 CCR 1007-3, Parts 99, 100, and Parts 262 through 279. The specific requirements that pertain to a generator of hazardous waste are based on the amount of hazardous waste generated monthly or stored onsite. Most, if not all, schools will fall under the status of conditionally exempt small quantity generator as long as they generate less than 100 kg of hazardous waste and less than 1 kg of acutely hazardous waste each month.

Per hazardous waste regulations, at a minimum, schools MUST:
1) make a hazardous waste determination on all wastes;
2) properly dispose of hazardous waste at a permitted facility (no on-site disposal of hazardous waste and no disposal of hazardous waste in the trash); and
3) maintain and operate laboratory and storerooms in a manner that minimizes the possibility of a release, fire, or explosion.

Best management practices for hazardous wastes in schools include:
- labeling containers with the words “hazardous waste”;
- keeping containers closed;
- maintaining containers in good condition;
- separating incompatible wastes;
- following emergency preparedness precautions including naming an emergency coordinator;
- posting emergency contact information; and
- training staff that manage hazardous waste on their responsibilities.

Hazardous wastes can be picked up and transported to a hazardous waste landfill by a registered (“notified”) hazardous waste transporter. You may find a list of registered hazardous waste transporters here: [www.colorado.gov/cdphe/schoolchemicals](http://www.colorado.gov/cdphe/schoolchemicals). You may also check with your local household hazardous waste program to see if they are able to accept hazardous waste from schools.

Beyond the hazardous waste requirements for handling the waste onsite, additional requirements usually apply to hazardous waste transportation. These include the use of a hazardous waste manifest, and Department of Transportation container requirements and placarding. Your registered hazardous waste transporter is familiar with these requirements and should ensure the waste is shipped in accordance with the requirements.
As standard practice, the division will consider all prohibited chemicals stored onsite to be waste. An exception may be allowed if a school arranges for the prohibited chemical to be accepted by another facility for its intended purpose. The prohibited chemical will then be viewed as a product and not a waste. To meet this exclusion, the school must have an arrangement in place with the receiving facility for the timely removal of the chemical from the school. The school must demonstrate the arrangement through appropriate documentation.

QUESTION A-8

If prohibited chemicals are present, are they labeled “Not for Use” or clearly marked to ensure they won’t be utilized prior to proper disposal?
6 CCR 1010-6, section 6.12.3(C)

Prohibited chemicals should be labeled “Not for Use” or clearly marked to ensure they won’t be used. If these chemicals meet the criteria for a hazardous waste they should also be labeled “hazardous waste.”

QUESTION A-9

Have you ensured that chemicals in your laboratories are not stored in inappropriate, damaged, leaking, cracked, or corroded containers?
6CCR 1010-6, section 6.12.3(A) and 6.12.3(H)

Chemicals must be stored in appropriate laboratory grade containers that are in good condition, not leaking, and that are compatible with the contents of the container. The use of household containers such as plastic milk and soda bottles to store chemicals is strictly prohibited. Chemicals stored inappropriately in damaged, leaking, or incompatible containers that are still in use at the school should be transferred immediately to structurally sound and compatible containers as outlined in the school’s Chemical Hygiene Plan. (The full list of requirements may be found in the guidance for QUESTION C-1: Chemical Hygiene Plan Requirements).

Chemicals stored in containers that are damaged, leaking, cracked, or corroded may be considered waste and potentially subject to the Colorado Hazardous Waste Regulations.

QUESTION A-10

Have you ensured that none of the chemicals in your laboratories are past the useful shelf life or expiration date marked on the container label?
6CCR 1010-6, section 6.12.1(A)

Chemicals that are past the manufacturer’s expiration date may become unstable, and are considered waste and subject to hazardous waste regulations.

If you identify a chemical stored past its expiration date, begin managing the material as a waste as outlined in the school’s Chemical Hygiene Plan (The full list of requirements may be found in the guidance for QUESTION C-1: Chemical Hygiene Plan Requirements). Determine whether or not the waste meets the criteria of a hazardous waste as outlined in Attachment C, and if so follow the requirements for your generator status found in the Colorado Hazardous Waste Regulations.
The chemical manufacturer or supplier should provide you with information on the product shelf life. Chemicals with a poor shelf life may degrade quickly and no longer be useful for their original purpose and should be properly disposed of within one year of purchase.

In general, schools should use the following guidelines for shelf life determination:

<table>
<thead>
<tr>
<th>Shelf Life Description</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>Less than one year</td>
</tr>
<tr>
<td>Fair</td>
<td>1 to 3 years</td>
</tr>
<tr>
<td>Good</td>
<td>3 to 5 years</td>
</tr>
<tr>
<td>Excellent</td>
<td>Greater than 5 years</td>
</tr>
</tbody>
</table>

By incorporating shelf-life characterization into the school chemical inventory, schools can better track chemicals with poor shelf life and dispose of them accordingly.

**QUESTION A-11**

Have you ensured that chemicals in your laboratories are not partially or wholly crystallized, solidified, or otherwise changed physically or chemically?  
6CCR 1010-6, section 6.12.1(F)

Certain lab chemicals that have crystallized, solidified, or otherwise changed physically or chemically can be unstable, and form explosive compounds. For example, certain prohibited chemicals including dioxane, ether, tetrahydrofuran, and vinyl chloride, among others, may form explosive peroxides as they age. Exposure to air is necessary to form peroxides, so head space within a container should be minimized.

Chemicals that have crystallized, solidified, or otherwise changed physically or chemically such that the chemicals can no longer be used for their original purpose are considered a waste. As such, schools should begin managing the material as a waste as outlined in the school’s Chemical Hygiene Plan (The full list of requirements may be found in the guidance for QUESTION C-1: Chemical Hygiene Plan Requirements). Schools must determine whether or not the waste meets the criteria of a hazardous waste as detailed in Attachment C. If hazardous wastes are identified follow the requirements for your generator status found in the Colorado Hazardous Waste Regulations. Chemical disposal or removal may create an imminent danger and/or health hazard and should be done only by appropriately trained staff or professionals.

**QUESTION A-12**

Have you ensured that no chemicals are present in your laboratories in amounts that cannot be used in a timely manner, or that are no longer needed, or no longer used?  
6CCR 1010-6, section 6.12.1(A) and 6.12.1(F)

All chemicals stored in amounts that cannot be used within their shelf life, or that are no longer used or needed are considered wastes. A hazardous waste determination must be made as outlined in Attachment C and if hazardous, the chemical must be managed under the requirements found in the Colorado Hazardous Waste Regulations.

Conducting the required yearly chemical inventories, maintaining the school chemical hygiene plan, and avoiding bulk chemical purchases will help your school from having overstocked, unwanted, or unused chemical in your storerooms.
QUESTION A-13

Have you ensured that no restricted chemicals in your laboratories are present in amounts that cannot be used within one calendar year from the date of purchase?
6CCR 1010-6, section 6.12.3(D)

Restricted chemicals are those chemicals in schools with a hazardous nature, but that may have potential educational utility. Restricted chemicals are restricted by use, and/or specific quantities. If a chemical is restricted by a specific quantity, the chemical name will be followed by the maximum allowed amount in parentheses. The quantity of all restricted chemicals must be limited to an amount that can be used within one calendar year from the date of purchase unless otherwise approved through a variance. Safer and less hazardous alternatives should be purchased and used in place of restricted chemicals whenever feasible.

Chemicals listed as “Demonstration use only” are a subclass in the restricted chemical list that are limited to instructor demonstration. Students may not participate in the handling or preparation of restricted chemicals as part of a demonstration.

Restricted chemicals are listed in the Rules and Regulations Governing Schools in the State of Colorado and are also available here:

QUESTION A-14

Have you ensured that there are no other chemicals stored or configured in any manner that may present a risk to human health or the environment?
6 CCR 1010-6, section 6.12.1(A), 6.12.1(D), and 6.12.3(A)

All chemicals and materials associated with the laboratory program must be stored in a manner that minimizes the possibility of a fire, explosion, or any unplanned release that may present a risk to human health or the environment. In general, the following guidelines should be followed:

- Chemicals should be stored in a well ventilated room and out of direct sunlight.
- Storage shelves should be secured to the wall or permanent structure and not overcrowded.
- Care should be taken so that chemicals are stored off the floor but below eye level.
- If metal shelving clips and brackets are used, they should be inspected for signs of corrosion. Corrosion could be a sign of poor ventilation in the storage area. Even as little as one air change per hour can help reduce corrosion although it is recommended that ventilation in the chemical storage area provide a minimum of 4 air changes per hour.

Other chemicals or materials that present potential hazards include cleaning or solvent solutions; combustible gases such as methane; liquid propane or butane; and compressed gases such as oxygen. These materials must be stored in a safe manner in containers that are in good condition and compatible with the contents and away from other incompatible materials. Ensure that all gas cylinders are securely fastened and upright.
Section B - Flammables and Corrosives

QUESTION B-1

Does each classroom, storeroom, and/or vocational area that stores 10 gallons or more of flammable chemicals have an appropriate flammables cabinet?
6 CCR 1010-6, section 6.12.1(D)

Flammable cabinets are required if the school has more than 10 gallons (38.75 L) of flammable or combustible materials within a given room or area. The flammables cabinet should have appropriate labeling indicating it meets NFPA Standard 30 and indicate the maximum amount of chemicals, in gallons, that can be stored in the cabinet.

QUESTION B-2

Are acids and other corrosive chemicals stored in an appropriate corrosives cabinet?
6 CCR 1010-6, section 6.12.1(D) and 6.12.3(A)

Corrosive chemicals should be stored in a dedicated corrosive chemicals cabinet with an interior made of corrosion-resistant material. Containers of corrosive chemicals must be stored so that any spills or leaks will be contained and isolated from other chemicals. If a wood corrosives cabinet is used, the shelves must be lined with polypropylene. If metal corrosive cabinets are used, the cabinet should be in good condition and free from signs of rusting/oxidizing.

Storing acids and bases together in one corrosives cabinet is acceptable if they are physically separated on different shelves or isolated from one another. Bottles may become covered with ammonium chloride from hydrochloric acid and ammonia fumes.

Nitric acid should be stored separately from acetic acid. Acetic acid is both a corrosive and flammable liquid. Nitric acid is a corrosive and a strong oxidizer. When nitric acid and acetic acid are combined, a flash fire will sometimes erupt. Some cabinets have a separate plastic compartment to store nitric acid.
QUESTION C-1

Does the school have a written and complete chemical hygiene plan in place?
6 CCR 1010-6, section 6.12.1(E)

A chemical hygiene plan (CHP) is a written program that promotes the safe management of chemicals for students and staff and promotes a culture of safety within the school. The CHP describes all the following:

- Procedures for general laboratory safety
- Chemical management (including procurement, storage, handling, and disposal)
- Spill response, and
- Procedures for the operation and testing of laboratory chemical hoods and other emergency and safety equipment

A template and further guidance for the development of a chemical hygiene plan can be accessed here: https://www.colorado.gov/cdphe/schools

QUESTION C-2

Is glassware designed for its intended use, in good condition and handled and stored in a safe manner?
6 CCR 1010-6, section 6.12.3(I)

All chemicals should be stored in appropriate laboratory grade containers. Transfer of chemicals to containers other than appropriately designed glassware is prohibited and can cause spills if chemicals erode the container. The use of household containers such as plastic milk and soda bottles to store chemicals is strictly prohibited. Periodically inspect glassware for cracks, chips and defects, replacing when necessary to avoid leaks and spills.
Section D - Ventilation and Fume Hood Use and Design

QUESTION D-1

Are the rooms where chemicals are stored actively ventilated?
6 CCR 1010-6, section 6.12.4(A)

All areas shall be adequately ventilated so that exposures to hazardous or toxic materials are maintained at a safe level. An open window or non-mechanical venting is considered passive ventilation, which is not acceptable.

Ensure that the ventilation system for the storeroom is not tied in with the rest of the school’s ventilation system as this can result in chemical vapors being distributed into other areas of the school. Because most organic vapors are heavier than air, the air should be ventilated by drawing it from the floor level. A minimum of four air changes per hour is recommended.

QUESTION D-2

Are fume hoods used for experiments, solution preparations and demonstrations that produce hazardous, toxic or noxious gases, mists vapors or dusts?
6 CCR 1010-6, section 6.12.4(C)

Sufficient fume hood capacity ventilation shall be provided and shall be used for any activity producing hazardous toxic or noxious gases, mists, vapors or dusts. The school chemical hygiene plan should describe when and for what purposes the fume hood should be used.

QUESTION D-3

Are fume hoods tested for a minimum face velocity of 100 feet/minute, with test results documented appropriately on an annual basis using a recognized standard method?
6 CCR 1010-6, section 6.12.4(C)

Laboratory fume hoods are designed to protect laboratory personnel by preventing contaminants, such as chemical vapors, dusts, mists and fumes, from escaping into the laboratory environment. Face velocity is the rate of flow of air moving into the laboratory hood entrance, usually expressed in feet per minute (fpm). A minimum face velocity of 100 fpm and a maximum of 120 fpm for general laboratory hoods must be provided.

All hoods should have documentation of annual testing and a sticker designating the maximum safe sash height that achieves a face velocity of 100 fpm.

It is important to remember that face velocity is not the only factor contributing to hood performance. Work practices and make-up air also affect performance. The following are best work practices for safe fume hood use:

- Conduct all operations that generate irritating or hazardous air contaminants inside a fume hood.
  Substitute less hazardous materials when possible.
- Minimize sources of turbulence at the hood face (e.g. foot traffic, equipment, fans, moving arms in and out).
• Do not store chemicals or apparatus in the hood. Store hazardous chemicals in an approved safety cabinet.
• When working with open chemicals, reduce the sash as much as possible to maximize hood performance.
• Keep all apparatus and chemicals at least 6 inches back from the front face of the hood.
• Do not use the hood as a waste disposal method (e.g. to volatilize chemicals).
• Keep the sash closed completely when the fume hood is not in use.

**QUESTION D-4**

Do fume hoods exhaust directly to the outside and at least 10 feet away from air intakes or building openings?
6 CCR 1010-6, section 6.12.4(C)

Laboratory fume hoods serve to control exposure to toxic, offensive or flammable vapors, gases and aerosols. Sufficient fume hood capacity ventilation shall be provided and shall be used for any activity producing hazardous, toxic, or noxious gases, mists, vapors, or dusts. Hoods must exhaust directly to the outside and be located a minimum of 10 feet from any building air intakes or building openings.
QUESTION E-1

If corrosive, toxic, or hazardous chemicals are in use, are appropriately designed and accessible eyewash and shower stations installed?
6 CCR 1010-6, sections 6.12.2(E) and 6.12.2(F)

An easily accessible operational eye wash fountain that meets the ANSI Z358.1-2009 Standard must be provided in each laboratory or other areas where corrosives or irritating chemicals are used. The eye wash fountain shall be clean and provide a continual hands-free flow of water. The use of portable eye wash bottles is not permitted. A highly visible sign must mark the eye wash fountain location.

An easily accessible operational safety shower that meets the ANSI Z358.1-2009 Standard, capable of providing continuous flowing water, shall be provided for each laboratory or other areas where corrosive or irritating chemicals are used. The safety shower may be centrally located so as to serve more than one area if doors are not locked, and convenient prompt access is available. A highly visible sign must mark the safety shower location.

Safety showers and eyewash fountains must be easily accessible. Easily accessible means no more than 55 feet from storage or use of corrosive or irritating hazardous chemicals so that it can be reached with impaired vision within 10 seconds or less.

QUESTION E-2

Are eyewash and shower stations tested annually with test results appropriately documented?
6 CCR 1010-6, sections 6.12.2(E), 6.12.2(F), and 6.12.2(J)

Eye wash fountains must be tested on an annual basis and documented with the date, initials of the staff member conducting the test and test results.

To test the eye station:
1. Visually inspect the unit, looking for damage and ensuring that the protective nozzle covers are still in place and functioning correctly. Covers protect the nozzles from dust and other contaminants but should be fitted in such a way as to not require a separate movement to remove them when the eye wash is activated.

2. Test the valve actuation: it should open in one second or less and stay on without being held.

3. Ensure that flushing to both eyes can be provided simultaneously.

4. Measure the flow with a flow meter or use a 1-gallon container. The eyewash should fill a 1 gallon container in 2.5 minutes or less. The flowmeter should show at least 0.4 gallons per minute (gpm).

It is also recommended that the eye wash is flushed until the water runs clean on a monthly basis to relieve the unit of any rust or pipe build-up.

Safety showers must be tested on an annual basis and documented with the date, initials of the staff member conducting the test and test results.

To test safety showers:

1. Visually inspect pipes for leaks and damage. Ensure that the unit is free of any obstructions.

2. Open the valve fully and verify that it stays open without the use of hands.

3. Measure the flow rate. Showers must deliver a minimum of 20 gpm flow. This can be accomplished by using a five-gallon container (with a mark at the three gallon level) and a curtain to channel the flow into the container. After activation, the level on the container should be reached within 9 seconds or less.

**QUESTION E-3**

**When open flames are used, are appropriate fire blankets provided and accessible?**
6 CCR 1010-6, section 6.12.2(C)

An easily accessible fire blanket must be provided in each laboratory or other area where an open flame is used. The fire blanket must be approved by NFPA 45 (Fire retardant treated 100% wool blanket). Any asbestos fire blankets need to be replaced.

**QUESTION E-4**

**Are extinguishers appropriate for the types of chemicals used and located in each laboratory?**
6 CCR 1010-6, section 6.12.2(I)

Extinguishers are required in all laboratories per NFPA 45 Fire Protection for Laboratories Using Chemicals. Dry chemical Class ABC extinguishers are recommended for laboratory use. In addition, if combustible metals (Mg, Na, K) are present, laboratories must have a Class D extinguisher as well.

**QUESTION E-5**

**Are extinguishers inspected annually with results documented?**
6 CCR 1010-6, section 6.12.2(J)
On an annual basis, schools should inspect extinguishers to ensure:

- extinguishers are in their designated places;
- there are no obstructions to access or visibility;
- safety seals are not broken or missing;
- there is no evidence of physical damage, corrosion, leakage or clogged nozzle;
- pressure gauge readings are in the proper range or position;
- operating instructions are legible and facing outward;
- extinguisher appears full - confirmed by weighing or lifting; and
- required maintenance and recharging of extinguisher is completed on-time.

Inspection documentation should include
- name of person conducting the inspection;
- date; and
- result of inspection.

**QUESTION E-6**

When corrosive, toxic or hazardous chemicals are in use, is appropriate protective eyewear used?
6 CCR 1010-6, section 6.12.2(B)

Eye protection that meets the American National Standards Institute's Practice for Occupational and Face Protection, ANSI Z87.1-2010 Standard must be worn by all students participating in, observing, or in close proximity to any experiment or activity which could result in eye injury.

**QUESTION E-7**

Is protective eyewear clean and sanitized if shared among multiple users?
6 CCR 1010-6, section 6.12.2(B)

Eye protection glasses, goggles, face shields, and similar eye protection devices shall be issued clean and properly sanitized and stored in a protected place.

If eyewear is shared and a UV light cabinet is used to sanitize eyewear, check to ensure that the bulbs function and that the cabinet is used in accordance with the instructions. UV lamps are designed to provide light energy of a certain wavelength. As they operate, they slowly lose their effectiveness. Therefore, schools should track the usage and replace the bulb once the lamp reaches the number of hours specified by the manufacturer.

Alcohol wipes or spray is also acceptable for sanitizing eyewear.

**QUESTION E-8**

Are classrooms using Bunsen burners or other equipment supplied with gas, equipped with emergency shut-off switches that are readily available, accessible and labeled for high visibility?
6 CCR 1010-6, section 6.12.2(G)

A master gas control valve (MGCV), is required on gas supply lines to science laboratories. The MGCV shall stop the flow of gas to all appliances/ equipment located in the room and must function as
manually operated emergency gas shut-off. One MGCV shall be provided for each room and made easily accessible. Electric shut-off switches shall be provided in areas where power equipment is used. Master gas valves and electric shut-off switches shall be labeled for high visibility and tested annually with documentation available upon request.

QUESTION E-9

Are emergency shut-off switches tested with results documented annually?
6 CCR 1010-6, sections 6.12.2(G) and 6.12.2(J)

Emergency shut off switches including master gas valves and electrical shut off switches must be tested on an annual basis and the test results documented. Documentation may consist of a tag connected to the shut off switch that shows the date the test was conducted, the name of the person conducting the test, and the test results. A passing result is defined as a valve or switch that, when activated, immediately ceases to supply power or gas to connected equipment.
Attachment A

Incompatibility of Common Laboratory Chemicals

When certain hazardous chemicals are stored or mixed together, violent reactions may occur because the chemicals are unsuitable for mixing, or are incompatible. Classes of incompatible chemicals should be segregated from each other during storage, according to hazard class.

Use the following general guidelines for hazard class storage:
- Flammable/Combustible Liquids and Organic Acids
- Flammable Solids
- Mineral Acids
- Caustics
- Oxidizers
- Perchloric Acid
- Compressed Gases

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Attachment B
Hazardous Waste Determination by School Laboratories

Hazardous waste identification begins with a straightforward point: in order for any material to be a hazardous waste, it must first be a waste. A waste is essentially a thing that someone throws away, an item with no value. A waste can also be abandoned by being burned or incinerated, stored in lieu of disposal, or recycled. That’s right, even materials that are going to be recycled may first have to be managed as waste!

Hazardous wastes can pose a danger to human health and the environment. They can be a solid, semi-solid, a liquid, or a contained gas. The criteria for hazardous waste identification are laid out in the Colorado Hazardous Waste Regulations 6 CCR 1007-3 Part 261, and are covered briefly here. Please visit the Hazardous Materials and Waste Management Division’s website for additional guidance documents on making this determination at http://www.colorado.gov/cs/Satellite/CDPHE-HM/CBON/1251615961696. “Hazardous Waste Identification Guidance Document,” found under Guidance - All Hazardous Waste Generators, is particularly helpful.

A waste can be a hazardous waste if it exhibits certain characteristics or if it is listed in the regulations. These wastes are called “characteristic” and “listed,” and a waste may meet the criteria for one or multiple characteristic descriptions or listings.

Characteristic hazardous wastes are based on properties of the waste such as levels of hazardous constituents, or physical properties such as ignitibility. Generators may use process knowledge or analytical tests to determine the presence of the characteristic. Some hazardous characteristics are defined by a narrative description and do not have a specific test such as those for reactive wastes. Characteristic hazardous wastes carry “D” hazardous wastes codes.

Listed hazardous wastes are listed in Part 261, and include some commonly generated wastes and solvents, wastes from very specific processes and industries, and formulations of specific unused chemicals. Listed hazardous wastes carry “F, K, P” and “U” hazardous wastes codes.

Hazardous Waste Can be One of Two Types

1. **Listed wastes:** Your waste is considered hazardous if it appears on one of four lists in the Colorado Hazardous Waste Regulations. Listed wastes are hazardous regardless of their concentration.

   ◆ **F listed hazardous wastes** are wastes from non-specific sources such as spent solvents or wastewater treatment sludges from electroplating.
      o Common F-listed wastes used in degreasing or used as solvents contain methylene chloride, methyl ethyl ketone, xylene, acetone, or toluene.
◆ **K listed hazardous wastes** are wastes from a *specific* source. For example, wastewater treatment sludge from the production of chrome yellow and orange pigments is listed as K002.

◆ **P and U listed wastes** are off-specification or discarded commercial chemical products or any residue remaining in a container that held commercial chemical products in the P or U listing or, any residue or contaminated media resulting from the cleanup of a spill of a commercial chemical product in the P or U listing.

2. **Characteristic wastes:** Even if a waste does not appear on the list it is considered hazardous if it falls under one of the following hazardous waste categories:

◆ **D001 - ignitable**
  - It is a liquid with a flash point less than 140°F,
  - It is not a liquid but is capable of causing a fire that burns so vigorously that it creates a hazard,
  - Is an oxidizer, or
  - It is an ignitable compressed gas.

◆ **D002 - corrosive**
  - It is a liquid that can dissolves steel at a specified rate, or
  - It is a liquid and has a pH less than or equal to 2 or greater or equal to 12.5.

◆ **D003 - reactive**
  - It is unstable,
  - It is explosive,
  - It undergoes violent change without detonation,
  - It produces toxic gases when mixed with water or other materials, or
  - It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes.
  - The Division holds that waste meets this definition if:
    - It contains a releasable sulfide concentration of 500 mg H₂S/kg, or
    - It contains a releasable cyanide concentration of 250 mg HCN/kg.

◆ **D004 through D043 - toxic**
  - It is a metal, pesticide or organic chemical at high enough concentrations that it fails the Toxicity Characteristic Leaching Procedure (TCLP) test method 1311.
  - Common metals that are hazardous at certain levels are lead, arsenic, barium, chromium, cadmium, silver, and mercury.
Hazardous Waste Determination Resources


◆ Apply knowledge of your process and use Material Safety Data Sheets (MSDS) for information regarding the products you use at your facility.

Be aware that the Material Safety Data Sheets may not provide all the information that you need to make a hazardous waste determination. In most instances OSHA only requires that the MSDS list ingredients that are health hazards if they are 1% or more of the material’s composition (1% = 10,000 parts per million). Therefore, some ingredients in a product that may be a hazardous waste when disposed may not be listed on the Material Safety Data Sheet if they are included in the product at amounts less than 1%. Since it is your responsibility to ensure all your hazardous wastes are managed and disposed of properly, it is wise to send samples to an environmental analytical lab that is familiar with the methods of analysis for hazardous waste, so you can make an accurate hazardous waste determination.

◆ Talk to your school district.

◆ Call the Hazardous Materials and Waste Management Division, Customer Technical Assistance Line at 303-692-3320.