



Corona Fire Department

Chemical Classification Guideline per 2016 California Fire Code

PURPOSE

The intent of this guideline is to provide the minimum standards necessary for the storage, use and handling of flammable and combustible liquids and/or hazardous materials in excess of maximum allowable quantities (MAQ) as identified in 2016 California Fire Code. Failure to comply with these standards shall be due cause for denial or revocation of required permits and filing for civil or criminal prosecution. The Fire Chief may waive any of these requirements upon receipt of alternate methods and materials that meet the intent of these standards.

SCOPE

The classification of hazards for chemicals stored, used, and handled at facilities is required to ensure that proper types of fire and life safety protection systems and procedures are in place. The information supplied by the applicant is also required to determine application of California Fire Code provisions and permit requirements. This information also allows the necessary precautions and safeguards to be taken by first responders to safely and effectively respond to an incident.

GUIDELINES

This guideline is applicable to **any** business storing, using, or handling flammable/combustible and/or hazardous materials. A separate chemical classification must be completed for each building, control area, outside storage area, or other detached structure at a facility, unless otherwise directed by the Hazardous Materials Section of the Fire Prevention Division. This guideline does not include all code requirements; the applicable sections of the California Fire and Building Codes should be consulted.

- A. Specific instructions regarding the completion of this packet are detailed in Attachment 1 of this guideline.
- B. The California Fire Code definitions for hazardous materials, flammable and combustible liquids by both physical and health hazards follow the instructions.
- C. Completed examples and blank forms for completion are provided:
 1. Chemical Classification Forms
 - Blank form
 - Sample form completed
 2. Chemical Classification Summary Totals
 - Sample by hazard classification
 - Sample by building, or area
- D. Fire Code permits will likely be necessary. A permit application shall be submitted to the Fire Prevention Division. Application shall include all provisions from CFC 105.6, CFC Chapters 50 through 67, Chapters 24, 27, 29, 23, 35, and Corona Municipal Code 15.12, as follows:
 1. All information requested on Chemical Classification forms,
 2. A copy of Material Safety Data Sheets (MSDS), unless other arrangements have been made,

3. A scaled site plan (1"=50' is suggested),
 4. Distances from buildings, building openings, property lines, between piles, containers, tanks use and storage areas,
 5. North indicator and legend of symbols,
 6. Vehicular access ways shown,
 7. Fire protection (method of suppression, detection, and notification existing and proposed),
 8. A plan showing secondary containment (diking) as required by the Corona Municipal Code.
- E. Additional information regarding equipment, devices, process and instrumentation diagrams, and/or floor plans may be required for review and approval, depending upon the types of products and/or equipment and the associated physical and health hazards.
- F. Each building, room or area shall be identified by placarding in accordance with National Fire Protection Association (NFPA) Standard 704, Standard System for the Identification of the Hazards of Materials for Emergency Response (2012 edition).
- G. Signage for employees and/or the public shall be included and shall be posted in any language determined appropriate, as applicable, i.e.,

“NO SMOKING – FLAMMABLE LIQUIDS”

- H. Copies of SDS for all permitted materials shall be retained on the premises, a “KNOX BOX” system shall be provided, if determined to be necessary during the analysis of the chemical classification or plan review.
- I. Any installation, system design, tenant improvement and/or equipment shall be in accordance with the approved plans and the requirements in the California Fire Code (CFC), California Building Code (CBC) and nationally recognized standards. Plans for installation of equipment, processes, storage and/or use shall be approved and permitted by the City, prior to commencement of any work or storage of materials.
- J. A Hazardous Materials Business Emergency Plan and Inventory is required to meet Federal and State reporting requirements for hazardous materials exceeding 55 gallons of a liquid, 500 pounds of a solid and 200 cubic feet of a gas. The HMBEP is a related program, but is not used to determine Fire and Building Code compliance issues. The reporting website for regulatory compliance is <https://cers.calepa.ca.gov> This is the California Electronic Reporting System.

CHEMICAL CLASSIFICATION PACKET

Dear Business Owner/Representative:

The classification of all chemicals stored, used, or handled at your facility is required to determine California Fire Code requirements. This information is required regardless of the requirements mandated by Chapter 6.95 of the California Health and Safety Code, as administered by the Corona Fire Department as a participating agency to the Riverside County Department of Environmental Health, for disclosure of hazardous materials exceeding threshold quantities. This information will be used to determine the whether or not your facility exceeds the maximum allowable quantities detailed in Table 5003.1.1(1), Table 5003.1.1(2), Table 5003.1.1(3), Table 5003.1.1(4) and Table 5003.11.1 of the CFC, and the Fire Code permits which will be required for your business. **Frequently, qualified professionals are used for completion of chemical classifications and hazardous materials disclosures.**

Attached are sample chemical classification forms and a list of definitions of hazard classes as defined by the 2016 California Fire Code. Other definitions are included to assist you with completion of the packet. **Each building and/or control area, outside storage area or other detached structure at the facility requires a separate Chemical Classification Packet including a summary sheet for each area, unless otherwise directed by Fire Department Staff.**

The blank chemical classification form included in this packet should be used to classify all chemicals stored, used, or handled at your facility regardless of quantities. The chemical classification form is required for all hazardous materials. The summary totals by hazard classification and/or by building or area are required.

1. Chemical Classification Form
2. Chemical Classification Summary Totals – by hazard classification
3. Chemical Classification Summary Totals – by building, or area

The format used in the samples must be maintained in your documents. **All fields** must be completed. Provide the name of the facility, address, and area addressed by the packet (if applicable) on each page of the Chemical Classification Packet. Use **only** the definitions provided to classify your chemicals into all applicable categories. The forms should be typed or printed legibly. No incomplete forms will be accepted.

Chemical Classification Form, sample #1, is a list of all the chemicals used, stored, or handled at the facility. Example chemicals have been provided with all required fields completed. The following list explains the information required in each field.

- Common or Trade Name: This is the name of the chemical as it appears on the **container label**.
- Chemical Name(s) and %: This is the technical name for the pure chemical. If the chemical is a **mixture**, list the components of the mixture with their percentage of composition. If it is a pure chemical in aqueous solution, list the percent concentration, e.g., sulfuric acid--50%.
- CAS number: The Chemical Abstract number can often be found on the Material Safety Data Sheet. If not, contact the chemical manufacturer for detailed information. There are a wide variety of on-line databases available. Chemical manuals also provide detailed information (see reference list on page 5). **A CAS number must be provided for each component of mixtures, along with the % of concentration.**
- Material Form: Is the product a solid, liquid, or gas? **Solids shall be reported in pounds, liquids reported in gallons, and gases reported in cubic feet. Liquefied petroleum gases and cryogenic liquids must be converted to gallons.**

- Aerosols must be reported in pounds and classified as Level 1, 2, or 3 based on the flammability of the propellant and the product (see definition of aerosol). However, the quantity of nonflammable/combustible components in the aerosol must be reported in gallons, e.g., .016 gallons (2 ounces) of tetramethrin in "Combat Fogger". The .016 gallons of tetramethrin must also be and included in the summary for that/those hazard class(es).
- Quantity Stored: The maximum amount in storage within unopened containers in the building or area.
- Quantity In Use: The maximum amount in use in the process/dispensing area(s) of the building. Also, indicate whether the amount in use is in an open or closed system(s) (see attached definitions).
- Total Quantity: The maximum in use and storage.
- Location: Is the product in a cabinet, lab room, high-piled rack system, open vat, etc. Multiple locations may require separate descriptions.
- Hazard Class(es): All hazard classifications for the chemical must be listed. There may be several applicable classifications. Use the hazard classifications defined in this document.

It is important to list all applicable classifications for each chemical because the code requirements vary for different classifications. If the hazard category includes sub-classes, such as Water-Reactive Class 1, ensure that the appropriate sub-class is identified. We realize that some product Safety Data Sheets (SDS) do not include a list of chemical components. If the manufacturer cannot provide this information, then, you may list specific hazard data used to classify that product, e.g., LD₅₀ value for toxic and highly toxic products, flash point and boiling point for flammable products, etc., and return the SDS with the packet.

Chemical Classification Summary Totals – by **hazard classification**, sample #2, is a list of the chemicals from the Classification Form. To develop this sheet, reorganize the information from the Classification Form and list it by hazard class. The following is a list of the required information:

- Chemical Name
- Amount Stored
- Open System Use Amount (O.S. Use)
- Closed System Use Amount (C.S. Use)
- Location of Storage
- Location of Use
- Totals for Interior Storage
- Totals for Exterior Storage
- Totals for Open System Use
- Totals for Closed System Use
- **Grand Totals by Hazard Class**

Chemical Classification Summary Totals – by building, or area; a sample list of the totals for the building and/or area is also provided. A summary is required depending on the scope, quantity and locations of the chemicals in use or storage.

If upon Fire Department review, there is any question as to the accuracy or completeness of the information provided, a third party technical report may be required at the expense of your business (2016 California Fire Code Sec. 104.7.2).

If you have any questions about these requirements or the information provided, contact the Fire Prevention Division at (951) 736-2220.

Internet Resources for Chemical Classifications, SDS and Chemical Databases:

<http://www.msdssearch.com> MSDS Search - a national repository.

<http://siri.org/msds/index.php> - The "national MSDS site".

<http://msds.ehs.cornell.edu/tscasrch.asp> - Toxic Substances Control Act (TSCA) Chemical Substances Inventory (maintained by Cornell University).

<http://www.epa.gov/enviro/html/emci/chemref/index.html> - EPA Chemical Fact Sheets.

<http://www.cdc.gov/niosh/topics/chemical-safety/> - National Institute for Occupational Health (NIOSH).

REFERENCE BOOKS:

Fluer, Larry, Hazardous Materials Classification Guide, International Fire Code Institute, 5360 Workman Mill Road, Whittier, California, 90601

Lewis Sr., Richard J., Sax's Dangerous Properties of Industrial Materials, 8th ed., Van Nostrand Reinhold Publications, 115 Fifth Avenue, New York, New York 10003

The Merck Index, 10th ed., Merck & Co. Inc., Rahway, New Jersey 07065 (1983)

Sittig, Marshall, Handbook of Toxic and Hazardous Chemicals and Carcinogens, Noyes Publications, Mill Road, Park Ridge, New Jersey 07856

Handbook of Compressed Gases, Compressed Gas Association Inc., 1235 Jefferson Davis Highway, Arlington, Virginia 22202

Fire Protection Guide to Hazardous Materials, 10th ed., National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101 Quincy, Massachusetts 02269

CALIFORNIA FIRE CODE DEFINITIONS FOR HAZARDOUS MATERIALS
BOTH PHYSICAL AND HEALTH HAZARDS

2016 EDITION

EXPLOSIVES

EXPLOSIVE:

A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters and display fireworks, 1.3G.

The term "Explosive " includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G by the hazardous materials regulations of DOTn 49 CFR Parts 100-185.

High explosive. Explosive material, such as dynamite, which can be caused to detonate by means of a No. 8 test blasting cap where unconfined.

Low explosive. Explosive material that will burn or deflagrate when ignited. It is characterized by a rate of reaction that is less than the speed of sound. Examples of low explosives include, but are not limited to, black powder, safety fuse, igniters, igniter cord, fuse lighters, fireworks, 1.3G and propellants, 1.3C.

Mass-detonating explosives. Division 1.1, 1.2 and 1.5 explosives alone or in combination, or loaded into various types of ammunition or containers, most of which can be expected to explode virtually instantaneously when a small portion is subjected to fire, severe concussion, impact, the impulse of an initiating agent or the effect of a considerable discharge of energy from without. Materials that react in this manner represent a mass explosion hazard. Such an explosive will normally cause severe structural damage to adjacent objects. Explosive propagation could occur immediately to other items of ammunition and explosive stored sufficiently close to and not adequately protected from the initially exploding pile with a time interval short enough so that two or more quantities must be considered as one for quantity-distance purposes.

UN/DOTn Class 1 explosives. The former classification system used by DOTn included the terms "high" and "low" explosives as defined herein. The following terms further define explosives under the current system applied by DOTn for all explosive materials defined as hazard Class 1 materials. Compatibility group letters are used in concert with the division to specify further limitations on each division noted (for example, the letter G identifies the material as a pyrotechnic substance or article containing a pyrotechnic substance, and similar materials).

Division 1.1. Explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load simultaneously.

Division 1.2. Explosives that have a projection hazard but not a mass explosion hazard.

Division 1.3. Explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.

Division 1.4. Explosives that pose a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.

Division 1.5. Very insensitive explosives. This division is comprised of substances that have a mass explosion hazard but which are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.

Division 1.6. Extremely insensitive articles which do not have a mass explosion hazard. This division is comprised of articles that contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation.

COMPRESSED GASES

COMPRESSED GAS: A material or mixture of materials which:

- is a gas at 68°F (20°C) or less at 14.7 psia (101.3 kPa) of pressure; and
- has a boiling point of 68°F (20°C) or less at 14.7 psia (101.3 kPa) which is either liquefied, nonliquefied or in solution, except those gases which have no other health or physical hazard properties are not considered to be compressed until the pressure in the packaging exceeds 41 psia (292.5 kPa) at 68°F (20°C).

The states of a compressed gas are categorized as follows:

- Nonliquefied compressed gases are gases, other than those in solution, which are in a packaging under the charged pressure and are entirely gaseous at a temperature of 68°F (20°C).
- Liquefied compressed gases are gases that, in a packaging under the charged pressure, are partially liquid at a temperature of 68°F (20°C).
- Compressed gases in solution are nonliquefied gases which are dissolved in a solvent.
- Compressed gas mixtures consist of a mixture of two or more compressed gases contained in a packaging, the hazard properties of which are represented by the properties of the mixture as a whole.

FLAMMABLE GAS: A material which is a gas at 68°F (20°C) or less at 14.7 psia (101.3 kPa) of pressure [a material has a boiling point of 68°F (20°C) or less at 14.7 pounds per square inch atmosphere (psia) (101.3 kPa)] which:

- is ignitable at 14.7 psia (101.3 kPa) when in a mixture of 13 percent or less by volume with air, or
- has a flammable range at 14.7 psia (101.3 kPa) with air of at least 12 percent, regardless of the lower limit.

The limits specified shall be determined at 14.7 psia (101.3 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E681.

FLAMMABLE LIQUEFIED GAS: A liquefied compressed gas which, under a charged pressure, is partially liquid at a temperature of 68°F (20°C) and which is flammable.

LIQUEFIED PETROLEUM GAS (LPG): A material which is composed predominantly of the following hydrocarbons or mixtures of them: propane, propylene, butane (normal butane or isobutane), and butylenes.

FLAMMABLE and COMBUSTIBLE LIQUIDS

Classify flammable and combustible liquids according to flash point and boiling point.

FLAMMABLE LIQUID: A liquid having a closed cup flash point below 100°F. Class I liquids shall include those having flash points below 100°F and are subdivided as follows:

Class I-A liquids include those having flash points below 73°F and having a boiling point below 100°F.

Class I-B liquids include those having flash points below 73°F and having a boiling point at or above 100°F.

Class I-C liquids include those having flash points at or above 73°F and below 100°F.

COMBUSTIBLE LIQUID: A liquid having a flash point at or above 100°F. Combustible liquids are subdivided as follows:

Class II liquids are those having closed cup flash points at or above 100°F and below 140°F.

Class III-A liquids are those having closed cup flash points at or above 140°F and below 200°F.

Class III-B liquids are those liquids having closed cup flash points at or above 200°F.

FLAMMABLE SOLIDS

FLAMMABLE SOLID: A solid, other than a blasting agent or explosive, that is capable of causing fire through friction, absorption or moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which has an ignition temperature below 212°F (100°C) or which burns so vigorously or persistently when ignited as to create a serious hazard. A chemical shall be considered a flammable solid as determined in accordance with the test method of CPSC 16 CFR; Part 1500.44, if it ignites and burns with a self-sustained flame rate greater than 0.1 inch per second along its major axis.

ORGANIC PEROXIDES

ORGANIC PEROXIDE: An organic compound that contains the bivalent -O-O- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms have been replaced by an organic radical. Organic peroxides can present an explosive hazard (detonation or deflagration) or they can be shock sensitive. They may also decompose into various unstable compounds over an extended period of time.

Descriptions of organic peroxides according to classification:

CLASS I: Class I peroxides are capable of deflagration, but not detonation.

CLASS II: Class II peroxides burn very rapidly and pose a moderate reactivity hazard.

CLASS III: Class III peroxides burn rapidly and pose a moderate reactivity hazard.

CLASS IV: Class IV peroxides burn in the same manner as ordinary combustibles and pose a minimal reactivity hazard.

CLASS V: Class V peroxides burn with less intensity than ordinary combustibles or do not sustain combustion and pose no reactivity hazard.

UNCLASSIFIED DETONABLE: Organic peroxides that are capable of detonation. These peroxides pose an extremely high-explosion hazard through rapid explosive decomposition.

OXIDIZERS

OXIDIZER: A material that readily yields oxygen or other oxidizing gas, or that readily reacts to promote or initiate combustion of combustible materials and, if heated or contaminated, can result in vigorous self-sustained decomposition.

Descriptions of liquid and solid oxidizers according to classification:

CLASS 4: An oxidizer that can undergo an explosive reaction due to contamination or exposure to thermal or physical shock and that causes a severe increase in the burning rate of combustible materials with which it comes into contact. In addition, the oxidizer causes a severe increase in the burning rate and can cause spontaneous ignition of combustibles.

CLASS 3: An oxidizer that causes a severe increase in the burning rate of combustible materials with which it comes in contact.

CLASS 2: An oxidizer that will cause a moderate increase in the burning rate of combustible materials with which it comes in contact.

CLASS 1: An oxidizer that does not moderately increase the burning rate of combustible materials.

PYROPHORIC MATERIALS

PYROPHORIC: A chemical with an autoignition temperature in air, at or below a temperature of 130°F.

UNSTABLE (REACTIVE) CLASSES

UNSTABLE (REACTIVE) MATERIALS: A material, other than an explosive, which in the pure state or as commercially produced, will vigorously polymerize, decompose, condense or become self-reactive and undergo other violent chemical changes, including explosion, when exposed to heat, friction or shock, or in the absence of an inhibitor, or in the presence of contaminants, or in contact with incompatible materials. Unstable (reactive) materials are subdivided as follows:

Descriptions of unstable reactive chemicals according to classification.

CLASS 4: Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures. This class includes materials that are sensitive to mechanical or localized thermal shock at normal temperatures and pressures.

CLASS 3: Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction but which require a strong initiating source or which must be heated under confinement before initiation. This class includes materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures.

CLASS 2: Materials that in themselves are normally unstable and readily undergo violent chemical change, but do not detonate. This class includes materials which can undergo chemical change with rapid release of energy at normal temperatures and pressures, and which can undergo violent chemical change at elevated temperatures and pressures.

CLASS 1: Materials that in themselves are normally stable but which, can become unstable at elevated temperatures and

pressures.

WATER-REACTIVE CLASSES

WATER-REACTIVE SOLID/LIQUID MATERIAL: A material that explodes; violently reacts; produces flammable, toxic or other hazardous gases; or evolves enough heat to cause autoignition or ignition of combustibles upon exposure to water or moisture. Water-reactive materials are subdivided as follows:

Descriptions of water-reactive chemicals according to classification:

CLASS 3: Materials that react explosively with water without requiring heat or confinement.

CLASS 2: Materials that react violently with water or have the ability to boil water. Materials that produce flammable, toxic or other hazardous gases, or evolve enough heat to cause autoignition or ignition of combustibles upon exposure to water or moisture.

CLASS 1: Materials that react with water with some release of energy, but not violently.

CRYOGENIC FLUIDS: A fluid having a boiling point lower than -130°F (-89.9°C) at 14.7 psia.

TOXIC CLASSES

HIGHLY TOXIC MATERIALS: A material which produces a lethal dose or lethal concentration which falls within any of the following categories:

- (a) A chemical that has a median lethal dose (LD₅₀) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams.
- (b) A chemical that has a median lethal dose (LD₅₀) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kg each.
- (c) A chemical that has a median lethal concentration (LC₅₀) in air of 200 ppm by volume or less of gas or vapor, or 2 mg/liter or less of mist, fume or dust, when administered by continuous inhalation for one hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each.

Mixtures of these materials with ordinary materials, such as water, may not warrant classification as highly toxic. While this system is basically simple in application, any hazard evaluation which is required for the precise categorization of this type of material shall be performed by experienced, technically competent persons.

TOXIC MATERIAL: A chemical falling within any of the following categories:

- (a) A chemical that has a median lethal dose (LD₅₀) of more than 50 mg/kg but not more than 500 mg/kg of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
- (b) A chemical that has a median lethal dose (LD₅₀) of more than 200 mg/kg but not more than 1,000 mg/kg of body weight when administered by continuous contact for 24 hours, (or less if death occurs within 24 hours) with bare skin of albino rabbits weighing between 2 and 3 kilograms each.
- (c) A chemical or substance that has a median lethal concentration (LC₅₀) in air more than 200 ppm but not more than 2,000 ppm by volume of gas or vapor, or more than 2 mg/L but not more than 20 mg/L of mist, fume or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

CORROSIVES

CORROSIVE: A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the point of contact. A chemical shall be considered to be corrosive if, when tested on the intact skin of albino rabbits

by the method described DOTn 49 CFR 173.137, such chemical destroys or changes irreversibly the structure of the tissue at the point of contact following an exposure period of 4 hours. This term does not refer to action on inanimate surfaces.

AEROSOLS

AEROSOLS: A product which is dispensed from an aerosol container by a propellant. Aerosol products shall be classified by means of the calculation of their chemical heats of combustion and shall be designated Level 1, Level 2 or Level 3.

Level 1 aerosol products: Those with a total chemical heat of combustion that is less than or equal to 8,600 British thermal units per pound (Btu/lb).

Level 2 aerosol products: Those with a total chemical heat of combustion that is greater than 8,600 Btu/lb, but less than or equal to 13,000 Btu/lb.

Level 3 aerosol products: Those with a total chemical heat of combustion that is greater than 13,000 Btu/lb.

For classification of aerosols, refer to the following table.

CLASSIFICATION OF AEROSOL PRODUCTS

CHEMICAL HEAT OF COMBUSTION		Aerosol Classification
Greater than (Btu/lb)	Less than or equal to (Btu/lb)	
0	8,600	1
8,600	13,000	2
13,000	-	3

MISCELLANEOUS DEFINITIONS:

The following definitions will assist you in completing the chemical classification forms. These are not hazard classes and should not appear on forms.

LIQUID: A material having a melting point that is equal to or less than 68°F (20°C) and a boiling point which is greater than 68°F (20°C) at 14 psia. When not otherwise identified, the term "liquid" includes both flammable and combustible liquids.

REACTIVE MATERIAL: A material, which can enter into a hazardous chemical reaction with other stable or unstable materials.

OPEN SYSTEM: Use of a solid or liquid hazardous material involving a vessel or system that is continuously open to the atmosphere during normal operations and where vapors are liberated, or the product is exposed to the atmosphere during normal operations. Examples of open systems for solids and liquids include dispensing from or into open beakers or containers, dip tank and plating tank operations.

CLOSED SYSTEM: The use of a solid or liquid hazardous material involving a closed vessel or system that remains closed during normal operations where vapors emitted by the product are not liberated outside of the vessel or system and the product is not exposed to the atmosphere during normal operations; and all uses of compressed gases. Examples of closed systems for solids and liquids include product conveyed through a piping system into a closed vessel, system or piece of equipment.

DETONATION: An exothermic reaction characterized by the presence of a shock wave in a material, which establishes and maintains the reaction. The reaction zone progresses through the material at a rate greater than the velocity of sound. The principle heating mechanism is one of shock compression. Detonations have an explosive effect.

DEFLAGRATION: An exothermic reaction, such as the extremely rapid oxidation of a flammable dust or vapor in air, in which the reaction progresses through the unburned material at a rate less than the velocity of sound. A deflagration can have an explosive effect.

CONTROL AREA: Spaces within a building where quantities of hazardous materials not exceeding the maximum

allowable quantities per control area are stored, dispensed, used or handled.

OUTDOOR CONTROL AREA: An outdoor area that contains hazardous materials in amounts not exceeding the maximum allowable quantities of Table 5003.1.1(3) or 5003.1.1(4).

PHYSICAL HAZARD: A chemical for which there is evidence that it is a combustible liquid, cryogenic fluid, explosive, flammable (solid, liquid or gas) organic peroxide (solid or liquid), oxidizer (solid or liquid), oxidizing gas, pyrophoric (solid, liquid or gas), unstable (reactive) material (solid, liquid or gas) or water-reactive material (solid or liquid).

HEALTH HAZARD: A classification of a chemical for which there is statistically significant evidence that acute or chronic health effects are capable of occurring in exposed persons. The term "health hazard" includes chemicals that are toxic, highly toxic and corrosive.

Chemical Classification Form

COMMON NAME	CHEMICAL NAME and % composition	CAS# ¹	MATERIAL FORM; solid, liquid, or gas	QUANTITY STORED ²	QUANTITY IN USE ² (Open vs. Closed)	TOTAL QUANTITY ² (Storage & Use)	LOCATION(S) (Storage & Use)	FIRE CODE HAZARD CLASSES; see definitions

¹ % of concentration per CAS #, from MSDS sheets

² Quantities of products shall be represented in pounds for solids, gallons for liquids, and cubic feet for gases

Chemical Classification Form – Completed Sample

COMMON NAME	CHEMICAL NAME and % composition	CAS# ¹	MATERIAL FORM: solid, liquid, or gas	QUANTITY STORED ³	QUANTITY IN USE ² (Open vs. Closed)	TOTAL QUANTITY ² (Storage & Use)	LOCATION(S) (Storage & Use)	FIRE CODE HAZARD CLASSES; Physical & Health Hazards
Acetic Acid	Acetic Acid, Glacial – 100%	64-19-7	Liquid	15 gal	5 gal, Open System	20 gal	Stor: Flam Cab Use: Wet Process	Class II Combustible/Corrosive
Acetone	2-propanone	67-64-1	Liquid	55 gal	10 gal, Open System	65 gal	Stor: Exter Stor Use: H-2 Room	Class I-B Flammable
Acetylene, Compressed	Acetylene – 100%	74-86-2	Gas	200 cf	200 cf, Closed System	400 cf	Stor: Weld Shop, Use: Weld Shop	Flammable Gas/Class 1 Unstable Reactive
Benzene	Benzene	74-13-2	Liquid	5 gal	1 gal, Open System	6 gal	Stor: Flam Cab Use: Lab	Class I-B Flammable
Formaldehyde with Methanol	Formaldehyde 37%, Methanol 15%, Water 52%	50-00-0 67-56-1	Liquid	110 gal	55 gal, Open System	165 gal	Stor: Exter Stor Use: H2 Room	Class II Combustible/Toxic
Hydrochloric Acid	Hydrochloric Acid – 100%	7647-01-0	Liquid	300 gal	55 gal, Closed System	355 gal	Stor: Corr Stor Use: Wet Process	Corrosive
Isopropanol	Isopropyl Alcohol – 100%	67-63-0	Liquid	15 gal	3 gal, Open System	18 gal	Stor: Flam Cab Use: Lab	Class I-B Flammable
Nitric Acid	Nitric Acid 10% Water 90%	7697-37-2	Liquid	55 gal	10 gal, Open System	65 gal	Stor: Corr Stor, Use: Wet Process	Class 1 Oxidizer/Corrosive
Sodium Dichromate	Sodium dichromate, anhydrous	10588-01-9	Solid	50 lb	10 lb, Open System	60 lb	Stor: H-4 Room Use: H-4 Room	Corrosive / Highly Toxic /Class 1 Oxidizer

¹ % of concentration per CAS #, from MSDS sheets

³ Quantities of products shall be represented in pounds for solids, gallons for liquids, and cubic feet for gases

SAMPLE

CHEMICAL CLASSIFICATION SUMMARY – BY HAZARD CLASSIFICATION

HAZARD CLASS: Class I-B Flammable Liquid

<u>Chemical Name</u>	<u>Amt Stored</u>	<u>O.S. Use</u>	<u>C.S. Use</u>	<u>Total quantity</u>	<u>Location of Storage</u>	<u>Location of Use</u>
Acetone	55 gal	10 gal	0 gal	10 gal	Exterior Storage	H-2 Room
Benzene	5 gal	1 gal	0 gal	6 gal	Flammable Cabinet	H-2 Room
Isopropyl Alcohol	15 gal	3 gal	0 gal	18 gal	Flammable Cabinet	Laboratory

Interior Storage: 20 gal Exterior Storage: 55 gal Open System Use: 14 gal Closed System Use: 0 gal

HAZARD CLASS: Class II Combustible Liquid

<u>Chemical Name</u>	<u>Amt Stored</u>	<u>O.S. Use</u>	<u>C.S. Use</u>	<u>Total quantity</u>	<u>Location of Storage</u>	<u>Location of Use</u>
Acetic Acid	15 gal	5 gal	0 gal	20 gal	Flammable Cabinet	Wet Process
Formaldehyde Mixture	110 gal	55 gal	0 gal	165 gal	Exterior Storage	H-2 Room

Interior Storage: 0 gal Exterior Storage: 110 gal Open System Use: 60 gal Closed System Use: 0 gal

HAZARD CLASS: Flammable Gas

<u>Chemical Name</u>	<u>Amt Stored</u>	<u>O.S. Use</u>	<u>C.S. Use</u>	<u>Total quantity</u>	<u>Location of Storage</u>	<u>Location of Use</u>
Acetylene	200 cf	0 cf	200 cf	200 cf	Weld Shop	Weld Shop

Interior Storage: 200 cf Exterior Storage: 0 gal Open System Use: 0 cf Closed System Use: 200 cf

HAZARD CLASS: Class 1 Oxidizer

<u>Chemical Name</u>	<u>Amt Stored</u>	<u>O.S. Use</u>	<u>C.S. Use</u>	<u>Total quantity</u>	<u>Location of Storage</u>	<u>Location of Use</u>
Nitric Acid	55 gal	10 gal	0 gal	65 gal	Corrosive Storage	Wet Process
Sodium Chromate	50 lb	10 lb	0 lb	60 lb	H-4 Room	H-4 Room

Interior Storage: 55 gal/50 lb Exterior Storage: 0 gal/0 lb Open System Use: 10gal/10 lb Closed System Use: 0 gal/lb

SAMPLE

HAZARD CLASS: Class 1 Unstable Reactive

<u>Chemical Name</u>	<u>Amt Stored</u>	<u>O.S. Use</u>	<u>C.S. Use</u>	<u>Total quantity</u>	<u>Location of Storage</u>	<u>Location of Use</u>
Acetylene	200 cf	0 cf	200 cf	200 cf	Weld Shop	Weld Shop

Interior Storage: 200 cf Exterior Storage: 0 gal Open System Use: 0 cf Closed System Use: 200 cf

HAZARD CLASS: Class 1 Water Reactive

<u>Chemical Name</u>	<u>Amt Stored</u>	<u>O.S. Use</u>	<u>C.S. Use</u>	<u>Total quantity</u>	<u>Location of Storage</u>	<u>Location of Use</u>
Sodium Hydroxide	50 lb	7 lb	0 lb	57 lb	Corrosive Storage	Wet Process

Interior Storage: 50 lb Exterior Storage: 0 lb Open System Use: 7 lb Closed System Use: 0 lb

HAZARD CLASS: Highly Toxic

<u>Chemical Name</u>	<u>Amt Stored</u>	<u>O.S. Use</u>	<u>C.S. Use</u>	<u>Total quantity</u>	<u>Location of Storage</u>	<u>Location of Use</u>
Sodium Chromate	50 lb	10 lb	0 lb	60 lb	H-4 Room	H-4 Room

Interior Storage: 50 lb Exterior Storage: 0 lb Open System Use: 7 lb Closed System Use: 0 lb

HAZARD CLASS: Toxic

<u>Chemical Name</u>	<u>Amt Stored</u>	<u>O.S. Use</u>	<u>C.S. Use</u>	<u>Total quantity</u>	<u>Location of Storage</u>	<u>Location of Use</u>
Formaldehyde Mixture	110 gal	55 gal	0 gal	165 gal	Exterior Storage	H-2 Room

Interior Storage 0 gal Exterior Storage: 110 gal Open System Use: 55 gal Closed System Use: 0 gal

SAMPLE

HAZARD CLASS: Corrosive

Chemical Name	Amt Stored	O.S. Use	C.S. Use	Total quantity	Location of Storage	Location of Use
Acetic Acid	15 gal	5 gal	0 gal	20 gal	Flammable Cabinet	Wet Process
Hydrochloric Acid	300 gal	0 gal	55 gal	355 gal	Corrosive Storage	Wet Process
Nitric Acid	55 gal	10 gal	0 gal	65 gal	Corrosive Storage	Wet Process
Sodium Chromate	50 lb	10 lb	0 lb	60 lb	H-4 Room	H-7 Room
Sodium Hydroxide	50 lb	7 lb	0 lb	57 lb	Corrosive Storage	Wet Process

Interior Storage: 370 gal/ 100 lb Exterior Storage: 0 gal/0 lb Open System Use: 15 gal/17 lb Closed System Use: 55 gal/0 lb

SAMPLE

CHEMICAL CLASSIFICATION SUMMARY – BY AREA

Class I-B Flammable:

Interior Storage: 20 gal
Exterior Storage: 55 gal
Open System Use 14 gal

Flammable Gas:

Interior Storage: 200 cf
Closed System Use: 200 cf

Class 1 Water Reactive:

Open System Use: 0 gal, 7 lb

Toxic:

Exterior Storage: 110 gal
Open System Use: 55 gal

Corrosive:

Interior Storage: 370 gal, 100 lb
Open System Use: 15 gal, 27 lb
Closed System Use: 55 gal, 0 lb

Class II Combustible:

Exterior Storage: 110 gal
Open System Use: 60 gal

Class 1 Oxidizer:

Interior Storage: 55 gal, 50 lb
Open System Use: 10 gal, 10 lb

Class 1 Unstable Reactive:

Interior Storage: 200 cf
Closed System Use: 200 cf

Highly Toxic:

Interior Storage: 50 lb
Open System Use: 10 lb

SAMPLE

Interior Storage:

Flam 1B liq	20 gal
Flam Gas	200 cf
Class 1 Oxidizer	55 gal, 50 lb
Class 1 Unstable Reactive	200 cf
Corrosive	370 gal, 100 lb
Highly Toxic	50 lb

Open System Use:

Flam 1B liq	14 gal
Class 1 Water-Reactive	7 lb
Toxic	55 gal
Corrosive	15 gal, 27 lb
Comb 11 liq	60 gal
Class 1 Oxidizer	10 gal, 10 lb
Highly Toxic	10 lb

Closed System Use:

Flam gas	200 cf
Corrosive	55 gal
Class 1 Unstable Reactive	200 cf

INTERIOR TOTAL: ** CLOSED SYSTEM USE MAY BE INCLUDED IN STORAGE TOTALS; CONSULT CFC FOR DETAILS

Flam 1B liq	34 gal
Class 1 Water-Reactive	7 lb
Toxic	55 gal
Corrosive	440 gal, 127 lb
Comb 11 liq	60 gal
Class 1 Oxidizer	65 gal, 60 lb
Highly Toxic	60 lb
Flam gas	200 cf
Class 1 Unstable Reactive	200 cf

Exterior Storage:

Flam 1B liq	55 gal
Comb 11 liq	110 gal
Toxic	110 gal