

**Moreno Valley Fire Department
Fire Prevention Bureau**

Chemical Classification Guideline



Approved and Authorized By:

Doug Bloom, Fire Marshal

Issued: January 1st 2023

Chemical Classification Guideline

Purpose:

The classification of hazards for chemicals stored, used, and handled at facilities is required to ensure that appropriate 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 the California Building Code (CBC), and California Fire Code (CFC) 2022 edition.

Scope:

These requirements are applicable to any business storing, using, or handling hazardous materials within the Riverside County Fire Department's jurisdiction. By completing a Chemical Classification and Quantification Packet, the hazardous materials inventory statement requirement in the California Fire Code, 2022 Edition is satisfied.

Guidelines:

Applicability

- A. A separate Chemical Classification Packet must be completed for each building, control area, outside storage area, or other detached structure at a facility.
- B. Specific instructions regarding the completion of this packet are detailed in the following Chemical Classification Packet.

Chemical Classification Packet

Date: _____
Facility Name: _____
Address: _____
Permit # _____
(if applicable) _____

Dear Architect/Business Owner:

The Classification of all chemicals stored, used, or handled at your facility is required prior to approval of any plans and/ or permits. This information will be used to determine application of California Fire Code provisions and permit requirements. This information is required regardless of your status with the Hazardous Materials Disclosure Office (the "Administering Agency" mandated by the California Health and Safety Code which require disclosure of chemicals in quantities exceeding specific threshold quantities). If no chemicals or other hazardous materials will be used, stored, or handled at the facility, a signed statement from the business owner or property manager will be accepted in lieu of this classification 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.

Use the samples provided as a guideline for your own documents. 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, these definitions come directly from the California Fire Code, 2022 Edition. No incomplete forms will be accepted.

Classification Form, sample #1, is a list of all the chemicals used, stored, or handled at the facility (this sample is for a single control area within a building). 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 composition. If it is a pure chemical, list the percent concentration, e.g. sulfuric acid-50%.
- CAS number: The Chemical Abstract number can sometimes be found on the Material Safety Data Sheet. If not, a chemical manual should provide this information. A CAS number must be provided for each component of mixtures.

- **Material form:** Is the product a solid, liquid or gas? **Solids shall be reported in pounds, liquid 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 included in the summary for that/those hazard class (es).

- **Quantity Stored:** The amount in storage within unopened containers in the building or area.
- **Quantity in Use:** The 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).
- **Location:** Is the product in a cabinet, lab room, high-piled rack system, open vat, etc.
- **Hazard Class(es):** All hazard classifications for the chemical must be listed. There may be several applicable classifications.

Please return the completed chemical classification forms, summary sheets, color coded floor plan and Materials Safety Data Sheets (MSDS) as soon as possible so that your plan review and/ or permit will not be delayed. If you have any questions about these requirements or the information provided, please contact your local office as noted on page 1 of this document.

Respectfully,

Doug Bloom
Fire Marshal

California Fire Code, 2022 Edition, Definitions for Physical and Health Hazards

EXPLOSIVES: 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.

COMPRESSED GAS: A material or mixture of materials which:

1. Is a gas at 68°F (20°C) or less at 14.7 psia (101 kPa) of pressure; and
2. Has a boiling point of 68° F (20°C) or less at 14.7 psia (101 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 exceed 41 psia (282 kPa) at 68°F (20°C).

The states of a compressed gas are categorized as follow:

1. Non-liquefied 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).
2. Liquefied compressed gases are gases that in a packaging under the charged pressure are partially liquid at a temperature of 68°F (20°C).
3. Compressed gases in solution are non-liquefied gases that are dissolved in a solvent.
4. Compressed gas mixtures consist of a mixture of two or more compressed gases contained in 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 kPa) of pressure [a material has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa)] which:

1. Is ignitable at 14.7 psia (101 kPa) when a mixture of 13 percent or less by volume with air or
2. Has a flammable range at 14.7 psia (101 kPa) with air of at least 12 percent, regardless of the lower limit.

The limits specified shall be determined at 14.7 psia (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM-E 681.

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 LIQUID: A liquid having a closed cup flash point below 100°F. Flammable liquids are further categorized into a group known as Class I Liquids. The Class I category is 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 closed cup flash point at or above 100°F. Combustible liquids are subdivided as follows:

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

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

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

FLAMMABLE SOLID: A solid, other than a blasting agent or explosive, that is capable of causing fire through friction, absorption of moisture, spontaneous chemical change or retained heat from manufacturing or processing, or which has an ignition temperature below 212° F., or which burns so vigorously or persistently when ignited that it created a serious hazards. 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 at a rate greater than .0866 inch (2.2 mm) per second along its major axis.

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 peroxide may present an explosive hazard (detonation or deflagration) if they may be shock sensitive. They can also decompose into various unstable compounds over an extended period of time.

Classification of organic peroxides according to hazard:

Class I: Describes those formulations that are capable of deflagration but not detonation.

Class II: Describes those formulations that burn very rapidly and that pose a moderate reactivity hazard.

Class III: Describes those formulations that burn rapidly and that pose a moderate reactivity hazard.

Class IV: Describes those formulations that burn in the same manner as ordinary combustibles and that pose a minimal reactivity hazard.

Class V: Describes those formulations that burn with less intensity than ordinary combustibles or do not sustain combustion and that pose no reactivity hazard.

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.

Classification of liquid and solid oxidizers according to hazard:

Class 4: An oxidizer that can undergo an explosive reaction due to contamination or exposure to thermal or physical shock and that cause severe increase in the burning rate of combustible materials with which it comes into contact. Additionally, 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 material with which it comes in contact.

Class 2: An oxidizer that can cause a moderate increase in the burning rate or that may cause spontaneous ignition of combustible materials with which it comes in contact.

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

Unstable (Reactive) Classes

UNSTABLE 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.

Classification of unstable reactive chemicals according to hazard

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

Class 3: Materials which in themselves are capable of detonation or of 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 that can undergo chemical change with rapid release of energy at normal temperatures and pressures, and that 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 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:

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 may react with water with some release of energy but not violently.

CRYOGENIC FLUIDS: a fluid having a boiling point lower than -130 °F at 14.7 pounds per square inch atmosphere (psia). (an absolute pressure of 101.3 kPa)

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

1. A chemical that has a median lethal dose (LD50) of 50mg per kg or less of body weight when administered orally to albino rats weighing between 200 and 300 grams.
2. A chemical that has a median lethal dose (LD50) of 200 mg per kg or less 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.
3. 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 to 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 that is required for the precise categorization of the type of material shall be performed by experienced, technically competent persons.

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

1. A chemical or substance that has a median lethal dose (LD50) of more the 50 mg/kg but not more than 500mg/kg of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
2. A chemical or substance 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.
3. A chemical or substance that has a median lethal concentration (LD50) 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.

RADIOACTIVE MATERIAL: A material or combination of materials that spontaneously emit ionizing radiation.

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 corrosive if, when tested on the intact skin of albino rabbits by the method described in DOTn 49 C.F.R.173.137, such chemical destroys or changes irreversibly the structure of the tissue at the site of contact following an exposure period of four hours. This tem does not refer to action on inanimate surfaces.

AEROSOLS: A product that 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 (Btu/lb)

Level 2 aerosol products Those with a total chemical heat of combustion that is greater than 8,600 units (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.

Miscellaneous Definitions:

The following Definitions will assist you in completing the Chemical classification forms. However 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 and a boiling point which is greater than 68 ° F at 14.7 psia. When not otherwise identified, the term 'liquid' includes both flammable and combustible liquids.

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

OPEN SYSTEM: The 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 the material which establishes and maintains the reaction. The reaction zone progresses through the material at a rate greater than the velocity of sound. The principal 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 vapors 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.

Floor Plan Required

A color coded floor plan is required with all hazardous materials inventory statement reports. ***The floor plan needs to show locations of all the chemicals being stored, whether they are in use, storage or packaged for retail sales.*** The floor plan needs to be color coded for the different chemicals that are stored. For materials with multiple hazards, color code according to the most hazardous component. If the commodities are stored on racks, please show the racks on the floor plan with the commodity location on the racks. The commodity classification legend that needs to be shown on the floor plan is as follows:

Sample legend. Please include a color coded legend of this type on the floor plan.

LEGEND			
COMBUSTIBLE LIQUIDS		CORROSIVES	
FLAMMABLE LIQUIDS		TOXICS	
AEROSOLS		OXIDIZERS	
FLAMMABLE GAS			

QUANTITY SUMMARY BY HAZARD REPORT					Control Area # _____					
Client:					Date:					
Project Description:					Generated for:					
HEALTH OR PHYSICAL HAZARD	IN USE OPEN SYSTEM			IN USE CLOSED SYSTEM			IN STORAGE			
	CLASS	SOLID	LIQUID	GAS	SOLID	LIQUID	GAS	SOLID	LIQUID	GAS
Carcinogen										
Corrosive										
Toxic										
Irritant										
Sensitizer										
Health Hazard										
Combustible Liquid	II									
	III-A									
	III-B									
Flammable Solid										
Flammable Gas (Liquefied)										
Flammable Liquid	I-A									
	I-B									
	I-C									
Combination	I-A-I-C,II, III-A									

Solids listed in pounds, Liquids listed in gallons {pounds}

QUANTITY SUMMARY BY HAZARD REPORT					Control Area # _____					
Client:					Date:					
Project Description:					Generated for:					
HEALTH OR PHYSICAL HAZARD	IN USE OPEN SYSTEM			IN USE CLOSED SYSTEM			IN STORAGE			
	CLASS	SOLID	LIQUID	GAS	SOLID	LIQUID	GAS	SOLID	LIQUID	GAS
Oxidizers	3									
	2									
	1									
Oxidizing Gas										
Unstable	2									
	1									
Water Reactive	2									
	1									
Aerosols	Level 3									
	Level 2									
	Level 1									

Solids listed in pounds, Liquids listed in gallons {pounds}