Orange County Fire Authority

Community Risk Reduction

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Completion of the Chemical Classification

Guideline G-04

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Completion of the Chemical Classification

1. PURPOSE

This guideline was developed to assist businesses in complying with the provisions of Chapter 50 of the 2025 California Fire Code (CFC). It is applicable to any business storing, using, or handling hazardous materials. Hazardous materials are chemicals that pose a physical hazard (like fire or explosion) or a health hazard (like toxic or corrosive). This guide treats hazardous waste as a hazardous material. This Chemical Classification meets the requirements of the Hazardous Materials Inventory Statement (HMIS) in the CFC.

2. SCOPE

All chemicals need to be classified with respect to their individual hazards, so a determination can be made relative to the Maximum Allowable Quantity (MAQ). This will allow the proper fire and life safety protection systems to be in place. OCFA will perform a MAQ review taking into account: controls areas, open vs. closed use, and indoor vs. outside storage.

3. SUBMITTAL REQUIREMENTS

Refer to OCFA Guideline A-02 for submittal process and requirements.

4. PLAN REQUIREMENTS

4.1 OCFA REVIEW - Attached are sample chemical classification forms, an explanation of the fields requiring completion, and a list of hazard classes as defined by the 2025 CFC. This guideline should be used to classify all chemicals stored, used, or handled at your facility *regardless of the quantities of each chemical.* The following three separate lists require completion for each Chemical Classification:

- Chemical Classification Form (shows entire inventory)
- Chemical Classification Summary Sheet (shows totals by hazard class)
- Chemical Classification Summary Totals (shows totals by storage area)

Safety Data Sheets (SDS/MSDS) shall be submitted along with the contact information from the preparer of the chemical information. A basic floor plan drawing of the facility is required to show chemical storage and use locations, and any special control areas.

4.2 MIXTURES - Classifying the hazards of mixtures can be complicated, especially if the individual components themselves have multiple hazards. Dilution almost always lessens the hazard of pure chemicals. Information listed on the SDS/MSDS may not be specific to the diluted mixture. Sometimes they list data from one of the most hazardous components instead. OCFA will make the final determination of the most appropriate hazard class.

If there is any question as to the accuracy or completeness of the information provided, you will be required to make corrections and resubmit your Chemical Classification. A third-party technical or engineering report may be required if your chemical information cannot be verified.

4.3 FORMS - Use the three sample forms in completing your own documents and assure all fields are completed. Provide the name of the facility, address, and area addressed by the guideline, if applicable, on each page of the Chemical Classification. Use only the definitions in the fire code to classify your chemicals into all applicable categories. Incomplete or incorrect forms may be returned.

4.3.1 Chemical Classification Form - Sample #1 in this document shows a list of all the chemicals used at a sample facility (a blank version of this form has been included at the end of this guideline for your information). Examples of chemicals have been provided with all data fields completed.

Note: Chemicals that have the same components and hazard classes may be grouped together. For example, if 10 gallons of blue paint and 20 gallons of red paint have the same basic components, they can be listed as 30 gallons of paint. In addition, all items such as motor oil, hydraulic fluid, antifreeze, waste motor oil, etc. are all classified as Class IIIB Combustible Liquids and can be grouped together under the heading, CL-IIIB Liquids. Conversely, if you have several containers of isopropyl alcohol at different concentrations, list these separately as they may be classified differently based on the individual flash points.

The following list explains the information required in each field:

COMMON NAME	CHEMICAL NAME	% COMP	CAS #	FORM	QUANT. STORED	QUANT. IN USE (Open/Closed)	LOCATION (Storage & Use)	HAZ CLASSES	JUSTIFICATION

4.3.1.1 Common Name: This is the name of the chemical as it is used in your industry. Sometimes it will be a trade name, such as Purple K®, WD40, Techron, muriatic pool acid, or “Safety Kleen.”

4.3.1.2 Chemical Name and %: This is the technical name for the *pure* chemical. If the chemical is a mixture, list the components of the mixture *with their composition percentage*. If it is a pure chemical, list the percent concentration as 100%. If the product is a water solution, list the percent concentration.

4.3.1.3 CAS Number: The Chemical Abstract Service number can usually be found on the SDS/MSDS or from the chemical supplier.

4.3.1.4 Form of a product: The form of a product is: solid, liquid, gas, or aerosol. Solids shall be reported in pounds, liquids in gallons, and gases in cubic feet. Liquefied petroleum gas (LPG) and cryogenic liquids are treated as liquids and reported in gallons. Aerosols shall be reported in pounds. For example, if some of the components in an aerosol make it toxic or corrosive, then that aerosol amount must also be included in the summary table for those hazard classes, in gallons.

4.3.1.5 Quantity Stored: Total amount within *closed* containers in the building or area.

4.3.1.6 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.

4.3.1.7 Location: In a cabinet, QC lab, high-piled rack system, outside tank, etc.

4.3.1.8 Hazard Classes: There are often several hazards for each chemical (classifications may be abbreviated in Attachment 1). All hazard classifications for the chemical must be listed. Carcinogens, Irritants, Other Health Hazards, Radioactive, and Sensitizers, are no longer regulated by the Fire Code; there is no need to show the totals for these chemicals (see Sample #3).

4.3.1.9 Justification: This column can be used to indicate where you obtained the information for the classification of the material. For example, if you classified a chemical as toxic, provide the LD_{50} data, likewise for corrosives and flammables the pH or the flash point data.

4.3.2 Chemical Classification Summary Sheet - Sample #2 shows a list of the chemicals from the sample Chemical Classification Form. To develop this sheet, reorganize the information from the Chemical Classification Form and sort the information by hazard class. The following is a list of the required information:

Chemical Name	Amount Stored	Open Use	Closed Use	Location of Storage	Location of Use

- Chemical Name
- Amount Stored
- Open System Use Amount
- Closed System Use Amount
- Location of Storage
- Location of Use
- Totals for Interior Storage
- Totals for Exterior Storage
- Totals for Open System Use
- Totals for Closed System

NOTE: Chemicals with multiple hazards are listed under each hazard classification (example is concentrated sulfuric acid is corrosive, toxic, and class 1 water-reactive).

4.3.3 Chemical Classification Summary Totals - Sample #3 shows a list of the totals by hazard classification for a given building and/or area. The following is a list of required information for each hazard class and an example of a completed section of the summary:

4.3.3.1 Hazard Class

4.3.3.2 Total amount stored or used inside the building

4.3.3.3 Total amount stored or used outside the building

4.3.3.4 Total amount used in open systems

4.3.3.5 Total amount used in closed systems

SAMPLE

FL-IB:

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

CL-II:

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

4.3.4 Reference Information - The following reference materials may be useful in the classification of hazardous substances at your facility:

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

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

4.3.4.3 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

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

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

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

4.3.4.7 *Genium's Handbook of Safety, Health, and Environmental Data for Common Hazardous Substances*

4.3.4.8 HMex software programs

4.3.4.9 SDS and/or MSDS from chemical manufacturers available on Web Internet sites

4.3.5 Fire Code Definitions for Hazardous Materials – Refer to the 2025 California Fire Code, California Code of Regulations – Title 24, Part 9, Chapter 2, for a list of definitions regarding hazardous materials.

4.4 HAZMAT IDENTIFICATION – NFPA 704 Placard (Diamond) and Global Harmonization System (GHS) Pictogram

The primary purpose of identifying hazardous materials is to provide basic information to first responders and emergency personnel during a fire, spill, or leak. Both the NFPA Diamond and the GHS Pictogram shall be used together.

4.4.1 NFPA Diamond – The NFPA diamond is a system of markings that identifies the hazards of a material in terms of three principal categories:

- Health - blue
- Flammability – red
- Instability – yellow
- Special Hazard - white

This system shall indicate the degree of severity by a numerical rating from 4 (severe hazard) down to 0 (minimal hazard). The white quadrant is used for special hazards like Water Reactive chemicals. For example:

- Flammable gases, pyrophoric, and FL-IA are assigned a 4 Red.
- Flammable solids and FL-IB are assigned a 3 Red,
- CL-II and CL-IIIA are assigned a 2 Red.

MSDS or SDS information can be used to assign each rating. The NFPA diamond is to be placed on each tank or drum.

When determining the most appropriate diamond placard for a building or room, NFPA suggests four different methods, with the fifth method being a combination of the first two.

1. Placard for the highest single hazard chemical
2. Placard for the largest quantity of any one chemical
3. Multiple placards, to account for more than one chemical
4. Worst case placard, that depicts the highest hazard in each category for all of the chemicals
5. Weighted average of each chemical quantity in its hazard category

4.4.2 GHS Pictogram – The GHS Pictogram uses standardized, diamond-shaped symbols to quickly communicate hazards. There are nine pictograms in total, divided into three hazard categories: physical (e.g., explosion, fire), health (e.g., toxicity, corrosive), and environmental (e.g., aquatic toxicity). OCFA does not require pictograms for hazards not regulated by the fire code (i.e., environmental, carcinogen, irritant). Each pictogram has a black symbol on a white background with a red border, representing specific dangers to users, workers, and the environment.

NOTE: For some areas in a plant or facility, the use of the actual chemical name is very common. OCFA encourages each facility to use specific chemical information to enhance safety.

CHEMICAL CLASSIFICATION FORM (SAMPLE #1)

COMMON NAME	CHEMICAL NAME	% Comp	CAS #	FORM	QUANT. STORED	QUANT. IN USE (Open/ Closed)	LOCATION (Storage & Use)	HAZ. CLASSES	JUSTIFICATION
Acetic Acid	Acetic Acid, Glacial	100	64-19-7	L	15 gal	5 gal, Ope	Stor: Flam Cab Use: Wet	CL-II, COR, OHH	Sax's Manual, pH is 12.5
Acetone	Acetone	100	67-64-1	L	55 gal	10 gal, Open System	Stor: Exter Stor Use: H-2	FL-IB, IRR, OHH	Merck Index, flash pt is 60F
Acetylene, Compressed	Acetylene	100	74-86-2	G	200 cf	200 cf, Close d	Stor: Weld Shop Use: Weld Shop	FLG, URG	SDS
Benzene	Benzene	100	74-13-2	L	5 gal	1 gal, Open System	Stor: Flam Cab Use	FL-IB, OHH, IRR, CAR	Genium's handbook
Formaldehyde with Methanol	Formaldehyde Methanol Water	37 15 48	50-00-0 67-56-1 7732-18-5	L	110 gal	55 gal, Open System	Stor: Exter Stor Use: H2 Room	CL-II, TOX, SENS, CAR, IRR	MSDS – Flash pt = 140 deg F, Oral rat LD50 = 100 mg/kg, Irr. to skin, Carc. and Sens.
Hydrochloric Acid	Hydrochloric Acid Water	90 10	7647-01-0 7732-18-5	L	300 gal	55 gal, Closed System	Stor: Corr Stor Use: Wet Process	COR, OHH	Perry's Handbook, pH is 13
Isopropanol	Isopropyl Alcohol	100	67-63-0	L	15 gal	3 gal, Open System	Stor: Flam Cab Use: Lab	FL-IB, OHH, IRR	Fluer's Manual
Fuel Injector Cleaner	2 Butoxy ethanol Butane Pentane CO2	15 40 40 5	111-76-2 109-97-8 109-66-0 124-38-9	A	30 lb/3 gal		Stor: Lab Cab Use: Lab	AERO-3,OHH, TOX, IRR	MSDS
Nitric Acid	Nitric Acid Water	10 90	7697-37-2 7732-18-5	L	55 gal	10 gal, Open System	Stor: Corr Stor Use: Wet Process	OXY-1, COR	MSDS, pH = 12.5
Sodium Dichromate	Sodium Chromate	100	10588-01-9	S	50 lb	10 lb, Open System	Stor: H-4 Room Use: H-4	COR, HTOX, OXY-1 CAR, OHH	MSDS, LD50=25 mg/kg
Sulfuric Acid	Sulfuric Acid Water	94 6	7664-93-9 7732-18-5	L	55 gal	15 gal, Closed System	Stor: Corr Stor Use: Wet Process	COR, TOX, , WR-1, OHH	SDS

CHEMICAL CLASSIFICATION SUMMARY SHEET (SAMPLE #2)

Hazard Class: FL-IB

Chemical Name	Amount Stored	Open Use	Closed Use	Location of Storage	Location of Use
Acetone	55 gal	10 gal	0 gal	Exterior Storage	H-3 Room
Benzene	5 gal	1 gal	0 gal	Flammable Cabinet	Laboratory
Isopropyl Alcohol	15 gal	3 gal	0 gal	Flammable Cabinet	Laboratory

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

Hazard Class: CL-II

Chemical Name	Amount Stored	Open Use	Closed Use	Location of Storage	Location of Use
Formaldehyde Mixture	110 gal	55 gal	0 gal	Exterior Storage	H-3 Room
Acetic Acid	15 gal	5 gal	0 gal	Flammable Cabinet	Wet Process

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

Hazard Class: FLG

Chemical Name	Amount Stored	Open Use	Closed Use	Location of Storage	Location of Use
Acetylene	200 cf	0 cf	200 cf	Weld Shop	Weld Shop

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

Hazard Class: OX-1

Chemical Name	Amount Stored	Open Use	Closed Use	Location of Storage	Location of Use
Sodium Chromate	50 lb	10 lb	0 lb	H-4 Room	H-4 Room
Nitric Acid	55 gal	10 gal	0 gal	COR Storage	Wet Process

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

Hazard Class: UR-1

Chemical Name	Amount Stored	Open Use	Closed Use	Location of Storage	Location of Use
Acetylene	200 cf	0 cf	200 cf	Weld Shop	Weld Shop

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

Company Name: _____ Page_____of_____

Company Address: _____ Area: _____

Hazard Class: WR-1

Chemical Name	Amount Stored	Open Use	Closed Use	Location of Storage	Location of Use
Sulfuric Acid	55 gal	0 gal	15 gal	COR Storage	Wet Process

Interior Storage: 55 gal Open Use: 0 gal Exterior Storage: 0 gal Closed Use: 15 gal

Hazard Class: HTOX

Chemical Name	Amount Stored	Open Use	Closed Use	Location of Storage	Location of Use
Sodium Chromate	50 lb	10 lb	0 lb	H-4 Room	H-4 Room

Interior Storage: 50 lb Exterior Storage: 0 lb Open Use: 10 lb Closed Use: 0 lb

Hazard Class: TOX

Chemical Name	Amount Stored	Open Use	Closed Use	Location of Storage	Location of Use
Formaldehyde Mixture	110 gal	55 gal	0 gal	Exterior Storage	H-3 Room
Sulfuric Acid	55 gal	0 gal	15 gal	COR Storage	Wet Process

Interior Storage: 55 gal Exterior Storage: 110 gal Open Use: 55 gal Closed Use: 15 gal

Hazard Class: COR

Chemical Name	Amount Stored	Open Use	Closed Use	Location of Storage	Location of Use
Acetic Acid	15 gal	5 gal	0 gal	Flammable Cabinet	Wet Process
Nitric Acid	55 gal	10 gal	0 gal	COR Storage	Wet Process
Sulfuric Acid	55 gal	0 gal	15 gal	COR Storage	Wet Process
Hydrochloric Acid	300 gal	0 gal	55 gal	COR Storage	Wet Process
Sodium Chromate	50 lb	20 lb	0 lb	H Room	H Room

Interior Storage: 425 gal/50 lb Exterior Storage: 0 gal/0 lb Open Use: 15 ga/20 lb Closed Use: 70 ga/0 lb

Company Name: _____ Page_____of_____

Company Address: _____ Area: _____

CHEMICAL CLASSIFICATION SUMMARY TOTALS (SAMPLE #3)

FL-IB:

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

CL-II:

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

FLG:

Interior Storage:	200 cf
Exterior Storage:	
Open Use:	
Closed Use:	200 cf

OXY-1:

Interior Storage:	55 gal, 50 lbs
Exterior Storage:	
Open System Use:	
Closed System Use:	10 gal, 10 lbs

WR-1

Interior Storage:	55 gal, 50 lbs
Exterior Storage:	
Open Use:	0 gal, 7 lbs
Closed Use:	15 gal, 0 lbs

UR-1

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

TOX:

Interior Storage:	55 gal
Exterior Storage:	110 gal
Open Use:	55 gal
Closed Use:	15 gal

HTOX:

Interior Storage:	50 lbs
Exterior Storage:	
Open System Use:	10 lbs
Closed System Use:	

COR:

Interior Storage:	425 gal, 50 lbs
Exterior Storage:	
Open Use:	15 gal, 20 lbs
Closed Use:	70 gal, 0 lbs

AERO-3:

Interior Storage:	30 lbs
Exterior Storage:	
Open System Use:	
Closed System Use:	

Company Name: _____ Page_____of_____

Company Address: _____ Area: _____

CHEMICAL CLASSIFICATION FORM

COMMON NAME	CHEMICAL NAME	% Comp	CAS #	FORM	QUANT. STORED	QUANT. IN USE (Open/ Closed)	LOCATION (Storage & Use)	HAZ. CLASSES	JUSTIFICATION

SR# (if applicable):_____

Company Name: _____ Page_____of_____

Company Address: _____ Area: _____