

FIRE DEPARTMENT • CITY OF NEW YORK



**STUDY MATERIAL FOR THE
CERTIFICATE OF FITNESS FOR:
SUPERVISION OF STORAGE AND HANDLING OF HAZARDOUS
MATERIALS IN RETAIL STORES**

C-36

**(AEROSOLS, CORROSIVE/OXIDIZING MATERIALS, AND
FLAMMABLE & COMBUSTIBLE LIQUIDS)**

All applicants are required to apply and pay for an exam online before arriving at the FDNY. It can take about 30 minutes to complete.

Simplified instructions for online application and payment can be found here:

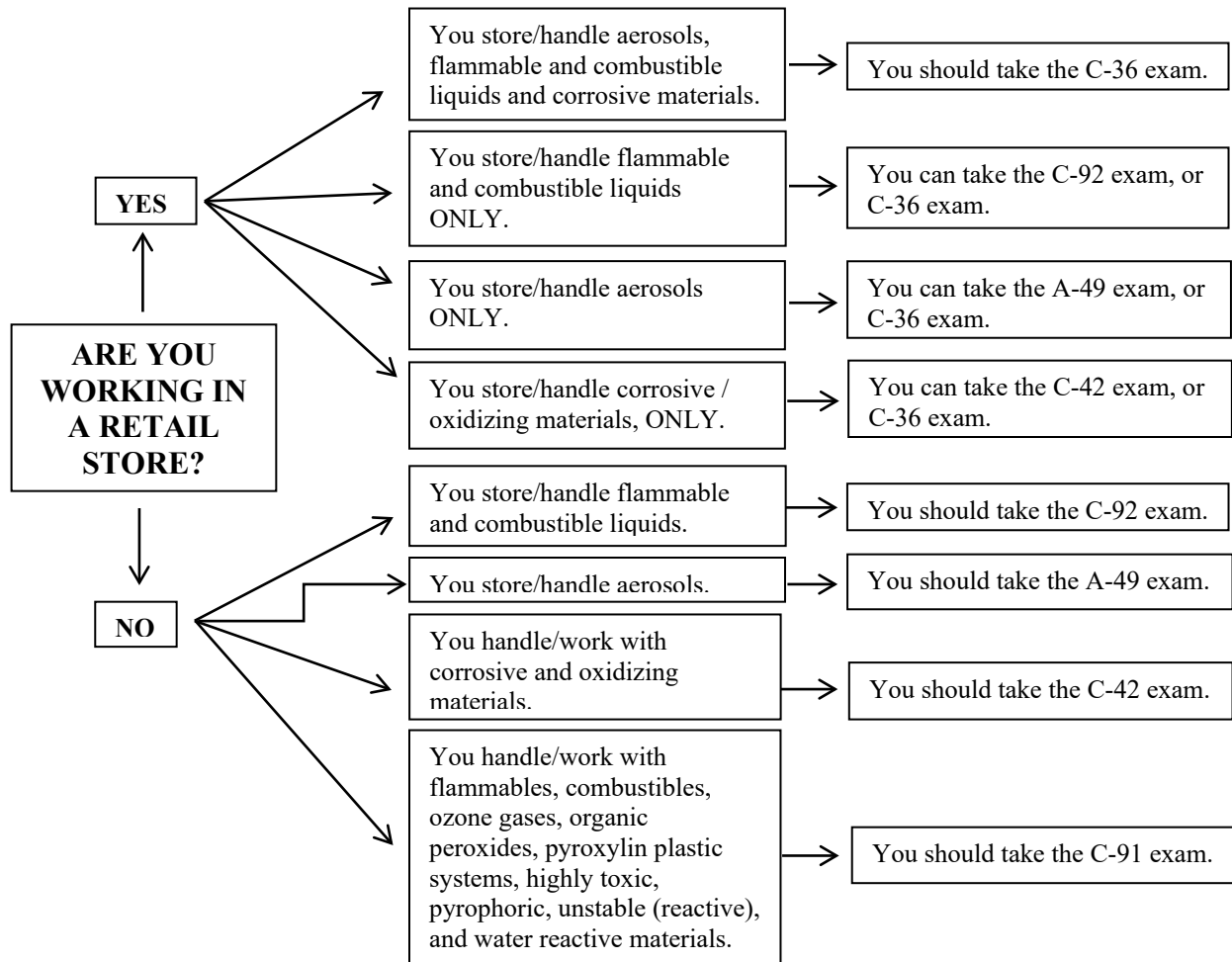
<http://www1.nyc.gov/assets/fdny/downloads/pdf/business/fdny-business-cof-individuals-short.pdf>

Create an Account and Log in to:

<http://fires.fdnyccloud.org/CitizenAccess>

This book is provided to the public for free by the FDNY.

WHICH CERTIFICATE OF FITNESS DO YOU NEED?



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EXAM SPECIFIC INFORMATION FOR C-36 CERTIFICATE OF FITNESS

Save time and submit application online!

All applicants are required to apply and pay for an exam online before arriving at the FDNY. It can take about 30 minutes to complete.

Simplified instructions for online application and payment can be found here:

<http://www1.nyc.gov/assets/fdny/downloads/pdf/business/fdny-business-cof-individuals-short.pdf>

Create an Account and Log in to:

<http://fires.fdnyccloud.org/CitizenAccess>

REQUIREMENTS FOR CERTIFICATE OF FITNESS APPLICATION

General requirements:

Review the General Notice of Exam:

<https://www1.nyc.gov/assets/fdny/downloads/pdf/business/general-notice-of-exam-cof.pdf>

Special requirements. C-36 Certificate of Fitness: None

Application fee must be paid with online submission:

Accepted forms of payment:

- Credit/debit card (American Express, Discover, MasterCard, or Visa)
- Personal or company check or money order (made payable to the New York City Fire Department)

A convenience fee of 2% will be applied to all card payments.

For fee waivers submit: ***(Only government employees who will use their COF for their work-related responsibilities are eligible for fee waivers.)***

- A letter requesting fee waiver on the Agency's official letterhead stating applicant full name, exam type and address of premises; **AND**
- Copy of identification card issued by the agency

REQUIREMENTS FOR ALTERNATIVE ISSUANCE PROCEDURE (AIP)

No AIP available. This certificate of fitness can only be obtained by passing the computer exam at the FDNY Headquarters.

**Each testing opportunity requires a separate application and payment.
Retesting on the same calendar day is not permitted.**

EXAM INFORMATION

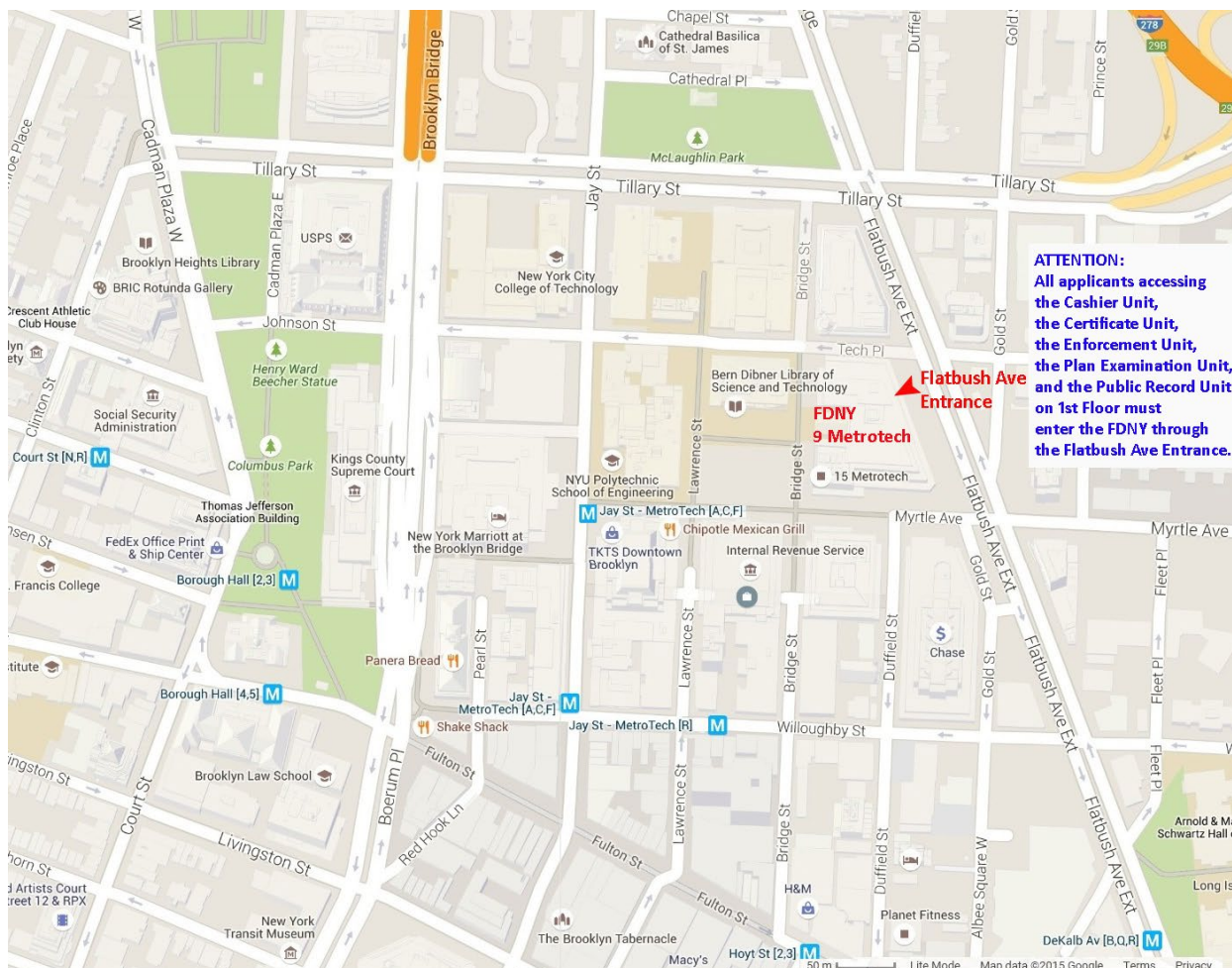
The **C-36** exam will consist of **25** multiple-choice questions, administered on a “touch screen” computer monitor. It is a time-limit exam. Based on the number of questions and reference material provided, you will have **38** minutes to complete the test. A passing score of at least 70% is required in order to secure a Certificate of Fitness.

Special material provided during the exam: Study Material and booklets are not allowed to be used during the exam. If required for exam, Reference Material will be provided to you by Exam room personnel. Exam computer station will also prompt if reference material is required for your exam.

Please always check for the latest revised booklet at FDNY website before you take the exam.

<http://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-c36-noe-study-materials.pdf>

Exam site: **FDNY Headquarters, 9 MetroTech Center, Brooklyn, NY. Enter through the Flatbush Avenue entrance (between Myrtle Avenue and Tech Place).**



RENEWAL REQUIREMENTS

General renewal requirements:

Review the General Notice of Exam:

<https://www1.nyc.gov/assets/fdny/downloads/pdf/business/general-notice-of-exam-cof.pdf>

Special renewal requirements for C-36 COF: None

The FDNY strongly recommends the C-36 COF holders to renew the COF on-line.

To learn the simplified on-line renewal:

<https://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-simplified-renewal-short.pdf>

QUESTIONS?

FDNY Business Support Team: For questions, call 311 and ask for the FDNY Customer Service Center or send an email to FDNY.BusinessSupport@fdny.nyc.gov

STUDY MATERIAL AND TEST DESCRIPTION

ABOUT THIS BOOKLET

This study material contains the information you will need to prepare for supervising storage and handling of hazardous materials (aerosols, corrosive/oxidizing materials, and flammable & combustible liquids) in retail stores. This booklet will not be provided for you during the exam. It is critical that you read and understand this study material to help increase your chances of passing this exam. The study material does not contain all the information you need to know to supervise storage and handle the above-mentioned materials in retail stores. It is your responsibility to become familiar with all applicable rules and regulations of the City of New York, even if they are not covered in this study material. In order to prepare for the exam, you will need to become familiar with NYC Fire Code chapters 27, 28, 31, 34 and 40. In addition you will need to be familiar with NFPA 30 which regulates the storage, handling and use of flammable and combustible liquids.

The C-36 exam will consist of 25 multiple choice questions, administered on a “touch screen” computer monitor. It is a time-limited test. Only **one** answer is correct for each question. If you **DO NOT** answer a question or mark more than one alternative your answer will be scored as incorrect. A score of **70%** correct is required on the examination in order to secure a Certificate of Fitness. Read each question carefully before marking your answer. There is no penalty for guessing.

SAMPLE EXAM QUESTIONS

The following questions represent the “format” of the exam questions, not the content of the real exam.

1. Which of the following are allowed to be used while taking a Certificate of Fitness examination at 9 Metro Tech Center?

- I. cellular phone
- II. study material booklet
- III. reference material provided by the FDNY
- IV. mp3 player

- A. III only
- B. I, II, and III
- C. II and IV
- D. I only

Only reference material provided by the FDNY is allowed to be used during Certificate of Fitness examinations. Therefore, the correct answer would be A. You would touch “A” on the computer terminal screen.

2. If the screen on your computer terminal freezes during your examination, who should you ask for help?

- A. the person next to you

- B. the firefighters
- C. the examiner in the testing room
- D. the computer help desk

If you have a computer related question, you should ask the examiner in the testing room. Therefore, the correct answer would be C. You would touch "C" on the computer terminal screen.

3. If you do not know the answer to a question while taking an examination, who should you ask for help?

- A. the person next to you
- B. the firefighters
- C. the examiner in the testing room
- D. you should not ask about test questions since FDNY staff can not assist applicants

You should not ask about examination questions or answers since FDNY staff cannot assist applicants with their tests. Therefore, the correct answer would be D. You would touch "D" on the computer terminal screen.

1. INTRODUCTION

This study material outlines NYC Fire Department regulations for the supervision of storage and handling of hazardous materials (aerosols, corrosive/oxidizing materials, and flammable & combustible liquids) in retail stores. C-36 Certificate of Fitness holders must ensure that all Fire Department regulations for the materials above are obeyed at all times.

Tables and charts in this booklet will be provided to you when you take the exam; however, this study material will not be provided during exam.

The 2014 Fire Code regulates hazardous materials. The code sets specific requirements for these hazardous materials in retail settings.

Several operational and maintenance requirements that the C-36 COF holder must be knowledgeable in:

- permits and Certificates of Fitness
- signage
- housekeeping
- portable fire extinguishers

2. DEFINITIONS

ACID: A solution that has a pH less than 7.0.

AEROSOL CONTAINER: A metal can, or a glass or plastic bottle designed to dispense an aerosol.

BASE: A solution that has a pH greater than 7.0. Basic materials or solutions are sometimes called caustic or alkaline.

CERTIFICATE OF FITNESS (C of F): A written statement issued by the NYC Fire Department certifying that the person to whom it is issued has passed an examination as to his or her qualifications or is otherwise deemed qualified to use or supervise the storage, handling and use of a material, conduct or supervise an operation, or supervise a facility for which such certificate is required by this code or the rules. It is valid for 3 years. It is required to produce the C of F when asked by an FDNY representative or Site Safety Manager or the Site Safety Coordinator.

CHEMICAL NAME: The scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry, the Chemical Abstracts Service rules of nomenclature, or a name that will clearly identify a chemical for the purpose of conducting an evaluation.

CLOSED CONTAINER: A container sealed by means of a lid or other device capable of preventing the escape of liquid, vapor or dusts in the ordinary course of storage, handling or use.

COMBUSTIBLE LIQUID: For purposes of transportation, a combustible liquid, as defined in the regulations of the United States Department of Transportation, as set forth in 49 CFR Section 173.120. For all other purposes, a liquid, other than a compressed gas or cryogenic fluid, having a closed cup flash point at or above 100°F (38°C), classified as follows:

Class II. Liquids having a closed cup flash point at or above 100°F (38°C) and below 140°F (60°C).

Class IIIA. Liquids having a closed cup flash point at or above 140°F (60°C) and below 200°F (93°C).

Class IIIB. Liquids having closed cup flash points at or above 200°F (93°C).

CORROSIVE MATERIAL: A material that causes full thickness destruction of human skin at the site of contact within a specified period of time when tested by methods set forth in DOTn regulations 49 CFR Sections 173.136 and 173.137, or a liquid that has a severe corrosion rate on steel or aluminum based on the criteria set forth in DOTn regulation 49 CFR Section 173.137(c)(2).

EXPLOSION: An effect produced by the sudden violent expansion of gases, whether or not accompanied by a shock wave or disruption, of enclosing materials, including the effects of the following sources of explosion:

1. Chemical changes such as rapid oxidation, deflagration or detonation, decomposition of molecules and runaway polymerization (usually detonations).
2. Physical changes such as pressure tank ruptures.
3. Atomic changes (nuclear fission or fusion).

FLAMMABLE LIQUID: For purposes of transportation, a flammable liquid defined in the regulations of the United States Department of Transportation, as set forth in 49 CFR Section 173.120. For all other purposes, a liquid, other than a compressed gas or cryogenic fluid, having a closed cup flash point below 100°F (38°C), classified as follows:

Class IA. Liquids having a flash point below 73°F (23°C) and having a boiling point below 100°F (38°C).

Class IB. Liquids having a flash point below 73°F (23°C) and having a boiling point at or above 100°F (38°C).

Class IC. Liquids having a flash point at or above 73°F (23°C) and below 100°F (38°C).

FLAMMABLE VAPORS OR FUMES: The concentration of flammable constituents in air that exceeds 25 percent of their lower flammable limit (LFL).

FLASH POINT: The minimum temperature in degrees Fahrenheit at which a liquid will give off sufficient vapors to form an ignitable mixture with air near the surface or in the container, but will not sustain combustion. The flash point of a liquid shall be determined by appropriate test procedure and apparatus as specified in ASTM D 56, ASTM D 93 or ASTM D 3278.

GENERAL SUPERVISION: Supervision by the holder of any Fire Department certificate who is responsible for performing the duties of the certificate holder but need not be personally present on the premises at all times.

HANDLING: The movement of a material in its container, the removal of the material from its container, or any other action or process that may affect the material, other than its storage or use.

HAZARDOUS MATERIALS: Those chemicals or substances that are physical hazards or health hazards as defined and classified in this study material, whether the materials are in usable or waste condition.

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.

INCOMPATIBLE MATERIALS: Materials that, if mixed or combined, could explode, generate heat, gases or other byproducts, or react in a way hazardous to life or property.

LOWER EXPLOSIVE LIMIT (LEL): See “Lower flammable limit.”

LOWER FLAMMABLE LIMIT (LFL): The minimum concentration of vapor in air at which propagation of flame will occur in the presence of an ignition source. The LFL is sometimes referred to as LEL or lower explosive limit.

OCCUPANCY: The purpose or activity for which a building or space is used or designed to be used. References to occupancy classification shall be deemed to include the equivalent occupancy classifications under the 1968 Building Code and all prior Building Codes or other applicable laws, rules and regulations. The occupancy classifications used in this code are defined as follows:

Group M. A mercantile occupancy, as defined in Section 309 of the Building Code.

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, classified as follows:

Class 1. An oxidizer that causes a readily measurable increase in the burning rate of combustible materials with which it comes in contact, but less than a moderate increase.

Class 2. An oxidizer that causes a moderate increase in the burning rate of combustible materials with which it comes in contact.

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

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

PERSONAL SUPERVISION: Supervision by the holder of any Fire Department Certificate of Fitness who is required to be personally present on the premises, or other proximate location acceptable to the department, while performing the duties for which the certificate is required.

pH: The negative logarithm of the hydrogen ion (H⁺) concentration of a solution (in moles per liter or molarity).

PROPELLANT: A gas which is liquefied or compressed in an aerosol container and works to expel the product in the container when the valve is actuated. A propellant is considered flammable if it mixes with air to form a flammable mixture or if a flame is created when mixed with air.

RACK: Any combination of vertical, horizontal, and diagonal members that supports stored materials. Shelving in some rack structures use shelves that can be solid, slatted, or open. Racks can be fixed, portable, or movable.

RETAIL DISPLAY AREA: An open area used for the purpose of viewing and purchasing merchandise. Individuals are generally free to roam around this area, which has items for sale on racks, shelves, or the floor.

SAFETY DATA SHEET (SDS) or MATERIAL SAFETY DATA SHEET (MSDS): A document prepared in accordance with the regulations of the United States Department of Labor, as set forth in 29 CFR Part 1910.1200 or a federally approved state OSHA plan which sets forth information concerning a hazardous material. MSDS may be in a paper or electronic form.

SHELF STORAGE: Storage on shelves less than 30 inches (762 mm) deep with the distance between shelves not exceeding 3 feet (914 mm) vertically.

3. PERMITS

An FDNY permit is required (and authorizes) to store, handle, use, or transport hazardous materials when required by the Fire Code. It also authorizes the permit holder to conduct an operation or maintain a facility at a specific premises or location, for which a permit is required by Fire Code section 105.6.

Permits are not transferable and any change in occupancy, operation, tenancy or ownership must require that a new permit be issued. Permits and Certificates of Fitness shall be readily available on the premises for inspection by Fire Department representatives.

SITE-SPECIFIC PERMIT

Such permit authorizes the permit holder to store, handle and use hazardous materials at a specific premises or location. Site-specific permits are valid for 12 months. Every permit or renewal requires an inspection.

Permits are not transferable and any change in occupancy, operation, tenancy or ownership must require that a new permit be issued. The Certificate of Fitness holder is responsible for making sure that all fire safety regulations and procedures are obeyed on the premises. Permits and Certificates of Fitness shall be readily available on the premises for inspection by Fire Department representatives.

CITYWIDE PERMIT

Such permit authorizes the permit holder to store, handle, use or sell hazardous materials, or conduct an operation on a citywide basis, for which a permit is required by FC105.6. A citywide permit is valid to temporarily store, handle, use or sell hazardous materials or to conduct an operation at one or more locations subject to the following restrictions:

- The duration of such activity at any individual location does not exceed 30 calendar days and all hazardous materials associated with such activity are removed from the location at the end of the workday. Periods of activity in excess of 30 calendar days at any one location shall require a site-specific permit.
- The quantity of hazardous materials being temporarily stored and used does not exceed 5 gallons of gasoline, or 250 gallons of any other flammable liquid, and 300 gallons of any combustible liquid. Storage or use of hazardous materials in quantities exceeding these amounts requires a site-specific permit for each location at which such storage or use occurs.



Sample



FIRE DEPARTMENT PERMIT (SITE-SPECIFIC)

DO 19		ACCOUNT NO. [REDACTED]
ISSUE DATE 04/09/2024	EXPIRATION DATE 06/19/2024	CONTROL #
PREMISES ADDRESS MANHATTAN NY 10018		
BLOCK/LOT	BIN # 1	ZIPCODE 10018
ADMIN CO. E034	BATTALION 7	DIVISION 1
ISSUED TO		
CORPORATION NAME [REDACTED]		
DBA		
HOURS OF OPERATION	PHONE # [REDACTED]	

PERMIT DESCRIPTION

QTY	TYPE/DESCRIPTION	DETAILS	FLOOR NO.
1	LPG STORAGE >= 20LB (PER CAGE)	062-00	GROUND FLOOR
1	TORCH USE - ANY OPEN FLAME IN A TORCH-APPLIED ROOF SYSTEM	069-02	THROUGHOUT

This permit authorizes the above-referenced owner to manufacture, store, handle, use, transport or sell a hazardous or combustible material and/or conduct an operation or maintain a facility regulated by the New York City Fire Code, as specified above, at the premises set forth herein, subject to the strict observance of the Fire Code and other laws, rules, and regulations enacted for the protection of the public. This permit is not transferable to any other person, firm or corporation and shall remain in effect for the period specified, unless suspended or revoked by the fire department prior to expiration.

BY ORDER OF THE FIRE COMMISSIONER

New York City Fire Code Section FC105.3.5 requires that permits be posted in a conspicuous location on the premises at all times and be readily available for inspection by any representative of the Department.

Fire Department, City of New York
 9 MetroTech Center, Brooklyn New York 11201-3857

AN EXAMPLE OF FDNY PERMANENT PERMIT

3.1 FLAMMABLE AND COMBUSTIBLE LIQUIDS:

A permit is required:

1. To store, handle or use amounts of Class I liquids, other than paints, varnishes, lacquers, gasoline and other petroleum-based Class I liquids, in excess of 5 gallons.
2. To store, handle or use amounts of gasoline and other petroleum-based Class I liquids other than paints, varnishes and lacquers, in excess of 2½ gallons.
3. To store, handle or use amounts of Class II or Class III liquids with a flash point of 300°F or less, other than paints, varnishes and lacquers, in excess of 10 gallons, except that a permit is not required for the:
 - storage or use of liquids in the fuel tank of a motor vehicle, aircraft, marine vessel, or watercraft
 - storage of fuel oil in stationary storage tanks in Group R-3 occupancies for use in stationary fuel oil burning equipment.
4. To store, handle or use Class I, Class II or Class III liquids having a flash point of 300°F or less that are commonly used for painting, varnishing, staining or other similar purposes, including paint, varnish and lacquer, in quantities exceeding 20 gallons.
5. To store, handle or use petroleum-based Class III liquids with a flash point exceeding 300°F, in quantities exceeding 70 gallons, except that a permit is not required for the storage and use of such liquids in the fuel tank of a motor vehicle, aircraft, marine vessel or watercraft for motive power.

3.2 AEROSOLS:

A permit is required to store, handle or use an aggregate quantity of Level 1, 2, or 3 aerosol products in excess of 100 pounds net weight.

1280 fluid ounces (fl oz) = 100 pounds (lbs)

Permit and C of F Calculations	
One Can Net Weight (oz)	Number of Cans
6	214
7	183
8	160
10	128
12	107
14	92
16	80
20	64
24	54
Example of combination:	

$(\text{oz.} \times \text{\#of cans}) + (\text{oz.} \times \text{\#of cans}) = \text{combined amount}$ $8 \text{ oz} \times 65 = \mathbf{520}$; $19 \text{ oz} \times 40 = \mathbf{760}$ $\mathbf{520 + 760 = 1280}$	
8 oz and 19 oz	65 and 40, respectively

3.3 CORROSIVE MATERIALS:

A permit is required to store, handle or use corrosive materials in quantities of:

- Liquids – 55 gallons
- Solids – 1000 pounds

3.4 OXIDIZING MATERIALS:

A permit is required:

To store, handle or use oxidizing materials in quantities of:

Liquids	Quantity	Solids	Quantity
Class 4	Any amount	Class 4	Any amount
Class 3	1 gallon	Class 3	10 pounds
Class 2	10 gallons	Class 2	100 pounds
Class 1	55 gallons	Class 1	500 pounds

4. RESPONSIBILITIES OF THE C-36 CERTIFICATE OF FITNESS HOLDER

Certificate of Fitness holders should be aware that they may need to demonstrate their knowledge or proficiency in their duties related to their certificate at any time a Fire Department representative is conducting an inspection of the premises.

The FDNY can deny, not renew, suspend or revoke the COF for misconduct, which could include the failure of the certificate holder to properly fulfill his or her duties for any reason.

Misconduct includes, but is not limited to:

- the failure of certificate holders to properly fulfill their duties
- any false and fraudulent conduct in connection with an application for a certificate or the duties of a certificate holder, including:
 - statements or submissions
 - unauthorized changes to or use of a certificate or possession of a fraudulent certificate
 - cheating on an examination
 - impersonating another person or allowing oneself to be impersonated
- the failure to promptly notify the Fire Department of any change in the applicant's or certificate holder's residence address, or work location
- any other conduct that decreases the integrity or reliability of an applicant or certificate holder
 - compromising the integrity or confidentiality of a Fire Department examination

SUPERVISION

The handling of hazardous materials in quantities requiring a permit must be performed under the PERSONAL supervision of a person holding a C-36 Certificate of Fitness.

The storage of hazardous materials in quantities requiring a permit must be performed under the GENERAL supervision of a person holding a C-36 Certificate of Fitness.

GROUP M OCCUPANCIES (MERCANTILE, RETAIL STORES) SHOULD CERTIFY NUMEROUS INDIVIDUALS TO ENSURE THERE IS SUPERVISION OF HANDLING AND STORAGE OF AEROSOLS AT THE LOCATION AT ALL TIMES.

5. GENERAL REQUIREMENTS

5.1 FLAMMABLE and COMBUSTIBLE LIQUIDS

The NYC Fire Code has 3 classes of flammable liquids and 3 classes of combustible liquids as defined in the following table.

Class of Flammable and Combustible Liquids

		Flash point	Boiling point	Examples
Flammable liquids (Class I liquids)	Class IA	< 73°F	< 100°F	Acetaldehyde, Ethyl ether, Formate, Pentane
	Class IB	< 73°F	≥ 100°F	Acetone, Ethanol, Methyl alcohol, Propyl alcohol
	Class IC	≥ 73°F but < 100°F	Not Applicable	Turpentine, Butyl alcohol, Hydrazine, Styrene, Xylene
Combustible liquids (Class II & III liquids)	Class II	≥ 100°F but < 140°F	Not Applicable	Kerosene, WD-40 lubricant
	Class IIIA	≥ 140°F but < 200°F	Not Applicable	Butyric Acid, Creostoe Oil
	Class IIIB	≥ 200°F	Not Applicable	Formalin, Glycerine, Picric acid, Propylene glycol

5.2 CORROSIVE AND OXIDIZIVE MATERIALS

A corrosive material is a gas, liquid or solid that causes permanent injury of intact skin at the site of contact. Any liquid that can corrode 1/4 inch of bare steel or aluminum within a year is also classified as a corrosive material.

Most corrosives are either acids or bases. Common acids include hydrochloric acid, sulfuric acid, nitric acid, chromic acid, acetic acid and hydrofluoric acid. Common bases are ammonium hydroxide, potassium hydroxide and sodium hydroxide.

Acids and bases are common corrosive materials. Information on pH can often be found in the SDS/MSDS. It is important to know the pH of substances because they may be corrosive or react with incompatible materials.

Classes of Corrosive Materials

		pH	Examples
Corrosive Materials	Acidic	0-7.0	Muriatic acid, non-chlorine shock-oxidizer
	Neutral	7	Pure water
	Basic	7-14	Baking soda, household ammonia, liquid pool chlorine

Oxidizing materials are liquids or solids that readily give off oxygen or other oxidizing substances (such as bromine, chlorine, or fluorine). They also include materials that react chemically to oxidize combustible (burnable) materials; this means that oxygen combines chemically with the other material in a way that increases the chance of a fire or explosion. This reaction may be spontaneous at either room temperature or may occur under slight heating. Oxidizing liquids and solids can be severe fire and explosion hazards. Maximum allowable storage requirements are shown in table on Appendix E.

Classes of Oxidizers

		Examples
Class 1		Aluminum nitrate, ammonium persulfate, barium peroxide, hydrogen peroxide solutions (8% to 27.5% by weight), magnesium nitrate
Class 2		Calcium chlorate, calcium hypochlorite (50% or less by weight), chromic acid (chromium trioxide), magnesium perchlorate, nitric acid (concentration greater than 40% but less than 86%)
Class 3		Ammonium dichromate, hydrogen peroxide (52 to 91% by weight), perchloric acid solutions (60 to 72% by weight), potassium bromate, potassium chlorate.
Class 4		Ammonium permanganate, hydrogen peroxide greater than 91%.

5.3 AEROSOLS

Aerosols are classified into 3 levels: Level 1, 2, and 3. The level type is based on the total British thermal units per pound (Btu/lb) of the aerosol. Examples of some aerosols are as follows:

Classes of Aerosol Products

		Chemical heat of combustion	Examples
Aerosols	Level 1	0 < 8,600 (Btu/lb)	Shaving cream, window cleaners, starch, rug shampoos, alkaline oven cleaners
	Level 2	8,600 < 13,000 (Btu/lb)	Hair sprays, deodorants, antiseptics, some furniture polishes, windshield deicers
	Level 3	> 13,000 (Btu/lb)	Paint, lacquer, lubricants, some furniture polishes, engine cleaners, some insecticides, oil-based antiperspirants

LIMITATIONS AND PROHIBITIONS OF AEROSOLS

It is unlawful to:

- Manufacture any level aerosol product in NYC;
- To store, handle or use Level 1, 2, or 3 aerosol products in metal cans exceeding 33.8 fluid ounces, or in glass or plastic bottles exceeding 4 fluid ounces.

Exceptions:

1. Level 3 aerosol products shall be stored, handled and used in containers with a maximum capacity of 24 fluid ounces.
2. Pressurized ether shall be stored, handled or used only in metal containers with a maximum capacity of 8 fluid ounces.
3. Level 1, 2 and 3 oven-cleaning aerosol products shall be stored, handled or used in containers with a maximum capacity of 16 fluid ounces.

5.4 EXITS

It shall be unlawful to obstruct or impede access to any required means of egress. All required means of egress, including each exit, exit access and exit discharge, shall be continuously maintained free from obstructions and impediments to immediate use in the event of fire or other emergency. Storage of any flammable and combustible liquids and aerosols, including stock for sale, shall not be stored near or be allowed to physically obstruct the route of egress.

5.5 SAFETY DATA SHEETS

Safety Data Sheet (SDS) or as formally called Material Safety Data Sheet (MSDS) information should be readily available for inspection by any representative of the Fire Department. The safety data sheet (SDS) contains specific information about the health and physical hazards of the material used, as well as safe work practices and required protective equipment. It may also describe the material's physical characteristics and procedures that should be followed in case of an emergency. For example, the SDS may list



appropriate and inappropriate extinguishing agents. The Certificate of Fitness holder must refer to the SDS when questions arise about how to handle, use, or store hazardous chemicals or materials. This information may be in paper form or electronic.

Inventory Forms

Records acceptable to the FDNY include copies of the annual inventory forms filed with the City of New York (as required by New York State General Municipal Law Section 209-u and/or the annual facility inventory forms filed with the City of New York as required by the NYC Right to Know Law). The forms should then be mailed to:

Hazardous Materials Operations
FDNY Training Academy
Building No. 8
Randalls Island, NY 10035

SEE APPENDIX B FOR COPY OF THE ACTUAL FORM.

6. STORAGE REQUIREMENTS

6.1 FLAMMABLE AND COMBUSTIBLE LIQUIDS

Storage and handling in Group M occupancies shall be in compliance as seen in appendix D.

ALL FLAMMABLE AND COMBUSTIBLE LIQUIDS STORAGE FOR SALE MUST BE ACCORDANCE WITH THE FOLLOWING:

- Storage on shelves must not exceed 6 feet in height and shelving must be metal.
- Storage on pallets or in piles if greater than 4 feet 6 inches in height, or where the ceiling exceeds 18 feet in height, must be protected by a sprinkler system.
- Storage on racks, if greater than 4 feet 6 inches in height, or where the ceiling exceeds 18 feet in height shall be protected in accordance with appendix D.
- Storage of empty or idle combustible pallets inside an unprotected liquid storage area shall be limited to a maximum pile size of 2,500 square feet and to a maximum storage height of 6 feet. Storage of empty or idle combustible pallets inside a protected liquid storage area shall comply with the requirements of Fire Department. Pallet storage shall be separated from liquid storage by aisles that are at least 8 feet.

CONTAINER SHELF STORAGE

Shelf storage of flammable and combustible liquids must be maintained properly. Shelving must be of approved noncombustible construction, adequately braced and anchored. Seismic requirements must be in accordance with the construction codes, including the Building Code.

All shelves must be of sufficient depth and provided with a lip or guard to prevent individual containers from falling.

Where storage on racks is allowed, a minimum 4-foot-wide aisle shall be provided between adjacent rack sections and any adjacent storage of liquids. Main aisles shall be a minimum of 8 feet wide.

FOR CONTAINERS STORED INDOORS

For Group M occupancy, combustible commodities shall not be stored above flammable and combustible liquids.

For Group M occupancy wholesale and retail sales, the containers for Class I liquids must be metal and shall not exceed a capacity of 5 gallons.

DISTANCE FROM CEILING AND ROOFS

Piles of containers shall not be stored closer than 3 feet to the nearest beam, chord, girder or other obstruction, and shall be 3 feet below sprinkler deflectors or discharge orifices of water spray or other overhead fire extinguishing system.

CLEARANCES FROM INCOMPATIBLE MATERIALS

THE MSDS/SDS'S SHOULD BE CONSULTED REGARDING SPECIFIC INCOMPATIBILITIES

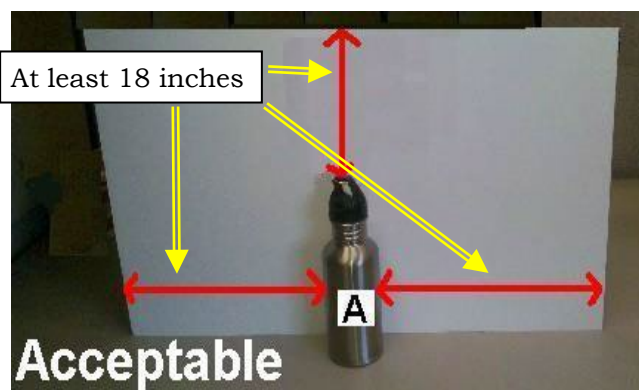
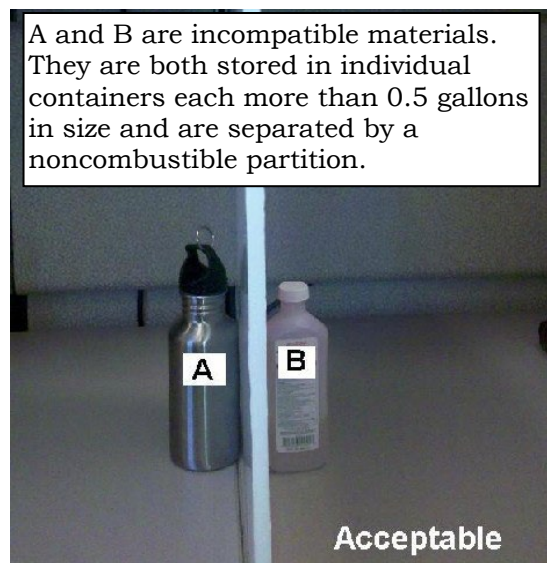
Hazardous materials that are incompatible with each other should not be stored in the same vicinity.

Separation shall be accomplished by:

- Segregating incompatible materials in storage by a distance of not less than 20 feet.

OR

- Isolating incompatible materials in storage by a noncombustible partition extending not less than 18 inches above and to the sides of the stored material.



STORAGE BELOW GRADE

CLASS I LIQUIDS SHALL NOT BE PERMITTED IN BASEMENTS, CELLARS OR OTHER AREAS BELOW GRADE

Class II and III liquids shall be allowed to be stored in basements, cellars or other areas below grade provided that such basement, cellar or other below grade area is protected throughout by a sprinkler system, and other fire protection required by the Fire Department and the Department of Buildings.

WARNING LABEL

All containers of flammable liquids offered for sale shall bear a warning label in accordance with federal laws, rules and regulations painted or printed on the container, indicating the liquid is flammable, and shall be kept away from heat and an open flame.

6.2 CORROSIVE MATERIAL

- Display height shall not exceed 6 feet above the finished floor in display areas of Group M occupancies. Storage height shall not exceed 8 feet above the finished floor in storage areas of Group M and Group S occupancies.
- Individual containers less than 5 gallons or less than 25 pounds shall be stored or displayed on pallets, racks or shelves. They shall not exceed 100 pounds for solids or 10 gallons for liquids in storage and display areas.
- Aisles 4 feet in width shall be maintained on three sides of the storage or display area.



6.3 AEROSOLS

Aerosol 1 products are those with a total chemical heat of combustion that is less than or equal to 8,600 British thermal units per pound (Btu/lb). This section addresses the special regulations for the indoor and outdoor storage of Level 2 and 3 aerosol products.

QUANTITY LIMITS FOR INDOOR STORAGE

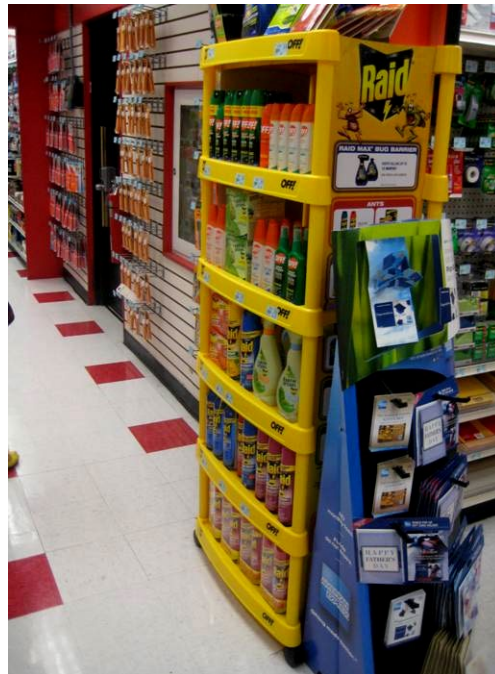
Level 2 and 3 aerosols that are stored in storage areas directly next to the retail displays of the products have the following limits:

MAXIMUM QUANTITIES OF LEVEL 2 AND 3 AEROSOL PRODUCTS IN RETAIL STORAGE AREAS

MAXIMUM NET WEIGHT PER FLOOR (pounds)			
Floor	Nonsegregated storage^{a,b}	Segregated storage	
		Storage cabinets^b	Separated from retail area^c
Basement or area below ground level	Not permitted	Not permitted	Not permitted
Ground Floor	2,500	5,000	Note d
Upper Floors	500	1,000	Note d

- a. The total aggregate quantity on display and in storage shall not exceed the maximum retail display quantity indicated in FC2806.3.
- b. Storage quantities indicated are the maximum allowed in any 50,000-square-foot area.
- c. The storage area shall be separated from the retail area with a 1-hour fire-resistance-rated assembly.
- d. See Segregated Storage in General Purpose Warehouse chart

THIS SECTION APPLIES TO LEVEL 2 AND 3 AEROSOL PRODUCTS ONLY



EXAMPLES OF CORRECT AEROSOL RETAIL DISPLAY

DISPLAY

- Aerosol containers shall not be stacked more than 6 feet high from the base of the aerosol array to the top of the aerosol array unless the containers are placed on fixed shelving or otherwise secured in an approved manner.
- Aerosols that are not exceeding 8 feet high must comply with the following requirements:
 - Only aerosol product being used for display purposes must be stored for sale in retail display areas and the total cannot exceed what is shown in the table on previous page.
- When retail display is on shelves, the height of such retail display to the top of the aerosol container cannot exceed 8 feet from the floor.
- Aerosol products located in retail display areas must be removed from combustible cartons.

Exception:

1. Display areas that use a portion of combustible cartons, which consist of only the bottom panel and not more than 2 inches of side panel are allowed. (See image below).
2. When the display area is protected in accordance with Tables 6.3.2.7(a) through 6.3.2.7(l) of NFPA 30B, storage of aerosol products in combustible cartons is allowed.

The length of the carton side panel on display shall be a maximum of 2 inches.



Correct length

When a sprinkler system is required for the protected retail display of aerosol products, the wet-pipe sprinkler system must be approved by the NYC Buildings Department and the NYC Fire Department. The approved wet-pipe sprinkler system shall be provided throughout the retail display area.

RETAIL AEROSOLS DISPLAYS EXCEEDING 8 FEET IN HEIGHT SHALL:

- be uncartoned and display cut cartoned Level 2 and 3 aerosols may not be displayed more than 6 feet above finished floor;
- have a sprinkler system designed to extend coverage to an area not less than 20 feet in all directions beyond the display area (if storing Level 2 and Level 3);
- have noncombustible curtains be installed between areas where ordinary and high-temperature ceiling sprinklers systems are next to each other.

FIRE SEPARATION

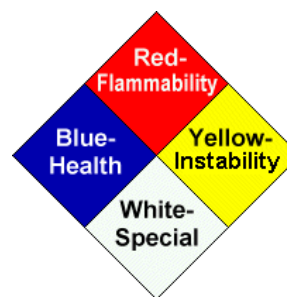
Level 2 and 3 aerosols shall:

- be separated from each other by not less than 25 feet
- be separated from flammable and combustible liquids storage
- have display areas by one or more of the following:
 1. horizontal distance of not less than 25 feet
 2. noncombustible partition extending not less than 18 inches above merchandise.
 - when merchandise is 25 feet from flammable or combustible liquids the noncombustible partition shall be liquid tight at floor level
- be in cartons, if displayed more than 8 feet above floor.
- be shelved in wire mesh racks, having uniform openings not more than 6 inches apart, with the openings comprising at least 50 percent of the overall shelf area.
- be in aisles and maintained not less than 7 ½ feet between rows of racks.
- be protected by in-rack sprinklers, horizontal barriers constructed of a minimum of 3/8 inch thick plywood or a minimum of 0.034 inch sheet metal.
- be adjacent to Class I, II, IIIA, and IIIB liquids only when the following conditions are met:
 - Limited to 1.06 gallon metal-relieving and non-relieving style containers and 5.3 gallon metal relieving style containers.
 - Automatic sprinkler protection for Class I, II, IIIA and IIIB liquids provided for flammable and combustible liquids.

7. LABELING AND SIGNS

The NFPA National Fire Protection Association, a private, non-profit organization that produces technical data related to fire protection and prevention, including the widely used NFPA diamond containing quadrants representing chemical hazards.

Unless otherwise exempted by the commissioner, hazard identification (diamond) signs are required for specific materials as set forth in NYC Fire Code referring to NFPA 704. These signs shall be conspicuously affixed on stationary containers and at entrances to locations where hazardous materials are stored, handled or used.



The diamond sign is divided into 4 quadrants:

- Within the blue, red, and yellow quadrants a number from 0 to 4 indicates the degree of risk associated with the chemical. The higher the number, the higher the risk.
- For some chemicals, the white quadrant contains symbols indicating special hazards.

The meaning of each code number and symbol is shown below.

Quadrant	Code	Meaning
<u>Health Hazard</u> <u>(Blue)</u>	4	Materials that, under emergency conditions, can be lethal.
	3	Materials that, under emergency conditions, can cause serious or permanent injury.
	2	Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.
	1	Materials that, under emergency conditions, can cause significant irritation.
	0	Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials
<u>Flammability Hazard</u> <u>(Red)</u>	4	Materials that rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and burn readily.

Quadrant	Code	Meaning
	3	Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions.
	2	Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not under normal conditions form hazardous atmospheres with air, but under high ambient temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air.
	1	Materials that must be preheated before ignition can occur. Materials in this degree require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur.
	0	Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.
<u>Instability</u> <u>(Reactivity)</u> <u>Hazard</u> <u>(Yellow)</u>	4	Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures.
	3	Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction but that require a strong initiating source or must be heated under confinement before initiation.
	2	Materials that readily undergo violent chemical change at elevated temperatures and pressures.
	1	Materials that in themselves are normally stable but that can become unstable at elevated temperatures and pressures.
	0	Materials that in themselves are normally stable, even under fire conditions.
<u>Special</u> <u>Hazard</u>	“W”	The materials that react violently or explosively with water (water reactivity rating of 2 or 3).

Quadrant	Code	Meaning
(White)	“OX”	The materials that possess oxidizing properties. The severity of the hazard posed by an oxidizer can be divided in to 4 classes from Classes 1 through 4. The adding of the quantification of the oxidation helps to better define the hazard. For example, for the material categorized as a Class 2 oxidizer (e.g. calcium chlorite) can be marked “OX 2” to better define the hazard.

8. FIRE PROTECTION SYSTEMS

FIRE PROTECTION AND EMERGENCY RESPONSES

The portable fire extinguisher shall be provided in quantities requiring a permit where flammable or combustible liquids are manufactured, stored, handled and used, including dispensing area.






8.1 FIRE EXTINGUISHERS

At least one portable fire extinguisher having a minimum 10-B: C rating shall be provided in the store. Portable fire extinguishers shall be located in conspicuous locations, along normal travel paths, within a 50 foot travel distance, where they will be readily accessible and immediately available for use.

Travel Distance is the actual walking distance from any point to the nearest fire extinguisher.

According to the **National Fire Protection Association (NFPA) and Fire Department Rule**, fire extinguishers are categorized according to their compatibility with the fuel

they are expected to extinguish, or the danger of energized electrical equipment. Fuels include four basic groups: wood, liquids, metals, and animal fats; and the hazard of electrical conductivity. Further, extinguishers are designated by alphabetical letters and symbols as shown in the table on the right.

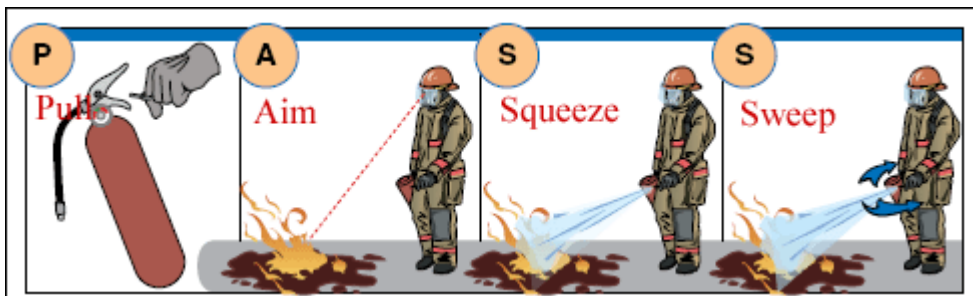
CLASSES OF FIRES	TYPES OF FIRES	PICTURE SYMBOL
A	Wood, paper, cloth, trash & other ordinary materials.	
B	Gasoline, oil, paint and other flammable liquids.	
C	May be used on fires involving live electrical equipment without danger to the operator.	
D	Combustible metals and combustible metal alloys.	
K	Cooking media (Vegetable or Animal Oils and Fats)	

In case of any fire, immediately call 911.

Fire extinguishers must be used in accordance with the instructions painted on the side of the extinguisher. They clearly describe how to use the extinguisher in case of an emergency. The Certificate of Fitness holder should be familiar with the use

of portable fire extinguishers. When it comes to using a fire-extinguisher just remember the acronym P.A.S.S. to help make sure you use it properly.

P.A.S.S. stands for Pull, Aim, Squeeze, Sweep. An example of these instructions is depicted in the picture below.



8.2 FIRE EXTINGUISHER PLACEMENT

Fire extinguishers must be located in conspicuous locations where they will be readily accessible and immediately available for use. These locations must be along normal paths of travel. Fire extinguishers having a gross weight 40 pounds or less must be installed so that the top of the extinguisher is not more than 5 ft above the floor. Hand-held fire extinguishers having a gross weight exceeding 40 pounds shall be installed so that their tops are not more than 3.5 feet above the floor (See images below). The clearance between the floor and the bottom of installed hand-held extinguishers shall not be less than 4 inches. In other words, **no fire extinguisher is allowed to be on the floor.**



- (1) For the fire extinguisher having 40 pounds or less, its top must not be more than 5 ft above the floor
- (2) The fire extinguishers must be accessible and unobstructed.



- (1) The bottom of the fire extinguisher must be at least 4 in above the floor.
- (2) The fire extinguisher must be properly mounted.



8.3 PORTABLE FIRE EXTINGUISHER TAGS

Installed portable fire extinguishers must have an FDNY standard PFE tag affixed. This tag will have important information about the extinguisher. By November 15, 2019, all portable fire extinguishers must have the new PFE tags. The FDNY will only recognize new PFE tags and will be issuing violations to business that have PFE installed without a proper tag.

The color of the fire extinguishers may be changed by the FDNY every few years. The FDNY recommends two ways to verify the tag's legitimacy:

1. Hologram:

A real hologram strip shown on the tag is 3 inches long by ¼ inch wide. Counterfeit tags will NOT have a high quality silver hologram. The hologram on a counterfeit tag will NOT change color as it is moved against the light.

2. QR code

IF you scan the QR code, it should direct you to the updated FDNY approved fire extinguisher company list. You can use the company list to verify if the company printed on the list is currently approved by the FDNY.

The information of the monthly inspection record must include the date of the inspection, the name/initials of the person who did the inspection. This monthly quick check is documented on the back of the PFE tag or by an approved electronic method that provides a permanent record.

ANNUALLY

At least annually all Portable Fire Extinguishers must be checked by a W-96 Certificate of Fitness holder from FDNY approved company. After each annual inspection W-96 COF holder will replace the PFE tag. The information of the annual inspection record must be indicated on the new PFE tag.

8.5 NOTIFICATIONS

The person responsible for the supervision of storage and retail display of flammable and combustible liquids, corrosive material and aerosol products should notify the site safety manager if an unsafe condition has been created. Any person who becomes aware of a fire or explosion or any other emergency shall immediately report such emergency to the Fire Department (Call 911). No owner or other person shall issue any directive or take any action to prevent or delay the reporting of a fire or other emergency to the Fire Department. After calling the Fire Department, the supervisor or the site safety manager or other designated person should also be notified.

The Certificate of Fitness holder must know the locations of and how to operate all the fire extinguishing devices, control devices, and fire alarm stations installed at the retail location. In case of a fire, explosion, major spill or emergency, the Certificate of Fitness (C of F) holder must notify the Fire Department by phone immediately. The Certificate of Fitness holder must know the telephone number of the Fire Department Borough Communication Office. The borough phone numbers are listed as follows. These phone numbers must be posted near the phones most likely to be used in case of an emergency.

- Manhattan (212) 999-2222
- Bronx (718) 999-3333
- Brooklyn (718) 999-4444
- Queens (718) 999-5555
- Staten Island (718) 999-6666

After notification by phone, the local fire alarm must be sounded. In some cases, the activation of the fire alarm will transmit a signal to the Fire Department via a FDNY approved central station company. The C of F holder shall initiate an orderly

evacuation when necessary following a hazardous incident, and take reasonable steps to isolate the hazard until the Fire Department arrives. The Certificate of Fitness holder must answer any questions asked by Firefighters and officers when they arrive. For example, he or she must indicate the location of the fire, describe the type of fire protection devices available, and describe the materials stored on the fire floor. The Public Record unit must be notified as soon as possible after an explosion or fire and Fire Incident report shall be filled out. The Public Record unit may be reached at 718-999-2681. The Bureau of Fire Prevention may require a detailed report on the causes and the consequences of the explosion or fire. Generally, this report must be filed within ten days after the incident.

9. Lithium-ion safety

Lithium-ion batteries are rechargeable batteries found in electric bikes, scooters, cars, laptops, tablets, phones, and many other common household devices.

Lithium-ion battery fires have caused deaths, serious injuries, and devastating damage to property around the city. It's important to follow rules for safe storage, charging, and disposal for these types of batteries.

If you own a lithium-ion powered device or plan to buy one, the FDNY has important safety tips that you should follow. These tips apply to all devices powered by lithium-ion batteries, including phones, tablets, laptops, e-cigarettes, toys, high-tech luggage, and even robotic vacuum cleaners.

Immediately stop using or charging battery and call 911 if you notice:

- **Fire or Smoke**
- **Overheating**
- **Change in color or shape**
- **Odd noises**
- **Leaking**
- **Strange smell**

ALWAYS:

- purchase and use devices certified by a Nationally Recognized Testing

Laboratory (NRTL). 

- follow the manufacturer's instructions for:
 - charging and storage.
 - correct battery, cord, and power adapter
- **keep exit path clear at all times.**
- plug directly into a wall electrical outlet for charging.
- keep batteries and devices at room temperature.
- store and/or charge batteries away from anything flammable.
- keep away from heat sources.
- bring batteries to a **NYC Battery Recycling Center**. Visit nyc.gov/batteries for more information.

NEVER:

- use aftermarket batteries or chargers.
- use damaged or altered batteries
- plug into a power strip or overload an outlet.
- overcharge or leave battery charging overnight.
- charge a battery or device under your pillow, on your bed, or near a couch.
- leave e-bikes or e-scooters unattended while charging.
- block your primary way in or out of a room/space with e-bikes, e-scooters, wheelchairs, etc.
- place batteries in Trash or Recycling bin. **It is ILLEGAL.** Visit nyc.gov/batteries for disposal locations and information.

**In the event of a Fire,
Leave and CLOSE the door.
Call 911 once you are in a safe location.**



Charging Lithium Ion

Lithium-ion batteries do not have to be fully charged; partial charge is the most suitable.

When **charging more than five (5)** personal mobility devices or their removable batteries, it must be in a **dedicated room with ventilation** and a self-closing door.

For a total battery capacity of 20 kilowatt-hours (kWh), a 2-foot separation between charging batteries is required. For a total battery capacity up to 50 kWh, a 3-foot separation is needed.

Chargers must only be used with a compatible battery pack. The original equipment manufacturer (OEM) charger interplays with the battery pack using the battery management system (BMS). The wrong battery/charger combination may not work safely. For example, the 100% cutoff to prevent overcharging, which damages batteries, may not work which can easily create hazardous conditions such as fires, explosions and/or injuries.

Always check with the manufacturer or retailer of the personal

mobility device, an authorized repair shop or a testing laboratory such as Underwrites Laboratories (UL) to see if replacement is recommended or listed and safe for use with that device. Using unauthorized parts, including batteries and/or chargers, may cause damage, fire and possibly void your warranty.

Extinguishing Lithium-ion

Water may not prevent a battery from burning and spreading. Battery cells are known to explode and quickly spread to another battery. It can spread to another devices.



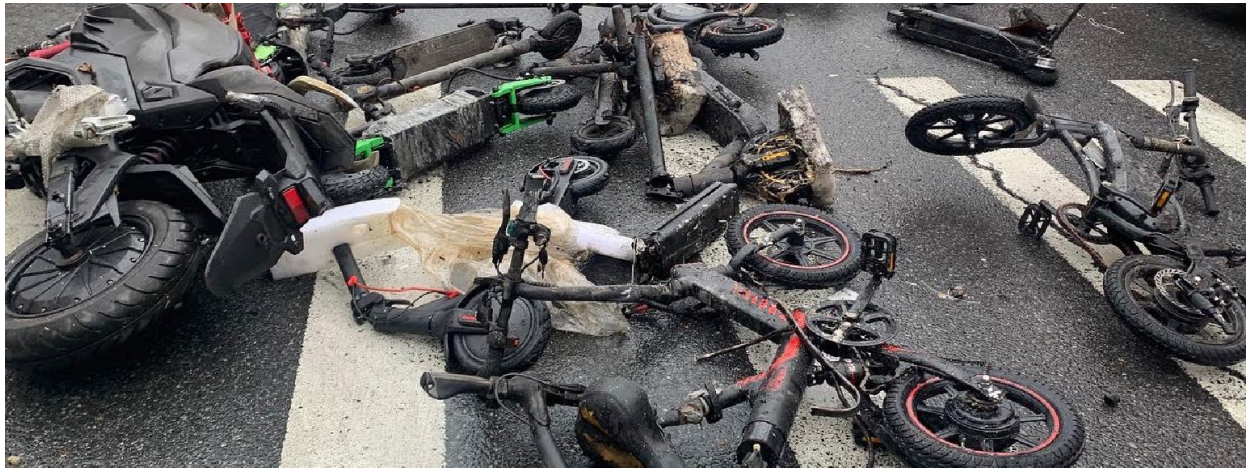
Fire Extinguishers
do not work
on lithium-ion batteries fires.

Unexpected Re-ignition.

Reignition is common. Lithium-Ion Batteries are known to unexpectedly re-ignite (without warning) minutes, hours and even days after all visible fire has been put out.

Lithium-ion batteries can enter an uncontrollable, self-heating state. This can result in the release of gas, cause fire and possible explosion.

These batteries may continue to generate heat even when there is no visible sign of fire. Once heat reaches a certain level fire may reignite on the battery and surrounding area.



APPENDIX

A. EXPLANATION OF SAFETY DATA SHEET (SDS)/MATERIAL SAFETY DATA SHEET (MSDS) AND SEVERAL EXAMPLES.

The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) to communicate the hazards of hazardous chemical products. As of June 1, 2015, the HCS will require new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below:

Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements.

Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.

Section 4, First-aid measures includes important symptoms/effects, acute, delayed; required treatment.

Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.

Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.

Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.

Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); ACGIH Threshold Limit Values (TLVs); and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the SDS where available as well as appropriate engineering controls; personal protective equipment (PPE).

Section 9, Physical and chemical properties lists the chemical's characteristics.

Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.

Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

Section 16, Other information, includes the date of preparation or last revision.

*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15 (29 CFR 1910.1200(g)(2)).

EMPLOYERS MUST ENSURE THAT SDSS/MSDS ARE READILY ACCESSIBLE TO EMPLOYEES.

COMMON EXAMPLES

FLAMMABLE LIQUIDS

Class IA

Ethyl ether

(Hazard Signal: 1 Health 4 Flammability 1 Instability)



Ethyl ether, is also known as Diethyl ether, simply ether, or ethoxyethane. It is a colorless, highly volatile flammable liquid with a characteristic odor. It is commonly used as a solvent.

Handling and Storage

Handling Precautions:

Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids, moisture.

Storage:

Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Do not store above 30°C (86°F). Hygroscopic; keep container tightly closed. Air Sensitive. Sensitive to light.

Fire Hazards

Extremely flammable in presence of open flames and sparks, of heat. Slightly flammable to flammable in presence of oxidizing materials, of acids. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. Burns with smoky greenish flame.

Health Hazards

Inhalation:

Irritant. General anesthesia by inhalation can occur. Continued exposure may lead to respiratory failure or death. Early symptoms include irritation of nose and throat, vomiting, and irregular respiration, followed by dizziness, drowsiness, and unconsciousness.

Skin Contact:

Irritating to the skin and mucous membranes by drying effect. Can cause dermatitis on prolonged exposure. May be absorbed through skin.

Eye Contact:

May cause irritation, redness and pain. Prolonged exposures to high concentrations of vapor can cause eye damage.

Chronic Exposure:

Repeated exposures may be habit forming. Prolonged exposures may result in headache, drowsiness, excitation, and psychic disturbances. Teratogenic effects are possible.



Class IB

Acetone

(Hazard Signal: 1 Health 3 Flammability 0 Instability)

Acetone is a colorless, flammable liquid with a sweet odor and the consistency of water. It is also referred to as imethyl ketone, propanone, and 2-propanone. Acetone is miscible with water and serves as an important solvent in its own right, typically as the solvent of choice for cleaning purposes in the laboratory. When mixed with water, an irritating flammable vapor is produced. This flammable liquid is shipped and stored inside glass bottles or cans, steel drums, and storage tanks at ambient temperatures.

Handling and Storage

Handling Precautions:

Keep locked up. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, acids, alkalis.

Storage:

Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Keep away from direct sunlight and heat and avoid all possible sources of ignition (spark or flame).

Fire Hazards

Highly flammable in presence of open flames and sparks, of heat. Highly flammable in presence of open flames and sparks, of heat.

Health Hazards

Inhalation:

High concentrations may lead to central nervous system effects (drowsiness, dizziness, nausea, headache, paralysis and loss of consciousness and even death). High vapor concentrations are irritating to the eyes, nose, throat and lungs.

▪ **Skin Contact:**

Moderately irritating to the skin. Prolonged or repeated contact can result in defatting and drying of the skin which may result in skin irritation and dermatitis (rash).

▪ **Eye Contact:**

Contact with the eye may cause moderate to severe irritation.



Turpentine

(Hazard Signal: 1 Health 3 Flammability 0 Instability)

Turpentine is a fluid with a strong odor obtained by the distillation of resin obtained from trees, mainly pine trees. The two primary uses of turpentine in industry are as a solvent and as a source of materials for organic synthesis. As a solvent, turpentine is used for thinning oil-based paints, for producing varnishes. Turpentine is also used as a source of raw materials in the synthesis of fragrant chemical compounds.

Handling and Storage

▪ **Handling Precautions:**

Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

▪ **Storage:**

Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Fire Hazards

Flammable in presence of oxidizing materials.

Health Hazards

▪ **Inhalation:**

May cause dizziness, headache, watering of the eyes, irritation of the respiratory tract, nausea, depression of the central nervous system, and serious irritation to the kidneys. Severe overexposure may cause unconsciousness.

▪ **Skin Contact:**

This material is a skin irritant.

▪ **Eye Contact:**

This material is a severe eye irritant.

▪ **Chronic Exposure:**

Reports have associated repeated and prolonged overexposure to solvents with neurological and other physiological damage. May cause jaundice, bone marrow damage, liver damage, anemia, nausea, skin irritation, headache, dizziness, some loss of memory, heart palpitations, and kidney damage, central nervous system damage, mental confusion, convulsions, coma, and death.

COMBUSTIBLE LIQUIDS



Class II

Kerosene

(Hazard Signal: 2 Health 2 Flammability 0 Instability)

Kerosene is a thin, clear combustible hydrocarbon liquid formed from hydrocarbons. In field settings, it is also referred to kerosine or fuel oil #1. Kerosene is widely used to power jet-engined aircraft (jet fuel) and some rockets, but is also commonly used as a heating fuel and for fire toys. Kerosene has an ignition quality similar to Numbers 1 and 2 Diesel Fuel. But Kerosene is too thin to work well as an engine fuel.

Handling and Storage

▪ **Handling Precautions:**

Keep locked up. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

▪ **Storage:**

Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Fire Hazards

Flammable in presence of open flames and sparks, of heat.

Health Hazards

▪ **Inhalation:**

Inhalation causes irritation to respiratory tract. Symptoms may include coughing, shortness of breath, burning sensation in chest, headache, nausea, weakness, restlessness and incoordination, drowsiness and coma.

▪ **Skin Contact:**

Causes irritation to skin. Symptoms include redness, itching, and pain. May cause dermatitis.

▪ **Eye Contact:**

May cause severe irritation and pain.

(B) WD-40 Lubricant

(Hazard Signal: 2 Health 2 Flammability 0 Instability)



WD-40 is the trademark name of a United States-made water-displacing spray. WD-40 stands for "Water Displacement – 40th Attempt". It was originally designed to repel water and prevent corrosion, and later was found to have numerous household uses.

Handling and Storage

▪ **Handling Precautions:**

Avoid contact with eyes. Avoid prolonged contact with skin. Avoid breathing vapors or aerosols. Use only with adequate ventilation. Keep away from heat, sparks, pilot lights, hot surfaces and open flames. Unplug electrical tools, motors and appliances before spraying or bringing the can near any source of electricity. Electricity can burn a hole in the can and cause contents to burst into flames. To avoid serious burn injury, do not let the can touch battery terminals, electrical connections on motors or appliances or any other source of electricity. Wash thoroughly with soap and water after handling. Keep containers closed when not in use. Keep out of the reach of children. Do not puncture, crush or incinerate containers, even when empty.

▪ **Storage:**

Store in a cool, well-ventilated area, away from incompatible materials. Do not store above 120°F or in direct sunlight.

Fire Hazards

Contents under pressure. Keep away from ignition sources and open flames. Exposure of containers to extreme heat and flames can cause them to rupture often with violent force. Vapors are heavier than air and may travel along surfaces to remote ignition sources and flash back.

Health Hazards

▪ **Inhalation:**

High concentrations may cause nasal and respiratory irritation and central nervous system effects such as headache, dizziness and nausea. Intentional abuse may be harmful or fatal.

▪ **Skin Contact:**

Prolonged and/or repeated contact may produce mild irritation and defatting with possible dermatitis.

▪ **Eye Contact:**

Contact may be irritating to eyes. May cause redness and tearing.

Class IIIA

(A) Butyric Acid

(Hazard Signal: 3 Health 2 Flammability 0 Instability)



Butyric acid also known under the systematic name butanoic acid. Butyric acid is found in butter, parmesan cheese, and vomit, and as a product of anaerobic fermentation (including in the colon and as body odor). It is a clear liquid and has an unpleasant smell and acrid taste, with a sweetish aftertaste

Handling and Storage

▪ **Handling Precautions:**

Keep container dry. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes.

▪ **Storage:**

Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Fire Hazards

Vapors may flow along surfaces to distant ignition sources and flash back. Closed containers exposed to heat may explode. Contact with strong oxidizers may cause fire.

Health Hazards

Corrosive. Causes eye and skin burns. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns.

▪ **Inhalation:**

May cause severe irritation of the upper respiratory tract with pain, burns, and inflammation. Causes chemical burns to the respiratory tract.

▪ **Eye Contact:**

Causes eye burns.

▪ **Skin Contact:**

Harmful if absorbed through the skin. Causes skin burns.

AEROSOL





WD-40

1 - Identification

<p>Product Name: WD-40 Aerosol</p> <p>Product Use: Lubricant, Penetrant, Drives Out Moisture, Removes and Protects Surfaces From Corrosion</p> <p>Restrictions on Use: None identified</p> <p>SDS Date Of Preparation: 12/10/2012</p>	<p>Manufacturer: WD-40 Company Address: 1061 Cudahy Place (92110) P.O. Box 80607 San Diego, California, USA 92138 -0607</p> <p>Telephone: Emergency only: 1-888-324-7596 (PROSAR) Information: 1-888-324-7596 Chemical Spills: 1-800-424-9300 (Chemtrec) 1-703-527-3887 (International Calls)</p>
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2 – Hazards Identification

<p>Hazcom 2012/GHS Classification: Flammable Aerosol Category 1 Aspiration Toxicity Category 1</p> <p>Label Elements:</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>DANGER! Extremely Flammable Aerosol. May be fatal if swallowed and enters airways.</p> <p>Prevention Keep away from heat, sparks, open flames, hot surfaces – No smoking. Do not spray on an open flame or other ignition source. Pressurized container: Do not pierce or burn, even after use.</p> <p>Response IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting.</p> <p>Storage Store locked up. Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F.</p> <p>Disposal Dispose of contents and container in accordance with local and national regulations.</p>

3 - Composition/Information on Ingredients

Ingredient	CAS #	Weight Percent	US Hazcom 2012/ GHS Classification
Aliphatic Hydrocarbon	64742-47-8	45-50	Flammable Liquid Category 3 Aspiration Toxicity Category 1
Petroleum Base Oil	64742-58-1 64742-53-6 64742-56-9 64742-65-0	<25	Not Hazardous
LVP Aliphatic Hydrocarbon	64742-47-8	12-18	Aspiration Toxicity Category 1

Carbon Dioxide	124-38-9	2-3	Simple Asphyxiant
Non-Hazardous Ingredients	Mixture	<10	Not Hazardous

Note: The exact percentages are a trade secret.

4 – First Aid Measures

Ingestion (Swallowed): Aspiration Hazard. DO NOT induce vomiting. Call physician, poison control center or the WD-40 Safety Hotline at 1-888-324-7598 immediately.

Eye Contact: Flush thoroughly with water. Remove contact lenses if present after the first 5 minutes and continue flushing for several more minutes. Get medical attention if irritation persists.

Skin Contact: Wash with soap and water. If irritation develops and persists, get medical attention.

Inhalation (Breathing): If irritation is experienced, move to fresh air. Get medical attention if irritation or other symptoms develop and persist.

Signs and Symptoms of Exposure: May cause eye and respiratory irritation. Inhalation may cause coughing, headache and dizziness. Skin contact may cause drying of the skin.

Indication of Immediate Medical Attention/Special Treatment Needed: Immediate medical attention is needed for ingestion.

5 – Fire Fighting Measures

Suitable (and unsuitable) Extinguishing Media: Use water fog, dry chemical, carbon dioxide or foam. Do not use water jet or flooding amounts of water. Burning product will float on the surface and spread fire.

Specific Hazards Arising from the Chemical: Contents under pressure. Keep away from ignition sources and open flames. Exposure of containers to extreme heat and flames can cause them to rupture often with violent force. Vapors are heavier than air and may travel along surfaces to remote ignition sources and flash back. Combustion will produce oxides of carbon and hydrocarbons.

Special Protective Equipment and Precautions for Fire-Fighters: Firefighters should always wear positive pressure self-contained breathing apparatus and full protective clothing. Cool fire-exposed containers with water. Use shielding to protect against bursting containers.

6 – Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Wear appropriate protective clothing (see Section 8). Eliminate all sources of ignition and ventilate area.

Methods and Materials for Containment/Cleanup: Leaking cans should be placed in a plastic bag or open pail until the pressure has dissipated. Contain and collect liquid with an inert absorbent and place in a container for disposal. Clean spill area thoroughly. Report spills to authorities as required.

7 – Handling and Storage

Precautions for Safe Handling: Avoid contact with eyes. Avoid prolonged contact with skin. Avoid breathing vapors or aerosols. Use only with adequate ventilation. Keep away from heat, sparks, pilot lights, hot surfaces and open flames. Unplug electrical tools, motors and appliances before spraying or bringing the can near any source of electricity. Electricity can burn a hole in the can and cause contents to burst into flames. To avoid serious burn injury, do not let the can touch battery terminals, electrical connections on motors or appliances or any other source of electricity. Wash thoroughly with soap and water after handling. Keep containers closed when not in use. Keep out of the reach of children. Do not puncture, crush or incinerate containers, even when empty.

Conditions for Safe Storage: Store in a cool, well-ventilated area, away from incompatible materials Do not store above 120°F or in direct sunlight. U.F.C (NFPA 30B) Level 3 Aerosol. Store away from oxidizers.

8 – Exposure Controls/Personal Protection

Chemical	Occupational Exposure Limits
Aliphatic Hydrocarbon	1200 mg/m ³ TWA (manufacturer recommended)
Petroleum Base Oil	5 mg/m ³ TWA, 10 mg/m ³ STEL ACGIH TLV 5 mg/m ³ TWA OSHA PEL
LVP Aliphatic Hydrocarbon	1200 mg/m ³ TWA (manufacturer recommended)

Carbon Dioxide	5000 ppm TWA (OSHA/ACGIH), 30,000 ppm STEL (ACGIH)
Non-Hazardous Ingredients	None Established

The Following Controls are Recommended for Normal Consumer Use of this Product
Appropriate Engineering Controls: Use in a well-ventilated area.
Personal Protection:
Eye Protection: Avoid eye contact. Always spray away from your face.
Skin Protection: Avoid prolonged skin contact. Chemical resistant gloves recommended for operations where skin contact is likely.
Respiratory Protection: None needed for normal use with adequate ventilation.

For Bulk Processing or Workplace Use the Following Controls are Recommended
Appropriate Engineering Controls: Use adequate general and local exhaust ventilation to maintain exposure levels below that occupational exposure limits.
Personal Protection:
Eye Protection: Safety goggles recommended where eye contact is possible.
Skin Protection: Wear chemical resistant gloves.
Respiratory Protection: None required if ventilation is adequate. If the occupational exposure limits are exceeded, wear a NIOSH approved respirator. Respirator selection and use should be based on contaminant type, form and concentration. Follow OSHA 1910.134, ANSI Z88.2 and good Industrial Hygiene practice.
Work/Hygiene Practices: Wash with soap and water after handling.

9 – Physical and Chemical Properties

Appearance:	Light amber liquid	Flammable Limits: (Solvent Portion)	LEL: 0.8% UEL: 5.6%
Odor:	Mild petroleum odor	Vapor Pressure:	95-115 PSI @ 70°F
Odor Threshold:	Not established	Vapor Density:	Greater than 1 (air=1)
pH:	Not Applicable	Relative Density:	0.8 – 0.82 @ 60°F
Melting/Freezing Point	Not established	Solubilities:	Insoluble in water
Boiling Point/Range:	322 - 388°F (161 - 198°C)	Partition Coefficient; n-octanol/water:	Not established
Flash Point:	122°F (49°C) Tag Open Cup (concentrate)	Autoignition Temperature:	Not established
Evaporation Rate:	Not established	Decomposition Temperature:	Not established
Flammability (solid, gas)	Flammable Aerosol	Viscosity:	2.79-2.96 cSt @ 100°F
VOC:	533 grams/liter (65%)		

10 – Stability and Reactivity

Reactivity: Not reactive under normal conditions
Chemical Stability: Stable
Possibility of Hazardous Reactions: May react with strong oxidizers generating heat.
Conditions to Avoid: Avoid heat, sparks, flames and other sources of ignition. Do not puncture or incinerate containers.
Incompatible Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide and carbon dioxide.

11 – Toxicological Information

Symptoms of Overexposure:
Inhalation: High concentrations may cause nasal and respiratory irritation and central nervous system effects such as headache, dizziness and nausea. Intentional abuse may be harmful or fatal.
Skin Contact: Prolonged and/or repeated contact may produce mild irritation and defatting with possible dermatitis.

Eye Contact: Contact may be irritating to eyes. May cause redness and tearing.
Ingestion: This product has low oral toxicity. Swallowing may cause gastrointestinal irritation, nausea, vomiting and diarrhea. This product is an aspiration hazard. If swallowed, can enter the lungs and may cause chemical pneumonitis, severe lung damage and death.
Chronic Effects: None expected.
Carcinogen Status: None of the components are listed as a carcinogen or suspect carcinogen by IARC, NTP, ACGIH or OSHA.
Reproductive Toxicity: None of the components is considered a reproductive hazard.

Numerical Measures of Toxicity:
The oral toxicity of this product is estimated to be greater than 5,000 mg/kg and the dermal toxicity greater than 2,000 mg/kg based on an assessment of the ingredients. This product is not classified as toxic by established criteria. It is an aspiration hazard.

12 – Ecological Information

Ecotoxicity: No specific aquatic toxicity data is currently available, however components of this product are not expected to be harmful to aquatic organisms
Persistence and Degradability: Component are readily biodegradable.
Bioaccumulative Potential: Bioaccumulation is not expected based on an assessment of the ingredients.
Mobility in Soil: No data available
Other Adverse Effects: None known

13 - Disposal Considerations

If this product becomes a waste, it would be expected to meet the criteria of a RCRA ignitable hazardous waste (D001). However, it is the responsibility of the generator to determine at the time of disposal the proper classification and method of disposal. Do not puncture or incinerate containers, even empty. Dispose in accordance with federal, state, and local regulations.

14 – Transportation Information

DOT Surface Shipping Description: Consumer Commodity, ORM-D until 12/31/2013
After 1/1/2014 UN1950, Aerosols, 2.1 Ltd. Qty (Note: Shipping Papers are not required for Limited Quantities unless transported by air or vessel – each package must be marked with the Limited Quantity Mark)
IMDG Shipping Description: Un1950, Aerosols, 2.1, LTD QTY
ICAO Shipping Description: UN1950, Aerosols, flammable, 2.1 NOTE: WD-40 does not test aerosol cans to assure that they meet the pressure and other requirements for transport by air. We do not recommend that our aerosol products be transported by air.

15 – Regulatory Information

U.S. Federal Regulations:
CERCLA 103 Reportable Quantity: This product is not subject to CERCLA reporting requirements, however, oil spills are reportable to the National Response Center under the Clean Water Act and many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.
SARA TITLE III:
Hazard Category For Section 311/312: Acute Health, Fire Hazard, Sudden Release of Pressure
Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III Section 313 Reporting requirements: None
Section 302 Extremely Hazardous Substances (TPQ): None
EPA Toxic Substances Control Act (TSCA) Status: All of the components of this product are listed on the TSCA inventory.
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65): This product does not contain chemicals regulated under California Proposition 65.

Canadian Environmental Protection Act: One of the components is listed on the NDSL. All of the other ingredients are listed on the Canadian Domestic Substances List or exempt from notification.
Canadian WHMIS Classification: Class B-5 (Flammable Aerosol)
This MSDS has been prepared according to the criteria of the Controlled Products Regulation (CPR) and the MSDS contains all of the information required by the CPR.

16 – Other Information:

HMIS Hazard Rating:
Health – 1 (slight hazard), Fire Hazard – 4 (severe hazard), Reactivity – 0 (minimal hazard)

Revision Summary: Convert to Hazcom 2012. Changes in all sections.

Prepared by: Industrial Health & Safety Consultants, Inc. Shelton, CT, USA

CORROSIVE MATERIAL



MURIATIC ACID

Material Safety Data Sheet

Emergency 24 Hour Telephone: CHEMTREC 800.424.9300

Corporate Headquarters: Hasa Inc.
 23119 Drayton Street
 Saugus, California 91350
 Telephone • 661.259.5848
 Fax • 661.259.1538

HASAMURIATIC ACID
 Material Safety Data Sheet (MSDS No. 110)

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION			
1.1	Product Identification		
1.1.1	Product Name	Hasa Muriatic Acid	
1.1.2	CAS # (Chemical Abstracts Service):	7647-01-0	
1.1.3	RTECS (Registry of Toxic Effects of Chemical Substances):	MW4025000	
1.1.4	EINECS (European Inventory of Existing Chemical Substances):	231-595-7	
1.1.5	Synonym	Hydrochloric Acid, Spirits of Salt	
1.1.6	Chemical Name	Hydrochloric Acid	
1.1.7	Chemical Formula	HCl	
1.2	Recommended Use	Household cleaning, swimming pool water pH control and neutralization.	
1.3	Company Identification	Hasa Inc. 23119 Drayton Street Santa Clarita (Saugus), California 91350	
1.4	Emergency Telephone Number	CHEMTREC: 1-800-424-9300 (24 hour)	
1.5	Non-Emergency Assistance Telephone Number	661-259-5848 (8 AM – 5 PM PST / PDT)	

SECTION 2: EMERGENCY OVERVIEW and HAZARD IDENTIFICATION		
2.1	Emergency Overview.	DANGER! Extremely corrosive, causes burns and eye damage, harmful if inhaled. Harmful or fatal if swallowed. Highly reactive with alkaline materials. Reacts with most metals to release hydrogen gas, a flammable gas.
2.2	Hazards Acute Effects: Hydrochloric acid is corrosive to the eyes, skin, and mucous membranes.	
2.2.1	Eye Contact:	Immediate pain, severe burns and corneal damage, which may result in permanent blindness. Low concentrations of vapor or mist (10-35 ppm) can be immediately irritating causing redness.
2.2.2	Skin Contact:	Dermal contact may produce severe burns, ulceration, and scarring.
2.2.3	Inhalation:	Acute inhalation exposure may cause coughing, hoarseness, inflammation and ulceration of the respiratory tract, chest pain, and pulmonary edema in humans. Pulmonary irritation, lesions of the upper respiratory tract, and laryngeal and pulmonary edema have been reported in rodents acutely exposed by inhalation. Acute animal tests in rats, mice, and rabbits, have demonstrated hydrochloric acid to have moderate to high acute toxicity from inhalation.
2.2.4	Ingestion:	Acute oral exposure may cause corrosion of the mucous membranes, esophagus, and stomach, with nausea, vomiting, and diarrhea reported in humans. Acute animal tests in rats, mice, and rabbits, have demonstrated hydrochloric acid to have moderate acute toxicity from oral exposure.
2.2.5	Aggravation of Pre-existing Medical Conditions:	Skin irritation may be aggravated in individuals with existing skin lesions. Breathing of vapors or sprays (mists) may aggravate acute or chronic asthma and chronic pulmonary disease such as emphysema and bronchitis.
2.3	Chronic Effects: Chronic occupational exposure to hydrochloric acid has been reported to cause gastritis, chronic bronchitis, dermatitis, and photosensitization in humans. Prolonged exposure to low concentrations may also cause dental discoloration and erosion.	
2.4	Carcinogenicity: Hydrochloric acid is not classified as carcinogenic by ACGIH or IARC, not regulated as a carcinogen by OSHA, and not listed as carcinogens by NTP.	
2.5	International Agency for Research on Cancer (IARC) Monographs: Hydrochloric acid is classified as Group 3 (Not classifiable as to its carcinogenicity to humans).	

SECTION 3: COMPOSITION INFORMATION ON INGREDIENTS			
	Ingredient	CAS No.	Weight % (Approx.)
3.1	Hydrochloric Acid	7647-01-0	31.44%
3.2	Water	7789-20-0	68.56%

SECTION 4: FIRST AID MEASURES		
4.1.	IF IN EYES	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
4.2.	IF ON SKIN OR CLOTHING	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
4.3.	IF INHALED	<ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. • Call a poison control center or doctor for further treatment advice.
4.4.	IF SWALLOWED	<ul style="list-style-type: none"> • Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information.

NOTE TO PHYSICIAN

Probable mucosal damage may contraindicate the use of gastric lavage.

SECTION 5: FIRE FIGHTING MEASURES

5.1	Flammability:	Nonflammable and noncombustible.
5.2	Auto-Ignition Temperature:	Not applicable.
5.3	Flash Point:	Not applicable.
5.4	Flammable Limits:	Not applicable.
5.5	Products of Combustion:	Hydrogen and chlorine
5.6	Fire Hazards in Presence of Various Substances:	Reacts with many metals to liberate hydrogen gas which can form explosive mixtures with air.
5.7	Explosion Hazards:	Not sensitive.
5.8	Fire Fighting Media and Instructions:	
	5.8.1	Extinguishing Media: Use extinguishing measures appropriate to local circumstances and the surrounding environment.
	5.8.2	Small Fires: Use carbon dioxide, dry chemical, dry sand, alcohol-resistant foam or water spray.
	5.8.3	Large Fires: Water spray, fog or alcohol-resistant foam. Move containers from fire area if you can do it without risk. Use water spray or fog; do not use straight streams. Dike fire-control water for later disposal; do not scatter the material.
5.9	Fire Involving Tank Cars / Trailer Loads	Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Do not get water inside containers. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES		
6.1	Small Spill:	Gather up with a squeegee and place in pool and spa. If this is not possible, absorb with sand, diatomaceous earth or similar products and securely bag, and place in trash for collection.
6.2	Large Spill:	If possible without personal risk, stop leak. Try to prevent the materials from entering drains, waterways, or sewers and dispose of in accordance with local regulations. Rinse exposed area with dilute sodium carbonate solution. Call Hasa for advice.

SECTION 7: HANDLING AND STORAGE		
7.1	Handling:	Keep away from skins and eyes. Do not inhale or swallow. Do not mix with chlorine type bleaches or other household chemicals. Whenever handling muriatic acid, wear protective clothing (goggles, old clothing and rubber gloves). Remove protective clothing and wash before reuse.
7.2	Storage and Disposal:	Store muriatic acid in a clean, dry place in the upright position. Keep out of reach of children, pets and other animals. Rinse empty container thoroughly before discarding.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION		
8.1	Engineering Controls:	Local exhaust to maintain levels below Permissible Exposure Limit (PEL).
8.2	Personal Protection:	When necessary, wear splash goggles or safety glasses and gloves.
8.3	Personal Protection in Case of a Large Spill:	Wear splash goggles or safety glasses and gloves. If natural ventilation is insufficient, wear a NIOSH approved respirator.
8.4	Exposure Guidelines:	
8.4.1	ACGIH (American Conference of Governmental and Industrial Hygienists) TLV (Threshold Limit Value)	5 ppm (7 mg/m ³) Ceiling
8.4.2	PEL (OSHA Permissible Exposure Limit)	5 ppm (7 mg/m ³) Ceiling Limit
8.4.3	IDLH (NIOSH Immediate Danger to Life & Health)	50 ppm (75 mg/m ³)
8.4.4	AIHA (American Industrial Hygiene Association)	ERPG – 1 (<i>The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to one hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor.</i>) : 3 ppm ERPG – 2 (<i>The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action.</i>): 20 ppm ERPG – 3 (<i>The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to one hour without experiencing or developing life-threatening health effects.</i>): 150 ppm

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES		
9.1	Physical State and Appearance:	Colorless liquid.
9.2	Odor:	Irritating and pungent odor.
9.3	Taste:	No information available
9.4	Molecular Weight:	36.46
9.5	Color:	Colorless
9.6	pH (1% solution):	<1.0
9.7	Boiling Point:	81 °C (178°F)
9.8	Melting Point:	Not applicable.
9.9	Freezing Point:	-42 °C (-44°F)
9.10	Critical Temperature:	Not applicable.
9.11	Specific Gravity (H ₂ O=1):	1.16 @ 15.5°C (60°F)
9.12	Bulk Density:	Not applicable.
9.13	Density:	9.7 lb. / gallon
9.14	Vapor Pressure:	20 mm Hq @ 20°C
9.15	Vapor Density:	Not pertinent.
9.16	Volatility:	Not applicable.
9.17	Odor Threshold:	4.7 ppm @ at 25 °C
9.18	Water / Oil Distribution Coefficient:	Not applicable.
9.19	Dispersion Properties:	Not applicable.
9.20	Solubility in Water:	Mixes well with water in all concentrations.

SECTION 10: STABILITY AND REACTIVITY		
10.1	Stability:	Stable under normal conditions of storage, handling, and use.
10.2	Instability Temperature:	85°C. Rate of decomposition increases with heat.
10.3	Conditions of Instability:	High heat, ultraviolet light.
10.4	Incompatibility with Various Substances:	Oxidizing agents, acids, nitrogen containing organic, metals, iron, copper, nickel, cobalt, organic materials, and ammonia. Corrosive to most metals with evolution of hydrogen gas, which may form explosive mixtures with air.
10.5	Corrosivity:	Corrosive to eyes and skin.
10.6	Special Remarks on Reactivity:	Rate of decomposition increases with heat.
10.7	Special Remarks on Corrosivity:	None.
10.8	Hazardous Polymerization:	Will not occur.




SECTION 11: TOXICOLOGICAL INFORMATION		
11.1	Routes of Entry:	Eyes, skin, ingestion, dermal absorption.
11.2	Eye Irritation:	NIOSH: 5 mg/30s rinse (rabbit).
11.3	Acute Oral Toxicity (LD₅₀):	NIOSH: 900 mg/kg (rabbit)
11.4	Acute Inhalation Toxicity (LC₅₀):	NIOSH: 6,400 mg/m ³ /30 minute (rabbit).
11.5	Chronic Effects on Humans:	Chronic occupational exposure to hydrochloric acid has been reported to cause gastritis, chronic bronchitis, dermatitis, and photosensitization in humans. Prolonged exposure to low concentration may also cause dental discoloration and erosion.
11.6	Toxic Effects on Humans:	NIOSH: Lowest published lethal dose: 2,857 µg/kg
11.7	Dermal Effects on Humans (mild):	NIOSH: 4%/24 hour.
11.8	Acute Potential Health Effects:	No additional information available.
11.9	Skin (LD₅₀):	>5010 mg/kg
11.10	Eyes:	No additional information available.
11.11	Ingestion:	No additional information available.
11.12	Inhalation (LC₅₀):	1562 ppm / 4 hr (3124 ppm for 1 hr) rat 1108 ppm / 1 hr (mouse)
11.13	Chronic Potential Health Effects:	No additional information available.

SECTION 12: ECOLOGICAL INFORMATION		
12.1	Ecotoxicity General:	This product is toxic to fish and aquatic organisms. Do not contaminate water containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.
12.2	Ecotoxicological Information:	LC ₅₀ Shrimp 100 to 330 ppm/48 hr (salt water) LC ₅₀ Mosquito Fish 282 mg/L (24 to 96 hours) LC ₅₀ Green crabs 100 mg/L (96 hr produced no stress effects) LC ₅₀ Gold fish 180 mg/L (96 hours) Aquatic Hazard Concern Level : moderate
12.3	Persistence and Degradation:	When hydrochloric acid is spilled onto soil, it will begin to infiltrate. The presence of water in the soil will influence the rate of chemical movement in the soil. During transport through the soil, hydrochloric acid will dissolve some of the soil material, in particular those of a carbonate base. The acid will be expected to remain for transport down toward the ground water table. Hydrogen chloride in water dissociates almost completely, with the hydrogen ion captured by the water molecules to form the hydronium ion.
12.4	Products of Biodegradation:	Not pertinent.

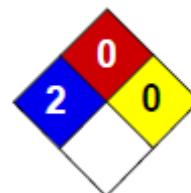
SECTION 13: DISPOSAL CONSIDERATIONS	
Do not contaminate food or feed by storage, disposal, or cleaning of equipment. Product or rinsates that cannot be used should be diluted with water before disposal in a sanitary sewer. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination system (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Dispose of in accordance with all applicable local, county, State, and Federal regulations.	

SECTION 14: TRANSPORT INFORMATION		
14.1	Shipping Name:	Hydrochloric Acid
14.2	Hazard Class / Division:	8
14.3	Identification No.:	UN 1789
14.4	Packing Group:	II
14.5	Reportable Quantity (RQ):	5,000 lb (1643 gallons)
14.6	DOT Special Permit 6614:	Hydrochloric acid may be shipped in deposit 1 gallon polyethylene bottles secured 4 per case in a plastic crate in accordance with DOT-SP-6614. In these cases, the special permit number "DOT-SP-6614" is included in the shipping description. The shipping description for return of empty deposit bottles and crates is "RESIDUE: LAST CONTAINED UN1789, HYDROCHLORIC ACID, 8, PGII, DOT-SP 6614".
14.7	Deposit Pails, Carboys and Drums:	The shipping description for return of empty deposit pails, carboys, and drum is "RESIDUE: LAST CONTAINED UN1789, HYDROCHLORIC ACID, 8, PGII".
14.8	<p>Materials of Trade (MOT) Exceptions. Under certain conditions, spa and pool maintenance chemicals may be loaded into pool service and builders trucks and shipped as a MOT, not subject to DOT regulations. A MOT means a hazardous material, other than a hazardous waste, that is carried on a motor vehicle – by a private motor carrier in direct support of his/her principal business that is other than transportation by motor vehicle.</p> <p>To qualify as a MOT, the hazardous material must fit into any one of the following classes or divisions (but not limited to) Corrosive Materials (Class 8) or Consumer Commodities (ORM-D).</p> <p>Quantity Limit for MOT: For Corrosive Materials (Class 8) that belongs to Packing Group II or III, or is a consumer commodity (ORM-D) – the maximum amount of material in each package is 30 kg (66 lbs) for solids, or 30 L (8 gal) for liquids. The aggregate gross weight of all MOTs on a motor vehicle may not exceed 200 kg (440 pounds).</p> <p>Packaging requirement:</p> <ol style="list-style-type: none"> 1 Packagings must be leak tight for liquids and gases, sift proof for solids, and be securely closed, secured against shifting, and protected against damage. 2 Each material must be packaged in the manufacturer's original packaging, or a packaging of equal or greater strength and integrity. 3 Outer packagings are not required for receptacles (e.g., cans and bottles) that are secured against shifting in cages, carts, bins, boxes or compartments. <p>Hazard communication:</p> <ul style="list-style-type: none"> • A non-bulk packaging other than a cylinder (including a receptacle transported without an outer packaging) must be marked with a common name or proper shipping name to identify the material it contains, including the letters "RQ" if it contains a reportable quantity of a hazardous substance. • The operator of a motor vehicle that contains a material of trade must be informed of the presence of the hazardous material (including whether the package contains a reportable quantity) and must be informed of the requirements of 49 CFR §173.6. <p>Other exceptions: A MOT may be transported on a motor vehicle under the provisions of 49 CFR §173.6 (e) with other hazardous materials without affecting its eligibility for these exceptions.</p> <p>The MOTs regulations do not require:</p> <ul style="list-style-type: none"> • shipping papers; • emergency response information; • placarding; or • formal training or retention of training records. 	
<p><i>This information is not intended to convey all specific regulatory or operational requirements / information relating to this product. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.</i></p>		

SECTION 15: REGULATORY INFORMATION		
15.1	U.S. Regulations:	
15.1.1	OSHA HAZCOM (Hazard Communication)	This material is considered hazardous under the HAZCOM standard (29 CFR 1910.1200).
15.1.2	OSHA PSM (Process Safety Management):	Not regulated under PSM standard (29 CFR 1910.119).
15.1.3	EPA EPCRA (EPA Emergency Planning and Community Right-to-know Act):	Not listed on Extremely Hazardous Substances and Their Threshold Planning Quantities. (Appendix A to 40 CFR Part 355)
15.1.4	EPA TSCA (Toxic Substance Control Act):	All components are listed or exempted. TSCA 12(b): This product is not subject to export notification.
15.1.5	EPA CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):	Reportable Quantity (RQ) under CERCLA: 5000 lbs. (1643 gallons).
15.1.6	EPA FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act):	Not regulated under FIFRA.
15.1.7	EPA RMP (Risk Management Plan):	Not regulated under RMP. (40 CFR 68.130)
15.2	State of California Regulations:	
15.2.1	CDPR (California Department of Pesticide Regulation):	Registration No: 10897-50008-AA (spray adjuvant)
15.2.2	CalARP (California Accidental Release Prevention):	Not regulated.
15.3	Canada Regulations:	
15.3.1	WHMIS (Workplace Hazardous Materials Information System):	WHMIS classification: D1A - Poisonous and infectious material - Immediate and serious effects - Very toxic E - Corrosive Materials
15.3.2	DSL (Domestic Substances List):	All components of this product are on the DSL.
15.4	International Inventory:	
15.4.1	AICS (Australian Inventory of Chemical Substances):	On inventory or in compliance with inventory.
15.4.2	KECI (Korean Existing Chemicals Inventory):	On inventory or in compliance with inventory.
15.4.3	PICCS (Philippine Inventory of Chemicals and Chemical Substances):	On inventory or in compliance with inventory.
15.4.4	IECSC (Inventory of Existing Chemical Substances in China):	On inventory or in compliance with inventory.
15.4.5	NZIoC (New Zealand Inventory of Chemicals):	On inventory or in compliance with inventory.

SECTION 16: OTHER INFORMATION		
16.1 HMIS III (Hazardous Materials Identification System):		
16.1.1	HEALTH	3
16.1.2	FLAMMABILITY	0
16.1.3	PHYSICAL HAZARD	1
16.2 NFPA 704 (National Fire Protection Association):		
16.2.1	Health	3
16.2.2	Flammability	0
16.2.3	Instability	0
16.2.4	Special	None
		
16.3	International Fire Code / International Building Code:	Corrosive Liquid.
16.4 ANSI (American National Standards Institute):		
16.4.1	Hazardous Industrial Chemicals - MSDSs-Preparation:	Complies with ANSI Z400.1 – 2004.
16.4.2	Hazardous Industrial Chemicals - Precautionary Labeling:	Complies with ANSI Z129.1 – 2006.
16.5 GHS (Globally Harmonized System):		
16.5.1	GHS Classification:	Acute Toxicity (Inhalation Category 3)
16.5.2	GHS Symbol:	
16.5.3	GHS Signal Word:	Danger
16.5.4	GHS Hazard Statement:	Toxic if inhaled.
16.6 GHS (Globally Harmonized System):		
16.6.1	GHS Classification:	Serious Eye Damage / Eye Irritation (Category 1)
16.6.2	GHS Symbol:	
16.6.3	GHS Signal Word:	Danger
16.6.4	GHS Hazard Statement:	Causes severe skin burns and eye damage.

OXIDIZING MATERIAL



Health	2
Fire	0
Reactivity	0
Personal Protection	E

**Material Safety Data Sheet
Aluminum nitrate nonahydrate MSDS**

Section 1: Chemical Product and Company Identification

Product Name: Aluminum nitrate nonahydrate Catalog Codes: SLA1981 CAS#: 7784-27-2 RTECS: BD1050000 TSCA: TSCA 8(b) inventory: Aluminum nitrate nonahydrate CI#: Not available. Synonym: Chemical Name: aluminum nitrate nonahydrate Chemical Formula: Al(NO3)3.9H2O	Contact Information: Sciencelab.com, Inc. 14025 Smith Rd. Houston, Texas 77396 US Sales: 1-800-901-7247 International Sales: 1-281-441-4400 Order Online: ScienceLab.com CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300 International CHEMTREC, call: 1-703-527-3887 For non-emergency assistance, call: 1-281-441-4400
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Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Aluminum nitrate nonahydrate	7784-27-2	100

Toxicological Data on Ingredients: Aluminum nitrate nonahydrate: ORAL (LD50): Acute: 3632 mg/kg [Rat]. 3980 mg/kg [Mouse]. 4280 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
 Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator). Prolonged exposure may result in skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation.

Potential Chronic Health Effects:
 CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:

Oxidizing material. Stop leak if without risk. Avoid contact with a combustible material (wood, paper, oil, clothing...). Keep substance damp using water spray. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:

Keep away from heat. Keep away from sources of ignition. Keep away from combustible material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes.

Storage:

Keep container tightly closed. Keep container in a cool, well-ventilated area. Separate from acids, alkalies, reducing agents and combustibles. See NFPA 43A, Code for the Storage of Liquid and Solid Oxidizers.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:

Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

TWA: 2 Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 375.13 g/mole

Color: Not available.

pH (1% soln/water): Not available.

Boiling Point: Decomposition temperature: 135°C (275°F)

Melting Point: 73°C (163.4°F)

Critical Temperature: Not available.

Specific Gravity: 1.058 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:

Easily soluble in cold water. Soluble in hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Eye contact. Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 3632 mg/kg [Rat].

Chronic Effects on Humans: Causes damage to the following organs: lungs, mucous membranes.

Other Toxic Effects on Humans:

Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 5.1: Oxidizing material.

Identification: : Aluminum Nitrate UNNA: UN1438 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations: TSCA 8(b) inventory: Aluminum nitrate nonahydrate

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):

CLASS C: Oxidizing material. CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):

R8- Contact with combustible material may cause fire. R36/38- Irritating to eyes and skin.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/11/2005 11:15 AM

Last Updated: 05/21/2013 12:00 PM

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B. HAZARDOUS MATERIALS REPORT FORM



NEW YORK STATE DEPARTMENT OF STATE
OFFICE OF FIRE PREVENTION AND CONTROL

HAZARDOUS MATERIALS REPORT FORM
(General Municipal Law, § 209-u)

The information entered herein is essential to your local fire chief for the protection of your employees, the fire-fighters and citizens in the immediate area, and to reduce damage to your property in the event of a fire or an emergency.

Every fire insurance policyholder, engaged in commerce in this state, is required by law to report the presence of hazardous materials at their business address.

Failure to file in accordance with the provisions of section 209-u of the General Municipal Law could result in a fine.

A separate report is required annually for each business address.

WHEN COMPLETED, THIS FORM MUST BE SENT TO YOUR LOCAL FIRE DEPARTMENT.

Hazardous Materials Location*

Firm Name _____	Street Add. Only _____
Bus. Add. _____	Bldg. Name or No. _____
City, State, Zip _____	City, State, Zip _____
Tel. No. _____	Policy Anniv. Date _____
Name Emergency Contact _____	Bus. Tel. _____ Home Tel. _____

(Signature and Title of Person Completing Form)

*It is suggested that a separate form be filled out for each building that contains hazardous materials.

EXEMPTIONS

Requests for exemptions from this law must be made in writing, attached to this form, and filed annually with your local fire department not later than the anniversary date of your policy.

All exemptions approved shall expire on the next policy anniversary date.

Exemptions denied shall require that the insured file a completed hazardous materials report form within 15 days of denial.

FOR FIRE DEPARTMENT USE ONLY

Exemptions: Approved _____ Denied _____ Additional Information Needed _____

(Date)

(Signature of Fire Chief)

(Fire Department Name and Address)

(Print Name of Fire Chief)

C. WORST CASE SCENARIOS

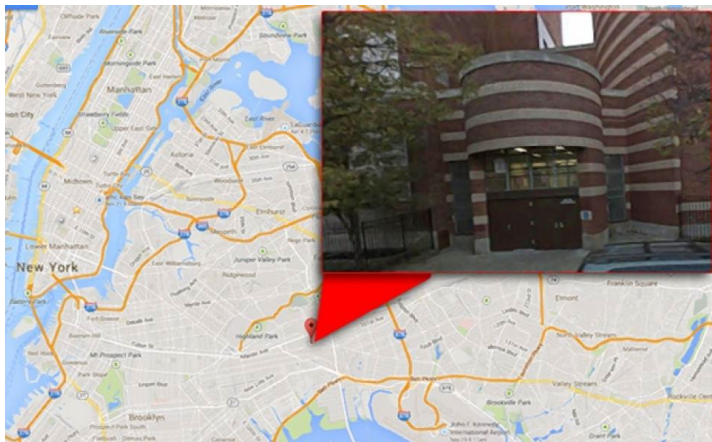
2001: “Father’s Day Fire” Astoria, NY



Dangerous and flammable chemicals including chemical containers, aerosol cans, paint cans and propane canisters were being illegally stored in the store. The fire started when two boys went looking for spray paint cans, which the store carried, and began rummaging in a storage area in the back of the store.

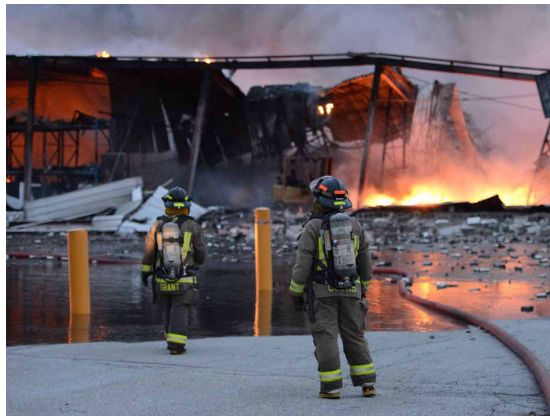
The hot water heater’s flame is believed to have been the igniting agent that started the disaster

2013: PS 64 School, Ozone Park, NY



Someone left an aerosol can of computer cleaner on a radiator and it burst injuring six young students.

2014: Mississauga Warehouse fire (near) Toronto, Canada



The warehouse was a storage facility for imported goods that included butane lighters and aerosol cans of insect spray, which appear to be the cause of the explosion (although the cause of the fire remains unknown). The responding fire crews were not aware that the building contained explosive materials. The explosion also blew out the windows of a fire truck and the heat melted parts of its exterior.

D. MAXIMUM ALLOWABLE QUANTITY OF FLAMMABLE AND COMBUSTIBLE LIQUIDS IN WHOLESALE AND RETAIL SALES USES PER CONTROL AREA_a

TYPE OF LIQUID	MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA (gallons)		
	Sprinklered ^b per footnote densities and arrangements	Sprinklered per FC Tables 3404.3.6.3(4) through 3404.3.6.3(8) and FC Table 3404.3.7.5.1 and the construction codes, including the Building	Nonsprinklered
Class IA	60	60	30
Class IB, IC, II and	7,500 ^c	15,000 ^c	1,600
Class IIIB	Unlimited	Unlimited	13,200

- a. Control areas shall be separated from each other by not less than a 1-hour fire barrier wall.
- b. To be considered as sprinklered, a building shall be protected throughout by a sprinkler system with a design providing minimum densities as follows:
 1. For uncartoned commodities on shelves 6 feet or less in height where the ceiling height does not exceed 18 feet, quantities are those allowed with a minimum sprinkler design density of Ordinary Hazard Group 2.
 2. For cartoned, palletized or racked commodities where storage is 4 feet 6 inches or less in height and where the ceiling height does not exceed 18 feet, quantities are those allowed with a minimum sprinkler design density of 0.21 gallon per minute per square foot over the most remote 1,500-squarefoot area.
- c. Where wholesale and retail sales or storage areas exceed 50,000 square feet in area, the maximum allowable quantities are allowed to be increased by 2 percent for each 1,000 square feet of area in excess of 50,000 square feet, up to a maximum of 100 percent of the table amounts. A control area separation is not required. The cumulative amounts, including amounts attained by having an additional control area, shall not exceed 30,000 gallons.

E. MAXIMUM ALLOWABLE QUANTITY PER INDOOR AND OUTDOOR CONTROL AREA IN GROUP M AND S OCCUPANCIES NONFLAMMABLE SOLIDS, NONFLAMMABLE AND NONCOMBUSTIBLE LIQUIDS d, e, f

CONDITION		MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
Material ^a	Class	Solids Pounds	Liquids gallons
HEALTH-HAZARD MATERIALS—NONFLAMMABLE AND NONCOMBUSTIBLE SOLIDS AND LIQUIDS			
Corrosives ^{b, c}	Not Applicable	9,750	975
Highly Toxics	Not Applicable	20 ^{b, c}	2 ^{b, c}
Toxics ^{b, c}	Not Applicable	1,000	100
PHYSICAL-HAZARD MATERIALS —NONFLAMMABLE AND NONCOMBUSTIBLE SOLIDS AND LIQUIDS			
Oxidizers ^{b, c}	4	Not Allowed	Not Allowed
	3	1,150 ^g	115
	2	2,250 ^h	225
	1	18,000 ^{i, j}	1,800 ^{i, j}
Nondetonable unstable (reactives) ^{b, c}	4	Not Allowed	Not Allowed
	3	550	55
	2	1,150	115
	1	Not Limited	Not Limited
Nondetonable water-reactives	3 ^{b, c}	550	55
	2 ^{b, c}	1,150	115
	1	Not Limited	Not Limited

- For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 cubic foot = 0.02832 m³.
- a. Hazard categories are as specified in FC2701.2.2.
 - b. Maximum allowable quantities shall be increased 100 percent in buildings protected throughout by a sprinkler system. When Note c applies, amounts increased shall be as set forth in both notes.
 - c. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets in accordance with FC2703.8. When Note b applies, amounts increased shall be as set forth in both notes.
 - d. See FC Table 2703.8.3.3 for design and number of control areas.
 - e. Allowable quantities for other hazardous material categories shall be in accordance with FC2703.1.
 - f. Maximum quantities shall be increased 100 percent in outdoor control areas.
 - g. Maximum amounts may be increased to 2,250 pounds when individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
 - h. Maximum amounts may be increased to 4,500 pounds when individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
 - i. Quantities are unlimited where protected by a sprinkler system.
 - j. Quantities are unlimited in an outdoor control area.