

**FIRE DEPARTMENT • CITY OF NEW YORK**

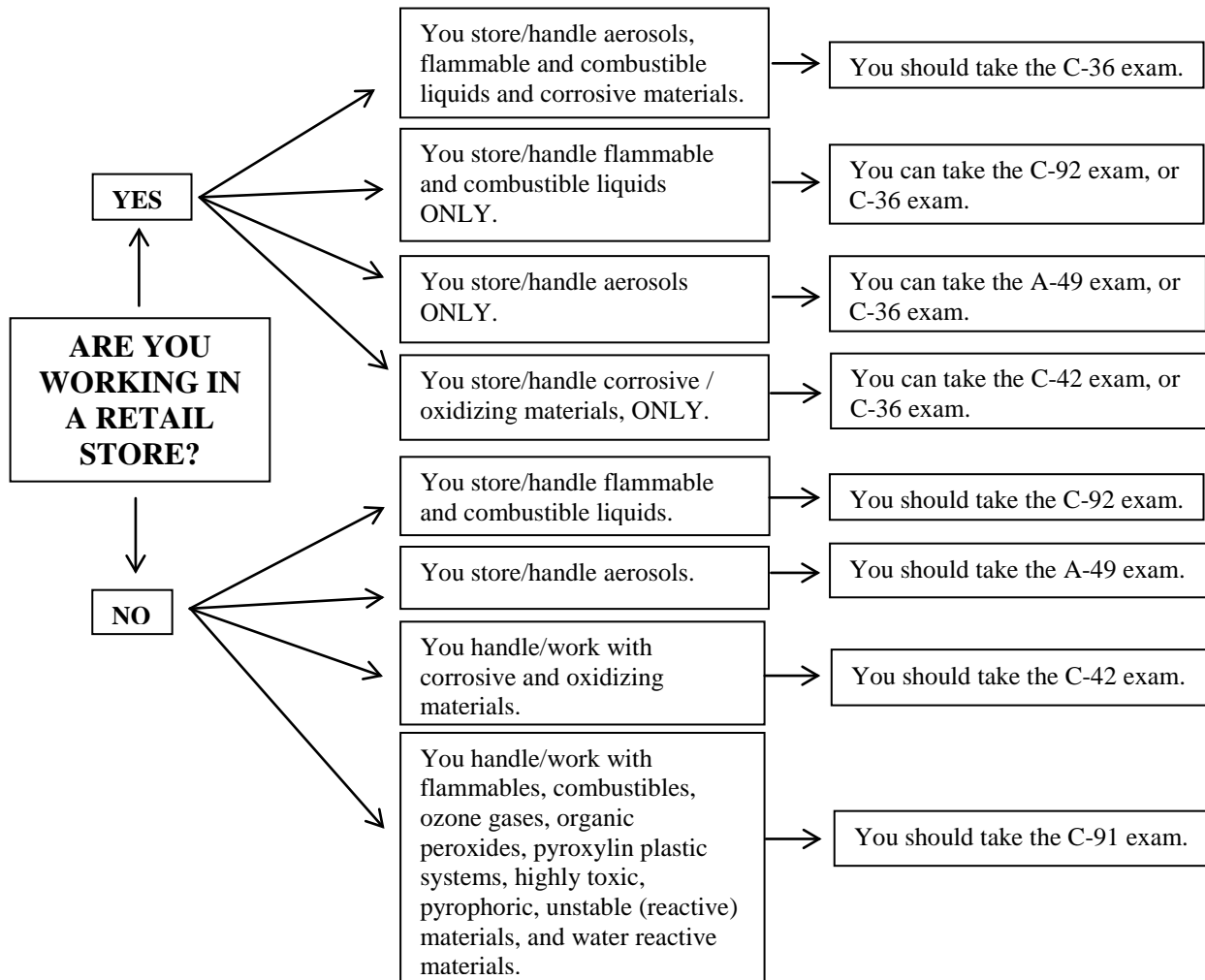


**STUDY MATERIAL FOR THE  
CERTIFICATE OF FITNESS FOR:  
SUPERVISION OF STORAGE AND HANDLING OF HAZARDOUS  
MATERIALS IN RETAIL STORES (PREMISES RELATED)**

**C-36**

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

**WHICH CERTIFICATE OF FITNESS DO YOU NEED?**



## Contents

Contents .....	1
NOTICE OF EXAMINATION .....	3
1. STUDY MATERIAL AND TEST DESCRIPTION .....	8
2. INTRODUCTION.....	10
3. DEFINITIONS.....	11
4. PERMITS.....	14
4.1 FLAMMABLE AND COMBUSTIBLE LIQUIDS:.....	14
4.2 AEROSOLS: .....	15
4.3 CORROSIVE MATERIALS:.....	15
4.4 OXIDIZING MATERIALS:.....	16
5. RESPONSIBILITIES OF THE C-36 CERTIFICATE OF FITNESS HOLDER .....	17
6. GENERAL REQUIREMENTS .....	18
6.1 FLAMMABLE and COMBUSTIBLE LIQUIDS.....	18
6.2 CORROSIVE AND OXIDIZIVE MATERIALS .....	18
6.3 AEROSOLS.....	19
6.4 EXITS .....	20
6.5 SAFETY DATA SHEETS .....	20
7. STORAGE REQUIREMENTS.....	22
7.1 FLAMMABLE AND COMBUSTIBLE LIQUIDS.....	22
7.2 CORROSIVE MATERIAL .....	23
7.3 AEROSOLS.....	24
8. LABELING AND SIGNS.....	27
9. FIRE PROTECTION SYSTEMS .....	29
APPENDIX .....	33
A. EXPLANATION OF SAFETY DATA SHEET (SDS)/MATERIAL SAFETY DATA SHEET (MSDS) AND SEVERAL EXAMPLES. ....	33
C. WORST CASE SCENARIOS .....	62
D. MAXIMUM ALLOWABLE QUANTITY OF FLAMMABLE AND COMBUSTIBLE LIQUIDS IN WHOLESALE AND RETAIL SALES USES PER CONTROL AREAa.....	64
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.....	64

## NOTICE OF EXAMINATION

### **TITLE:**

Examination for Certificate of Fitness for Supervision of Storage and Handling of Hazardous Materials (Aerosols, Corrosive Materials, and Flammable & Combustible Liquids) in Retail Stores (C-36).

**Date of Exam:** Written exams are conducted Monday through Friday (except legal holidays) 8:00 AM to 2:30 PM.

### **REQUIREMENTS FOR WRITTEN EXAM**

Applicants who need to take the exam must apply in person and bring the following documents:

1. Applicants must be at least 18 years of age.
2. Applicants must have a reasonable understanding of the English language.
3. Applicant must provide two forms of identifications; at least one form of identification must be government issued photo identification, such as a State-issued Drivers' License or Non Driver's License or a passport.
4. Applicants must present a letter of recommendation from his/her employer. The letter must be on official letterhead, and must state the applicant's full name, experience and the address where the applicant will work. If the applicants are self-employed or the principal of the company, they must submit a notarized letter attesting to their qualifications. For more info:
  - Sample of recommendation letter:  
<http://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-sampler-rec-letter.pdf>
  - Sample of self-employed letter:  
<http://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-sample-self-rec-letter.pdf>
5. Applicants must present a completed application for certificate of fitness (A-20 Form).  
<http://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-application-form.pdf>
6. Applicants not currently employed may take the exam without the recommendation letter. If the applicants pass the exam, FDNY will issue a temporary letter with picture for the job seeking purpose. The C of F card will not be issued unless the applicants are employed and provide the recommendation letter from his/her employer.
7. Special requirements for C-36 Certificate of Fitness: None.
8. **APPLICATION FEE:**

Pay the **\$25** application fee in person by one of the following methods:

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

For fee waivers submit: **(Only government employees who will use their C of F 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

A convenience fee of 2.49% will be applied to all credit card payments.

**9. 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 amount of the 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.

Call (718) 999-1988 for additional information and forms.

**Special material provided during the exam:** *The tables which appear in the booklet will be provided to you as a reference material when you take the exam at MetroTech, however, the booklet will not provide to you during the 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-f78-s78-noe-study-materials.pdf>

10. If all the requirements are met and pass the exam a certificate will be issued the same day. Applicant who fails the exam will receive a failure report. To retake the exam applicants will need to submit a new application and payment.

**RENEWAL REQUIREMENTS**

This Certificate of Fitness must be renewed every **THREE YEARS**. The renewal fee is **\$15**. FDNY also reserves the right to require the applicants to take a re-examination upon submission of renewal applications.

You will receive a courtesy notice of renewal 90 days before the expiration date. However, it is your responsibility to renew your Certificate. It is very important to renew your C of F before it expires. Renewals submitted 90 days (up to one year) after the expiration date will incur a \$25 penalty in addition to the renewal fee. Certificates expired over one year past expiration date will not be renewed. New exams will be required.

**To change a mailing address:**

- Submit a letter requesting the change of mailing address and a copy of your C of F with \$5.00 fee.

**To change a work location,**

- Submit a letter from your current employer (on company letterhead) confirming that you are an employee and stating your new work location with a copy of your C of F and a \$5.00 fee

**To request a replacement certificate:**

- Submit a driver's license or passport, social security number, mailing address and a \$5.00 fee.
- The certificate can be renewed **On-line, by Mail or in Person**.

- **Renewal online**

If you are an individual, make sure you have your 12 digit Certificate of Fitness Access ID. This can be found on your Renewal Notice. If you do not have your Renewal Notice, your Access ID is your 8 digit Certificate of Fitness number and the last four digits of your social security number. If you are submitting renewals on behalf of a company's employees, the company must be approved by FDNY and have an 8 digit Company Code. To request approval, email [pubrenew@fdny.nyc.gov](mailto:pubrenew@fdny.nyc.gov).

Renewal fee can be paid by one of the following methods:

- Credit card (American Express, Discover, MasterCard, or Visa)
- Debit card (MasterCard or Visa)
- E-check

A fee exempted applicants cannot renew online only by mail or in person.

If all the requirements are met, the certificate of fitness will be mailed out within 10 days.

For online renewal go to: <https://a836-citypay.nyc.gov/citypay/FDNYCOF>

- **Renewal by mail**

Mail your Renewal Notice (or if you did not receive a Renewal Notice, a copy of your certificate), along with your fee payment, Personal or company check or money order (made payable to the New York City Fire Department)

For fee waivers submit: ***(Only government employees who will use their C of F 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 and if applicable, supporting documents to:

**NYC Fire Department (FDNY)**  
Cashier's Unit  
9 MetroTech Center, 1st Floor  
Brooklyn, NY 11201

If all the requirements are met, the certificate of fitness will be mailed out within four to six weeks.

- **Renewal in person**

Submit your Renewal Notice (or if you did not receive a Renewal Notice, a copy of your certificate), along with your fee payment by one of the following methods:

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

For fee waivers submit: ***(Only government employees who will use their C of F for his or her 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 and if applicable, your supporting documents to:

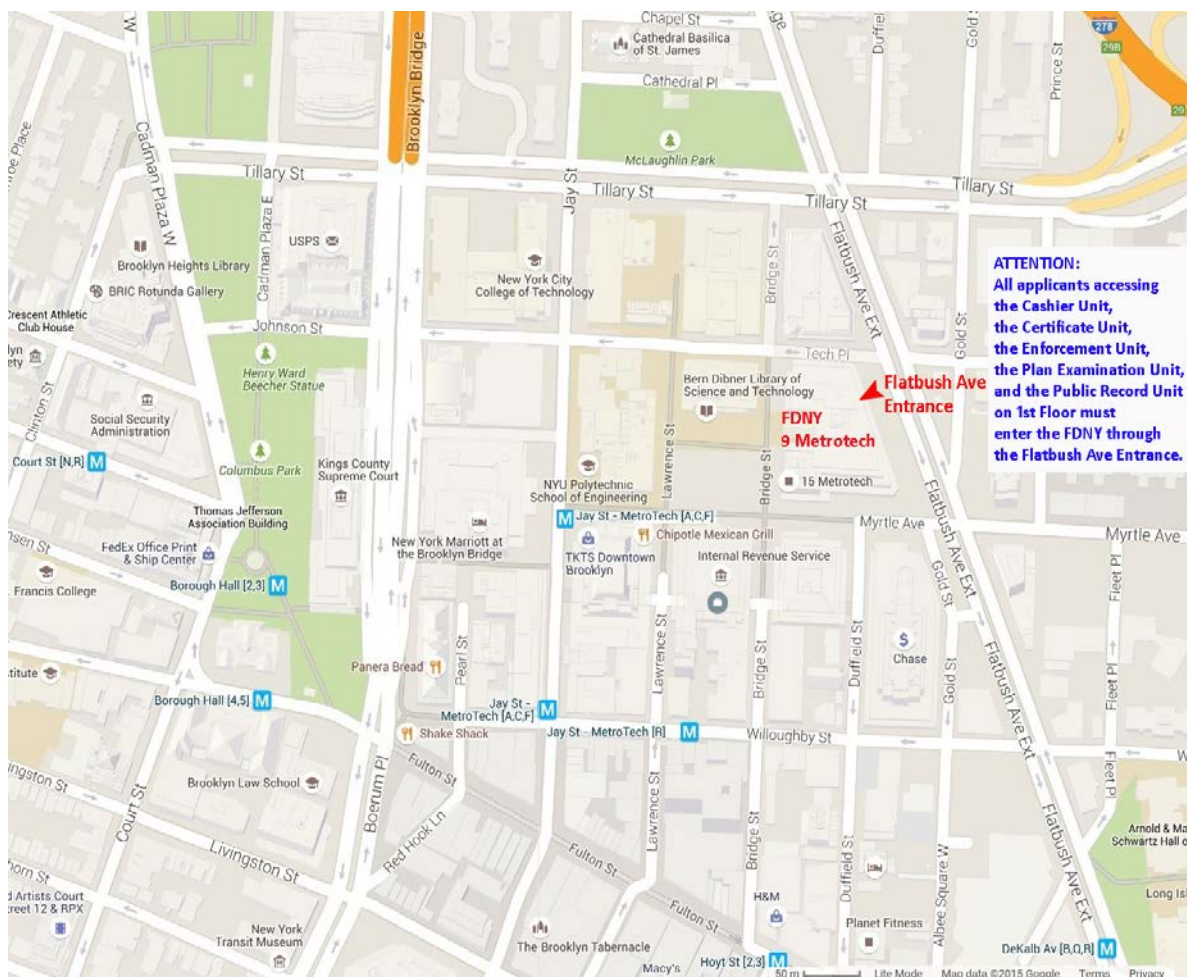
**NYC Fire Department (FDNY)**

3/16/17

Cashier's Unit  
9 MetroTech Center, 1st Floor  
Brooklyn, NY 11201

If all the requirements are met, the certificate of fitness will be issued the same day.  
**A convenience fee of 2.49% will be applied to all credit card payments for original or renewal certificates.**

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





## 1. 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 to 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 QUESTIONS**

**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 in the testing room
- 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 in the testing room
- C. the examiner in the testing room
- D. you should not ask about test questions since FDNY staff cannot 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.

## 2. 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

### 3. 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<sup>+</sup>) 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.

## 4. PERMITS

## 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.

[illegible]

## AN EXAMPLE OF FDNY PERMANENT PERMIT

#### 4.1 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.

#### 4.2 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
<b>Example of combination:</b>	
(oz. × #of cans) + (oz. × #of cans) = combined amount 8 oz × 65 = <b>520</b> ; 19 oz × 40 = <b>760</b> <b>520 + 760 = 1280</b>	
8 oz and 19 oz	65 and 40, respectively

#### 4.3 CORROSIVE MATERIALS:

##### A permit is required:

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

- Liquids – 55 gallons
- Solids – 1000 pounds



**4.4 OXIDIZING MATERIALS:****A permit is required:**

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

Liquids		Solids	
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

## **5. 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.

## 6. GENERAL REQUIREMENTS

### 6.1 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**

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

### 6.2 CORROSIVE AND OXIDIZING 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**

<b>pH</b>	<b>Examples</b>
-----------	-----------------

<b>Corrosive Materials</b>	<b>Acidic</b>	0-7.0	Muriatic acid, non-chlorine shock-oxidizer
	<b>Neutral</b>	7	Pure water
	<b>Basic</b>	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**

<b>Examples</b>	
<b>Class 1</b>	Aluminum nitrate, ammonium persulfate, barium peroxide, hydrogen peroxide solutions (8% to 27.5% by weight), magnesium nitrate
<b>Class 2</b>	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%)
<b>Class 3</b>	Ammonium dichromate, hydrogen peroxide (52 to 91% by weight), perchloric acid solutions (60 to 72% by weight), potassium bromate, potassium chlorate.
<b>Class 4</b>	Ammonium permanganate, hydrogen peroxide greater than 91%.

## **6.3 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

		<b>Chemical heat of combustion</b>	<b>Examples</b>
<b>Aerosols</b>	<b>Level 1</b>	0 < 8,600 (Btu/lb)	Shaving cream, window cleaners, starch, rug shampoos, alkaline oven cleaners
	<b>Level 2</b>	8,600 < 13,000 (Btu/lb)	Hair sprays, deodorants, antiseptics, some furniture polishes, windshield deicers
	<b>Level 3</b>	> 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.

## **6.4 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.

## **6.5 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,



3/16/17

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.

## 7. STORAGE REQUIREMENTS

### 7.1 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**

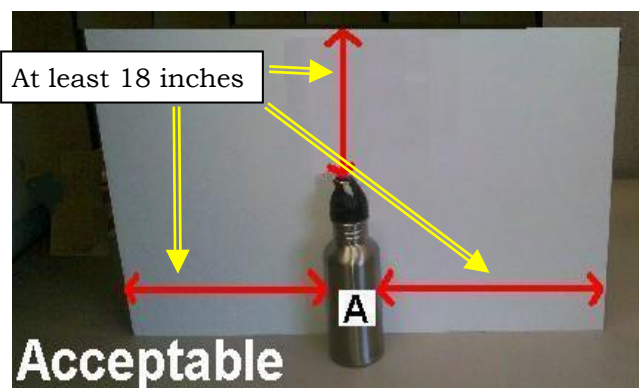
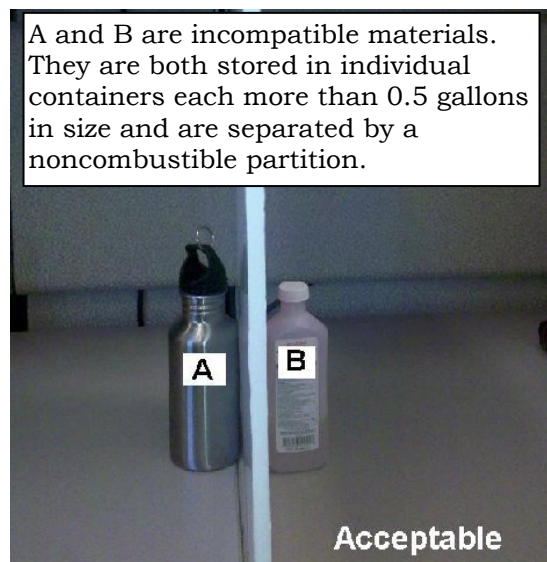
**THE MSDS/SDS'S SHOULD BE CONSULTED  
REGARDING SPECIFIC INCOMPATIBILITIES**

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.

**7.2 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.

### 7.3 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 <sup>a,b</sup>	Segregated storage	
		Storage cabinets <sup>b</sup>	Separated from retail area <sup>c</sup>
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.

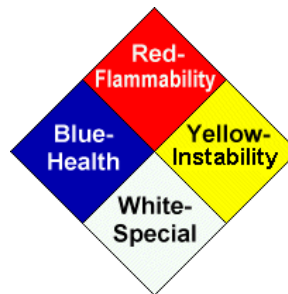
## 8. LABELING AND SIGNS

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
<b><u>Health Hazard</u></b> <b><u>(Blue)</u></b>	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
<b><u>Flammability Hazard</u></b> <b><u>(Red)</u></b>	4	Materials that rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and burn readily.
	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.

Quadrant	Code	Meaning
	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.
<b><u>Instability</u></b> <b><u>(Reactivity)</u></b> <b><u>Hazard</u></b> <b><u>(Yellow)</u></b>	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.
<b><u>Special</u></b> <b><u>Hazard</u></b> <b><u>(White)</u></b>	<b>“W”</b>	The materials that react violently or explosively with water (water reactivity rating of 2 or 3).
	<b>“OX”</b>	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 <b>“OX 2”</b> to better define the hazard.



## 9. 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.

#### 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.

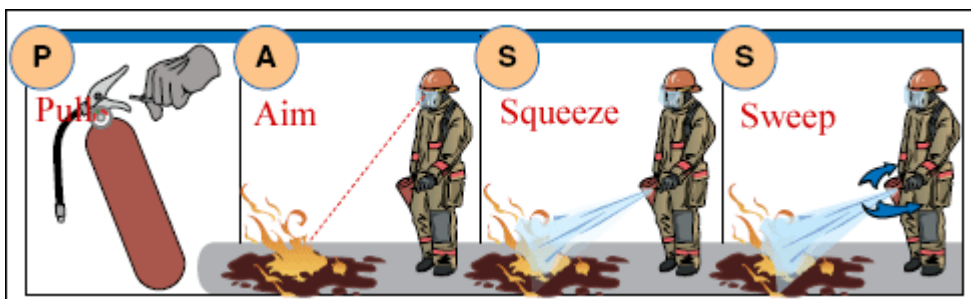
**Travel Distance** is the actual walking distance from any point to the nearest fire extinguisher.

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
<b>A</b>	Wood, paper, cloth, trash & other ordinary materials.	
<b>B</b>	Gasoline, oil, paint and other flammable liquids.	
<b>C</b>	May be used on fires involving live electrical equipment without danger to the operator.	
<b>D</b>	Combustible metals and combustible metal alloys.	
<b>K</b>	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.

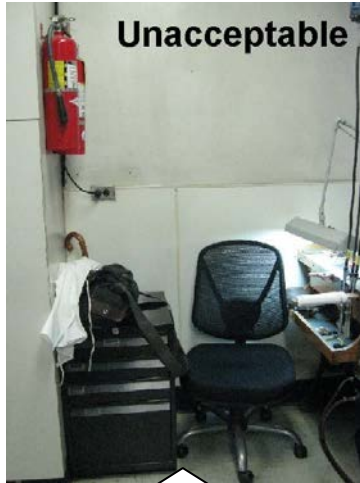


#### FIRE EXTINGUISHER PLACEMENT

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.



weight  $\leq$  40 lbs



### MONTHLY INSPECTION

Fire Extinguishers shall be monthly inspected, or "quick checked". Inspection verifies that a portable fire extinguisher is available and will operate. It is intended to give reasonable assurance that the portable fire extinguisher is fully charged and operable.

This is done by verifying that:



- Fire extinguishers are in their assigned place;
- Fire extinguishers are not blocked or hidden;
- Fire Extinguishers have not been actuated or tampered with;
- Fire extinguishers show no visual sign of damage or abuse that prevents its operation;
- Ensure that the fire extinguishers tags are current;
- Pin and seals are in place;
- Nozzles are free of blockage.
- Pressure gauge reading or indicator on the fire extinguisher are all in the operable range or position;

A BASIC INSPECTION IS A VISUAL EXAMINATION OF THE PORTABLE FIRE EXTINGUISHER.

### ANNUAL INSPECTION

In addition, fire extinguisher service and maintenance is required once per year. It includes a thorough examination, any necessary repair, recharging and/or replacement. It is intended to give maximum guarantee that an extinguisher will operate successfully and safely in the event of a fire. This annual inspection must be performed by W-96 Certificate of Fitness holder employed by a FDNY approved portable fire extinguisher company.

### MONTHLY INSPECTION TAG

Monthly inspection tag.



### 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.

## 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:**

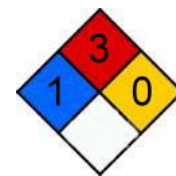
Irritating to the skin and mucous membranes by drying effect. Can cause dermatitis on prolonged exposure. May be absorbed through skin.

##### **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 StorageHandling 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 HazardsInhalation:

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**

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

**2 – Hazards Identification****Hazcom 2012/GHS Classification:**

Flammable Aerosol Category 1

Aspiration Toxicity Category 1

**Label Elements:****DANGER!**

Extremely Flammable Aerosol.

May be fatal if swallowed and enters airways.

**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.

**Response**

IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting.

**Storage**

Store locked up.

Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F.

**Disposal**

Dispose of contents and container in accordance with local and national regulations.

**3 - Composition/Information on Ingredients**

<b>Ingredient</b>	<b>CAS #</b>	<b>Weight Percent</b>	<b>US Hazcom 2012/ GHS Classification</b>
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 1-888-324-7596 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 <sup>3</sup> TWA (manufacturer recommended)
Petroleum Base Oil	5 mg/m <sup>3</sup> TWA, 10 mg/m <sup>3</sup> STEL ACGIH TLV 5 mg/m <sup>3</sup> TWA OSHA PEL
LVP Aliphatic Hydrocarbon	1200 mg/m <sup>3</sup> 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**

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

<b>SECTION 2: EMERGENCY OVERVIEW and HAZARD IDENTIFICATION</b>		
2.1	<b>Emergency Overview:</b>	<b>DANGER!</b> 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	<b>Hazards Acute Effects:</b>	Hydrochloric acid is corrosive to the eyes, skin, and mucous membranes.
2.2.1	<b>Eye Contact:</b>	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	<b>Skin Contact:</b>	Dermal contact may produce severe burns, ulceration, and scarring.
2.2.3	<b>Inhalation:</b>	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	<b>Ingestion:</b>	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	<b>Aggravation of Pre-existing Medical Conditions:</b>	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	<b>Chronic Effects:</b>	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	<b>Carcinogenicity:</b>	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	<b>International Agency for Research on Cancer (IARC) Monographs:</b>	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%

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

<b>SECTION 5: FIRE FIGHTING MEASURES</b>		
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	<b>Small Spill:</b>	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	<b>Large Spill:</b>	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	<b>Handling:</b>	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	<b>Storage and Disposal:</b>	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	<b>Engineering Controls:</b>	Local exhaust to maintain levels below Permissible Exposure Limit (PEL).
8.2	<b>Personal Protection:</b>	When necessary, wear splash goggles or safety glasses and gloves.
8.3	<b>Personal Protection in Case of a Large Spill:</b>	Wear splash goggles or safety glasses and gloves. If natural ventilation is insufficient, wear a NIOSH approved respirator.
8.4	<b>Exposure Guidelines:</b>	
8.4.1	ACGIH (American Conference of Governmental and Industrial Hygienists) TLV (Threshold Limit Value)	5 ppm (7 mg/m <sup>3</sup> ) Ceiling
8.4.2	PEL (OSHA Permissible Exposure Limit)	5 ppm (7 mg/m <sup>3</sup> ) Ceiling Limit
8.4.3	IDLH (NIOSH Immediate Danger to Life & Health)	50 ppm (75 mg/m <sup>3</sup> )
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 <sub>2</sub> 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 Hg @ 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 (LD <sub>50</sub> ):	NIOSH: 900 mg/kg (rabbit)
11.4	Acute Inhalation Toxicity (LC <sub>50</sub> ):	NIOSH: 6,400 mg/m <sup>3</sup> /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 (LD <sub>50</sub> ):	>5010 mg/kg
11.10	Eyes:	No additional information available.
11.11	Ingestion:	No additional information available.
11.12	Inhalation (LC <sub>50</sub> ):	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 <sub>50</sub> Shrimp 100 to 330 ppm/48 hr (salt water) LC <sub>50</sub> Mosquito Fish 282 mg/L (24 to 96 hours) LC <sub>50</sub> Green crabs 100 mg/L (96 hr produced no stress effects) LC <sub>50</sub> 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.

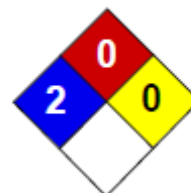
<b>SECTION 14: TRANSPORT INFORMATION</b>		
14.1	<b>Shipping Name:</b>	Hydrochloric Acid
14.2	<b>Hazard Class / Division:</b>	8
14.3	<b>Identification No.:</b>	UN 1789
14.4	<b>Packing Group:</b>	II
14.5	<b>Reportable Quantity (RQ):</b>	5,000 lb (1643 gallons)
14.6	<b>DOT Special Permit 6614:</b>	Hydrochloric 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	<b>Deposit Pails, Carboys and Drums:</b>	The shipping description for return of empty deposit pails, carboys, and drum is "RESIDUE: LAST CONTAINED UN1789, HYDROCHLORIC ACID, 8, PGII".
14.8	<p><b>Materials of Trade (MOT) Exceptions.</b> 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><b>Quantity Limit for MOT:</b> 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><b>Packaging requirement:</b></p> <ol style="list-style-type: none"> <li>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.</li> <li>2 Each material must be packaged in the manufacturer's original packaging, or a packaging of equal or greater strength and integrity.</li> <li>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.</li> </ol> <p><b>Hazard communication:</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> </ul> <p><b>Other exceptions:</b> 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"> <li>• shipping papers;</li> <li>• emergency response information;</li> <li>• placarding; or</li> <li>• formal training or retention of training records.</li> </ul> <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>	



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

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

**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

<b>Product Name:</b> Aluminum nitrate nonahydrate	<b>Contact Information:</b>
<b>Catalog Codes:</b> SLA1981	Sciencelab.com, Inc.
<b>CAS#:</b> 7784-27-2	14025 Smith Rd.
<b>RTECS:</b> BD1050000	Houston, Texas 77396
<b>TSCA:</b> TSCA 8(b) inventory: Aluminum nitrate nonahydrate	US Sales: 1-800-901-7247
<b>CI#:</b> Not available.	International Sales: 1-281-441-4400
<b>Synonym:</b>	Order Online: <a href="http://ScienceLab.com">ScienceLab.com</a>
<b>Chemical Name:</b> aluminum nitrate nonahydrate	<b>CHEMTREC (24HR Emergency Telephone), call:</b>
<b>Chemical Formula:</b> Al(NO <sub>3</sub> ) <sub>3</sub> ·9H <sub>2</sub> O	1-800-424-9300
	<b>International CHEMTREC, call:</b> 1-703-527-3887
	<b>For non-emergency assistance, call:</b> 1-281-441-4400

#### 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 (LD<sub>50</sub>): 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

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.*

## 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)

New York State Department of State, Office of Fire Prevention and Control  
DOS-0347 (12/02)



**V Hazardous Material Listing (attach additional sheets if necessary)**

Note: Definitions of symbols are on the second page of the instruction sheet.

[illegible]**VI Special Considerations/Remarks:**

## C. WORST CASE SCENARIOS

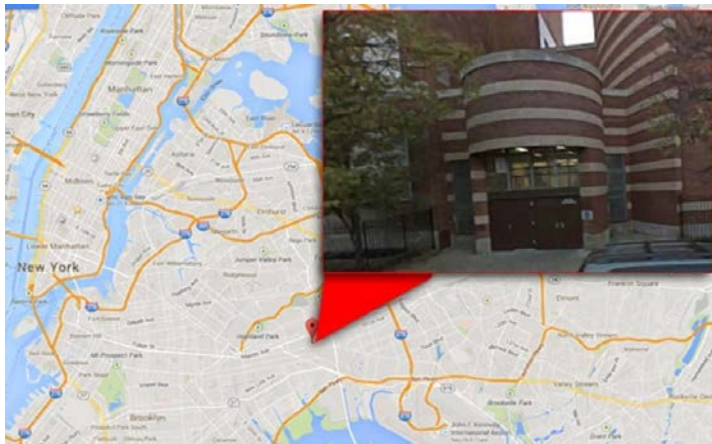
### **2001: “Father’s Day Fire” Astoria, NY**



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<sup>a</sup>

TYPE OF LIQUID	MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA (gallons)		
	Sprinklered <sup>b</sup> 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 <sup>c</sup>	15,000 <sup>c</sup>	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 <sup>d, e, f</sup>

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

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.