



County of Sonoma
FIRE & EMERGENCY SERVICES DEPARTMENT

FIRE SERVICES EMERGENCY MANAGEMENT HAZARDOUS MATERIALS



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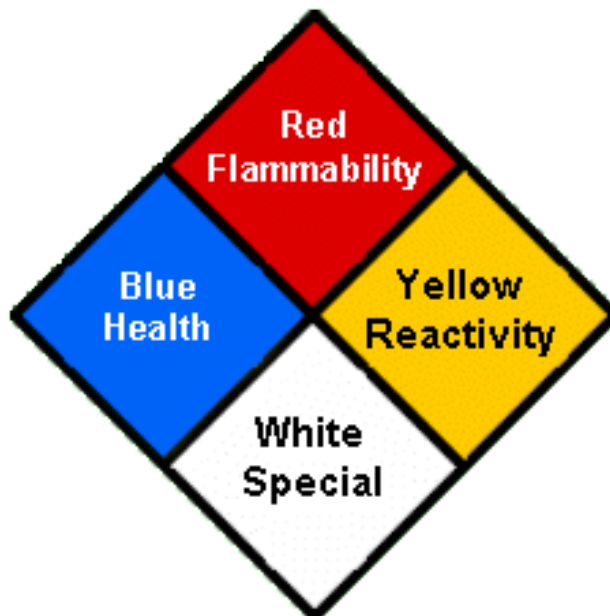
Informational Bulletin

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| Date Issued: | January 10, 2009 | Bulletin No: | 2009-04N |
| Topic: | NFPA- HAZARD WARNING MARKING REGULATIONS | | |
| Code Reference | National Fire Protection Association (NFPA)704,49 California Fire Code (CFC) 2703.5, 407.3 | | |
| For Use By: | Permit Applicants and Staff | | |

NOTE: This bulletin is a summary of Fire Services interpretations of County and State Codes. Information contained herein applies to typical instances and may not address all circumstances.

INFORMATION BULLETIN- HAZARD WARNING MARKING REGULATIONS

Due to the amounts of hazardous materials being stored and used within Sonoma County, an immediate warning system to identify their presence is required. The purpose of this warning system is to provide a "Quick Look" at the potential hazards for emergency responders. The diamond shaped placard identifies the "Health", "Flammability", and "Reactivity" hazards of materials and indicates the order of severity of each hazard by the use of numerical grading from four (4), indicating severe hazard or extreme danger, to zero, indicating no required warning. The bottom quadrant is used to identify special hazards important to emergency responders.





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NUMBER SELECTION FOR EACH HAZARD CATEGORY

The placard warning system numbers for each hazard category are defined in NFPA-704. A sampling of placards for some commonly encountered chemicals is attached and are also referenced in NFPA-49 "Hazardous Chemicals Data". They may also be found on the Material Safety Data Sheets (MSDS) for many products. The numbers are generally determined according to the following criteria:

HEALTH

- 4 Materials that, on very short exposure, could cause death or major residual injury including those materials which have an inhalation LC50 of 1000 parts per million (ppm) or less, an oral LD50 of 5 mg/Kg or less, or a dermal LD50 of 40 mg/Kg or less.
- 3 Materials that, on short exposure, could cause serious temporary or residual injury, including those materials which have an inhalation LC50 of 3000 parts per million (ppm) or less, an oral LD50 of 50 mg/Kg or less, or a dermal LD50 of 200 mg/Kg or less.
- 2 Materials that, on short exposure, could cause temporary incapacitation or possible residual injury, including those materials which have an inhalation LC50 of 5000 parts per million (ppm) or less, an oral LD50 of 500 mg/Kg or less, or a dermal LD50 of 1000 mg/Kg or less.
- 1 Materials that, on short exposure, could cause serious irritation, but only minor residual injury, including those materials which have an inhalation LC50 of 10000 parts per million (ppm) or less, an oral LD50 of 2000 mg/Kg or less, or a dermal LD50 of 2000 mg/Kg or less.
- 0 Materials that, on short exposure under fire conditions, would offer no hazards beyond that of ordinary combustibles.

FLAMMABILITY

- 4 All flammable gases and Class I-A flammable liquids, i.e. liquids with a flash point below 73F and a boiling point below 100F.
- 3 Class I-B and C flammable liquids, i.e liquids with flash point below 100F, but a boiling point above 100F. Materials that burn with extreme rapidity are also included, e.g. nitrocellulose or organic peroxides.
- 2 Class II and III-A flammable/combustible liquids, i.e. flash point greater than 100F, but not exceeding 200F. Highly combustible solids are also included.



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- 1 Class III-B combustible liquids, i.e. flash point greater than 200F, and most ordinary combustible materials.
- 0 Materials that will not burn.

REACTIVITY

- 4 Materials readily capable of detonation or explosive reaction at normal temperatures and pressures. Includes materials that are very sensitive to heat, shock or light. Examples would include: Explosives A & B and Organic Peroxides.
- 3 Materials which when heated and under confinement are capable of detonation and which may react violently with water. A -W- should appear as a special hazard if an explosive reaction with water can be expected. Examples would include: Blasting Agents, Fireworks, and Ammonium Nitrate Fertilizer.
- 2 Materials which will undergo a violent chemical change at elevated temperatures and pressures but do not detonate. A -W- should appear as a special hazard if contact with water may cause a violent reaction or may cause potentially explosive mixtures to be formed. Examples would include: Combustible Metals and Water Reactive Corrosive Materials.
- 1 Materials which are normally stable, but may become unstable in combination with other materials or at elevated temperatures and pressures. A -W- should appear as a special hazard if a vigorous but not violent reaction with water may take place. Examples would include: most common Corrosive and Oxidizing Materials.

SPECIAL HAZARDS

Special hazard symbols such as -W- (water reactive), OXY (oxidizing material), CRY* (cryogenic material), COR* (corrosive material), or the biohazard* or radiation* warning symbols will be added to the white bottom section of the placard when available information indicates that one of these special hazards exists. When multiple special hazards exist, white panels will be added below the placard to list the additional special hazards that apply.

**Indicates that these are Sonoma County practices that have modified or are in addition to NFPA 704 recommendations.*



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REQUIREMENTS FOR PLACARDS AND THEIR PLACEMENT

PLACARD SIZE REQUIREMENTS

The required measurements for facility placards are a minimum of fifteen inches by fifteen inches (15"x15") with each category diamond seven and a half inches by seven and a half inches (7 1/2"x7 1/2"). Each category diamond on the placard must have the proper background color. The numbers are to be five inches (5") in height with a three-quarter inch (3/4") stroke and the number is to be centered within its five hundred sixty two and one-half square inch (562.5 sq.in.) diamond. The numbers may be either white or black providing sufficient contrast is made against the background color in each category.

Placards for building or area subdivisions must be no smaller than eight inches by eight inches (8"x8") with the same category diamond color requirements. Numbers should be contrasting white or black and be of an appropriate size to be easily read within each category diamond.

FACILITY PLACARDS

Facility and building placards identify the highest hazard rating in each category based on the combined materials in a category rating exceeding threshold quantities. Placards shall be affixed to buildings or areas within the facility on each side where entry can be made at an appropriate height to be easily seen upon approaching. A placard must be placed at the property line on a facility gate or post if a placarded building or area within a facility cannot be easily seen when approaching the property. Placards will be required when the following amounts of materials are stored or used at a facility.

SUBDIVISION PLACARDS

Subdivisions (rooms or compartments) of buildings or areas within a facility will be placarded to indicate the greatest possible hazards within those subdivisions. Placards that are placed to identify hazards in building or area subdivisions due to storage or process shall be affixed next to access points into the subdivisions. These placards must be visible when doors into subdivisions are open or closed. Placards will be required when the following amounts of materials are stores or used in a subdivision.

QUANTITY DETERMINATION

The following table is intended to provide guidance in determining the quantities of each classification that warrant placarding.



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| RATING NUMBER | AMOUNT REQUIRING OUTSIDE PLACARDING ON A BUILDING OR AREA WITHIN A FACILITY |
|---------------------|---|
| HEALTH | |
| 4 | Any amount |
| 3 | Any amount |
| 2 | More than 100 lbs or 10 gals. Or 50 cu. ft. (aggregate totals of weight or volume) |
| 1 | More than 500 lbs or 55 gals. Or 200 cu. ft. (aggregate totals of weight or volume) |
| FLAMMABILITY | |
| 4 | More than 1 lb or 1 gal. or 50 cu. ft. (aggregate totals of weight or volume) |
| 3 | More than 100 lbs or 10 gal. or 50 cu. ft. (aggregate totals of weight or volume) |
| 2 | More than 500 lbs or 55gals. or 1000 cu. ft. (aggregate totals of weight or volume) |
| 1 | More than 1000 lbs or 110 gals or 2000 cu. ft. (aggregate totals of weight or volume) |
| REACTIVITY | |
| 4 | More than 10 lbs or 5 gals or 10 cu. ft. (aggregate totals of weight or volume) |
| 3 | More than 10 lbs or 5 gals or 50 cu. ft. (aggregate totals of weight or volume) |
| 2 | More than 100 lbs or 55 gals or 200 cu. ft. (aggregate totals of weight or volume) |
| 1 | More than 100 lbs or 55 gals or 1000 cu. ft. (aggregate totals of weight or volume) |



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COMMONLY ENCOUNTERED HAZARDOUS MATERIALS

| CHEMICAL | HEALTH | FIRE | REACTIVITY |
|----------------------------------|--------|------|------------|
| Acetylene (Dissolved in Acetone) | 1 | 4 | 3 |
| Acetic acid | 2 | 2 | 1 |
| Acetone | 2 | 3 | 0 |
| Ammonia | 3 | 1 | 0 |
| Ammonium hydroxide | 3 | 0 | 0 |
| Ammonium nitrate | 1 | 0 | 3 |
| Arsine | 4 | 4 | 1 |
| Acetonitrile | 2 | 3 | 0 |
| Argon (gas) | 0 | 0 | 0 |
| Argon (cryogenic) | 3 | 0 | 0 |
| Butane | 1 | 4 | 0 |
| Butyl alcohol | 2 | 3 | 0 |
| Calcium hypochloride | 1 | 0 | 3 |
| Carbon disulfide | 2 | 4 | 0 |
| Carbon monoxide | 3 | 4 | 0 |
| Carbon tetrachloride | 3 | 0 | 0 |
| Chlorine (gas) | 3 | 0 | 1 |
| Chloroacetic acid | 3 | 1 | 0 |
| Chloroform | 2 | 0 | 0 |
| Chromic acid | 3 | 0 | 1 |
| Chloropicrin | 4 | 0 | 3 |
| Diborane | 3 | 4 | 3 |
| Dichlorosilane | 3 | 4 | 2 |
| Diesel fuel | 0 | 2 | 0 |
| Diethylether | 2 | 4 | 1 |
| Ethylene oxide | 2 | 4 | 3 |
| Ethanol (grain alcohol) | 1 | 3 | 0 |
| Ethylene glycol | 1 | 1 | 0 |
| Gasoline | 2 | 3 | 0 |
| Hydrazine | 3 | 3 | 2 |
| Hydrochloric acid | 3 | 0 | 0 |
| Hydrofluoric acid | 4 | 0 | 0 |
| Hydrogen cyanide | 4 | 4 | 2 |
| Hydrogen peroxide (35-52%) | 2 | 0 | 1 |
| Hydrogen | 0 | 4 | 0 |
| Isopropyl alcohol | 2 | 3 | 0 |
| Methane | 1 | 4 | 0 |
| Methylethyl ketone | 2 | 3 | 0 |



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| CHEMICAL | HEALTH | FIRE | REACTIVITY |
|-------------------------|--------|------|------------|
| Methylene chloride | 2 | 1 | 0 |
| Nitric acid (70%) | 3 | 0 | 2 |
| Nitric acid (40%) | 3 | 0 | 0 |
| Nitrous oxide | 1 | 0 | 1 |
| Oxygen | 0 | 0 | 1 |
| Oxygen (cryogenic) | 3 | 0 | 2 |
| Ozone | 3 | 0 | 2 |
| Perchloroethylene | 2 | 0 | 0 |
| Phenol | 4 | 2 | 0 |
| Phosphine | 3 | 4 | 1 |
| Phosphoric Acid | 2 | 0 | 0 |
| Phosphorous oxychloride | 3 | 0 | 2 |
| Potassium cyanide | 3 | 0 | 0 |
| Potassium hydroxide | 3 | 0 | 1 |
| Propane | 1 | 4 | 0 |
| Silane | 2 | 4 | 3 |
| Sodium cyanide | 3 | 0 | 0 |
| Sodium hydroxide | 3 | 0 | 1 |
| Sodium hypochlorite | 3 | 0 | 1 |
| Stoddard solvent | 2 | 2 | 0 |
| Sulfuric acid (>93%) | 3 | 0 | 2 |
| Sulfuric acid (>80%) | 3 | 0 | 1 |
| Toluene | 2 | 3 | 0 |
| Trichloroethane | 2 | 0 | 0 |
| Trichloroethylene | 3 | 0 | 0 |
| Waste Oil | 1 | 2 | 0 |
| Xylene | 2 | 3 | 0 |