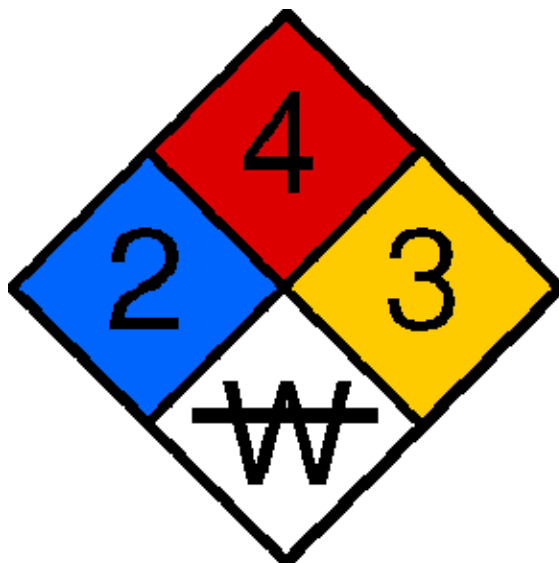


NFPA 704 Hazard Identification System

The [National Fire Protection Agency \(NFPA\)](#), in section 704 of the National Fire Code, specifies a system for identifying the hazards associated with materials. Information contained on this and linked pages comes directly from the 1990 edition of **NFPA 704**. Although the system was developed primarily with the needs of fire protection agencies in mind, it is of value to anyone, including someone enrolled in a chemistry laboratory course, who needs to handle potentially hazardous material.

The hazard identification signal is a color-coded array of four numbers or letters arranged in a **diamond** shape. An example is shown below. You will see hazard diamonds like this on trucks, storage tanks, bottles of chemicals, and in various other places around campus and around town. The blue, red, and yellow fields (health, flammability, and reactivity) all use a numbering scale ranging from 0 to 4. A value of zero means that the material poses essentially no hazard; a rating of four indicates extreme danger. The fourth value (associated with white) tends to be more variable, both in meaning and in what letters or numbers are written there. Please note that in the introductory chemistry labs at the University of Oregon, we do not use the **NFPA**-specified symbols in the white field. Instead, we use an [alternative set of symbols](#) that indicate the kind of protective gear that should be used when handling the material. These alternative symbols are drawn from the [HMIG](#) system, which [differs somewhat](#) from the **NFPA** system.

Select one of the four diamonds to get more information.



[Red](#) | [Blue](#) | [Yellow](#) | [White](#)

Flammability

Susceptibility of Material to Burning.

(Red)

A note about the word [inflammable](#):

Inflammable means the material **will** burn. Think of "inflammation" -- if you have an inflamed wound, it is red and hot to the touch. As recently as about 15 years ago, trucks and containers were marked "inflammable" if they contained material that could burn (material that won't burn is called non-inflammable). The problem was that many people

assumed inflammable meant that a material would *not* burn -- a potentially deadly mistake. Today, the word "flammable" has replaced "inflammable" almost entirely, but don't be confused if you encounter the older term.

0	Material will not burn.	Example: water
1	Material must be pre-heated before ignition can occur.	Example: corn oil
2	Material must be moderately heated or exposed to relatively high ambient temperature before ignition can occur.	Example: diesel fuel oil
3	Liquids and solids that can be ignited under almost all ambient temperature conditions.	Example: gasoline
4	Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature, or that are readily dispersed in air and that will burn readily.	Example: propane gas

Health Hazard

Type of Possible Injury.

(Blue)

A discussion of health hazards and the terminology used to describe them is given in [Appendix A](#) of the OSHA Hazard Communication Standard (29 CFR 1910.1200 App A).

0	Material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible material.	Example: peanut oil
1	Material that on exposure would cause irritation but only minor residual injury.	Example: turpentine
2	Material that on intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury.	Example: ammonia gas
3	Material that on short exposure could cause serious temporary or residual injury.	Example: chlorine gas
4	Material that on very short exposure could cause death or major residual injury.	Example: hydrogen cyanide

Reactivity

Susceptibility of Material to Burning.

(Yellow)

0	Material that in itself is normally stable, even under fire exposure conditions, and is not reactive with water.	Example: liquid nitrogen
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1	Material that in itself is normally stable, but which can become unstable at elevated temperatures and pressures.	Example: phosphorus (red or white)
2	Material that readily undergoes violent chemical change at elevated temperatures and pressures or which reacts violently with water or which may form explosive mixtures with water.	Example: calcium metal
3	Material that in itself is capable of detonation or explosive decomposition or reaction but requires a strong initiating source or which must be heated under confinement before initiation or which reacts explosively with water.	Example: fluorine gas
4	Material that in itself is readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures.	Example: trinitrotoluene (TNT)

Special Precautions Protective Gear Required (White)


Special Precautions

The fourth, white, field of the hazard signal can have variable content, depending on who prepared the signal. The 1990 edition of the National Fire Codes (section 704, chapter 5) specifies only two symbols. Additional symbols are commonly included. The field may also be left blank if no special hazards are present.

Protective Gear Required

An alternative set of symbols from the Lab Safety Supply Inc. [HMIG labeling system](#) is used in the introductory chemistry laboratory at the University of Oregon. These symbols indicate the type(s) of protective equipment that must be used whenever the material in question is handled. The symbols are the letters A - K and X, with 'A' indicating that goggles must be worn, and successive letters indicating progressively greater amounts of protective gear. A full description of the [symbols used](#) is found on posters placed at various points around the lab.

Symbols specified in National Fire Codes, section 704	
W	Material shows unusual reactivity with water (i.e. don't put water on it). Example: magnesium metal
OX	Material possesses oxidizing properties. Example: ammonium nitrate (fertilizer used in Oklahoma City bomb)
Other symbols commonly used	
ACID	Material is an acid.

ALK	Material is a base (alkaline).
COR	Material is corrosive.
	Material is radioactive.

