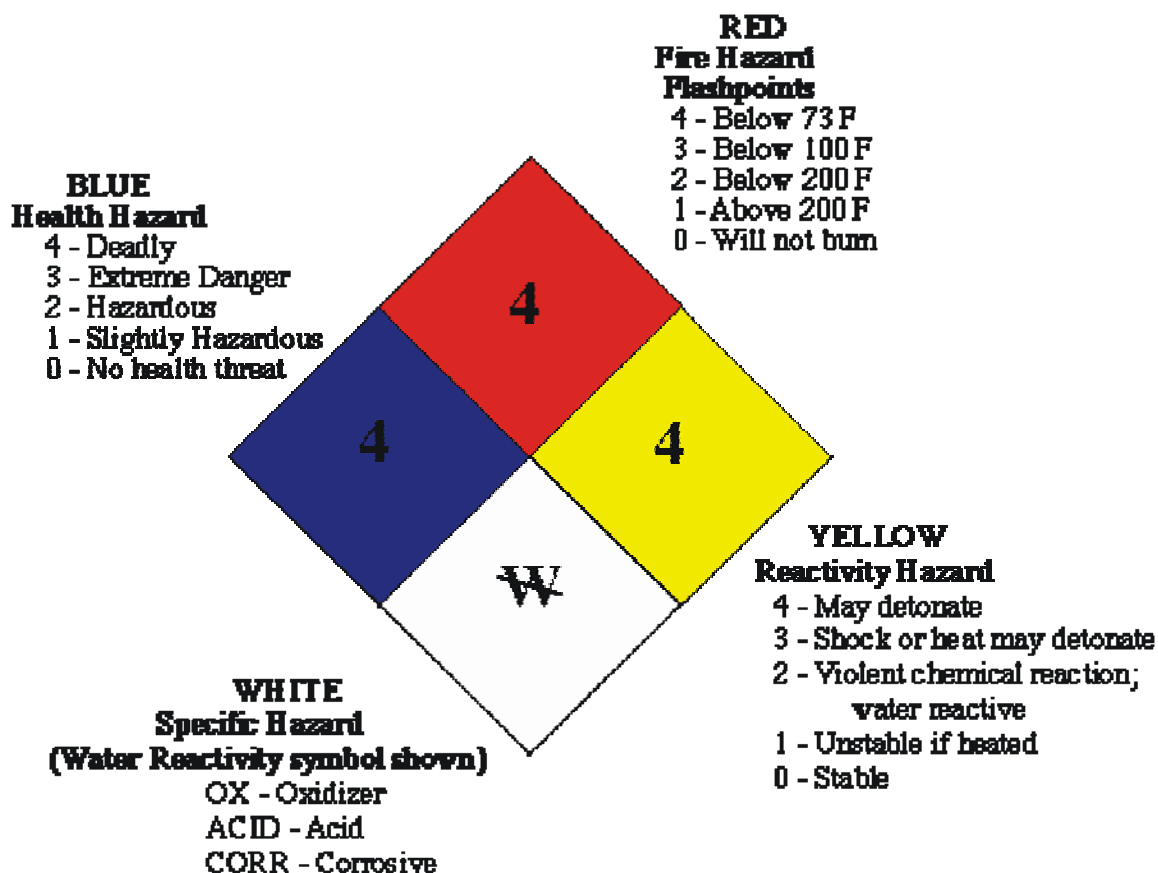


ATTACHMENT 2 - NFPA 704 RATING SYSTEM

Hazardous Materials Identification System

This widely used chemical labeling system was originally intended to provide basic information to fire fighting, emergency, and other personnel, enabling them to more easily decide whether to evacuate the area or to commence emergency control procedures. It was also intended to provide them with information to assist in selecting fire fighting tactics and emergency procedures.

The system is based on a diamond shaped marking that is divided into 4 regions, each assigned a color, and a numerical rating in each region. The regions depict health hazard, fire hazard, reactivity hazard and a region to indicate a reactivity with water, or other specific hazards if water reactivity is not an issue. An example of the marking follows.



Toxic materials

The health rating is intended to provide emergency response personnel with an idea of the degree of danger posed by a specific material. It addresses only issues related to acute, or short-term, exposures, and does not consider the danger posed from chronic or long-term exposures. The disadvantage of this system is that it does not address exposure to carcinogenic or mutagenic materials. The standard is concerned only with exposure as related to respiratory or contact incidents, since ingestion is an unlikely scenario for fire fighters. A 3 or a 4 will be assigned to any material that is classified as "Poison - Inhalation hazard" by the DOT.

Flammable materials

The flammability rating is dependent upon the ease of ignition of a material. Many materials will burn under one set of conditions but will not burn under any other condition. The numeric values are assigned based on the flashpoint (the minimum temperature at which a liquid gives off vapor in sufficient concentrations to allow the substance to ignite) of the material. The flashpoint supplies useful information regarding the degree of hazard. First, if the material has no flashpoint, it is not a flammable material. Second, if it has a flashpoint, it must be considered flammable or combustible. Also, the flashpoint can be used as an indication of susceptibility of ignition - lower flashpoints indicate increased susceptibility.

Reactive materials

The reactivity rating measures a material's susceptibility to violent reaction - detonation, polymerization, explosion, etc. The violence of the reaction may be increased by addition of heat or pressure, by mixture with other materials to form fuel-oxidizer combinations, or by contact with incompatible substances or contaminants. Because of the complexity of these types of reactions it is not straightforward to use a simple numeric scale to identify the degree of hazard. Rather these situations involving reactive materials must be evaluated individually. The numeric rating will be used to rank the ease, rate and potential quantity of energy that may be released.

Water Reactives and Oxidizers - Special Hazards

Materials which are unusually reactive with water are denoted with a "W" with a slash through it. The number in the yellow box will then indicate the degree of reactivity.

Materials which are capable of increasing the intensity of a fire by supplying fuel during fire situations will be labeled with the legend "OX" in this section of the diamond.

DEGREE OF HAZARD

The degrees of hazard shall be ranked according to the potential severity of the exposure as shown in the following table. Keep in mind that these ratings were devised to rate the degree of hazard in a fire situation. The disadvantage of this system, obviously, is that it does not address the hazard of day-to-day benchtop exposure in the chemical laboratory.

Health Hazard	Fire Hazard	Reactivity Hazard
<p>4 Materials which on very short exposure could cause death or major injury, even with prompt medical attention.</p> <p>3 Materials which on short exposure could cause death or major injury even though prompt medical treatment is given.</p> <p>2 Materials which on intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical treatment is given.</p> <p>1 Materials which on exposure would cause irritation but only minor residual injury, even if no treatment is given.</p> <p>0 Materials which on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.</p>	<p>4 Materials which will rapidly vaporize at atmospheric pressure and normal temperature, or which are readily dispersed in air and which will burn readily.</p> <p>3 Liquids and solids that can be ignited under almost all temperature conditions.</p> <p>2 Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur.</p> <p>1 Materials that must be preheated before ignition can occur.</p> <p>0 Materials that will not burn.</p>	<p>4 Materials which are readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures.</p> <p>3 Materials which in themselves are capable of detonation or explosive reaction but require a strong initiating source or which must be heated under confinement before initiation or which react explosively with water.</p> <p>2 Materials which are normally unstable and readily undergo violent chemical change but do not detonate. Also materials which may react violently with water or which may form explosive mixtures with water.</p> <p>1 Materials which are normally stable, but which can become unstable at elevated temperatures and pressures or which may react with water with some release of energy but not violently.</p> <p>0 Materials which are normally stable, even under fire exposure conditions, and which are not reactive with water.</p>