

HMIS – HAZARDOUS MATERIALS IDENTIFICATION SYSTEM

How many of us really know what we're looking at when we look at the zero (0) to four (4) rating on an HMIS chemical product label? The **OSHA Hazard Communications Standard (HCS)** requires all chemical products in the workplace to be labeled to warn of any hazards the product may present. The HMIS may be used to comply with the labeling requirements of the (HCS).



The standard which can be found in the **Code of Federal Regulations at 29 CFR 1910.1200** covering: Hazard evaluation, MSDSs, the written program, labels and employment training, first became effective Nov 1985.

The label is the familiar one that features three color-coded fields to indicate the health (blue), flammability (red), and reactivity (yellow) hazards associated with a material. Each of these fields contain a white block to be marked with a numerical hazard rating of from 0 to 4, to indicate the severity of hazard, zero being the least, 4 being the most hazardous. A fourth white field is used to identify protective equipment that must be used in order to handle the material safely. A white block within this field is coded with the letters from A-K and X to identify specific protective equipment. Additionally, a white space at the label top is used to insert the name of the chemical product being identified.

The problem that I have is that it's easy to identify with zero (0) when you see it next to the colored blocks identified with health, flammability and reactivity but what is the defined meaning of a one (1) or a two (2) or a three (3) or a four (4)? Based on the system employed it is easy to know that a value of zero (0) indicates that the chemical material presents essentially no hazard to the user. However, what are the relative dangers potentially faced when seeing a higher rating? Do you have the definitions in your head? For the majority of you, I think not.

So what are the definitions that are used to define the hazards presented by various chemical products? Let's review the definitions behind the 5 number hazard rating system.

Health Hazard (Blue)

Type of Possible Injury

- 0** **MINIMAL** – No chemical is without some degree of toxicity.
- 1** **SLIGHT** – Slightly toxic material. Will have one or more of the following characteristics:
 - *May cause irritation but only minor residual injury even without treatment.*
 - *Recognized innocuous materials when used with reasonable care.*
- 2** **MODERATE** – Moderately toxic material. Will have one or both of the following characteristics:
 - *Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical treatment is given.*
- 3** **SERIOUS** – Toxic material. Will have one or more of the following characteristics:
 - *May cause serious temporary or residual injury on short-term exposure even though prompt medical attention is given.*
 - *A known or suspected small animal carcinogen, mutagen or teratogen.*
- 4** **EXTREME** – Highly toxic material. Will have one or more of the following characteristics:
 - *On very short exposure could cause death or major residual injury even though prompt medical treatment is given.*
 - *A known or suspected human carcinogen, mutagen or teratogen.*

Flammability Hazard (Red)

Susceptibility of Material to Burning

- 0** **MINIMAL** – Will have one or more of the following characteristics:
 - *Will not burn.*
 - *Will not exhibit a flash point.*
 - *Will not burn in air when exposed at 1500 F (815.5 C) for 5 minutes.*
- 1** **SLIGHT** – Slightly combustible. Flash point at or above 200 F (93.4 C). Will have one or more of the following characteristics:
 - *Must be preheated for ignition to occur.*

- Will burn in air when exposed at 1500 F (815.5 C) for 5 minutes.
- 2 MODERATE – Combustible:** Flash point at or above 100 F (37.8 C) but below 140 F (60 C), or a flash point at or above 140 F (60 C) but below 200 F (93.4 C). Will have one or more of the following characteristics:
- Must be moderately heated or exposed to relatively high temperatures for ignition to occur.
 - Solids which readily give off flammable vapors.
- 3 SERIOUS – Flammable:** Flash point below 73 F (22.8 C) and boiling point at or above 100 F (37.8 C), or a flash point at or above 73 F (22.8 C) but below 100 F (37.8 C). Will have one or more of the following characteristics:
- Vaporizes rapidly and can be ignited under almost all ambient conditions.
 - May form explosive mixtures with or burn rapidly in air.
 - May burn rapidly due to self-contained oxygen.
 - May burn spontaneously in air.
- 4 EXTREME –** Extremely flammable. Flash point below 73 F (22.8 C) and boiling point below 100 F.

Reactivity (Yellow)
Susceptibility of Material to Burning

- 0 MINIMAL –** Normally stable material which is not reactive with water.
- 1 SLIGHT –** Will have one or more of the following characteristics:
- Normally stable material, which can become unstable at high temperature and pressure.
 - May react with water to release energy but not violently.
- 2 MODERATE –** Will have one or more of the following characteristics:
- Normally unstable and readily undergoes violent change but does not detonate.
 - May undergo chemical change with rapid release of energy at normal temperature and pressure.
 - May undergo violent change at elevated temperature and pressure.
 - May react violently with water.
 - Forms potentially explosive mixtures with water.
- 3 SERIOUS –** Will have one or more of the following characteristics:
- Can detonate or explode but requires a strong initiating force or confined heating before initiation.
 - Readily promotes oxidization with combustible

- materials and may cause fires.
 - Is sensitive to thermal or mechanical shocks at elevated temperatures.
 - May react explosively with water without requiring heat or confinement.
- 4 EXTREME –** Will have one or more of the following characteristics:
- Can explode or decompose violently at normal temperatures and pressure.
 - Can undergo violent self-accelerating exothermic reaction with common materials or by itself.
 - May be sensitive to mechanical or local thermal shock at normal temperatures and pressure.

Personal Protection (White)

Equipment that must be used in order to handle material safely.

- A Safety Glasses
- B Safety Glasses & Gloves
- C Safety Glasses, Gloves & Apron
- D Face Shield, Gloves & Apron
- E Safety Glasses, Gloves & Dust Respirator
- F Safety Glasses, Gloves, Apron & Dust Respirator
- G Safety Glasses, Gloves & Vapor Respirator
- H Splash Goggles, Gloves, Apron & Vapor Respirator
- I Safety Glasses, Gloves, Dust & Vapor Respirator
- J Splash Goggles, Gloves, Apron, Dust & Vapor Respirator
- K Air Line Hood or Mask, Gloves, Full Suit & Boots
- X Ask supervisor or safety specialist for handling instructions.

So now you have them, the definitions that you should have in mind (certainly within quick reference) whenever you look at an HMIS label and its 5 numerical hazard ratings of from 0-4.

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Ref: National Paint & Coatings Assn. <http://www.paint.org> and the U of Oregon <http://chemlabs.uoregon.edu/safety/HMIG.html>