Risk *versus* Hazard

"Risk" and "hazard" are two words that you may hear used interchangeably, but there is a very important difference in the meaning of these two little words.

WHMIS is a hazard-based classification system. Read on to learn what this means and the importance of doing a risk assessment for materials that have WHMIS hazards.

What is Hazard?

"Hazard" is the harm that something can cause. The harm may be physical injury, damage to health, property and/or the environment. Hazard is an intrinsic or "built-in" characteristic. In WHMIS we talk about hazardous materials, materials that can produce harm.

The WHMIS hazard classes (and possible harm they can cause) are:

- Compressed gas (exploding containers)
- Flammable and combustible material (fire)
- Oxidizing material (feeds a fire)
- Material causing immediate and serious toxic effects (e.g. death)
- Material causing other toxic effects (e.g. irritation, respiratory sensitization or cancer)
- Corrosive material (destruction of skin or metals)
- Dangerously reactive material (e.g. explosive reaction)

What is Risk?

"Risk" is the likelihood that a hazardous material will cause harm to people, property or the environment.

There are two factors that can increase or decrease risk:

1. The seriousness of the **hazard**. For example, one material may cause skin cancer, while another may cause skin irritation. Cancer is a much more serious effect than irritation.
2. How much **exposure** there is to the hazard. Exposure is the extent to which people or objects are subjected to the hazard. Exposure can be influenced by factors such as the length or duration of exposure (short *versus* long), how much exposure (high concentration *versus* low) and/or the route of exposure (inhalation *versus* skin contact *versus* ingestion).

It is commonly accepted that:

Risk = hazard x exposure

This is a simple way of saying that the degree of risk depends on both the nature of the hazard ***and*** the nature of the exposure. A material with a low hazard can pose a high risk if exposure is high. A material with a high hazard can pose less risk if exposure is low.

Controlling hazards by reducing risk

Consider the following example:

"Not Too Safe" is used as a rust inhibitor on metal piping. An ingredient of "Not Too Safe" can cause cancer if inhaled. This is the **hazard** of "Not Too Safe".

Company K8 has carefully evaluated various types of rust inhibitors and has determined that to get the performance they require, "Not Too Safe" is the best product. The supplier sells "Not Too Safe" in an aerosol container or as a liquid in a can, with brush application. The job can be done more quickly with aerosol application.

Should Company K8 buy this material as an aerosol or as a liquid?

This material should be purchased as a liquid. Spray application of the aerosol will result in more airborne exposure. With brush application, inhalation exposure will be reduced or eliminated. The company should also consider implementing engineering controls (e.g. ventilation) and providing respiratory protection for workers depending on how much and how frequently "Not Too Safe" is used.

If the company controls inhalation **exposure** to this material, they will minimize **risk**.

K8 should also continue to evaluate alternatives to "Not Too Safe" – with the ultimate goal of purchasing a less hazardous product.

Many chemicals have hazardous properties. A risk assessment considers the hazards, use and potential exposure to the product. Appropriate workplace controls can reduce or eliminate risk by reducing or eliminating exposure.

For additional information and resources, visit **www.whmis.gc.ca** and/or **www.ccohs.ca**

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