



WHMIS

Quick Facts

Workplace Hazardous Materials Information System



Dangerously Reactive Materials

Dangerously Reactive Materials are unstable or highly reactive materials that can undergo extremely hazardous uncontrolled reactions. They can cause explosions, fires or extreme heating, with potential for significant personal injury and property damage. These materials are not commonly used in workplaces because of their hazards. When used, they must be handled and stored in stringently controlled conditions. Specialized training and supervision is required.



Hazards of Dangerously Reactive Materials

This WHMIS Class covers various dangerous reactions including:

Decomposition – an unstable chemical breaks apart into simpler chemicals, e.g. nitroglycerin

Polymerization – a chemical reaction in which many small molecules (monomers) join together to form a large chain-like molecule (polymer), e.g. acrylonitrile, acrylates

Reaction with water to release a toxic gas, e.g. chlorosulfuric acid

Self-reaction when shocked or heated, e.g. metal azides in automobile airbags

In many cases the dangerous reaction can be controlled by adding a **stabilizer** or **inhibitor**. This is a chemical that is added in small amounts to the material to slow down or prevent an unwanted reaction such as polymerization.

Many dangerously reactive materials are also highly reactive with many other incompatible materials.

Many of these materials also possess other hazardous properties. For example, Methyl ethyl ketone peroxide is also oxidizing (WHMIS Class C), very toxic (Class D1A), and corrosive (Class E).

Working Safely with Dangerously Reactive Materials

Dangerously reactive materials require extreme caution during handling and storage because of the ease with which a hazardous reaction can start. You must know about conditions that could lead to instability or reactions [see the *Stability* and *Reactivity* section of the Material Safety Data Sheet (MSDS)] and make sure that they never occur.

UNDERSTAND all of the hazards (e.g. toxicity, corrosivity, flammability) associated with the material and how to use it safely.

CONSULT the MSDS for specific information about the proper handling and storage of the material.

KNOW the appropriate emergency response procedures **prior** to using these materials (e.g. fire, spill, leak)

ENSURE that appropriate firefighting and spill control equipment is readily available.

Engineering Controls

Adequate engineering controls are essential to ensure safe working conditions, prevent emergencies and lessen the consequences of an accident. Engineering controls may include:

- temperature and humidity control;
- isolation and enclosure, possibly including blast shields;
- ventilation.

ENSURE that all engineering controls specified by the manufacturer are in place and working properly.

Workplace Procedures

USE the smallest amounts possible.

ELIMINATE ignition sources (sparks, open flames).

KEEP containers away from heat and out of direct sunlight. Avoid sudden temperature changes.

KEEP away from all incompatible materials. Consult the MSDS for specific details.

STORE container according to manufacturer's recommendations, including temperature range.

STORE in the shipping container or other approved, labeled container.

LABEL containers with date opened and disposal date.

AVOID prolonged storage.

INSPECT containers regularly for signs of bulging, corrosion, colour change, etc.

CHECK stabilizer/inhibitor levels regularly and replenish as necessary or as specified by the manufacturer.

PRACTICE good housekeeping and keep work areas clear of incompatible materials.

DO NOT USE material if physical characteristics and appearance do not match the MSDS or if material is of unknown age

DO NOT RETURN any used or unused material to the original container. Trace amounts of a contaminant might start a dangerous reaction.

DO NOT REUSE empty containers as they may contain hazardous residue.

Plan and prepare for emergencies...

Emergencies involving dangerously reactive materials can happen very quickly and have catastrophic effects.

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

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