



Automotive Industry Action Group

OHS-1

Guideline for Hazardous Material Storage

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Guideline for Hazardous Material Storage



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Guideline for Hazardous Material Storage

FOREWORD

A number of regulations and guidelines exist for the storage of flammable and combustible materials in buildings; however, there is little direction for storing materials with hazards other than flammability. Similarly, guidelines for storing hazardous materials during transportation are available that cover various hazards such as reactivity and compatibility, but there are very few rules governing material stored in facilities, even though the same concerns of reactivity and compatibility apply. Recent publications acknowledge the concern over chemical storage. The U.S. Chemical Safety and Hazard Investigation Board reports that 22 percent of the serious incidents they studied involved storage equipment (including designated storage areas), and 10 percent involved bulk storage drums. Furthermore, 46 percent of incidents about which causal information is known are attributed to inadequate procedures for storing / handling reactive chemicals, and 27 percent are attributed to inadequate training for storing / handling reactive chemicals. In one specific example, French investigators attributed a massive explosion in a chemical plant in Toulouse to the negligent storage of incompatible materials.

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Guideline for Hazardous Material Storage



INTRODUCTION

Purpose

This document provides guidelines for plants and depots to efficiently and safely segregate hazardous materials. The goal of the document is to protect people, property, the environment, and company assets by minimizing the risk of fires, explosions, and hazardous releases resulting from improper storage. As a result of employees using these guidelines, it is intended that packages containing hazardous materials that might react dangerously with one another will not be stored next to each other or in a position that would allow a dangerous interaction in the event of a leakage.

In addition to this Guideline (OHS-1), the AIAG Hazardous Material Storage Work Group has produced an associated video. This Hazardous Material Storage Introduction Video (OHS1-V) is meant to emphasize the importance of taking this guideline serious and following the recommended procedures herein to prevent personal injury and loss of property. This video is available through AIAG and each hard copy of OHS-1 will have the video attached. It is recommended that users of this guideline view the video before doing a deep dive in trying to use and implement the best practices highlighted in this guideline.

Benefits

Potential benefits of using this guideline include the following:

- Reduced possibility of having an unintended chemical reaction
- Reduced possibility of having a fire
- Reduced possibility of having an explosion
- Reduced possibility of having a chemical release
- Reduced accident liability
- Reduced severity of damage
- Reduced insurance costs
- Improved compliance with DOT HAZMAT Security plan
- Improved workplace organizational processes such as “5S,” “foot printing,” etc.
- Better inventory control

Sources

Although a number of sources were used, this document is developed for the most part from the Hazardous Materials Regulations of the Research and Special Programs Administration, U.S Department of Transportation. It is based on Title 49 section 174.81 of the Code of Federal Regulations (49 CFR 174.81) "Segregation of Hazardous Materials," 49 CFR 175.78 "Stowage Compatibility of Cargo," 49 CFR 176.83 "Segregation," and particularly on 49 CFR 177.848 "Segregation of Hazardous Materials." It was modified to account for additional classifications from other regulations and for storage application rather than transportation.

Scope

This document does not classify materials but rather provides for the application of existing classification schemes. It assumes that the materials in question are classified and that such information is available from MSDS, labels, shipping documents, etc. It is intended that persons responsible for safety, industrial hygiene, environmental affairs, production control, material handling, or similar tasks will use this guideline to determine a safe way to store and, where necessary, segregate hazardous material.

While these guidelines can apply to chemical facilities, they are aimed at any industry that stores chemicals, including obvious chemicals such as sulfuric acid but also products like paints, fertilizers, and cleaners that may not always be thought of as "chemicals." The guidelines apply to materials in portable containers such as drums, totes, boxes, cans, cartons, etc. in storage. Most importantly, they apply to chemical mixtures as well as discrete chemicals. The guidelines *do not* address bulk goods ("piles" of materials) large stationary containers (bulk tanks), or laboratory quantities.

These guidelines apply to solids, liquids and gases that are "hazardous materials." "Hazardous material" is used as a generic "common sense" term, not a regulatory term, but would include materials defined by various regulations as "hazardous materials" (US-DOT), "dangerous goods" (Canadian MOT, UN-transportation), "hazardous substance" (US-EPA, US-CPSC), "extremely hazardous substance" (US-EPA), "toxic substance" (US-EPA), hazardous waste (US-EPA, "hazardous chemical" (US-OSHA), and others. Such materials would have hazard properties such as being flammable, being combustible, an oxidizer, reactive, a compressed gas, explosive, radioactive, infectious, toxic, or corrosive. A given material may have more than one hazardous property. Subsidiary classes should also be considered when determining material storage and segregation. Materials may have (regulatory) exemptions or alternative classifications such as "ORM" (Other Regulated Material) or "consumer product." It is intended that materials be stored by their original classification, without regard to exemptions.

Note that these guidelines address only some of the requirements for storage. Additional regulations, standards, and guidelines from federal, state, and local agencies and consensus groups have been published addressing chemical / hazardous material storage. Those documents appropriate to your facility should also be followed.

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LIMITATIONS IN THE SCOPE OF THIS DOCUMENT

Waste Chemicals

These guidelines are best used for the storage of chemical products that are used in plant or production facilities. They can be applied to waste chemical products generated by the facility; however, the storage of waste materials is subject to additional regulations (i.e., RCRA). Additional confounding factors related to chemical waste storage are the following:

- Waste chemical products are harder to classify as to their hazards because they are generated from a variety of chemical processes and can therefore contain a number of hazards.
- Waste chemical products need to be properly identified through chemical analysis before being classified as to their hazards.
- Chemical waste products have other regulations governing the time, amount, and location that they can be stored in a facility before being removed by a licensed waste hauling company.
- Chemical waste products have specific requirements as to packaging containers, etc. These specific requirements also must be known and followed and these products are, therefore, not necessarily packaged in a manner similar to incoming raw materials.

For guidance in storing waste chemical products, it is recommended that you contact your facilities environmental manager or environmental consultant.

Toxic Materials Storage

Toxic materials represent a broad range of toxic levels, and not all require segregated storage. Materials with moderate or chronic toxicity generally do not present a severe hazard in storage. However, it is recommended that cautionary measures be implemented to minimize employee exposure. Acutely hazardous materials that are volatile (toxic gases or high vapor-pressure toxic liquids) are the materials of most concern. Consequently, solids, materials with special toxicity (carcinogens, etc.), and materials of lesser toxicity do not usually require segregation. When classifications of toxicity such as OSHA's "toxic" and "highly toxic" are used, additional investigation is almost always needed. Where there is doubt, it is prudent to segregate the more toxic groups.