

Identifying and Regulating Hazardous Materials in the United States

According to the U.S. Department of Transportation, for transportation purposes, the term “Hazardous Material” or “Dangerous Goods” means: “... a substance or material, which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated. The term includes hazardous substances, hazardous wastes, marine pollutants, and elevated temperature materials as defined in... 49CFR171.8.”

Hazard Descriptions

There are four elements that make up a hazmat description:

1. *Proper Shipping Name:* Frequently shipped hazardous materials are listed in the regulations by a specific name, such as Sulphuric Acid. Less frequently shipped hazardous materials are listed by a generic name to categorize the material by characteristic, such as “Flammable Solids, n.o.s.,” by use, such as “Paint Related Material,” or by family, such as, “Acids, n.o.s” (Not Otherwise Indicated).
2. *Hazard Classes:* Hazardous materials or “hazmats” are divided into nine categories known as Hazard Classes. A material may meet the criteria for more than one hazard class; but since it can only be assigned to one hazard class, additional hazardous properties must be identified by labels.

Each hazard class is assigned a number for ease of international identification. The nine Hazard Classes are:

- 1 Explosive
- 2.1 Flammable Gas
- 2.2 Non-Flammable Gas
- 2.3 Poison Gas
- 3 Flammable Liquids
- 4.1 Flammable Solids
- 4.2 Spontaneously Combustible
- 4.3 Dangerous When Wet
- 5.1 Oxidizers
- 5.2 Organic Peroxide
- 6.1 Poison/Toxic Liquids & Solids
- 7 Radioactives
- 8 Corrosive Materials
- 9 Miscellaneous (e.g. dry ice) and ORM-D (Other Regulated Materials - Class D) Consumer Commodity

3. *Identification Number:* Commonly referred to as “the UN Number,” each proper shipping name has a unique 4-digit number preceded most often by the letters UN and sometimes by the letters NA and ID. The purpose of this number is universal emergency response identification. For example, the identification number for Sulphuric Acid is UN 1830. With the exception of ORM-D Consumer Commodity materials, every hazmat has its own identification number, and this identifier is required on hazmat packagings and in shipping paper descriptions.
4. *Packing Group:* Along with the aforementioned proper shipping name and identification number, with few exceptions, most chemicals are assigned a Packing Group which denotes degree of hazard. Packing Groups are noted as either I, II, or III, with Packing Group I representing the most severe danger and packing Group III, the least. The packing group is only required to be shown on the shipping paper; however, it affects package selection.

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How Regulations Are Adopted

With a worldwide movement towards harmonization to facilitate commerce and ensure safety and consistency, the international regulatory agencies that govern air (ICAO/IATA) and ocean (IMO) transport incorporate United Nations (UN) recommendations as the basis for their shipping requirements. Likewise, most nations utilize the UN Recommendations as the basis for their own surface transportation requirements for shipment within their own boundaries, although variations exist within each country.

The United Nations Committee of Experts establishes classification and testing criteria and proposes requirements designed to ensure the safe and legal transport of hazardous materials. The Committee's recommendations do not have force of law unless adopted by the country of origin.

Each nation's Competent Authority has the option of adopting these requirements as part of its own transportation regulations. Enforcement of the regulations is by each country's respective regulatory agency.

Besides the U.S. Department of Transportation, international export shipments are also governed by:

- Transport of Dangerous Goods (TDG) (Canada)
- Mexican Dangerous Goods Transport (Mexico)
- European Rail & Road Requirements (RID/ADR)
- International Civil Aviation Organization (ICAO - Air)
- International Air Transport Association (IATA Airline Tariff)

Carriers, such as United Parcel Services (UPS), may also issue their own guidelines which may pose additional restrictions.



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