
Part II: Dangerous Goods
Proper Classification of Specimens

 **Transporting Dangerous Goods**

Dangerous Goods: Proper Classification of Specimens

Hazard Classes

- There are nine hazard classes—two of these are often used by laboratories:

Class 1: Explosives

- 1.3 Explosives
- 1.4 Explosives

Class 2: Gases

- 2.1 flammable gas
- 2.2 Non-Flammable, Non-Toxic gas
- 2.3 Toxic (poison) gas

Class 3: Flammable Liquids

Class 4: Flammable Solids

- 4.1 Flammable solid
- 4.2 Spontaneously combustible
- 4.3 Dangerous when wet

Class 5: Oxidizers and Organic Peroxides

- 5.1 Oxidizers
- 5.2 Organic Peroxides

Class 6: Toxic (poisonous) and Infectious Substances

- 6.1 Toxic Substances
- 6.2 Infectious Substances

Class 7: Radioactive

Class 8: Corrosive

Class 9: Miscellaneous Dangerous Goods

First, Dangerous goods must be classified into the correct hazard class:

- There are 9 hazard classes. If a hazard class is wide in scope, it may be divided into additional divisions.
- For training purposes, you should know all 9 hazard classes exist. But generally, you will only use 2 of these hazard classes.
- Infectious substances fall under Class 6, Division 6.2. Dry ice falls under Class 9, Miscellaneous.
- When preparing a specimen for shipping, you must know the hazard class to complete the packaging and documentation correctly.

Packing Groups

- Packing groups within a hazard class indicate the degree of danger:
 - **Packing Group I** – Great Danger
 - **Packing Group II** – Medium Danger
 - **Packing Group III** – Minor Danger
 - Infectious and biological specimens are not assigned to a packing group

In addition to the 9 hazard classes most hazardous substances are further assigned to a packing Group

- The 3 packing groups indicate the degree of hazard the substance presents.
- For training purposes, you should know the packing groups exist, however when shipping medical specimens you will not need to refer to a packing group, as neither 6.2 Infectious substances, nor Biological Substance Category B are assigned to a packing group.
 - You must specify a packing group if you ship any type of acid, corrosive, or flammable.

Infectious Substances

- Infectious substances (Class 6, Division 6.2) are divided into two categories:
 - Category A, Infectious Substance Affecting Humans
 - Category B, Biological Substance
- Rules for packaging and shipping are determined by whether a substance is Category A or Category B

Class 6, Division 6.2 Infectious substances are divided into two categories:

- Category A, Infectious
- Category B, Biological Substance
- Rules for packaging and shipping are determined by how an infectious substance is categorized

Category A Infectious Substances

- **Category A** is an infectious substance transported in a form that, when exposure to it occurs, is capable of causing permanent disability, life-threatening or fatal disease to humans or animals.
- Identified as:
 - UN2814, Infectious Substance, Affecting Humans in both 49 CFR and in IATA
 - Packing Instruction 620 in IATA (table 3.6.2.2.1)
 - Paragraphs 173.134 and 173.196 in 49CFR

Category A Infectious substances:

• **Category A** is an infectious substance transported in a form that, when exposure to it occurs, is capable of causing permanent disability, life-threatening or fatal disease to humans or animals.

(Note: An exposure occurs when an infectious substance is released outside of the protective packaging, resulting in physical contact with humans or animals.)

- 49 CFR and IATA require a Hazard Class 6 label
- IATA packing instruction 620
- The proper shipping name is “Infectious substance Affecting Humans”

Category B Biological Substances

- **Category B** is an infectious substance, referred to as a biological substance, that does not meet the criteria for Category A.
- Identified as:
 - UN3373 in 49 CFR
 - Packing Instruction 650 in IATA (table 3.6.2.2.2.2)
 - Paragraphs 173.134 and 173.199 in 49CFR
 - Biological substance, Category B

Category B Infectious substances:

- **Category B** is an infectious substance, referred to as a biological substance, that does not meet the criteria for Category A.
- 49 CFR and IATA require a UN3373 marking
- IATA packing instruction 650
- The proper shipping name is “Biological substance, Category B”

Category A & Category B Examples

- Examples of Category A and Category B substances:

Category A, Infectious

- Bacillus anthracis (cultures only)
- Brucella abortus (cultures only)
- Hepatitis B virus (cultures only)
- Herpes B virus (cultures only)

Category B, Biological

- HIV
- Hepatitis
- West Nile
- SARS

How do you know if a substance is Category A, Infectious or Category B, Biological?

- It is the responsibility of the laboratory staff to classify the specimen.
- This slide lists some examples of Category A, Infectious or Category B, Biological examples.

Category A Examples

- Examples of Category A, Infectious substances:

<i>Bacillus anthracis</i> (cultures only)	Japanese Encephalitis virus (cultures only)
<i>Brucella abortus</i> (cultures only)	Junin virus
<i>Brucella melitensis</i> (cultures only)	Kyasanur Forest disease virus
<i>Brucella suis</i> (cultures only)	Lassa virus
<i>Burkholderia mallei</i> - <i>Pseudomonas mallei</i> - Glanders (cultures only)	Machupo virus
<i>Burkholderia pseudomallei</i> - <i>Pseudomonas pseudomallei</i> (cultures only)	Marburg virus
<i>Chlamydia psittaci</i> - avian strains (cultures only)	Monkeypox virus
<i>Clostridium botulinum</i> (cultures only)	<i>Mycobacterium tuberculosis</i> (cultures only)
<i>Coccidioides immitis</i> (cultures only)	Nipah virus
<i>Coxiella burnetii</i> (cultures only)	Omsk hemorrhagic fever virus
Crimean-Congo hemorrhagic fever virus	<i>Poliovirus</i> (cultures only)
Dengue virus (cultures only)	Rabies virus
Eastern equine encephalitis virus (cultures only)	<i>Rickettsia prowazekii</i> (cultures only)
<i>Escherichia coli</i> , verotoxigenic (cultures only)	<i>Rickettsia rickettsii</i> (cultures only)
Ebola virus	Rift Valley fever virus
Flexal virus	<i>Russian spring-summer encephalitis virus</i> (cultures only)
<i>Francisella tularensis</i> (cultures only)	Sabia virus
Guanarito virus	<i>Shigella dysenteriae type 1</i> (cultures only)
Hantaan virus	<i>Tick-borne encephalitis virus</i> (cultures only)
Hantaviruses causing hantavirus pulmonary syndrome	Variola virus
Hendra virus	Venezuelan equine encephalitis virus
Hepatitis B virus (cultures only)	<i>West Nile virus</i> (cultures only)
Herpes B virus (cultures only)	<i>Yellow fever virus</i> (cultures only)
Human immunodeficiency virus (cultures only)	
Highly pathogenic avian influenza virus (cultures only)	

Category A: An infectious substance transported in a form that, when exposure to it occurs, is capable of causing permanent disability, life-threatening or fatal disease in otherwise healthy humans. These specimens are assigned to UN2814. Indicative examples of Category A Infectious Substances are listed in IATA table 3.3.D.

The proper shipping name for Category A is “Infectious Substance, affecting humans.” When the infectious substances to be transported are unknown but suspected of meeting the criteria for inclusion in Category A, the technical name is “Suspected Category A Infectious Substance.” Per IATA regulations, if there is doubt as to whether or not a substance meets the criteria, it must be included in Category A.

This slide lists Category A, Infectious examples. However, this list is not inclusive.

Exempt Human Specimens

These are specimens that do not contain infectious substances, substances containing micro-organisms that are non-pathogenic to humans, and substances in a form that any present pathogens have been neutralized or inactivated.

Examples include:

- Dried blood spots
- Blood or blood components that have been collected for the purpose of transfusion
- Blood or urine tests to monitor cholesterol levels, blood glucose levels, or hormone levels
- Tests conducted for insurance or employment purposes to determine the presence of drugs or alcohol
- Pregnancy tests

The classification of "Exempt Human Specimen" applies only to shipments by aircraft. The US Department of Transportation considers these samples to be outside of their regulations and thus does not assign them a classification at all.

Cultures

- **Cultures** are the result of a process by which pathogens are intentionally amplified or propagated in order to generate high concentrations. As such, the risk of infection is increased if exposure occurs. This definition does not include cultures intended for diagnostic and clinical purposes.
- Cultures can be classified:
 - Category A, Infectious
 - Category B, Biological Substance

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Cultures can be classified as Category A, Infectious or Category B, Biological Substance:

- Any culture intended for the intentional generation of pathogens as well as any culture shipped for identification purposes must be shipped as Category A, Infectious.
- Cultures can be shipped as Category B, Biological if they aren't intended for the intentional generation of pathogens and can't be found in the Category A list in the IATA regulations.